



CASE STUDY

AUTONOMOUS VEHICLE ASSET MANAGEMENT SYSTEM FOR HEAVY INDUSTRY SOFTWARE PROVIDER

Resulted in a safer, smarter, and productive work site

Client Background

Heavy industries such as construction and mining, among others, have traditionally been highly labor-intensive. Even after the arrival of large vehicles and robust yet intricate machinery to reduce this effort, this line of work has typically posed significant risk to the safety of their operators as well as other people onsite. Aside from this, efficient allocation of these vehicles and machinery is not easily scalable using traditional approaches.

An elegant and effective solution to both problems is to make vehicular and mechanical assets autonomous and remote controlled. This would result in fewer people spending less time in dangerous sites and better insights about the utilization and allocation of these assets. However, most machines and vehicles used in such environments are from before the Internet of Things (IoT) era. Further, the harsh environments these assets usually operate in require a degree of robustness that far exceeds comparable alternatives used in other industries.

The client provides a software platform which is used by their clients in heavy industries to convert industrial assets, specifically construction and mining fleets, from standalone and independent entities into connected and autonomously operated machines. This software platform supports real-time monitoring of both autonomous and non-autonomous assets to provide a more detailed and complete view of equipment utilization, helping analyze and improve overall productivity at a job site.

KEY BENEFITS

- Improved analysis of asset utilization and resulted in distributed workload between assets efficiently.
- Enhanced asset data collection in terms of quality and quantity due to increased monitoring touchpoints.
- Resulted in ease of asset usage with the end-to-end solution.

The Objective

Before working with Xoriant, this solution had been effectively implemented in many instances, but the client required some upgrades to facilitate deployment at a bigger scale. Moreover, the client wanted to build and deploy a next-generation autonomous vehicle asset management system to fulfil increasing need across heavy industries for the following:

- Safer work environment for site workers
- Work sites no longer requiring human entry
- Streamlined, round-the-clock operations
- Smarter, more productive, and more cost-effective solution

Xoriant Solution | Key Contributions

With deep expertise in artificial intelligence (AI) and UI/UX design, Xoriant was chosen to design and develop a complete end-to-end solution for the client. Our key contributions for the client include:

- Designing an advanced user interface (UI) framework for intuitive yet detailed understanding
- Enabling support for real-time asset monitoring through mapping and localization
- Site planning, vehicle insights, fleet dispatch, real-time progress monitoring and job completion tracking for more detailed understanding of equipment utilization and overall site productivity
- AI-based intelligent operational planning of autonomous vehicle usage to increase efficiency and speed
- Visual dashboarding and data export functionality for better insights from data
- Onsite as well as cloud-based technology for better flexibility

KEY BENEFITS

- Achieved higher security and accessibility due to the use of hybrid technology.
- Improved safety ratings for onsite workers with the use of this vehicle asset management system.

Technology Stack

**Docker | Kubernetes | MERN stack (MongoDB, Express, React, NodeJS) | Leaflet.js | GraphQL
ELK Stack | Rabbit MQ | AWS (Kinesis Data Streams, Video streams, S3 storage) | Ubuntu
Linux OS**



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