



Leveraging AI-Driven Analytics in Power BI to Enhance Business Intelligence for Real-Time Decision Support in Smart Manufacturing

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Abstract:

Manufacturing environments generate large volumes of operational, quality, and machine-level data, yet decision-making often remains slow and reactive. This paper explores how AI-driven analytics integrated within Microsoft Power BI can transform traditional reporting into real-time decision intelligence. The study highlights the role of Industry 4.0, operational KPIs, quality KPIs, and AI-enabled insights such as predictive maintenance and anomaly detection. The findings demonstrate that Power BI, when combined with AI capabilities, significantly enhances visibility, reduces downtime, and supports future-ready digital transformation.

Keywords:

Power BI, Smart Manufacturing, AI-Driven Analytics, Predictive Maintenance, Industry 4.0, Real-Time Decision Support