

Big Data Analytics for Predictive Maintenance in Manufacturing

Dana Turner
PhD
University of Auckland
Auckland 1010, New Zealand

Drew Scott
Dr.
ETH Zurich
Rämistrasse 101, 8092 Zürich, Switzerland

Pat Brown
Prof.
University of Malaya
50603 Kuala Lumpur, Malaysia

Abstract. The use of big data analytics in predictive maintenance is transforming manufacturing processes by enabling the early detection of equipment failures. This article examines the role of big data technologies, such as machine learning and IoT, in predicting maintenance needs and optimizing equipment performance. Through various case studies, it highlights the benefits of predictive maintenance, including cost reduction and improved operational efficiency.

Keywords: Big Data Analytics, Predictive Maintenance, Manufacturing, Machine Learning, IoT

Introduction

Predictive maintenance is a game-changer for the manufacturing industry, driven by the capabilities of big data analytics. By leveraging machine learning and IoT technologies, manufacturers can anticipate equipment failures and schedule maintenance proactively, thereby reducing downtime and costs. This article explores the application of big data analytics in predictive maintenance, showcasing several case studies that demonstrate its impact on operational efficiency and cost-effectiveness. As the industry moves towards data-driven decision-making, predictive maintenance offers a strategic advantage in maintaining equipment and optimizing performance. However, challenges such as data integration and analysis complexity remain.

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References

1. Kumar, N., & Kataria, V. Enhanced Sentiment Classification using a Multi-layered Stacked Ensemble Architecture.
2. Рагимов, Э. Р. (2006). Об одном подходе оценки риска при проектировании защищенных корпоративных сетей. Информационные технологии моделирования и управления, (1), 94-98.