basics of Design

Why Integrated Cloud PLM Guarantees Product Lifecycle Visibility

Make Sure Nothing Escapes Your Product Team's Watchful Eye

New product design and development processes are the force behind the success of every electronics manufacturer. Unfortunately, too many companies operate with a silo mentality with departments that do not work cross-functionally. Design engineering and manufacturing, which should be closely linked, can sometimes behave like separate companies only occasionally meeting to "catch up."

Dysfunctional silo mentality can even exist within one department in a company. Hardware designers and software developers within the same engineering department might only rarely share information on product development issues. That lack of information sharing can condemn a product to failure, sending engineers "back to the drawing board."

While these problems are far too common, there are ways manufacturing companies can empower their product development teams.

By adopting an integrated Product Lifecycle Management (PLM) system, companies large and small can improve the efficiency of their operations, resulting in better-quality products with faster time to market. And with the ease of communications access provided by cloud-based computing, a truly holistic PLM solution can help any electronics manufacturer achieve new levels of success in new product development.

Shatter Silos with PLM

An integrated, holistic cloud PLM solution—particularly a multi-tenant cloud-based solution with global access—does away with the silos and speeds the product development cycle, by increasing business insights for all members of the extended product development team.

What is multi-tenancy? Simply put, it's an architecture in which a single instance of software serves multiple customers who—like an apartment complex—are called tenants. Why is that important? A vendor has a single-minded focus on one code base and platform to make rock–solid with all customers accessing the latest version with the latest updates. If a vendor is working on dozens of different versions for each and every company, each one ends up never being completely buttoned-down.

Different groups within a company, whether in design, manufacturing, procurement, or accounting, can share their knowledge and experience because they are all

working in the same application—not isolated into distant groups. And that communication improves product quality and speeds time to market.

If you're a modern electronic product manufacturer, your business requires rapid development cycles in a high-volume, competitive market. You need to identify that critical integrated circuit (IC) that might provide your product the critical edge in terms of final product performance, quality, or cost. Engineering, manufacturing, purchasing, and various other groups within a company all need to act fast to incorporate this key design change into the latest product. An integrated PLM solution allows different members of a company's product development team, including outside suppliers, to plug in at any time and from any location to receive product updates seamlessly.

An integrated PLM solution keeps involved parties informed on all the details of designing and manufacturing those products, including the bill of materials (BOM), the suppliers for each part, and the compliance records for applicable parts. Should a part become obsolete and need replaced, a PLM system can be used to clearly communicate the need to all product team members, including suppliers, to find a suitable replacement, perhaps one that can even bring an improvement in product performance or a reduction in manufacturing cost.

How Holistic PLM Helps

For any competitive electronic product, first-to-market opportunities may represent a relatively narrow window of time, and losing days or weeks on a design-to-manufacturing product development cycle can mean the difference between profit and loss for the company.

For electronic products developed for rapidly emerging markets, such as the Internet of Things (IoT), fast time to market and high product quality are differentiators that are critical for success. Billions of IoT devices are projected to sell into a wide range of markets, including automotive, personal communications, medical, and security applications, and companies with silo mentalities will simply not compete in this aggressive, competitive landscape. An integrated PLM approach provides the means to play a major role in these soon-to-be-huge IoT device markets.

An integrated PLM approach tied to the product record provides tremendous insight into the design and manufacturing processes for an electronic product. All members of a product development team share in the various steps required to create a modern electronic product, specifying components for a product's BOM, ensuring components meet regulatory compliance and purchasing components from distributors or suppliers.

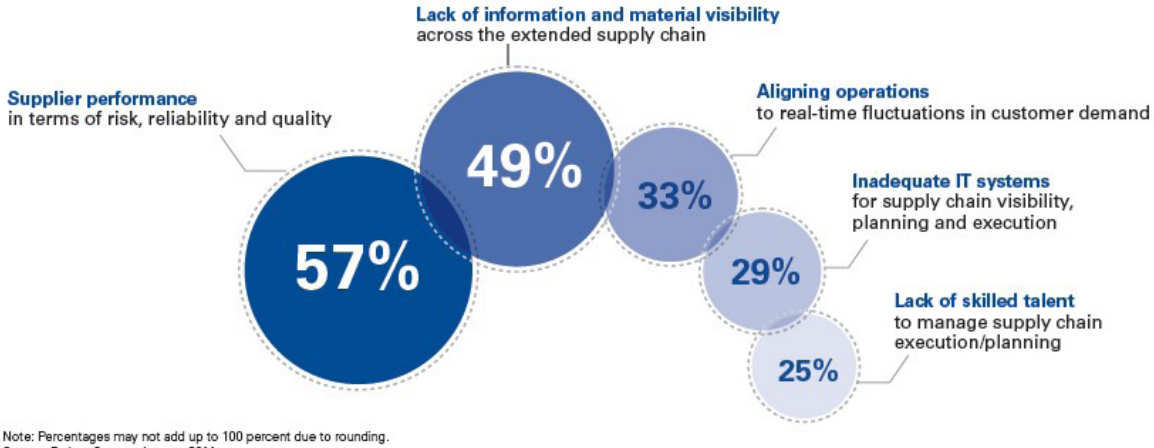
Not only are the different groups within a company tightly linked and always connected to the product development process, but distributors, suppliers, and contractors can be linked in as well.

And, with a holistic, integrated PLM approach that uses cloud-based networking, the different members of a company's product development team can be connected from anywhere at any time. Rather than having to scramble to procure different components when an engineering department makes a late change to a BOM, a purchasing department can access a company's PLM system to keep track of any changes or updates made to a BOM, without slipping on the firm's time-to-market expectations for that product.

Holistic PLM Approach Benefits Quality, Too

Integrated PLM solutions include tools that make it possible to move well beyond the basic management of a product and provide clear, visual insight into the

Big challenges for global supply chain



Note: Percentages may not add up to 100 percent due to rounding.
Source: Forbes Survey, January 2014.

design, development, and manufacturing of a product, including component costs, availability, and factors affecting time to market.

An integrated PLM system can not only improve a company's efficiency in product development but, when tied to an embedded quality management system (QMS), it can yield new products that are constantly improving in quality. A holistic approach to quality can dramatically reduce product design errors.

A PLM-based quality solution helps companies involved with products where quality is critical, such as in the medical device sector, to better meet FDA regulations and product quality business processes, including; 21 CFR Part 11, 21 CFR Part 820 and CAPA (corrective action and preventive action). As Peter Lucas, COO of Epic Medical Concepts & Innovations (EMCI), observed of the holistic PLM solution provided by Arena PLM BOMControl and Arena Quality, "We know when we change a specification on one part of one of our devices, we immediately know what other parts, products, procedures, and manufacturing processes are affected," said Lucas. "We can jump straight from there into engineering and document change requests and orders, as those can interconnect with our CAPA process within Arena Quality."

This type of holistic approach to PLM results in continuous improvements in product quality; operating costs will decrease as product failure rates decrease, both inside the company during product development and for customers outside the company. By combining PLM and QMS practices, quality begins at the design stage of every product, with such factors as the selection of PCB materials and components for a new product based on tradeoffs between cost and long-term reliability. From engineering to procurement, every group can share in the water-tight quest for quality that comes with a continuous quality improvement platform that is embedded in an effective PLM system.

In the medical device industry, quality is not only important, but often a matter of life or death. A holistic approach to medical device product lifecycle, from regulatory compliance, to global monitoring, quality assurance (QA), risk management, and part nonconformance, can deliver a single, integrated view that eliminates errors and builds better quality products.

By integrating PLM and QMS approaches, all members of product development teams and related departments can be part of a quality improvement process, identifying problems before they become more serious, and participating in a "quality campaign" that will continue to drive the company towards achieving higher and higher quality goals.

What Does a Holistic PLM Approach Look Like?

Because of the clear business insights that it provides, an integrated PLM solution can minimize the impact of engineering change requests (ECRs) and engineering change orders (ECOs) on a product's time to market. Based on product demand, manufacturing efforts can be optimized to meet demands even as part inventories are tracked and replenished to satisfy product throughput requirements.

The Embedded Tools a Holistic PLM System Should Have

An aggregate demand solution—tied to the product record—that estimates total parts and materials demand for each product's BOM by forecasting the number of units that will be built for a given time period. Costs and sourcing details can be included in the forecast for accurate estimates, and to provide knowledge of inventory and material requirements.

A project management solution with reference links to key files, requests, applications, and projects to keep partners informed about the different phases of a project and confirm different stages of completion.

An analytics tool that adds business intelligence (BI) capability to the suite for full analysis and development of business strategies linked to new product development. Arena Analytics goes beyond spreadsheets, making it possible to use product data to strengthen BI. It makes it possible to produce reports that present product data in visibly clear formats, with greater insights into business processes. As part of an integrated holistic PLM solution, these reports and metrics can be updated at any time in Arena PLM with cloud-based access for all product teams.

One sure way to manage the development of high quality products throughout theproduct lifecycle is to provide a single, comprehensive view of the entire product record. Next-generation PLM solutions provide more busi-

nessprocess and product context with an extended view of related businessprocesses from product development to quality management to projectmanagement.

Holistic PLM Includes Embedded Tools and Integration of External Solutions

A holistic PLM solution every product development team member a single, crystal-clear view, from the design stage and the creation of a BOM through the members of the team involved with procurement of the BOM and the marketing and business management of that product. A holistic integration should include both internal embedded tools and integration of external solutions.

That degree of software flexibility extends to other suppliers' CAM and CAD software tools, as well as to other modern business tools, such as enterprise resource planning (ERP) software. By integrating these different business-fueled, product-development tools, clear insight into a product's lifecycle is provided to all team members, with PLM data readily available to any members with Internet access.

Arena PLM BOMControl allows users to communicate changes and data, including CAM and CAD files, product data management (PDM) files, and electronic-design-automation (EDA) files, so that details concerning a product are kept up to date.

The power of the Arena PLM suite increases through its ease of integration with outside CAD tools, such as Cadence® OrCAD®. In working with strategic partner EMA (www.ema-eda.com), Arena Solutions has seamlessly integrated OrCAD into the Arena PLM ecosystem for an even more powerful product management solution.

Manny Marcano, President and CEO of EMA, feels that this high level of integration enables product development teams to keep product and engineering data stay in sync. Marcano says"A lot of companies are growing very quickly and are looking for a one-size-fits-all, off-the-shelf, plug-and-play environment. Because Arena and EMA are working together, we're able to address that need on the electrical side and the PLM side, and we can get them up and running in a matter of hours, in some cases."

Why Arena PLM?

The Arena PLM system is an integrated solution for electronics manufacturers, linking product management, design tools, business management, and global distributors and inventory sources to tackle the evolving demands of fast-moving markets. This holistic PLM solution unites product development team members, from design engineers to parts suppliers, and helps make the product development cycle more efficient, less time consuming, and more rewarding, resulting in higher-quality products with shorter times to market. For electronic product markets expected to be numbering in the billions annually, a holistic PLM solution may be the best way to compete. ■

Resources

1. TechTarget: Arena PLM specializes in Medical Equipment Validation, http://searchmanufacturingerp.techtarget.com/feature/Arena-PLM-specializes-in-medical-equipment-validation

2. Arena Solutions, "How to Turn Your Engineers Into Product Design Superheroes," Electronic Design online, http://electronicdesign.com/basics-design/how-turn-your-engineers-product-design-superheroes.

3. John Papageorge, Blog Post, Arena Solutions, "Arena Analytics Provides Insights Into Critical Product Data," http://www.arenasolutions.com/blog/post/arena-analytics-provides-insights-into-critical-product-data/