Product Lifecycle Intelligence: Turn PLM Data into Insights with Machine Learning

by Jordan Reynolds, Michael Glessner, Joe Dury and Nick Ward

Discrete manufacturers and R&D professionals have long viewed product lifecycle management (PLM) as a means to enhance manufacturing and design process management, data integrity and digital mockup. While these capabilities serve as a baseline to address operational challenges, current out-of-the-box solutions lack the maturity to maximize the value of product data and quickly tie it to business decisions. In increasingly digital environments, PLM solutions that can offer a broad suite of analytical capabilities appear well positioned to meet the needs of manufacturers.

In order to bridge the gap between the capabilities that are available today and those required to put the full potential of product data to work, we recommend an approach based on our Product Lifecycle Intelligence (PLI) framework. PLI is an application of advanced analytics across the product lifecycle to improve innovation results. It applies machine learning techniques to mine operational insights from product development data in business systems including PLM, ERP, QMS, MES and more.

Four Categories of Analytics that Draw Insights from Product Data

There are four categories of analytics that can be used to draw insight out of PLM data. First, descriptive analytics are the easiest to execute and involve using data to explore trends and performance after they happen. Most organizations already engage in forms of descriptive analytics with their PLM product data today. Diving deeper, the next level of analysis involves diagnostic analytics, which explain the reasons behind historical trends. This information can provide insights about which variables are most responsible for an outcome.

The third category is predictive analytics, which uses advanced machine learning algorithms to peer into the future and understand the most likely outcomes before they happen. For example, imagine an algorithm that could predict that a product in early stages of development will likely fall short of market expectations. Knowing this in advance through predictive analytics would allow resources to be diverted to R&D products that are more likely to be successful.

Finally, the fourth and most advanced category is prescriptive analytics, which makes evidence-based recommendations to help optimize future outcomes. Imagine asking your data to tell you how to decrease product cycle times, or which suppliers to use to meet demand needs on time.

The analytics offered by true PLI can take PLM data and use it to create models that can guide decisions to maximize value. As an organization advances from descriptive to prescriptive, the potential for results-driven insights, particularly before critical investment decisions are made, increases sharply. PLI helps organizations predict the impact of product development decisions on key business performance metrics, like demand, cycle time, cost, quality, regulatory compliance, manufacturability and supply chain efficiency.

Put Product Data to Work with PLI

The PLM software on the market today does a great job of managing product data through rapid change and capturing this contextually, but is less stellar at putting that data to work through datamining and analytics. For many discrete manufacturers, this means that they are sitting on months or even years of untapped R&D product data. With product lifecycle intelligence, companies can bridge the gap in PLM analytics capability today.

Companies with less mature PLM or PDM implementations can also benefit from PLI. Even with small or moderate amounts of data, PLI offers the ability to understand current performance, historical averages, the variances across different business units and functions, and begins to paint an emerging picture of the root causes that are influencing performance challenges. As your organization iterates through product development efforts and your database grows to be robust, the value of PLI grows accordingly.

The imperative is now. Democratize the data by allowing front line users to generate insights that matter to them, thus maximizing the value from your product data—or wait for your competitors to do it first!

How Can Product Lifecycle Intelligence Help You?

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