"STEP-UP OF AI AND ML IN TRADITIONAL MANUFACTURING"

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The evolution of Artificial Intelligence (AI) and Machine Learning (ML) in industry has many advantages that can increase efficiency and profitability. The goal is to reduce common process-driven losses related to waste, quality, and yield. With more optimized production processes, we can increase the number of products available at a competitive price. Predictive maintenance helps lower costs. Knowing the condition of machines and equipment can help predict their remaining useful life (RUL). This allows engineers to improve their performance and prevent unexpected downtime.

Take for example one of the oldest traditional manufacturing processes of metal casting. India, USA and China together produce 70% of total castings produced in the world. Casting is considered as the mother manufacturing process which feeds others. Smart Foundry technology belongs to Industry 4.0 revolution and also called as Foundry 4.0.

There has to be effective integration of Man, Machine, Method and Material to all levels of the value chain network. Almost similar ways, other traditional manufacturing processes are on the edge of paradigm shift.

Automation is the key factor for producing metal products through a castings process where IoT can be implemented to monitor and control real time process parameters along with parameters like surrounding environment- temperature and humidity of the metal casting process.

The foundry men are required to address the challenges and on-site issues to academic and research groups in order to convert traditional foundries to smart foundries. There should also be up skilling and reskilling of employees. Modelling tools, CFD/FEM simulations, use of IoT and sensors can help in increasing quality and casting yield.

Artificial intelligence and machine learning will help the process designer to predict the quality of products. They may also predict the values of optimum process parameters using supervised and unsupervised ML models. The beauty of these models is they can work without simulation data for desired results. If sufficient production data of manufacturing is available, we may not need costly simulation software that involves high cost, time and expertise.

In fact, I would say in certain cases ML eliminates use of simulation software in production. Hence the future technologies with AL and ML are stepping up for high standards of the Manufacturing Sector.

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