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Why PLM Users Should Embrace the Cloud

SOLIDWORKS

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BACKGROUND

Since the 1980s, product lifecycle management (PLM) has allowed organizations to more effectively plan, design, manufacture and manage their products. PLM provides a centralized database of product information and the tools to use it, and by doing so it improves efficiency and decreases time to market.

New approaches to software deployment, such as the cloud, can help PLM shine even brighter. First a buzzword and now a seeming necessity, the cloud has served an integral part in modern consumer and professional software alike. Legacy systems of all sorts are striving to move to the cloud to obtain the flexibility and convenience of an online solution.

In this engineering.com report, we'll examine the benefits of adopting cloud-based PLM software. This report will cover:

- Where PLM came from, and where it's going
- The many benefits of cloud PLM
- How cloud-based PLM can increase data security
- Emerging contenders in the cloud PLM space
- Expert advice on migrating existing enterprise data to cloud PLM

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INTRODUCTION

Product lifecycle management (PLM) software got its start in the 1980s, around the same time as the SUV, a now popular three letter acronym for the sport utility vehicle. In 1985, the American Motors Corporation (AMC) was developing the Jeep Grand Cherokee. The company was looking for a way to compete with larger automakers, and its solution was to go digital. AMC invested in Dassault Systèmes' CATIA computer-aided design (CAD) package, a move which allowed AMC's engineers to ditch their drafting tables in favor of computers.

CAD was just the beginning. Soon, AMC had installed a system that served as a central database for all of the Jeep design documents. With this, the company's ability to collaborate greatly improved.

"It helped with communication," commented François Castaing, AMC's head of engineering in 1985. "Conflicts were resolved faster. Engineering changes were reduced."

The interplay between CATIA and AMC's central product database was an early form of product data management (PDM), a central subset of PLM. As the company further iterated on what Castaing called their "data pipeline," the benefits of PLM became more and more apparent. In 1987, AMC was bought by Chrysler, and the larger automaker made full use of AMC's pioneering approach to automobile development.

"Chrysler had moved from just connecting product designers to connecting everyone involved in designing and building the product," reflected Castaing, who remained head of engineering at Chrysler after the acquisition. So successful was Chrysler's use of PLM that, according to

The Jeep Grand Cherokee helped kick off the popularity of both SUVs and PLM.

Castaing, the automaker's development costs were half those of the industry average by the mid 90s. Its competitors had yet to modernize their own processes with a PLM strategy.

"When I think of PLM, I think of a string," explained Mohit Daga, Senior Product Portfolio Manager at SOLIDWORKS. "It can stretch from evaluating an idea in the inception phase to connecting the big ecosystem of stakeholders that are needed to realize the idea, from generation through to production and manufacturing and then completing it through the lifecycle."

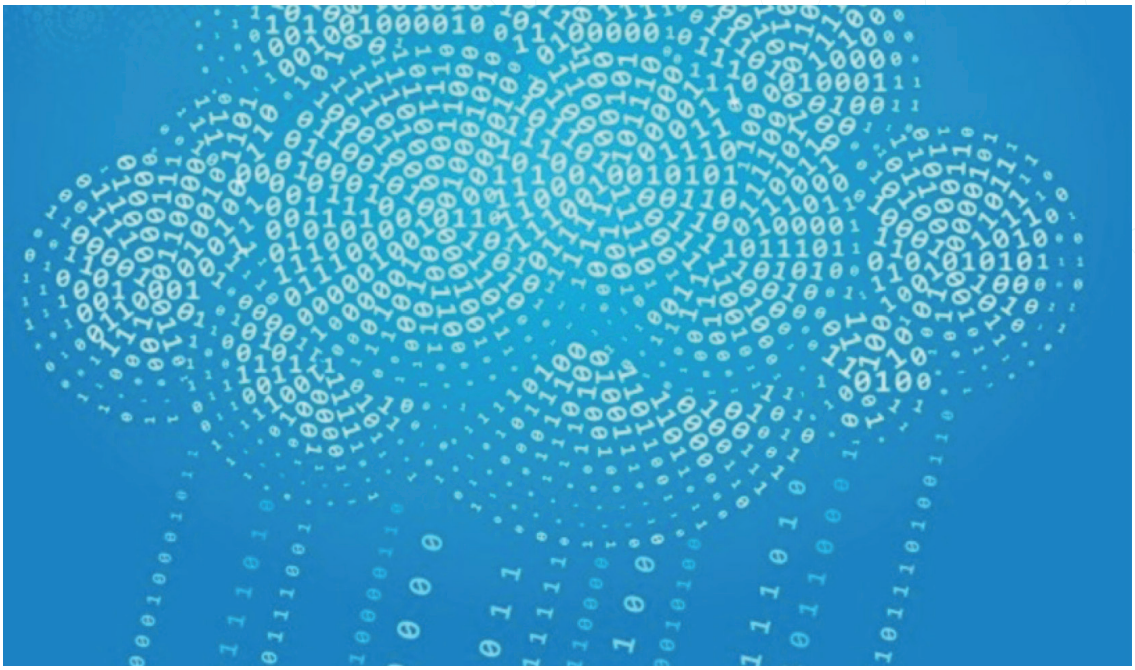
Today, PLM is standard in many organizations, including the entirety of the automotive industry. Large automakers as well as their organizations rely on it, as do many small and medium enterprises dealing in product development. All enjoy the benefits of the "string" connecting the product from birth to death, but each uses PLM in the way best suited to them. "The string can be stretched depending on how you want to use it," Daga continued. "And different companies use it in different ways."

A MODERN APPROACH TO PLM

Just as Chrysler's competitors were slow to adopt PLM, so too has PLM been slow to adopt modern software approaches. Enterprise software is often built on legacy codebases too large—and perhaps too risky—to tinker with. As a result, these critical systems can have the feel of being stagnant and clunky.

Users today have higher expectations of their software; connecting to the cloud is one such expectation. In a recent survey conducted by engineering.com, we asked over 300 engineers, designers and managers to weigh in on whether they were interested in a cloud PDM solution (PDM, recall, comprises a core subset of PLM). Of the cross-industry respondents, 13 percent indicated that they were eager to implement a cloud solution. Another 42 percent indicated they were open to the idea. The remainder revealed they're more comfortable with a local solution for now, but as cloud PLM increases in adoption, that reluctance may fade.

According to research from Dassault Systèmes, which exclusively examined SOLIDWORKS users, the preference for cloud PLM vastly outweighs the reluctance. "Eighty percent of SOLIDWORKS customers say they have medium to high interest in managing their product lifecycle data on the cloud," Daga revealed. "But not eighty percent of SOLIDWORKS users have a PLM system," he added. This shows that some companies may be looking to skip traditional PLM altogether and jump straight into a cloud solution.



(Image courtesy of Dassault Systèmes.)

WHAT IS THE CLOUD?

The cloud is a fun name for a simple concept: instead of storing data on a local machine, store it on a remote server. In this way, it can be accessed by many machines via the Internet. At the consumer level, the advantages of the cloud have proven irresistible. Dropbox, Box, Google Drive, OneDrive, Apple iCloud—these are just some of the many popular file storage services that live in the cloud. Spotify, Tidal, Apple Music and other cloud music services allow users to store their music libraries in the cloud and stream them from any device. Google Docs, Sheets, and Slides are part of Google's cloud-based suite of productivity tools that allow multiple users to simultaneously collaborate on a document without ever leaving their web browser.

In contrast, users of enterprise software such as PLM have been slower to adopt the cloud. Part of it is simply a carefully measured pace of change. Another part is a long-standing concern over the security of the cloud. With news stories such as the Equifax data breach in 2017, in which 147 million people had their personal information stolen, you can hardly blame companies for being concerned for their data. Product development companies go to great lengths to protect their intellectual property. If the cost of peace of mind is using old-fashioned PLM software, many will pay the price.

However, that price is becoming increasingly steep. The benefits of a cloud-based approach to PLM, coupled with advances in cloud security, may tip the scales. It's fair to be concerned about your data's security, but as we'll see shortly, the perception of the cloud as inherently unsafe is unwarranted. For now, however, let's put that concern aside and take a look at the many potential benefits of PLM on the cloud.

WHAT CAN THE CLOUD OFFER PLM?

In the consumer realm, the benefits of the cloud are readily apparent, and they can be summed up in a word: convenience. Users of cloud storage services can access their data from anywhere, on any device, as long as they have a connection to the Internet. Changes made on one device are immediately reflected on another. Users of cloud software tools can enjoy the ability to collaborate in real-time with peers around the globe. There are no forked files—each user has access to the same single source of truth. Users of the cloud needn't worry about the size of their hard drives; they can keep their local devices lightweight and download only what they need when they need it.

These same conveniences transfer to cloud PLM software, but they're more than just the sum of their parts. In an enterprise context, conveniences and expediencies translate to quicker timelines, earlier product launches, and ultimately, higher profit. The less friction caused by software tools, the more time engineers and designers have to spend engineering and designing.

On its own, PLM offers many benefits:

- It centralizes information throughout the product development cycle.
- It improves productivity over time as models and processes are readily re-usable.
- It gives greater access to data and improves the capability of design reviews.
- It reduces duplicate designs and wasted effort. It extends efficiency with real-time dashboards and reports.

And the list goes on. By marrying PLM with the cloud, many of these benefits become even more prominent, and many new benefits arise. Here's a look at the biggest.

GREATER ACCESS TO PRODUCT DATA

(Image courtesy of Dassault Systèmes.)

With PLM, companies have a centralized database of information throughout the product development cycle. This centralization allows more stakeholders to come into the fold, from designers to salespeople and everyone in-between. Cloud-based PLM takes this centralized access to data a step further. Users need look no further than their web browser to find the data they're looking for or to participate in design reviews. And the ability for cloud PLM systems to partition data by role—mechanical engineer, project manager, manufacturing, etc.—means users can home in on exactly the data that's relevant to them.

SCALABLE

A cloud PLM solution is inherently scalable. If you need to add a user (or several) to the system, it's as easy as typing in their name. Unlike traditional PLM systems, there's no fussing about with licenses or downloads. The new user simply logs in and gets to work.

"Being on the cloud makes it easily scalable," Daga explained. "If you want to grow teams in different remote areas of the world, you can. Or if you want to grow-as-you-go, you can do that as well." As we'll see later, the scalability of a PLM system is crucial to its successful adoption within an organization.

EASIER MAINTENANCE

It's not just the product stakeholders who stand to benefit from cloud-based PLM. A company's IT team may be the biggest beneficiary of a switch to the cloud.

"We frequently hear from our customers who are managing extensive PLM or PDM systems that there's a lot of IT overhead that goes along with managing that," Daga noted.

The process of setting up and updating traditional PLM systems is notoriously laborious. Daga tells the story of one company that took an entire weekend and an extensive IT team to update their traditional PLM system. Often, IT administrators are left crossing their fingers and praying that an upgrade doesn't break something fundamental.

With cloud PLM, maintenance is a thing of the past. "On the cloud it just happens overnight," Daga said. "For Dassault Systèmes, our platform updates overnight and you see the brand-new thing the next day."

ANY DEVICE, ANY TIME

(Image courtesy of Dassault Systèmes.)

The way people work is changing, and so are expectations for how and where they work. With a cloud approach to PLM, users are no longer tied to their desktop workstations. Because all the data is stored online, users can just as easily access PLM on their laptops, tablets, and phones as they can on their workstation.

"Everyone's connected nowadays, everyone wants access to everything all the time," said Daga. "Having PLM in the cloud will enable that form of product mindset."

REDUCED COST OF ENTRY

When you're using the cloud for PLM, you don't need to invest in expensive hardware resources to host your own database. And since you don't need that extra hardware, you don't have to spend as much time maintaining it. This results in a lower cost of entry for cloud PLM compared to traditional PLM. And, with less effort needed to keep PLM software up-to-date, the cost advantages of cloud PLM perpetuate.

"There's a low initial investment, a low barrier-of-entry to get into cloud PLM," said Daga. "I would say that's overall one of the biggest benefits." For those companies who have yet to invest in PLM of any sort, it's more cost-effective to invest directly in cloud PLM rather than a more traditional option.

ENABLING INNOVATION

Cloud PLM offers better access to product data, enhanced collaboration involving more stakeholders, easier installation and maintenance, multi-device convenience, a low cost of entry and extreme scalability. But it's not just about having a better PLM process, according to Daga. It's about building a better, more innovative organization.

"In a competitive business context, manufacturing companies need to look beyond their existing PLM strategy and consider how their business can sustainably deliver innovative experiences. So, it's not just about PLM, it's about thinking what's best for your business," Daga said.

SECURITY ON THE CLOUD: IS MY DATA SAFE?

We now return to the topic that stops many could-be cloud users in their tracks: security. The fear is that, by connecting to an external cloud, a company's sensitive data could be compromised. When proprietary information is crucial to your business, you want to make sure your IP is under lock-and-key.

However, as Daga likes to point out, the cloud may actually be a safer place to store data than your local servers. Why? It comes down to a matter of resources. "We have a whole security team at Dassault Systèmes working on the security aspect," Daga said.

Customers of cloud PLM providers worry about the security of their data, but the providers themselves may worry even more. After all, if your customers can't trust you, you won't have customers. Accordingly, cloud providers such as Dassault Systèmes make data security a top priority. And, often, their capacity to do so far exceeds that of their customers.

"Think of a small company trying to secure their data set or their system," Daga ventured. "They'll have some resources, let's just say two resources. They have two resources trying to secure their data, trying to secure their environment. Now think of Dassault Systèmes. We're managing your data in our 3DEXPERIENCE platform. We have not two resources, but ten or a hundred or a thousand resources. It's multi-fold more."

In Daga's view, most companies could benefit twice over by securing their data on the cloud. They could offload the burden of security from their own limited resources to a much bigger team of security experts, and thereby

(Image courtesy of Dassault Systèmes.)

better protect their IP. Traditional methods of sharing data—emails, flash drives, and the like—are flagrant security risks. Sharing data on the cloud is a much higher standard.

"We put a lot of emphasis on having the data very secure," Daga said. "We have some of the best certifications and approvals, and that's something we take very seriously. Being a company which works globally, we have to be very sensitive. That's the DNA of the company overall, to have secure data on the cloud."

CLOUD SECURITY WITH DASSAULT SYSTÈMES

Let's take a look at some of the specific ways that cloud software providers protect their customers' data. We'll use Dassault Systèmes, provider of the 3DEXPERIENCE cloud platform, as an example.

For starters, Dassault Systèmes follows industry security standards and best practices for its cloud security. These include the International Organization for Standardization (ISO) 27000-series of standards for information security, with a particular emphasis on ISO 27002; the National Institute of Standards and Technology (NIST) 800 series of standards for computer security, employed by the US federal government; the Open Web Application Security Project (OWASP) security testing methodologies, and the Control Objectives for Information and Related Technologies (COBIT) framework for IT management.

Dassault secures its cloud platform across multiple layers, including the Internet layer (all traffic is filtered and channels are secured between the customer and hosting environment), application layer (which undergoes a strict security review process and continuous threat scanning), in-cloud layer (customer instances are independent of other systems, preventing cross-customer data access), virtual systems layer (virtualized systems are regularly tested with random attacks to ensure integrity), and finally, physical security (access to data centers is strictly limited and logged, and data is backed up onto redundant disks).

Layers of security on Dassault Systèmes' 3DEXPERIENCE cloud platform. (Image courtesy of Dassault Systèmes.)

These security precautions are crucial to cloud software providers like Dassault Systèmes. That goes doubly for cloud PLM, which has the potential to expose a company's entire digital thread. Ultimately, PLM users want the peace of mind that their data remains just that—their data. And contrary to many users' expectations, the cloud is not a breach in that peace of mind, but a fortification.

THE BEST WAY TO ADOPT A NEW PLM PLATFORM

There are many PLM providers racing to offer cloud PLM solutions. Many of these are start-ups, young companies looking for a shot at market disruption. Others are established enterprise software providers, either updating their existing PLM systems for the cloud or creating new solutions entirely. Cloud PLM platforms include Upchain, a fully cloud-based PLM and PDM system; PTC Windchill, an established PLM platform that can connect to the cloud via Microsoft Azure; FusePLM, a browser-based cloud PLM platform; Propel, cloud PLM built on top of the Salesforce CRM platform; and a new cloud data and lifecycle management suite on Dassault Systèmes' 3DEXPERIENCE platform.

"It's a suite of portfolio solutions that we are working on to provide data and lifecycle management solutions on the 3DEXPERIENCE platform," commented Daga. 3DEXPERIENCE is a cloud-based platform from Dassault Systèmes that encompasses an array of design, manufacturing and business applications tied together in a single environment.

"The 3DEXPERIENCE platform from Dassault Systèmes provides value to every stakeholder, connecting everyone to a single source of product definition," Daga explained. "This is key. You have one product definition, and everything follows out of that. The platform provides digital continuity across a comprehensive and robust set of data-driven applications, ensuring everyone is working with the latest and most up-to-date information, overall developing increased efficiency, improved collaboration, lower cost and faster time-to-market. As well as, obviously, a better experience for the customers."

(Image courtesy of Dassault Systèmes.)

THE CHALLENGE OF DATA MIGRATION

If you're convinced by the advantages of switching to a cloud PLM solution, or you currently have no PLM solution and are looking to get one, you'll want to do so as painlessly as possible. Daga offered his advice on how the process can be made smoother.

"Data migration overall is going to be one of the key factors for success of cloud implementation of PLM," he explained. "And not just data from existing PLM systems. The reality is that there are a lot of customers with no PLM or even PDM solution. So, there's a need for migration of data, but not just from other PLM systems. It's a need for migration from network drives and other cloud storage solutions."

Daga has observed that many customers successfully adopt a slow-and-steady approach to data migration. In many cases, these customers opt to retain their existing systems while the new PLM systems come onboard. "It's a transition, a very slow transition," Daga said. "And the old system, if they have an old system of PLM, becomes more like an archive. Whereas the new system becomes their go-to PLM system. They want to keep both."

In this way, users can acclimatize to the new PLM system without worrying about where to find their old data. Eventually, the new system becomes the go-to system and the data migration is complete.

The other option is to try and bring over all the data at once. Daga points out that Dassault Systèmes is working to accommodate these types of en masse migrations in its 3DEXPERIENCE platform, which has the architecture in place to support transitions from other PLM systems. It's not yet as easy as a simple click-and-switch—IT administrators the world over would fall to their knees in gratitude if it were—but Daga foresees the process becoming quicker and easier in the future.

"We are architectured to support customers who want to move towards the 3DEXPERIENCE solution," Daga said. "Depending on what you're using, we might have a solution to get you up and running right away. We're not there yet for all the solutions that are out there, because there's hundreds or maybe even thousands of different solutions available. We are working towards solutions based on what our customers want the most." Otherwise, the slow transition approach to data migration has worked well for many companies.

6 TIPS FOR SWITCHING TO CLOUD PLM

Besides the hassle of data migration, there are several other considerations when switching or adopting a PLM platform. Daga offered six tips that have proven successful with his customers:

1. Create your PLM and overall digitalization strategy, and make sure all executives and senior management are on board. The new direction must be embraced by the entire company in order to succeed.
2. Prototype and review your existing processes and solutions to determine which departments are best positioned to reap the benefits of a PLM solution. Who can benefit most from more comprehensive digital continuity throughout the organization? Start there.
3. Find a leader for the transition project. There should be an internal champion for the implementation, especially when some processes will be transformed and some brows furrowed. If there's no champion and not everybody's on board, it can be a challenge to move the project forward.
4. Make sure there are regular checks and balances, especially in the beginning. Since there will be an initial learning curve for everyone involved—and not everyone's learning curve will be the same—having checks and balances helps make sure everyone's coming along.
5. Choose a PLM platform that enables you to grow as you go. That's important so that you can start in the areas that bring the highest value and gain the confidence to extend to other areas, processes and departments at the pace that your business dictates.
6. To tie it all together: Start small, scale over time, and look at solving more and more problems over time. Don't try to hit a home run the first time you're at bat.

CLOSING COMMENTS

As the complexity of modern design workflows continues to increase, we rely more and more on software solutions to keep design on track. To this end, many companies have already embraced product lifecycle management (PLM). Now, there may be an opportunity to improve PLM with the cloud.

We all want to develop products more quickly, more efficiently and more profitably. Cloud PLM may help in meeting this goal. By switching from traditional, locally-based PLM systems to a modern, cloud-based approach, companies can make their product data more accessible. Internal and external members of the design process can have greater access to the information they require, making collaboration more effective. Users can access their data on the device of their choice. With a cloud-based PLM solution, software maintenance is instant and headache free. Cloud PLM is infinitely scalable and has a lower cost of entry than traditional systems. Perhaps best of all, cloud PLM enables organizations to innovate and deliver better experiences for their customers.

While many users are (rightfully) concerned that their data remains secure, cloud PLM isn't the security risk many imagine it to be. The resources and capital that cloud software providers spend on securing their customers' data often far exceeds the capacity of the customers themselves. And because their reputations are on the line, if there's one thing cloud providers take extremely seriously, it is security.

The benefits of PLM, made even more compelling when coupled with the cloud, are critical for any modern organization. "PLM must be a key component on every manufacturer's product development process," said Daga.

If your organization is looking for a way to improve workflows and better manage product data, it's worth looking into a cloud PLM solution. Whether that's an upgrade with your current PLM provider, a switch to a new provider, or a first leap into PLM, the benefits of cloud PLM are too numerous to ignore.

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