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PREDICTIVE MAINTENANCE IN ERP SYSTEMS: STUDY OF DIFFERENT CASES AND SUCCESSFUL APPLICATIONS IN MODERN INDUSTRIES

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ABSTRACT

This thesis examines the significant importance of Enterprise Resource Planning (ERP) systems in modern industrial facilities and the critical role of integrating predictive maintenance into ERP through a literature review. ERP systems are essential in contemporary industries due to their ability to streamline various business processes, enhance productivity, and facilitate real-time data management. By providing a centralized platform for data integration and process automation, ERP systems enable companies to achieve operational efficiency, reduce costs, and improve decision-making. The implementation of predictive maintenance within ERP systems represents a significant advancement in maintenance strategies. Predictive maintenance leverages data analysis and machine learning to predict equipment failures before they occur, thereby optimizing maintenance schedules and minimizing downtime. By integrating predictive maintenance into ERP systems, businesses can fully utilize their data, leading to more accurate and timely maintenance interventions, contributing to cost savings, preventing unexpected failures, and reducing unnecessary maintenance activities. Finally, a case study on predictive maintenance of pumps using the SAP data platform is analyzed, and five different algorithms are compared in terms of their performance.

ADVANTAGES OF INTEGRATING ARTIFICIAL INTELLIGENCE INTO ERP SYSTEMS

- Production Planning
- Smooth Workflow
- Increasing Productivity
- Reduction Of Inventory Costs
- Automation Of Human Resources
- Financial Management
- Big Data Analysis
- Predictive Analytics Process
- Management Of Equipment Failures
- Real-time Response
- Performance Improvement
- Better Prediction

PROCESS OF PREDICTIVE MAINTENANCE

Predictive Maintenance (PdM) is considered innovative in the field of equipment maintenance, leveraging advanced technologies and data analytics to predict possible failures and optimize maintenance programs. The process includes five steps:

- Index Identification
- Index Measurement
- Index Modeling
- Index Prediction
- Decision Making

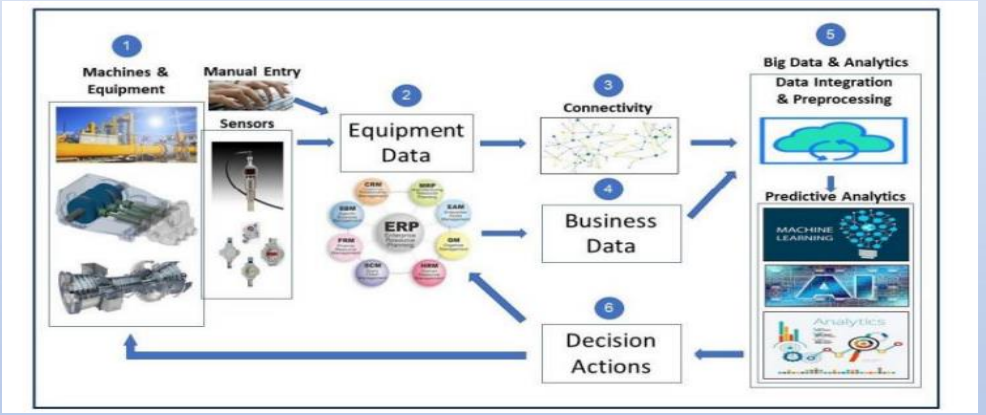

Figure 1 The process of integrating predictive maintenance with an ERP system

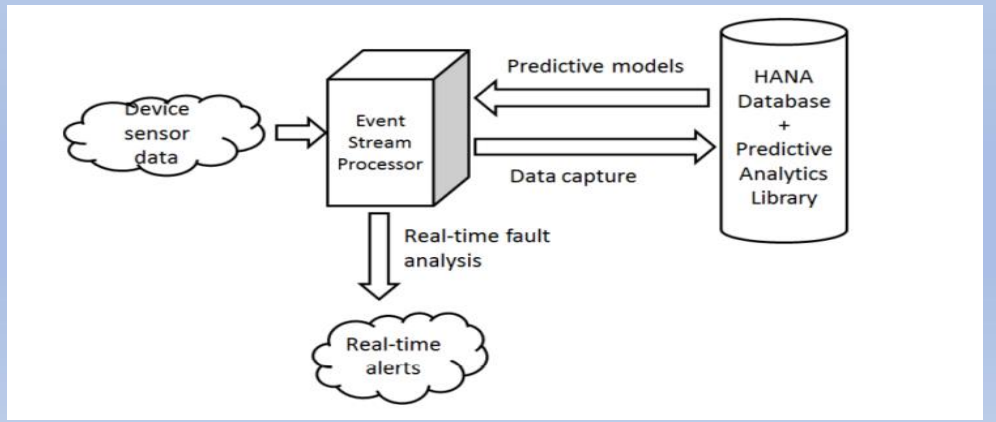

Figure 2 Operating procedure of SAP with predictive maintenance