Case Study

Gyrfalcon IntelliEdge Solutions
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Remote Monitoring Solutions for Heavy Machinery with IoT and Immobilisation Control Systems

Problem Statement

Fleet owners of Heavy machinery equipment face significant challenges in themanagement of their fleet, primarily due to the lack of granular, real-time usage data of individual equipment and machinery. Data requirement include information on usage, precise location tracking, and detailed operational hours. IoT enablement of the equipment can provide the data and transparency required for the utilisation analysis and optimisation of equipment use. IoT-enabled monitoring solutions address these challenges by providing real-time visibility, geofencing capabilities, and location-based alerts. Additionally, remote immobilization of machinery—a particularly crucial feature for rental operations—can prevent unauthorized use and ensure compliance with rental agreements.Beyond location tracking and access control, the integration of advanced sensors (e.g., fuel sensors and CAN controller-based data systems) enhances fleet planning, maintenance scheduling, and overall operational efficiency.Thus, the critical step in IoT-based fleet management is implementing a real-time monitoring solution that captures usage hours, location data, and key performance insights, enabling data-driven decision-making for optimized equipment utilization.

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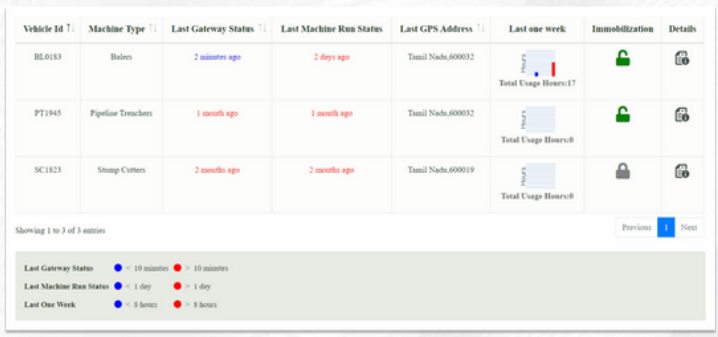
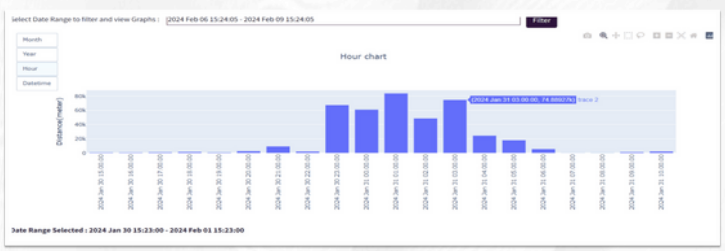
HEAVY MACHINERY CASE STUDY

Challenges Where IoT Can Make A Difference

- Location Tracking – Monitor equipment across large or remote job sites.
- Network Issues – Limited cellular access in poor coverage or dense forest areas.
- Machinery Misuse – Overuse, unauthorized subletting, and operation beyond rental periods.
- Lack of Predictive Maintenance – No data-driven insights for proactive upkeep.
- Fuel Pilferage – Unauthorized fuel consumption causing losses.
- Battery Backup – Need for independent power to ensure uninterrupted monitoring.
- Reactive Maintenance – Unplanned breakdowns leading to downtime and high repair costs.
- Remote Control Limits – Inability to shut down equipment remotely during emergencies.
- Mobile Alerts – Need Geo-fencing, motion detection particularly during non-operational hours, and theft alerts.
- User-Friendly Dashboards – Mobile & web-based dashboards with role-based access.
- Fleet Management Dashboard – High-level summary of location, utilization, and usage patterns.





Solution Implementation

We deployed an IoT-based heavy machinery monitoring and control system to enhance visibility, efficiency, and operational control. The solution featured real-time location tracking over a cellular network, ensuring seamless monitoring across job sites. Automated usage hour tracking optimized equipment utilization and enabled predictive maintenance scheduling, reducing downtime. Remote control capabilities allowed operators to start, stop, or restrict equipment functionality, enhancing security and flexibility. A centralized IoT dashboard provided real-time analytics and anomaly alerts, empowering data-driven decision-making and improving overall fleet management.

Opportunities and Next Steps

- Integration of CAN controllers and fuel monitoring sensors to gather deeper insights into equipment performance and fuel consumption.
- Capturing machinery maintenance data and service downtime to enable predictive analytics, minimizing unexpected failures and optimizing maintenance schedules.
- Comprehensive Fleet Management solutions that integrate rental rates, operational expenditures, financial projections, and workforce planning for better strategic decision-making.