Prescriptive Maintenance in Automotive Manufacturing: Concepts, Theoretical Benefits and Potential Outcomes

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Abstract. Prescriptive maintenance is an advanced maintenance approach that goes beyond forecasting potential anomalies and failures but also suggesting effective actions to prevent them. Enhanced and superior maintenance leads to higher equipment reliability and reduced downtime. Meanwhile, automotive manufacturing recognizes maintenance as a crucial factor regarding operational efficiency and safe protocols. Accordingly, inefficient maintenance increases delays and costs. Moreover, automotive industry does not tolerate even minor anomalies and errors given its high precision requirements and safety demands. Automotive manufacturing industry is characterized by complex production systems, requiring optimized maintenance to maintain high efficiency and deliver consistent product quality. Therefore, this paper outlines prescriptive maintenance concepts resulting in improved automotive manufacturing performance. The purpose of this paper is to provide a theoretical foundation for understating the role of prescriptive maintenance in enhancing manufacturing and its associated outcomes in automotive fabrication processes. Furthermore, this study offers recommendations for digitizing maintenance by exploring the core concepts, components and potential advantages of this innovative practice.

Keywords: Prescriptive maintenance, Automotive industry, Digitalization.