ASK THE EXPERT

Why Manufacturers Need a Connected Systems Approach from Design to Production and Beyond

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Manufacturers are battling rough winds in multiple areas and struggling to buoy the bottom line. While innovation is key, the methods to achieve these goals can't run on outdated systems and limited IT expertise.

To gain efficiencies, from design to production and beyond, product lifecycle management (PLM) and enterprise resource planning (ERP) systems need to work fluidly together. A single source of truth improves data accuracy and efficiency across engineering, manufacturing, and service.

Florian Harzenetter, Senior Director, Global Advisor for Industrials and E&HT, PTC, explains how manufacturers can innovate and improve their bottom lines by leveraging connected data systems.

What challenges are today's industrial manufacturers facing?

Industrial manufacturers are contending with slowing demand for their products. Limited demand and geopolitical insecurities compound the strain. Operating expenses are increasing, while a growing labor shortage is making it difficult to find qualified workers. In such a challenging landscape, innovation is the best path forward. But too often, manufacturers' internal structures and processes are not modernized. The resulting lack of internal visibility limits collaboration and their ability to innovate.

Why are traditional ERP systems not able to address these challenges efficiently?

ERP systems provide great value for customers, but they typically come into play once product designs are in place, when optimization opportunities are limited, and manufacturers know what parts they need and the processes to produce them.

Given that more than 80% of product cost and manufacturing effort lock in after completion of product design, ideally, products should be optimized for cost and

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manufacturing efficiency before then, when changes are easy and fast. To do so, designs and bills of materials need to be available for review and analysis early in the product development process when change is cheap. It's important to have an engineering backbone to assess all product properties running up to the ERP handover. PLM and ERP need to work together to optimize the whole value chain for customers, starting with the design process. Together, they can carry a product from the cradle to the grave — from design to production to service.

Given this landscape, how can manufacturers improve their operational efficiency and factory productivity?

First, because design decisions influence downstream processes and decisions, manufacturers need to find and judge design options early to zero in on the most optimal designs quickly and efficiently. All the different disciplines — systems engineering, software development, mechanical, electrical, and electronics design — need to work together to develop a functional, viable, and safe product.

The engineering backbone needs to allow this level of analysis and optimization. Optimal design choices can be published to the ERP systems at all manufacturing locations and shared with the network of suppliers. Such a unified flow of information from engineering to manufacturing and service is what we call a digital thread. Connected product data can help create digital work instructions specific to the ordered product configuration, which improves workforce efficiency and reduces errors.

PLM and ERP systems working together will also enable flexible operations so companies can switch production locations and capacities within their production network.

Why are we seeing increased pressure for new revenue streams, and how is servitization helping?

Industrial companies mostly operate B2B businesses, selling equipment with long lifecycles of 20 to 30 years. Given product longevity and slowing demand, manufacturers are looking for new revenue opportunities by supplying spare parts, providing maintenance, or upgrading services.

Digital solutions that help customers operate purchased products more effectively over their lifecycles are another aspect of servitization. Optimizing customer operations helps companies maintain a good relationship with their customers, which is critical to creating ongoing revenue streams. Product vendors are best placed to offer service that increases customer satisfaction and loyalty.

Maintaining strong relationships with customers requires data, and it's why connected software solutions play a role here, too. Another advantage: Data derived from field service can cycle back and inform the design process. Closing the loop with service has significant potential for design optimizations too.

What kind of infrastructure do manufacturers need to implement these solutions?

Industrial companies often do not have the newest IT infrastructure. Running complex tools and heavy enterprise systems like PLM and ERP can be quite a burden for manufacturers with dated infrastructure. The alternative would be to rely on external software-as-a-service (SaaS) vendors who run, maintain, and update these systems. Attending to system maintenance, servers, patching databases, or other IT problems is not the core competency of manufacturing companies. By using SaaS systems, manufacturers can focus on their strengths and transfer the weight of implementing and running a PLM system to external software vendors.

How do these connected data management solutions make room for new technologies like AI?

SaaS comes into play here as well. Manufacturers who use a SaaS solution running on a secure cloud infrastructure can leverage current technologies like AI without placing their intellectual property at risk. Using these technologies helps manufacturers harness their most precious asset: data. Today and tomorrow, manufacturers can leverage the latest advances in digital transformation and drive optimizations from data to boost profits and stay a step ahead of the competition.

Transforming your manufacturing processes and driving operational efficiency through cost savings means navigating the complexities of connected systems.

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