Energy & Utilities

Case Study

Empowering an Energy Utilities firm with Advanced Analytics Solutions

Client Overview

The client develops, sells and services energy analytics software to renewable energy producers, OEMs, transmission and distribution utilities, and other energy companies.

Business Requirements

- Develop demand forecasting models for distribution companies using the data flux from weather reports, historical energy consumption data, and IoT sensor data.
- Develop survival models based on data collected from weather forecasts and wind turbine sensors for determining when to conduct preventive maintenance on poorly performing wind turbines.

Indium Solution

- To handle large volume of data, OpenTSDB was utilized.
- Demand Forecasting:
  - To obtain high accuracy and low variance findings, Indium implemented Generalized Additive Modelling with Non-parametric regression to get more generalization and piecewise splines.
  - Generated models were saved in PMML object to produce demand forecasting results.
- Predictive Maintenance:
  - Applied survival analysis to predict the expected time of failure of a wind turbine.
  - Used Isolation Forest and Advanced Outlier Detection methods to detect anomalies in wind turbines.

Business Impact

- **Demand Forecasting:** Reduced surplus and inventory costs by 5% for DISCOMS. With better inputs for financial, operational planning and budgeting, revenue management process became proactive and efficient.
- **Predictive Maintenance:** Energy grids were able to give alerts which in turn was helpful in repairing the turbines before they go out of order. This projected a significant 5-6% cost savings in repair and maintenance. Enhanced Predictive Maintenance aided the client business to maximize revenue recovery, reducing sunk costs by 2-3%.

Tools

R Programming, Grafana, OpenTSDB, PostgreSQL

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Solution Approach