Achieve Operational Efficiency with Asset Monitoring and Tracking

The Wipro* end-to-end asset monitoring and tracking solution helps organizations better manage fleets and equipment at industrial sites, reducing costs, improving operational efficiency, and enhancing worker safety.

Executive Summary

Industrial organizations manage sites, such as ports, mines, and large manufacturing plants, that can present hazardous conditions. Knowing where people, equipment, and vehicles are at any given moment, as well as having vital information about the health of each, is critical to being able to respond in rapidly changing conditions. The ability to predict when equipment needs servicing before it fails is also an important aspect in achieving operational efficiency and reducing the cost of unintended downtime. Connecting vehicles with sensors is the third fastest-growing use of connected technology after smartphones and tablets. But communication is frequently unreliable because signal interference often disrupts cellular connectivity in these environments.

The end-to-end Wipro* asset monitoring and tracking solution, powered by Intel® technology, collects critical vehicle maintenance information along with geolocation to make work sites easier to manage. This information is stored in the cloud where it can be analyzed and visualized to increase operational efficiency, enhance worker safety, and improve the overall health and life span of equipment.

Figure 1. The Wipro* asset monitoring and tracking solution uses sensors to connect information about the health and location of equipment, inventory, and workers to the cloud where information is analyzed, visualized, and business insights are extracted.
Solutions based on In remote and hazardous work locations, Wipro solutions can identify the exact location of workers and hazardous conditions in the environment, as well as provide workers with alerts and SOS alarms in case of an emergency.

- **Improve equipment health.** Tracking real-time equipment conditions can help predict when equipment needs maintenance before it fails.
- **Gain actionable information.** Solutions based on the Internet of Things connect, manage, and secure devices that collect equipment data.
- **Decrease theft and unauthorized use.** Wipro enables organizations to monitor and track fleet information, making it faster and easier to pinpoint theft and unauthorized use.

### Business Challenge: Worker and Asset Monitoring on Industrial Sites

Industrial sites, such as ports, large manufacturing plants, and mines, can present hazardous conditions for workers and equipment. Many industrial sites include heavy equipment like excavators, dumpers, cranes, and trucks that are in constant motion as they fulfill customer demands. Managing vehicles, routes, inventory, and workers in these environments entails collecting a variety of sensor data to track and monitor everything from location and driver behavior to mileage, speed, braking patterns, and fuel economy.

Understanding where everything is in a constantly changing industrial environment is critical to keeping workers safe and predicting when equipment needs servicing. But inadequate communications, such as cellular connectivity, is often insufficient in these environments because of signal interference. Fleet management systems, using Internet of Things (IoT) technology, can help increase fleet effectiveness and improve overall operational efficiency.

### Asset Tracking and Monitoring Improves Port Efficiency in India

Wipro recently deployed its fleet management platform, which uses Intel® technology, as a proof of concept (PoC) at a major shipping port in Gujarat, India. The port spanned several square miles and its operations included movable and fixed assets, such as excavators, dumpers, cranes, shovels, trucks, and container handlers. The PoC included end-to-end asset tracking and health monitoring with geolocation and data extraction.

The goals of the PoC were to improve inventory flow, increase worker safety, prevent loss, and better predict when equipment required maintenance. To do this, the port was covered by long-range, low-power connectivity using LoRaWAN®, a WAN solution, in concert with sensors, IoT gateways, and cloud-based monitoring and analytics.

In addition to geographic location, the vehicle data collected included ambient pressure, speed, tilt, engine runtime, engine coolant temperature, engine RPM, runtime from engine start, fuel level, ambient air temperature, engine oil temperature, and fuel injection timing. The data, which was transmitted to the cloud using the Intel® IoT Platform, provided real-time analytics for monitoring. The results included the following benefits:

- **Reduced costs.** Understanding the health of equipment led to an improvement in preventative maintenance and a reduction in downtime, spare parts, and high warranty costs.
- **Increased uptime.** With better preventative maintenance, the port was able to increase the overall life span of its equipment and decrease the frequency of breakdowns.
- **Reduced loss.** Fuel theft was a suspected problem before deploying the PoC, but with constant monitoring of fuel levels, theft was minimized.

### Solution Value: Improved Efficiency and Decreased Costs

With the Wipro end-to-end asset monitoring and tracking solution, remote and hazardous locations are easier to manage, worker safety is improved, and organizations can monitor the health of high-value assets and inventory, and more accurately predict maintenance needs. The benefits of the Wipro asset monitoring and tracking solution include:

- **Increased operational efficiency.** Industrial organizations can track the geographic location and movement of vehicles, personnel, and equipment. With geo-fencing, organizations can also protect sensitive areas from contractors and others who should not have access.
- **Enhanced worker safety.** In remote and hazardous work locations, organizations can identify the location of workers and also provide them with condition alerts and SOS alarms in case of an emergency.
- **Improved equipment health.** Tracking equipment condition through real-time measurements, such as vibration, temperature, and tilt, can help predict when equipment needs maintenance before it fails, increasing its overall life span.

The Wipro dashboard (see Figure 2 on the next page) makes it easy to track equipment and inventory as they move throughout the site and to monitor fleet data like fuel level, tire pressure, and engine temperatures.
Solution Architecture: Enabling Rapid Insights at Industrial Locations

The Wipro solution uses sensors to connect equipment, inventory, and even workers to the cloud where information is analyzed and visualized, and business insights are extracted. Wipro uses the Intel IoT Platform (see Figure 3) end-to-end architecture to connect devices and third-party providers to the Wipro cloud applications using Amazon Web Services*

With LoRaWAN, a low-power, long-range WAN, the Wipro solution provides bidirectional communication to and from sensors on equipment, vehicles, and wearables. The sub-gigahertz (GHz) frequency provides better range and penetration and can cover distances greater than 15 km (9.3 miles). The Wipro solution extracts and transmits data through the Intel IoT Platform to Amazon Web Services, where data analytics provide information on equipment health that result in more accurate preventative maintenance.

The Intel IoT platform provides the following capabilities:

- **Security features.** Tightly integrated hardware and software security from edge-to-cloud, along with data protection and policy management, transmits trusted data to applications.
- **Interoperability.** Modular, standardized Intel technologies seamlessly communicate to one another, accelerating time to market and reducing the cost of deploying and maintaining IoT solutions.

- **Scalability.** Intel IoT products help deliver scalable compute from edge-to-cloud.
- **Manageability.** Device, security, and advanced data management provide organizations with the capabilities to manage and deploy large-scale IoT systems.
- **Analytics.** Delivering trusted data and the capability to run analytics at the edge or in the data center enables real-time insights and streamlined operations.

Figure 2. The Wipro* dashboard provides real-time information about where vehicles and personnel are located and environmental and mechanical conditions.

Figure 3. The Wipro* asset tracking and monitoring solution use the Intel® IoT Platform for performance and reliability.
Operating in ports, mines, large manufacturing plants, and other industrial sites often include conditions that can be hazardous. Wipro delivers an end-to-end asset monitoring and tracking solution for remote and hazardous work sites. This solution uses sensors to connect data to the cloud where information is analyzed, visualized, and business insights are extracted. The Wipro solution built on Intel technology can help increase operational efficiency, reduce cost, track equipment use, enhance worker safety, and improve the overall health and life span of equipment.

Find the solution that is right for your organization. Contact your Intel representative or visit intel.com/iot.