

Heavy Industrial Equipment Monitoring



PERSISTENT

THE BUSINESS PROBLEM: EFFICIENT DEPLOYMENT & OPERATION

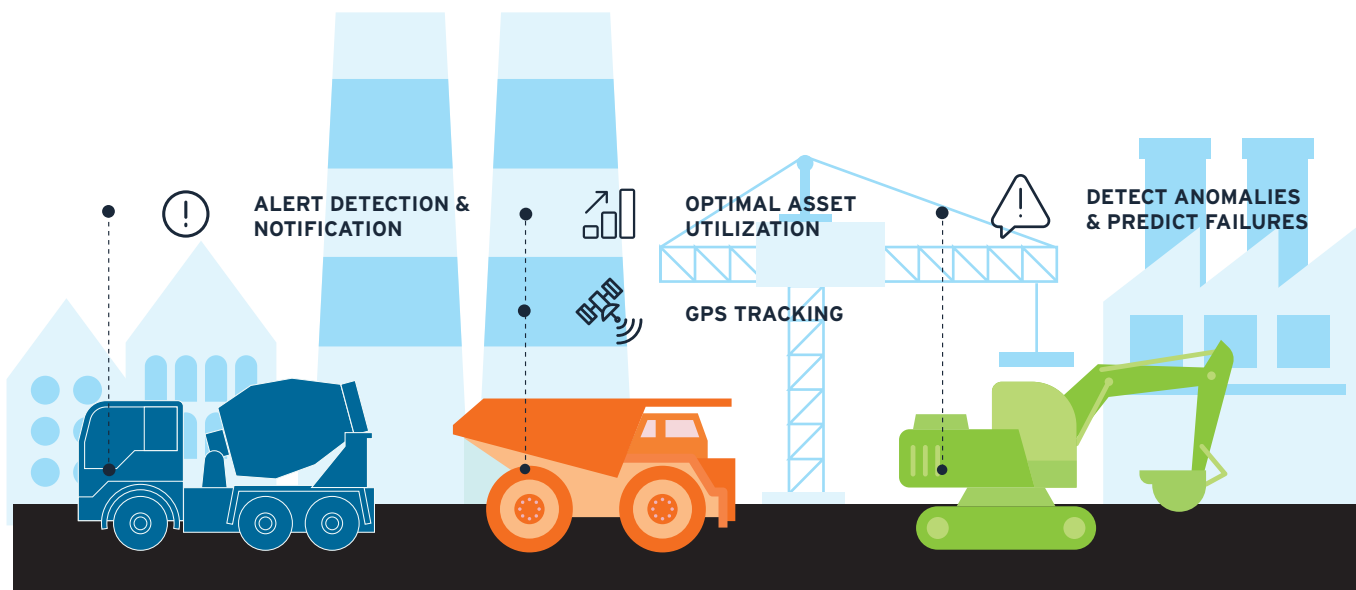
Firms in a wide array of industries (e.g. quarrying/mining, construction) rely on expensive equipment operating in extreme environments. Owners and operators of such equipment are challenged to optimize their CAPEX and OPEX (e.g. fuel, electricity) and reduce catastrophic breakdowns.

Agencies supplying heavy industrial equipment seek to minimize leakage of revenue as below:

- Scheduling complexities or logistics problems can delay the return of equipment after the last day of the rental period, and customers frequently continue using the equipment beyond the contracted period. Such extra usage can be monetized, through usage tracking.
- Delays in the delivery of heavy equipment to the intended customer location leads to customer dissatisfaction and potentially revenue impact. Consistent, on-time delivery usually leads to repeat customer business.
- Unscheduled maintenance-related downtime of the heavy equipment results in a potential loss of revenue. Performance monitors can help avoid such situations.

Persistent Systems has developed a solution that covers

- **Tracking Equipment Usage from Delivery to Return:** Ensures compliance with rental agreements & raises alerts for unauthorized usage
- **Delivery Logistics Management:** Ensures that the equipment reaches the rental customer on time, via real-time tracking of equipment movement
- **Adverse Event Detection and Response:** Ensures timely intervention when monitored alert conditions are met
- **Operational Status & Maintenance Dashboards:** Real-time visibility into the condition of equipment
- **Predictive Maintenance:** Anomaly detection and failure prediction to improve customer support, spare parts inventory planning and new product “design for reliability”
- **Billing Systems Support:** Options to implement usage-based billing models, possibly involving chargeability to multiple agencies
- **Ecosystem Support:** All features noted above are also available as REST API's to enable integration with software systems used by business partners.



REAL-TIME SERVICES

- Display real-time equipment positions on map
- Create geo-fence entry/exit alerts and notifications
- Create time-fence for theft detection
- Notify alerts to users/groups over multiple communication channels: email, SMS, IM, CRM, etc.

ANALYTICS & MACHINE LEARNING

- Rapid, visual creation of machine learning data pipelines (e.g. for predictive failure anomaly detection) & BI dashboards/analytics
- Vehicle maintenance reports leveraging OBD-II & CAN bus port diagnostic data (fuel/coolant/oil level, fuel/oil pressure, coolant/oil temperature, fuel/power consumption, engine/motor load/torque, etc.)

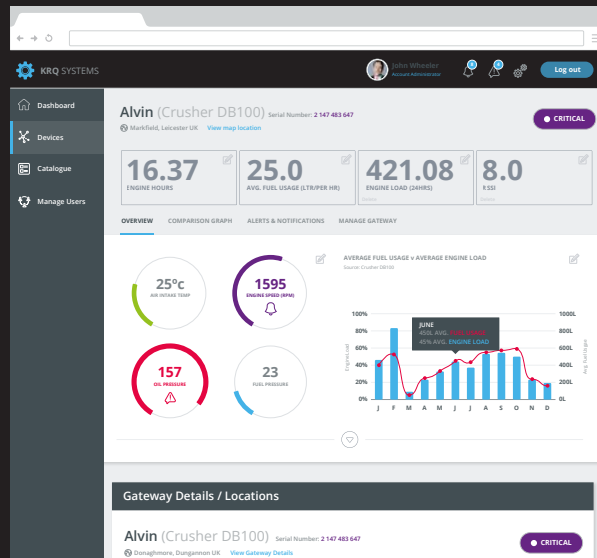
CLOUD & DEVICE SUPPORT

- Works with any sensors and devices that support the MQTT protocol, over a wide array of media (e.g. Iridium satellite, GSM/UMTS/LTE, Wi-Fi, LoRa)
- Supports OBD-II & CAN bus diagnostic port data ingestion
- APIs and UIs make it possible to model new attachment sensor/actuator for new equipment attachments and implements
- Optional module for bootstrapping and SW upgrades of devices via SFTP, SCP and OMA-DM
- Runs on AWS IoT, Microsoft Azure IoT & IBM Watson IoT platforms

Screen shot of the dashboard for Heavy Industrial Equipment Monitoring

Contact Concert Team:
iot@persistent.com

Concert, is a fully customisable IOT platform for any business, sector or city that helps make people, places and products better, faster and safer.



About Persistent Systems

Persistent Systems (BSE & NSE: PERSISTENT) builds software that drives our customers' business; enterprises and software product companies with software at the core of their digital transformation. For more information, please visit: www.persistent.com

India

Persistent Systems Limited
 Bhageerath, 402,
 Senapati Bapat Road
 Pune 411016.
 Tel: +91 (20) 6703 0000
 Fax: +91 (20) 6703 0009

USA

Persistent Systems, Inc.
 2055 Laurelwood Road, Suite 210
 Santa Clara, CA 95054
 Tel: +1 (408) 216 7010
 Fax: +1 (408) 451 9177
 Email: info@persistent.com



PERSISTENT