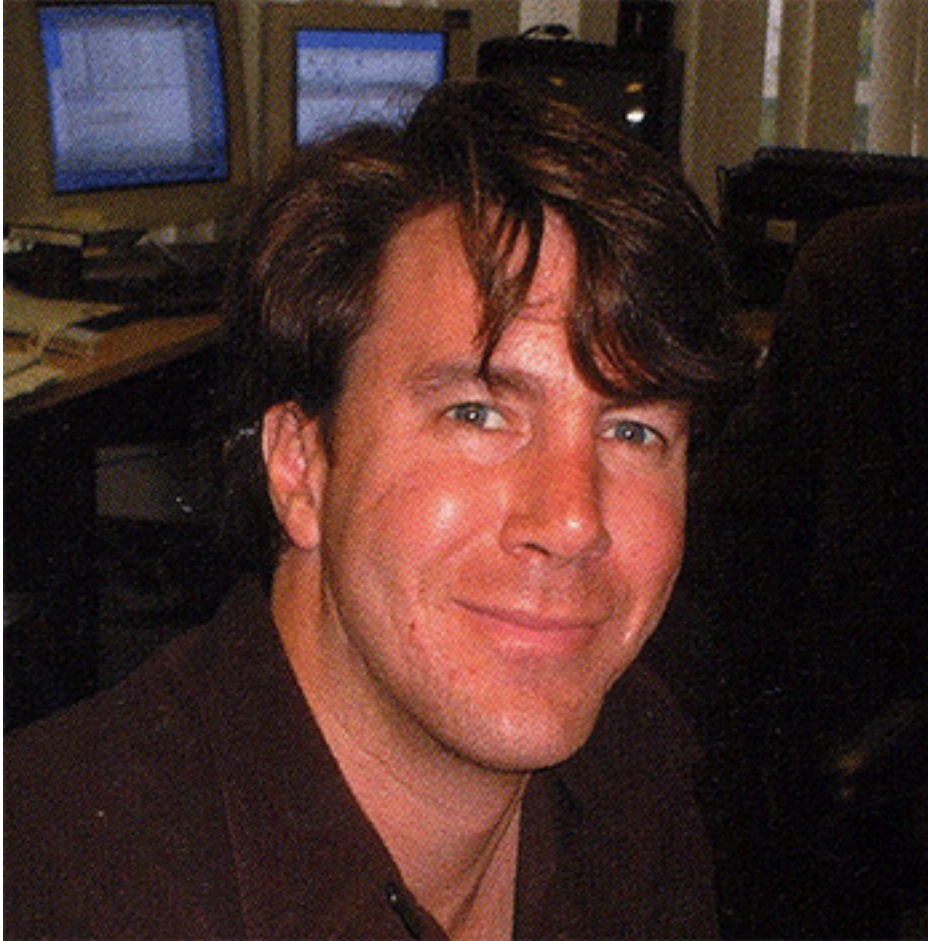


Why the Cloud?

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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.

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

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supply chain. No product is an island — they each rely on an extended chain of suppliers — and neither should be an organization's design and manufacturing software.

Very large product design and manufacturing companies could afford to connect expensive proprietary software to at least some significant portion of their global supply chain. This enabled them to make engineering more efficient and productive, using worldwide sourcing to optimize the cost and quality of every part. Small and mid-sized manufacturers were forced to endure higher data friction and more primitive, isolated, less expensive software tools, which resulted in less optimized designs and higher costs.

But the advent of cloud PLM has completely changed this picture.

Benefits of Cloud

This is a golden age of innovative electronics makers. Components are cheap and plentiful, overseas manufacturing facilities are sophisticated and fast. Electronics companies can remain nimble, because they don't have to invest in industrial facilities. The cloud model for PLM matches needs of a modern outsourcer perfectly.

As engineering and manufacturing data moves to the cloud, mid-sized manufacturers are finding that they can easily and automatically pull component and engineering data into their designs, transparently move those designs 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.

This nimbleness means that manufacturers and outsourcers alike using cloud-based PLM can connect to a wide range of suppliers easily and inexpensively. With traditional on-premise PLM software, the customer has to purchase a site license for each supplier, which now typically costs about \$5,000 to \$7,000 each, in addition to the yearly support costs of \$1,000 to \$1,500 per license. Then, if the supplier does not already have the software installed, it must be deployed, which can take weeks or even months to complete. With a cloud-based solution, there's no need to deploy software on-site for suppliers and the cost of adding suppliers is but a fraction of the on-premise providers. Some mid-sized manufacturers using cloud-based PLM collaborate with more than 300 suppliers around the world, a feat which would prove far too expensive and unwieldy with traditional PLM software.

This more nimble and substantially less costly model is fueling a renaissance of sophisticated products produced by tiny companies. And in the mid-market, companies such as GoPro, Fitbit, and Aliph are leveraging sophisticated cloud-native enterprise applications to produce tightly targeted and highly engineered products at costs that allow them to compete and beat multi-national competitors.

Secure Data in the Cloud

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Storing proprietary intellectual property (IP) assets such as product designs and manufacturing plans in the cloud and outside of the company firewall is still new to many mid-sized manufacturers. And just as 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.

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. More innovative product companies that embrace the cloud are finding they can bring carefully targeted products to market faster with reduced errors and lower costs.

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