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A Paradigm Shift towards Personalized and Scalable Product Development and Lifecycle Management Systems in the Aerospace Industry

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Abstract : Integrated systems for product design, manufacturing, and lifecycle management are difficult to implement and customize. Commercial software vendors, including CAD/CAM and third party PDM/PLM developers, create user interfaces and functionality that allow their products to be applied across many industries. The result is that systems become overloaded with functionality, difficult to navigate, and use terminology that is unfamiliar to engineers and production personnel. For example, manufacturers of automotive, aeronautical, electronics, and household products use similar but distinct methods and processes. Furthermore, each company tends to have their own preferred tools and programs for controlling work and information flow and that connect design, planning, and manufacturing processes to business applications. This paper presents a methodology and a case study that addresses these issues and suggests that in the future more companies will develop personalized applications that fit to the natural way that their business operates. A functioning system has been implemented at a highly competitive U.S. aerospace tooling and component supplier that works with many prominent airline manufacturers around the world including The Boeing Company, Airbus, Embraer, and Bombardier Aerospace. During the last three years, the program has produced significant benefits such as the automatic creation and management of component and assembly designs (parametric models and drawings), the extensive use of lightweight 3D data, and changes to the way projects are executed from beginning to end. CATIA (CAD/CAE/CAM) and a variety of programs developed in C#, VB.Net, HTML, and SQL make up the current system. The web-based platform is facilitating collaborative work across multiple sites around the world and improving communications with customers and suppliers. This work demonstrates that the creative use of Application Programming Interface (API) utilities, libraries, and methods is a key to automating many time-consuming tasks and linking applications together.

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