

# Pipeline Analytics for a Leading Oil & Gas Company

A leading American petroleum and natural gas exploration and production company headquartered in Houston, Texas and incorporated in Ohio. The company had 2.163 billion barrels of oil of which 44% was in the United States, 32% was in Canada, 12% was in Equatorial Guinea, and 11% was in other countries in Africa, primarily Libya.

## Business Challenges & Objectives

- Reduce pipeline inspection, repair and maintenance cost by identifying pipe segments susceptible to corrosion.
- Reduce leak associated costs by proactively identifying and remediating potential leaks.
- Improve visibility into the pipeline operational and historical parameters to enhance pipeline installation and replacement decision making.

## Solution

- ✓ Build a production-ready application to provide users with an end-to-end data picture of pipelines. The visibility will be achieved by consolidating and combining pipeline segments, leaks, and corrosion data.
- ✓ Data Analysis and machine learning predictive models to support leak identification and pipeline segment replacement decision-making process and identify factors affecting corrosion

## Outcome

Analytics dashboard will help in identification of leak and aid in decision making for the pipeline which needs to be replaced. The application will help in faster issue assessment and resolution and improve customer experience.



## Potential Business Impact

End to End visibility of pipeline

Faster issue detection and resolution

Improve decision making process

Identify factors affecting corrosion

# Pipeline Analytics

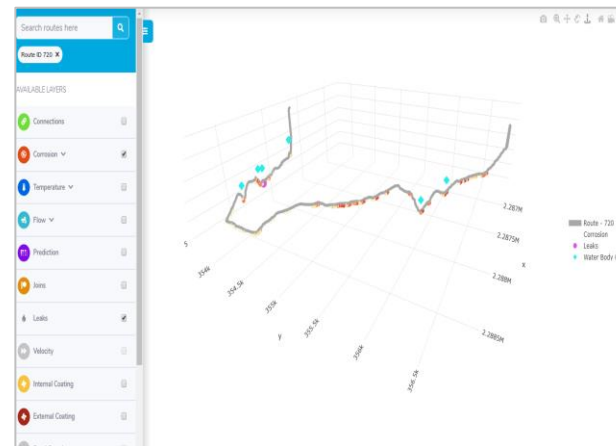
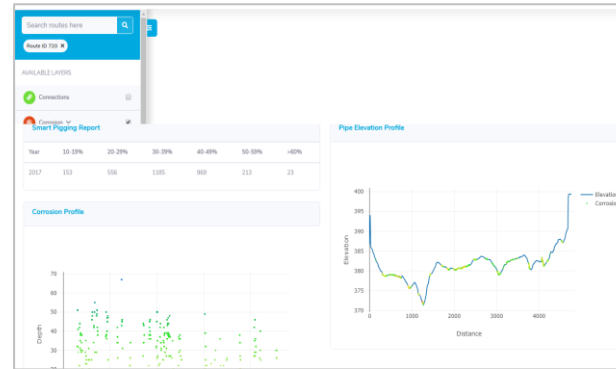
ML Models

Supervised Learning

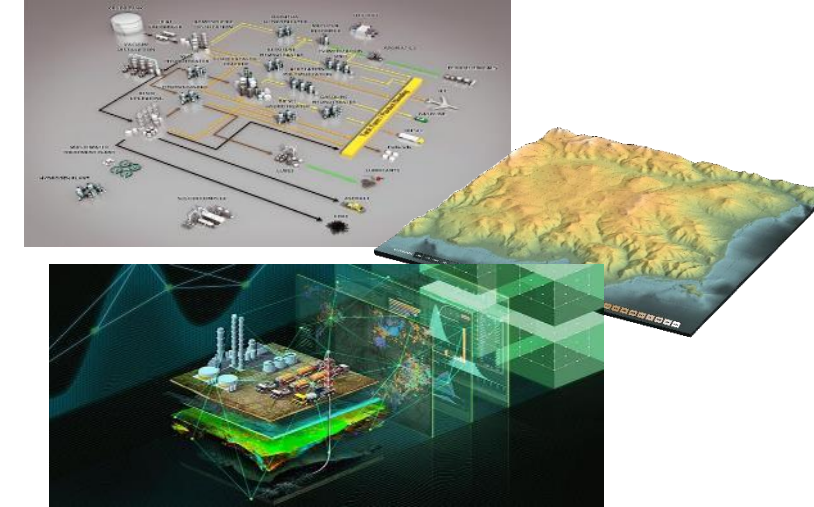
Unsupervised Learning

Logistic Regression  
 Decision Trees  
 Random Forest  
 SVM(Linear)  
 SVM(RBF)  
 Gaussian NB  
 Complement NB  
 Artificial Neural Network

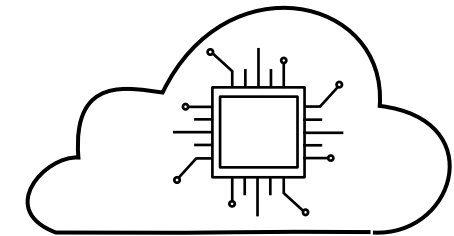
K-means clustering  
 Principal Component Analysis



Completed



Digital Twin



Machine learning models to predict corrosion and leaks

Planned