

Article

Cloud Connected Content Makes Making Easier

David Beats Goliath

One of the most important trends in manufacturing over the past 30 years has been the importance of global operations. A focus on quality in the '80s enabled outsourcing and demand-driven inventory management in the '90s. Over the last decade, lean manufacturing with global supply chains has driven dramatic cost reductions in almost every industry. Throughout, the companies that achieved dominance generally did so with complex, high-quality products produced in high volume by a global supply chain. Think Apple.

The next wave in manufacturing— managing, connecting, and sharing data in the cloud— doesn't change the fundamental fact that making well-engineered products at low cost and high quality is the key to manufacturing success. What it does change is how big a manufacturer has to be in order to compete successfully in a global marketplace. Cloud manufacturing is enabling small and mid-sized companies to build profitable, growing businesses by making better products than their global competitors.

An Uneven Playing Field

Pre-cloud, successful global manufacturers invested millions of dollars to install, customize, and connect proprietary enterprise software systems. Big enterprise software has its challenges (and some spectacular failures), but overall this investment has enabled big- company engineers working with pre-engineered libraries of parts to spend more of their time optimizing their designs. And their designs are generally managed in expensive Product Data Management (PDM) and Product Lifecycle Management (PLM) systems. These are integrated to downstream Enterprise Resource Planning (ERP) systems, either at the company's own factories or at a contract manufacturer, so every part is readily sourced from a global supply chain.

In contrast, engineers at mid-sized companies traditionally browsed websites, manually copied component data into their designs, did as much engineering as they had time for, and then handed spreadsheets and PDF files off to their purchasing departments. Then, overworked procurement personnel used faxes, email, and telephone calls to send specifications and design data to a small network of often- local suppliers, which faced the same inefficiencies in their own operations.

More strategically minded mid-sized manufacturers have long recognized that better data management can make them more competitive. Pre- cloud, they invested in their own on- premise design and manufacturing software to create islands of well- managed product and component data behind their firewalls. This helped, but even the most forward- looking mid-sized manufacturer could not afford truly integrated data management throughout the product lifecycle and across the supply chain.



Low-friction component data management with expensive proprietary software has allowed global manufacturers to do more engineering and use worldwide sourcing to optimize the cost and quality of every part. Higher data friction and more primitive, isolated software tools have meant less optimized designs and higher costs for small and midsized manufacturers. But that has now changed.

Connected Cloud Content Levels the Playing Field

As engineering and manufacturing data moves into the cloud, midsized manufacturers are finding that they can easily and automatically pull component and engineering data into their designs, transparently move the design between different tools to ensure performance and manufacturability, and securely and directly publish data to suppliers worldwide for prototyping and production. Manufacturing data in the cloud is nimble. It can be connected into a larger ecosystem of cloud services and moved where you need it, when you need it.

Newly nimble cloud-powered data is fueling a renaissance of sophisticated “maker” products produced by tiny companies. It has also enabled new hardware-based business models. Barnes & Noble—yes, the bookseller— has re-invented itself and now delivers content on a high-tech e-reader that goes toe-to-toe with its competition. And in the mid-market, companies such as Cambium Networks, GoPro, Fitbit, and Aliph are leveraging sophisticated cloud-native enterprise applications (such as Arena BOMControl and NetSuite) to produce tightly targeted and highly engineered products at costs that allow them to compete and win against top-tier multinational competitors—the Goliaths.

Protecting Data in the Cloud

Storing proprietary intellectual property (IP) assets such as product designs and manufacturing plans in the cloud—outside of the company firewall—is still new to many midsized manufacturers. While there used to be few offerings from which to choose, now a wider array of cloud-based vendors and products are available.

When customers select a bank, broker, or other financial services vendor, they look first for security and stability, and then service and accessibility. The same hierarchy of concerns applies to cloud manufacturing. When selecting cloud providers to host key IP assets, first look for trustworthy vendors with a time-tested, cloud-based business model and audited operations. Then, compare products for functionality, connectivity, and cost.

It can be instructive to ask for each prospective provider’s Service Organization Controls (SOC) report, which is issued by independent auditors only after a lengthy standards-based review of the provider’s operations. The controls listed in a SOC report say a lot about the stability and security of a cloud provider. They can even be used to understand whether the cloud service is the vendor’s primary business or a sideline.

Some questions to consider: Does the provider operate its own servers or outsource to a third party? Does it have the infrastructure and procedures to restore service after a disaster? How strong are its internal controls to restrict access to customer data? What is its historical performance and uptime? Is there a clear process and commitment to “withdrawals” of data when customers leave?

When your money is deposited in the bank, it is more secure, easier to access, and better controlled than money in a back-office safe. In just the same way, established cloud manufacturing applications and services can provide better data security and tighter control over your firm’s critical IP than you typically achieve with software running on your own servers—if you choose reliable and trustworthy providers.

Will All Manufacturing Data Be Connected?

The success of cloud manufacturing is disrupting the market for manufacturing software, sparking a quiet war over the future of manufacturing data. The participants in this war: cloud-native, software-as-a-service (SaaS) providers that advocate what is known as a “multi-tenant” delivery model, and traditional software vendors that provide hosted delivery of their single-tenant applications. The terms—and more importantly, their impact—are easily misunderstood.

Cloud-native SaaS providers champion a multi-tenant delivery model. In this approach many customers are served from one (or a few) large instances of new, purpose-built cloud solutions. Think of the way a bank serves many customers from a shared financial services infrastructure.

Traditional software vendors have responded to the multi-tenant SaaS challenge with a hosted version of their single-tenant (one software installation per customer) applications. These vendors tout their hosted delivery option as a premium alternative to traditional, on-site software, in the same way a safe deposit box can provide better security than an in-home safe.

The impact of each approach is clear. Using the banking example again, offering banking services—ATMs, online banking applications, and bill-payment services—is costly. Because a bank manages its customer accounts in a secure, shared “multi-tenant” infrastructure, no single banking customer has to bear the full cost of these services. The costs are shared, and the services are available for customers of all sizes. Similarly, securely connecting software, services, and manufacturing data is costly. Providers of multi-tenant cloud services are able to spread those costs across many customers. Connected manufacturing data and related services and software become available for all multi-tenant cloud-services customers, regardless of size.

In contrast, assets stored in a single-tenant safe or safe deposit box remain disconnected from the larger world of financial services. In the same way, when manufacturing data remains in single-tenant software (whether hosted in a private cloud or in on-site servers) it also remains disconnected from the larger world of manufacturing services—except when the owner of the data has the scale and financial wherewithal to set up and maintain its own integrations.

The tenancy war will decide whether midsized manufacturers enjoy the benefits of connected, nimble data.

Embracing the Cloud

Cloud manufacturing is bringing new competition to traditionally stable markets. Connected data is providing easy access to a global supply chain while driving down the cost of going from concept to shipping product. It’s helped Nautilus reinvent a classic business. Square has revolutionized payment processing with elegant technology and extremely low cost design. SunPower has leveraged cloud manufacturing to continuously improve performance, drive down cost, and extend its reach in the solar industry. Midsized manufacturers that embrace the cloud are finding they can bring carefully targeted products to market faster, at world-beating costs—and win against bigger, more bureaucratic competitors.

About Arena

Arena, the inventor of cloud PLM, provides an all-in-one product development platform that unites PLM, ALM, supply chain collaboration, and QMS for the design and manufacture of complex electronics. With Arena, electrical, mechanical, software and firmware engineers can collaborate with manufacturing and quality teams to manage their bill of materials, facilitate engineering change orders, and speed prototyping. As a result, Arena customers can better meet standards while they ensure regulatory compliance, improve training management, reduce costs, increase quality, and collapse time to market. Arena has been ranked a Top 10 PLM provider and won the coveted Design News Golden Mousetrap Award in 2016. For more information, please visit <http://www.arenasolutions.com>.

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