Sequence model for asset failure prediction [natural resources]

Business Objective

- Accumulate sensor data and other inputs and build prediction models for equipment failures
- To identify highly probable machines to fail for proactive intervention along with path to failure
- To manage and control “what might happen”

Benefit

- Service processing lead time can be significantly reduced
- Optimization of cost of service
- Helps accurately predict failures
- Increase in productivity

Expected Outputs

- An interactive dashboard to help clients reduce the future failures and maintenance cost
- A predictive model with probability score for individual machine to fail in the future

Data Used

- Sensor data
- Machine production data
- Alert types data
- Primary, secondary statistics of machines

Design

- Identifies significant factors affecting machine failure.
- Derive predictive model to identify the characteristics of high probability machine failure

Output

- Machine level predictive score based on sensor, primary, secondary & alert data
- Segmentation of different failure types

Benefits

- Identifying significant factors based on alert types, equipment information, causes for failure
- Root cause analysis to gain info on major failure reasons for machines.

Significant factors which lead to better identification of defective machines

- Descriptive analysis on sensor, alert, primary & secondary data capturing the machine characteristics
- Sankey Diagram to represent the major paths leading to failure and non failure

- Logistic regression to identify key drivers
- Daily failure probability prediction to identify the next failure event
- Neural Network to provide better prediction

- Model equation and predicted failure score for proactive intervention management in high failure segments
- Futuristic predicted failure probability with significant variables information