A detailed **3-day workshop plan on Predictive Maintenance using Artificial Intelligence (AI) and Data Analytics** — ideal for engineers, maintenance professionals, data scientists

By the end of this workshop, participants will be able to:

- Understand predictive maintenance (PdM) fundamentals and its business value.
- Learn how to collect, clean, and analyze sensor and operational data.
- Apply AI/ML techniques for fault detection, anomaly detection, and remaining useful life (RUL) prediction.
- Design and deploy predictive maintenance dashboards and alerts.

Integrate predictive models with IoT and SCADA systems for real-time monitoring

- Maintenance & Reliability Engineers
- Data Analysts & Data Scientists
- Plant & Operations Managers
- IoT Solution Developers
- Asset Management Professionals

Day 1 – Fundamentals of Workshop Outline

Predictive Maintenance

Theme: From Reactive to Predictive — The Maintenance Evolution

Topics Covered:

- Maintenance strategies: Reactive, Preventive, Predictive
- Importance and ROI of predictive maintenance
- Data sources: sensors, IoT, vibration, temperature, pressure, logs
- Understanding failure modes and FMEA (Failure Mode & Effects Analysis)
- Data requirements for predictive analytics

Hands-on Exercise:

- Explore sample industrial dataset (e.g., vibration and temperature readings)
- Identify key features and fault patterns

Tools Introduced:
Excel / Python / Power BI (intro), IoT overview (MQTT, Modbus, OPC-UA)

Day 2 – Machine Learning for Predictive Maintenance

Theme: Data-Driven Models for Fault Prediction

Topics Covered:

- Data preprocessing and feature engineering
- Introduction to machine learning algorithms for PdM:
  - Regression models
  - Classification (fault detection)
  - Anomaly detection
- Building Remaining Useful Life (RUL) prediction models
- Model evaluation and cross-validation

Hands-on Exercise:

- Build and test predictive models using Python (Scikit-learn)
- Visualize model results and performance metrics

Tools Introduced:
Python (Pandas, Scikit-learn, Matplotlib), Jupyter Notebook

Deliverables for Participants:

- Workshop handbook (PDF)
- Sample PdM datasets
- ML model templates for predictive maintenance
- Real-time dashboard template
- Certificate of Completion

Instructor: Mr Suresh Tripathi is a founder of Geosun Pty Ltd an Australian company registered in year 2000 to provide AI corporate training, data center solutions and data pipeline end-to-end cloud platform. He has nearly 25+ years of work experience in digital data analytics integrated with AI and tech platforms. His education qualifications include master degree in Statistics from India, master degree in Geostatistics from Australia and master degree in Geoscience from Australia. He completed his AI certificate courses from Stanford Business School from California and High Impact Leadership from Cambridge University, UK. He has worked in Australia and US focusing his career on data strategy, tech platforms, and developing in-house training. He has worked with range of industries in Australia and US that include Deloitte, Flybuys, Ambulance Victoria, CFA (Emergencies Services), Avexa, Covance, Avance Clinical (Pharmaceuticals), Intelligen, Commonwealth Bank, Hackett Group (US), Health and Safety Sphera Solutions(US), Vic Government (Environment, water and energy), Waste Management (US), Outfront Media (US), Adani Mining (Australia) and Fura Gems Industries (Dubai).

Fee: Rs 50,000 per participant plus GST payable to GeosunAI Tech Cloud Pvt Ltd. RTGS/Cheque/ PhonePe via below link form.

Bank: Punjab National Bank

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