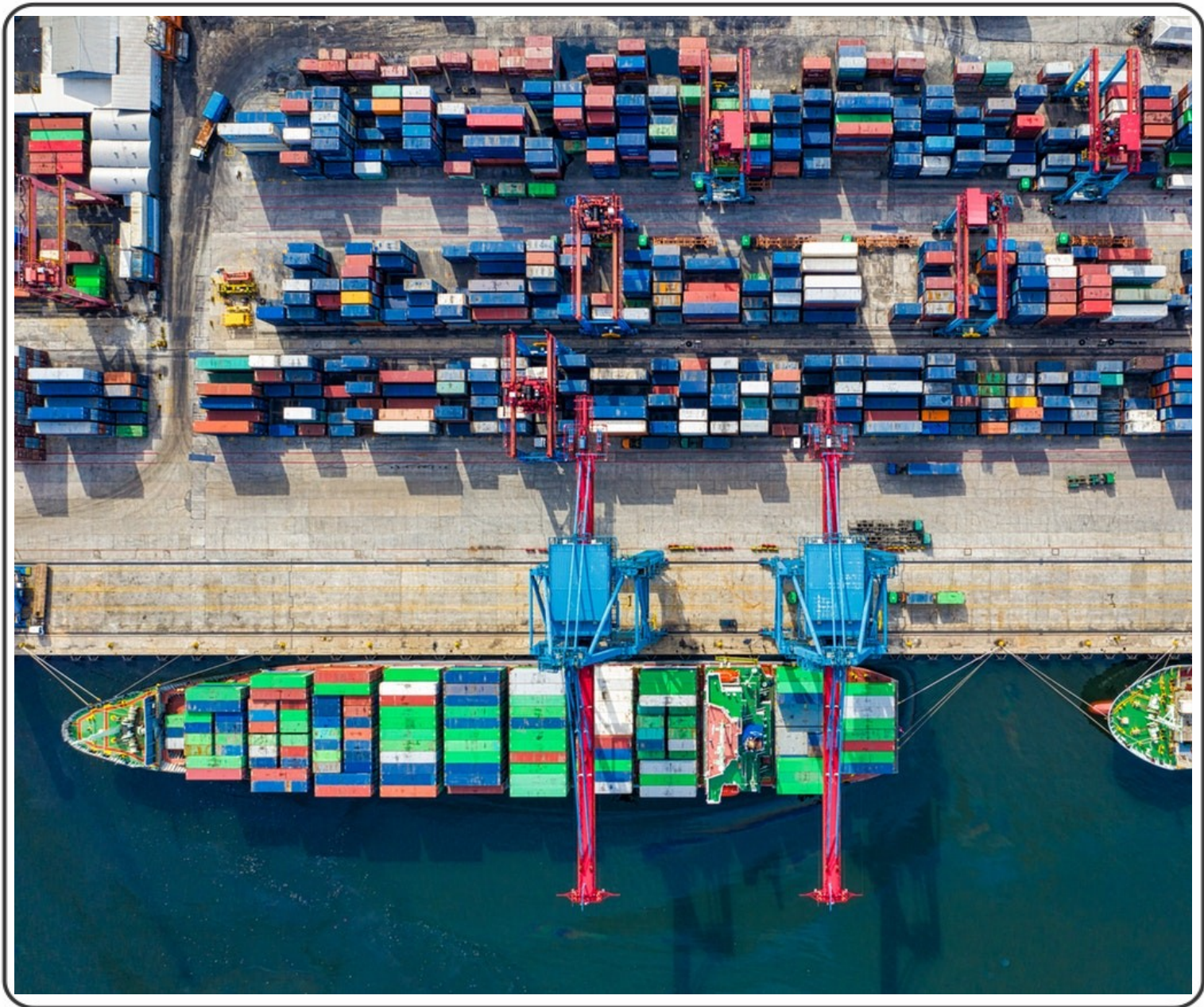


IoT for Ports and Vessels



Background

Ports and container vessels form the backbone of the global economy as over 90% of the world's trade is carried out by sea. With the largest port handling upwards of 42 million TEUs of cargo, it can be gauged that the efficient utilization of resources with minimum downtime is essential to keep the maritime transport machinery working smoothly. To enable this, CASCADEMIC Solutions has designed systems to monitor the different types of cranes on the ports as well as monitor the vessels to collect their run-time data for analysis.

Challenges

The volume of traffic passing through ports is so high that it is imperative for them to operate at optimum efficiency. Any minor breakdown means the loss of time and revenue. For this, it is important to monitor the health of the cranes, and also to check the number of loading and unloading cycles they perform to monitor their utilization and the efficiency of the operator.

For vessel operators, the biggest challenge is maintaining the health of their fleet and monitoring the operation of each of the vessels for their fuel consumption and efficiency. In order to ensure that the ship remains seaworthy, they also need to monitor the parts of the ship in which cargo is carried, including the refrigerating and cool chambers. After taking care of these aspects, by monitoring the location of the ship and correlating it with weather and tidal data, the routes of the vessels can be optimized to improve the fuel efficiency.

Solution

For Ports

CASCADEMIC's Port monitoring solution is designed to integrate with the PLCs of the cranes and monitor their operating parameters. It can also be interfaced with vibration sensors, which can be mounted on the various motors and other moving parts to continuously monitor their health. All of this data can be sent to the cloud or local servers over a cellular or WiFi network for carrying out analytics.

For Vessels

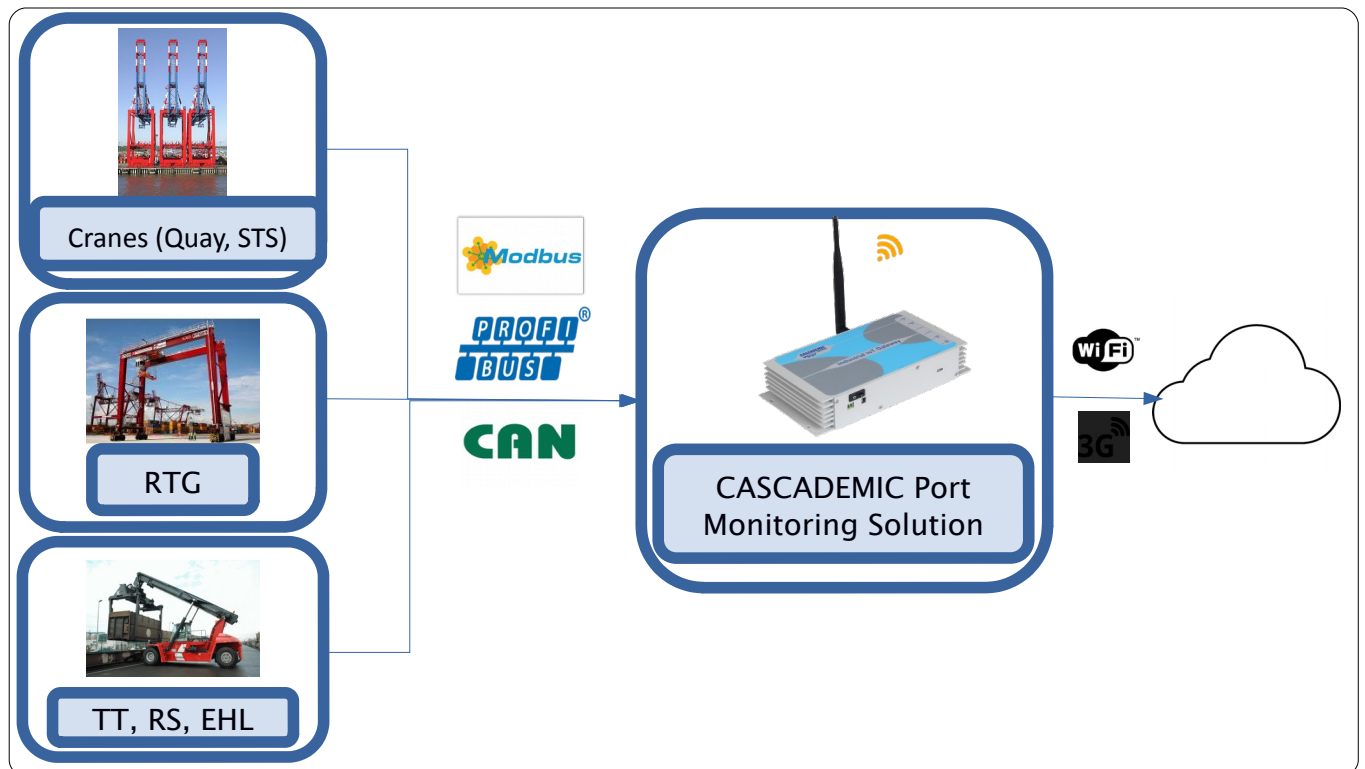
CASCADEMIC's Vessel Monitoring Solution is installed on ships to monitor the location, fuel levels and the run-time of the engines, diesel generators, and other fuel powered equipment for calculating the fuel efficiency. The Vessel Monitoring Solution can be interfaced with temperature and humidity sensors to monitor the refrigeration units, while vibration sensors can be used for machine health monitoring.

Value Proposition

For Ports

The solution delivers business value through:

- Collecting the crane operating parameters to carry out analytics for predictive maintenance
- Higher Asset Utilization with continuous monitoring of loading and unloading cycles
- Reduce down-time by planning for maintenance of equipment based on usage



Parameters monitored

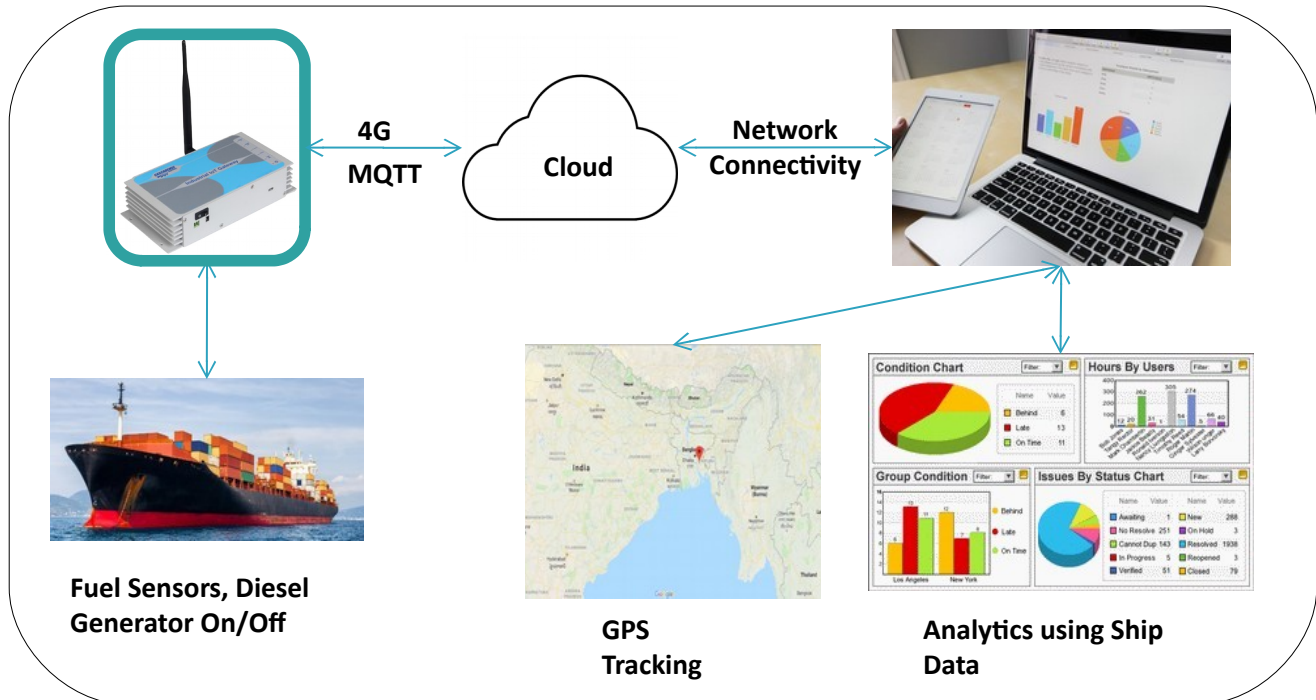
- Crane On/Off Status
- On/Off status of crane motors (Wheel, Trolley, Hoist)
- Spreader Lock Status
- Speed
- Fuel Level
- Tire pressure and temperature
- Vibration sensor data
- Acoustic sensor data
- Vehicle status monitoring

IoT for Ports and Vessels

For Vessels

Value Proposition:

- Calculate fuel efficiency based on run-time of engines, diesel generators, pumps, etc
- Monitor health of equipment by monitoring the temperature, humidity, vibration
- Collected data enables predictive maintenance
- Optimize routes by correlating data with weather and tidal data



Parameters Monitored

- Latitude
- Longitude
- Speed
- Course over Ground
- Water depth referenced to the transducer (Echo Sounder)
- Diesel Generator Running Status (For each Diesel Generator present)
- Diesel Generator Voltage Output (For each Diesel Generator present)
- Fuel Level (For each fuel tank)