

A mining tracking system: smart IoT solution for a mining industry

⚠ Challenge

Apadana Kavosh, a major company from the Middle East, specializes in mine exploring, extracting, and mineral exporting, and has a fleet of 1,000 vehicles operating on sites and about.

The client had a full list of weak spots, lack of control and data or reports. The company needed to optimize mining equipment tracking for over 100 vehicles by applying smart IoT mining solutions. Here are the aspects they needed to improve, implement, or integrate:

- better distribution of dump trucks to excavators, as well for drilling, road construction, and sprinkling water on roads, and optimizing vehicle routes;
- maintenance and repair management as Apadana Kavosh suffered from high costs in these areas;
- more efficient management of parts and materials in warehouses;
- acquiring a full data collection on the fleet operations both for daily tasks control and to base their strategic decisions on;
- controlling the drivers to prevent violations, decrease vehicle wear and tear and follow the safety protocols, as well as managing drivers' work time;
- controlling instant and total fuel consumption to optimize it, decrease costs and prevent fuel theft.

This is just to name a few of the issues: there were a lot of points for automation, digitization and control in the client's vast business which would lead to the company's growth leap. All of them could be sorted out and positively affected with a reliable mining vehicle tracking system with advanced features and capabilities.

🔧 Solution

The Wialon partner [Giti Costar Rahbord \(GGRCO\)](#) has offered their services and implemented a project that fully covers the client's need in advanced mining GPS systems and brings all that IoT offers for a mining industry.

Hardware

First, the service provider installed [GalileoSky 7X Wi-Fi](#) trackers, fuel sensors, and a new tire pressure monitoring system on the vehicles. This base was supported by a bunch of additional equipment such as contactless readers to collect even more data on the fleet performance.

Software

The data from the installed devices and the CAN-BUS (which was additionally decoded as the vehicle brand used onsite had a proprietary protocol not compliant with the global standards) is sent to [Wialon, the GPS tracking system](#). This data is shown, monitored and used in many ways:

- mining location tracking and more: the customer now has access to real-time vehicle location, CAN-BUS parameters, data about extraction in the field, views reports on carried weight, traveled distance and time, number of cycles, and other details. Now mining equipment tracking gives the **360 view of the fleet operations**;
- **Eco-Driving** is used for controlling drivers' violations based on parameters from 3D accelerometers, CAN-BUS, weight, tire pressure and temperature; this allows not only to reduce amounts spent on maintenance and repair, but also contributes to better driving on sites, avoiding accidents and adding safety to the workplace for drivers and other staff;
- **controlling the tire pressure** plays a huge role in saving money on spare parts, maintenance works and such, which is particularly important for expensive mining equipment and its costly spare parts.

GGRCO delivered a custom mining tracking system on top of the telematics data that consists of several components:

- **Manual and automatic dispatch management system.** The application ensures more efficient and controlled tracking and dispatching of mining machines for drilling, extraction and road construction. In addition, route optimization was performed since previously there was no map of mine sites;
- **Planning and executing maintenance** to reduce idle time and increase the vehicle lifespan;
- **Warehouse management** of parts and materials for proper inventory tracking;
- A **drilling dispatching** module with the possibility of monitoring equipment, measuring and controlling drilling patterns and drilling depth on mines;
- **Road construction dispatching** to manage temporary roads and road repair.

Integration of these system components was offered for deeper automation of mining operations: for example, maintenance and warehouse modules are integrated with each other as maintenance activities utilize spare parts and materials stored in warehouses.



How IoT for the mining industry works: the client's site with vehicles controlled by the implemented mining tracking system

During the project implementation, the service encountered and successfully overcame the typical yet difficult points of working with the smart mining solutions and IoT in the mining industry, such as lack of electricity or network coverage, harsh environments and weather conditions, as well as global semiconductors shortage and COVID-19.

The service provider offers customer support during the working hours and has conducted training for customer's employees, including specific sessions on hardware troubleshooting. This ensures the client's vast staff is well-prepared for using the mining IoT solution to its most.

🏆 Results

The smart mining solutions provided by GGRCO have benefited the client, increasing the overall efficiency and performance among all mine facilities, boosting service technician productivity, safety, and decreasing fuel costs. The implemented mining tracking system is a perfect example of utilizing IoT for the mining industry and has allowed the client to get a number of vivid improvements and operate on a new level:

✔ Increased performance

Thanks to the mining tracking system and its functionality, the company has boosted operational efficiency and productivity, improved mining equipment tracking, and automated processes, unleashing workers' resources for other tasks, if compared to the pre-project situation.

✔ One software for all purposes

The client has got total control over all mining operations in a single piece of software – a cost-effective smart mining solution.

✔ New level of planning

Based on past reports and results and overall visibility, the company now can improve all planning and scheduling operations for the future, ensuring efficient growth and making more of the optimized resources.

✔ Advanced fuel control

Thanks to mining equipment monitoring features and controlling fuel consumption, a clear picture of fuel traffic is no longer a desired result, but a reality. With a great potential for further growth!

✔ Lowered costs

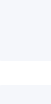
The mining tracking system allows the customer to save on a number of processes, from fuel consumption and maintenance to decreasing idle time, automating activities and increasing the equipment lifespan thanks to current technology adoption.

Company profile

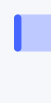
🏆 **IoT project of the year nomination:** Construction and demolition

Industry: Mining and processing

Solutions

 Wialon

Hardware

 Galileosky 7x

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