Industrial IoT Use Cases

W3C WoT Open Day
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Some things are hard to predict
You can only observe and see them fail …

Industrial processes must be protected
Industrial Use Cases - Industries

Manufacturing
Transportation and Logistics
Smart City
Utilities
Oil and Gas
Insurance

Engineering and Construction
Healthcare
Agriculture
Smart Buildings
Mining
Connected Car
Safety
Industry: Manufacturing

Predictive Maintenance
  Monitoring and predicting machine failures and anomalies

Maintenance automation
  Automating the process of creating a maintenance/service ticket based on reactive or predictive detection of problems
Industry: Manufacturing

Quality Improvements
  improving quality through monitoring the condition of manufacturing equipment

Industrial safety
  Reducing industrial safety incidents/accidents
Industry: Manufacturing

Environment monitoring

Monitoring environment in the manufacturing plant for presence of poisonous gases, excessive noise/heat, etc.

Real-time monitoring

Real-time monitoring and KPI calculations of production equipment
Industry: Transportation & Logistics

Shipment tracking
  Tracking of shipment en-route - condition, quality and location monitoring

Fleet tracking
  Monitoring fleet vehicles, fuel costs, maintenance needs, assignments
Industry: Transportation & Logistics

Cold chain monitoring
Ensuring integrity of the cold chain - from warehouses to refrigerated trucks to delivery

Warehouse monitoring
Monitoring equipment and stock in warehouses, yards
Industry: Smart city

Infrastructure monitoring

  Monitoring of Bridges, Dams, Levees, Canals - material condition, deterioration, vibrations monitoring

Smart Parking

  Tracking usage, availability of parking spaces and automating billing/reservations
Industry: Smart city

Smart Lighting
Smart control of street lights based on presence detection, weather predictions, etc.

Waste Management
Monitoring of garbage containers to optimize the trash collection route
Industry: Smart city

Highway Monitoring
  Monitoring of highways and providing appropriate signage

Environment monitoring
  Monitoring of air pollution, water pollution
Industry: Utilities

Advanced Metering Infrastructure
  Automated reading of residential and C&I (Commercial and Industrial) meters, and billing

Distributed Energy Resource management
  Monitoring the condition and output of distributed renewable energy generation equipment
Industry: Utilities

Distribution Automation
- Monitoring and remote-controlling Distribution equipment

Crew safety
- Improving safety of utilities crew in the field
Industry: Oil and Gas

Pipeline monitoring
- Offshore platform monitoring
- Industrial safety on offshore platforms

Leakage detection
- Detecting/Predicting leakage through the pipelines
Industry: Oil and Gas

Tank/Reservoir level monitoring
  Monitoring and Controlling the levels in tanks and reservoirs

Automated Stock Taking
  Automated calculation of a distributed stock through various storage tanks and delivery pipes/trucks
Industry: Insurance

Proactive Asset Monitoring
  Monitoring of high value assets such as connected structures, fleet vehicles, etc.

Usage based insurance
  Usage tracking and customized insurance policies

Safety monitoring
  Employee/Occupant safety monitoring
Industry: Insurance

Loss reduction - leakage detection
Detecting leakages to limit the losses

Loss prevention - garaging fleet vehicles
Predictive weather monitoring and re-routing fleet vehicles to covered garages to limit loss due to hail damage, tree damage
Industry: Engineering and Construction

Worker Safety
Worker monitoring for industrial safety

Construction Asset Monitoring
Monitoring assets at construction site
Industry: Healthcare

Clinical Trials
Data collection and analytics of clinical trial data

Pharmaceutical monitoring
Monitoring of medicines and totes throughout the supply chain

Remote Patient Monitoring
Monitoring of patients after hospitalization
Industry: Agriculture

Soil condition monitoring
  Monitoring soil conditions and creating optimal plans for watering, fertilizing

Produce monitoring
  Monitoring produce conditions
Industry: Smart Buildings

Energy management
  Monitoring energy usage throughout the building

Equipment monitoring, Occupant satisfaction
  Monitoring equipment in the buildings such as HVAC, Elevators, etc. Monitoring satisfaction of occupants
Industry: Mining

Worker safety
  Improving safety of utilities crew in the field

Equipment monitoring
  Monitoring mining equipment
Industry: Connected Car

Connected Car

Monitoring of CANBUS, Infotainment
Industry: Safety and Security

Video surveillance

Monitoring assets used for video surveillance and media
Asset monitoring

Industrial use cases demand:
- Management of assets around the globe.
- Continuous monitoring of sensor data.
- Detection of alerts and incidents.
- Anomaly detection and prediction of failures.
- Correlations between different assets to allow prediction of device failures.
Example: Asset Monitoring of plugfest devices
Example: Asset Monitoring of plugfest devices

- WoT members use various different assets during the plug fest
- Asset types are described via a WoT Thing Description
- By using the td2dm converter the device models were imported into the Oracle IoT Cloud service
- Several simulation instances were created for these asset types
- Instances were associated with geographic locations via geo-fencing
Simulated devices continuously send messages
Dashboard
Tracking assets around the globe
Zoom in to focus on regions
Zoom in to focus on individual assets
### Managing Assets

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Check status of individual assets
Summary

• Most industrial use cases require continuous monitoring of multiple things/devices.
• When multiple devices/things are managed by an application, the application can use device properties and events to report a status overview.
• Big data analytics can be used to predict upcoming failures.
• The user can drill down to an individual asset to detect a problem easily and quickly.