

ONEOSTATS

PREDICTIVE MAINTENANCE SOLUTION

- **Predictive Maintenance Solution Model** to anticipate system failures and minimize downtime.
- Analyze trends in sensor data to identify early failure indicators.
- Map alarms and source readings for a comprehensive failure prediction strategy.

CORE CAPABILITIES AND FUNCTIONALITIES:

1. Proactive Maintenance Scheduling:

1. Predicts potential system failures before they occur, enabling timely intervention.
2. Optimizes maintenance schedules to minimize downtime and extend asset lifecycles.

2. Advanced Analytics and Machine Learning:

1. Leverages ML models to analyze sensor data, alarms, and trends for accurate predictions.
2. Handles seasonality, trends, and external factors for comprehensive analysis.

3. Real-Time Monitoring and Alerts:

1. Continuously monitors live data to identify anomalies and generate real-time alerts.
2. Helps operators respond quickly to critical issues.

4. Interactive Dashboard and Web Application:

1. Provides an intuitive interface for visualizing system health, failure trends, and maintenance recommendations.
2. Enables customization of insights by asset type, location, and failure category.

5. Seamless Data Integration:

1. Integrates with existing systems such as Azure SQL Server, data lakes, and IoT sensors.
2. Supports large-scale data ingestion and preprocessing for accurate model training.

6. Cost Optimization:

1. Reduces maintenance costs by focusing on predictive insights rather than reactive measures.
2. Minimizes unplanned downtime and associated operational disruptions.

7. Scalability and Adaptability:

1. Easily scales across multiple machines and locations, adapting to different industries and asset types.
2. Configurable to address the unique requirements of diverse operational setups.

8. Comprehensive Reporting:

1. Generates detailed reports on maintenance schedules, failure trends, and cost savings.
2. Provides actionable insights for operational improvement and risk mitigation.

TARGET USERS:

1. Energy and Utilities Companies:

- Businesses managing critical infrastructure like compressors, turbines, and grids.

2. Operations and Maintenance Teams:

- Teams responsible for maintaining system reliability and ensuring smooth operations.

3. Manufacturing and Industrial Plants:

- Industries with complex machinery requiring proactive maintenance to avoid costly downtimes.

4. Asset Managers:

- Professionals overseeing the performance, reliability, and maintenance of physical assets.

5. Field Engineers and Technicians:

- Individuals who perform on-site diagnostics and repairs, benefiting from predictive insights.

6. Corporate Decision-Makers:

- Executives focused on operational efficiency, risk mitigation, and cost reduction.

7. Data Analysts and Reliability Engineers:

- Analysts identifying trends and correlations in machine data to support maintenance planning.

8. IT and Digital Transformation Teams:

- Teams working on integrating advanced analytics and IoT solutions into existing operations.

MODEL FOR PREDICTIVE MAINTENANCE:

- **Analysis:** Captures trends, seasonality, and noise in sensor readings over time.
- **Exogenous Variables (X):** Incorporates external factors to improve prediction accuracy.
- **Seasonality Support:** Effectively models recurring patterns in sensor data, crucial for periodic maintenance needs.
- **Implementation:**
 1. Data Preprocessing:
 - Cleaned and aggregated data from sensor readings and alarms.
 - Addressed missing values and ensured data stationarity.
 2. Model Design:
 - Selected parameters based on trend, seasonality, and residual analysis.
 - Included relevant exogenous factors like pressure and temperature etc.
 3. Training and Evaluation:
 - Trained the model on historical data for compressors.
 - Validated predictions using actual failure and alarm events.

WORKFLOW:

