

Industry 5.0 and New Business Models in Mining. Adoption Case of Machine Learning to Optimize the Process at a Copper Semi Autogenous Grinding (SAG) Mill

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Abstract

Traditional industries like mining are in the spotlight for the need of improving processes to-wards net zero emissions. This article presents a case on a new business model to ease the adoption of Machine Learning (ML) to optimize industrial processes, applied to a copper mine. The focus of the paper is to present an agile methodology to ease the adoption of ML in industrial environments. The authors intend to illustrate the way a ML platform with a Low code solution approach can give results in two months to optimize a traditional production process. The methodology used in the case allows to obtain a data model to be validated in less than two months. This work pretends to give more light to the use of industrial data and the way traditional industries can evolve towards the Industry 5.0 paradigm which emphasizes the need to achieve sustainability in the production environment. The featured process is copper milling and the adoption of the low code solution is based on lean startup methodology. The cycle to obtain validated results includes the involvement of people from the process as well as analytics experts. At the end, the contributions of the solution to improve Operational Equipment Effectiveness (OEE) can be seen, and the process operators became empowered with the predictions that give the platform.

Keywords

Lean startup methodology; OEE; AI/ML; Low code platform; Industry 5.0.

Biography

Federico Walas Mateo received his MSc. in Advanced Manufacturing Systems from Kingston University, UK, he currently works at the Institute of Engineering and Agronomy, Universidad Nacional Arturo Jauretche (UNAJ), and at Industrial Engineering Faculty, Universidad Nacional de Lomas de Zamora (UNLZ). Federico does research in Smart Manufacturing, Industry 4.0, Innovation ecosystems, Open Innovation, Technological Startups, Data driven models. The current project is 'Analysis of the approach in Local SMEs to Production 4.0 tools.

Andrés Redchuk received his PhD from the University Rey Juan Carlos (Spain). His research activities focus on process improvement with optimization and operational research. His work concerns Quality Intelligence, Process

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Julián Eloy Tornillo received his MSc. in Decision Systems Engineering from Rey Juan Carlos University, Spain, he currently works at the Industrial Engineering Faculty, Universidad Nacional de Lomas de Zamora (UNLZ). Julián does research in Industry 4.0 and Process Improvement.