

Simple is Hard—But When You Get It Right, You Can Change the World

Upchain's User-Centric Approach to
Enabling PLM



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Takeaways

What you need to know

Takeaway #1

For years, the PLM industry has added complex capabilities while paying lip service to ease of deployment and use. PLM doesn't need to be hard anymore.

Takeaway #2

Upchain began with this end in mind so that its solution would be easy to implement and use. They continuously add new functionality, yet at the same time simplify the user experience..

Takeaway #3

Using multi-tenant cloud and modern tools, Upchain developed a new user-centric approach that supports an extended set of PLM use cases while avoiding historic PLM pitfalls.

Takeaway #4

Upchain has architected its solution to be an operating system—transparent to the user, embedded within the commonly used enterprise desktop tools (e.g., MS Office), and able to integrate to enterprise, cloud, mobile, and desktop solutions.

Takeaway #5

Upchain's PLM solution has been designed to drive innovation by enabling an integrated environment that allows users to work in their native applications while easily collaborating with others throughout their value chain.

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Introduction

“Everything should be made as **simple** as possible, but not simpler.”—Albert Einstein

The famous German-born theoretical physicist, Albert Einstein, said it best, “Everything should be made as **simple** as possible, but not simpler.” Unfortunately, the PLM industry has a history of developing and implementing solutions that often end up being hard to use and complex to maintain. Why, you might ask? Well, in a recent CIMdata position paper¹ it was noted that after more than 30 years of the development and delivery of commercially available solutions, complexity has arisen because “PLM has its roots in engineering, where everything is a problem that must be solved with a robust, ‘do it all,’ comprehensive solution, often over-engineered ‘just-in-case,’ and perhaps even overly optimized to support out of date use cases.” Additionally, commercial pressures and major customers drove acquisitions of point solutions that were never architected to work with the core PLM solution. This often resulted in a hodgepodge of technologies. To support a complete end-to-end lifecycle solution, this needs to change. PLM is an enterprise strategy and must be enabled for all extended enterprise participants, not just those in engineering.

To overcome this mindset and make the complex simple, Upchain, a relatively new entry into the PLM economy, has done the heavy lifting. They

have architected their solution in a manner that it can easily adapt to an organization’s changing business requirements while still delivering a user-centric user-first experience. For Upchain, this meant that they weren’t trying to satisfy every possible use case, but rather deliver a solution that adds value and supports key users’ requirements. By focusing on the capabilities that are widely needed, it has left those capabilities that most companies don’t need out of the

equation and along with architectural constructs that often make PLM solutions—their implementation, use, and maintenance—difficult and overly complex. Ultimately, an organization needs a solution that is simple—one that has been architected to be resilient, flexible, easily upgradable, and extendable, as well as quick to deliver value. Upchain’s focus on end users and solution value enables their user community to maximize ROI and focus on innovation.



Image courtesy of Upchain

¹ <https://www.cimdata.com/en/resources/complimentary-reports-research/position-papers/item/13455-why-is-plm-often-so-hard-simple-is-best-position-paper>

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Why Making it Simple has Been So Hard

PLM has often been overengineered to support the complexity of engineering at the expense of everyone else

There are several reasons that PLM has the reputation of being hard to develop, implement, use, and maintain. Some are well deserved, and others are a result of what was trying to be enabled at the time. Many of today's leading PLM solutions have their roots in engineering. This legacy has resulted in a significant amount of complexity and/or customization that may not be appropriate or have added value. Unfortunately, for most industrial companies, PLM is not recognized as an enterprise solution, but rather is seen and managed as an engineering tool that is responsible for the creation and management of engineering data. The first reason is that solutions were not architected and implemented for the enterprise, but rather for the perceived complexities associated with engineering and its diverse user base (e.g., a software engineer has different requirements than those of a mechanical engineer, and an electrical engineer is different from both). In many cases, this made sense. Early adopters who implemented PLM in the 1980s and 1990s tended to be large, highly integrated organizations. While there are still some large and vertically integrated companies, most companies are part of dynamic value chains—operating as customers and suppliers at the same time—where flexibility and agility are key. These value networks evolve and change

over time, and as a result, the solutions that support them must be just as flexible and agile.

A second reason often identified is that many of the PLM solutions have been designed by engineers for engineers. Of course, there is nothing wrong with engineers designing and delivering solutions for their peers, but since PLM really is an enterprise solution, a true lifecycle-oriented solution needs to be designed for a more diverse user base—as complex as necessary

and as simple as possible. This requires an enterprise view—one that seeks to understand the entire extended enterprise's needs and optimized from end-to-end. This isn't an engineering technology issue—it is a C-level business issue that needs to be championed by a C-level role and implemented by stakeholders responsible for the various departments and organizations throughout an extended enterprise.



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Customization isn't the answer for simplification, it is often part of the problem that makes PLM harder

Finally, a third commonly seen reason is when PLM solutions are implemented to manage current processes as they exist, enabling a company to “do it their way” because they believe that they are fundamentally different from other companies and must have a uniquely tailored solution. While companies often start with good intentions to manage their product lifecycle processes, they often get sidetracked to solve edge use cases that rarely happen or worse, shouldn't happen. Unfortunately, many companies do not stop to think about what they really need across their entire enterprise from an end-to-end lifecycle perspective. They might start by believing that they can “make things easier,” but often end in sub-optimizing and adding complexity rather than simplifying and optimizing. The result is often a highly customized and complex solution that is neither extensible nor sustainable. All of which leads to more complexity, because to get the job done, many people feel that they need to work around the new system instead of allowing the system to serve their needs directly.

Over the years, IT and engineering have both argued that structure is required and without structure, chaos ensues. While taken to the extreme that is probably true, not having



Image courtesy of Upchain

structure isn't what keeping it simple is about. It is about finding the right balance between organizational control and individual freedom to innovate. Or as Dr. Einstein stated, “Everything should be made as simple as possible, but not simpler.” Companies need to look to solutions, like Upchain's, that are designed to drive innovation by enabling an integrated environment that allows users to work in their

native applications while easily collaborating with others throughout their value chain. A solution that is transparent to the users—providing the data and process management capabilities needed by all extended enterprise users. A solution that provides the right structure, not too little or too much. Providing the right structure that works for all stakeholders—one that enables repeatable and sustainable innovation.

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Successful PLM implementations rely on innovation platforms that don't get in the users' way

Successful PLM implementation programs share several key characteristics. First and foremost, they focus on enabling a company's complete extended enterprise user community. This user-centric approach requires the implementation of capabilities and the enablement of processes that are honed and optimized from a user perspective—seeking to make PLM's data and process management capabilities transparent and highly intuitive for all (i.e., including non-engineering product stakeholders). Such an approach typically results in a solution that maximizes the organization's return on PLM investment (e.g., the true cost/benefit analysis over a multi-year period).

A close and critical second issue is, to be successful with PLM, a company must select a solution that can be implemented in a flexible and agile manner that best enables the attributes of a sound Product Innovation Platform.² This means it must seek to enable an environment that best satisfies the five Strategic Imperatives for platforms (i.e., Connection, Gravity, Flow, Openness, and End-to-End Lifecycle Support), as well as the seven Foundational Characteristics (i.e., Sustainability, Data Management & Find, Through-Life Configuration Management &

Traceability, Process & Knowledge Management, Upgradeability, Enterprise Infrastructure Utilization, Availability, and Stability) as defined by CIMdata. So, what does this all really mean? Does a company need to rip out what they have and replace it with one monolithic system? While this may be the best approach for some companies, it usually doesn't maximize the PLM-related ROI. What is really needed is to implement, over time, a flexible and agile solution that will allow an organization to tie together its various data creation and management systems into a holistic, adaptable, end-to-end digital environment where users have easy secure access to the data they need, when they need it.

Such solutions make it easier for technical and non-technical groups (e.g., sales and marketing) to access and use product-related data as needed to perform their tasks. This creates an environment that enables users to work within their natural tools as much as possible and avoid data reentry where errors often occur. When approaching PLM in this manner, lifecycle processes and data management connect the personal and departmental level productivity tools to the enterprise. It isn't about ripping and

replacing, rather it is about enabling an effective work environment, guided by an overall solution architecture and vision, where users focus on delivering products that satisfy customers rather than non-value added and administrative tasks. This is accomplished by transforming legacy tools and solutions into an environment that enables the right level of creative freedom, while ensuring processes are traceable and flexible, and data configurations are well managed—the digital thread and associated digital twins that represent and support the company's products..

Above all, successful PLM implementations ensure that the resulting PLM environment addresses what is determined to be the critical set of enterprise PLM requirements (i.e., today's as well as what might be tomorrow's) in the simplest manner possible so that it's adopted by the entire organization, forming an effective work environment that enables innovation. The PLM solution should be easy to implement, use, and enhance. The best solution providers meet these business and solution requirements ensuring return on investment is maximized.

² <https://www.cimdata.com/en/resources/about-plm/a-cimdata-dossier-plm-platformization>

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“...It's all about the UX and enabling use cases in a manner that results in an intuitive experience.”

From the beginning, Upchain's CEO & Founder, Mr. John Laslavic, a veteran of the PLM industry, chose to take a different approach—build an end-to-end PLM solution that delivers a user-centric and optimized user experience (UX) from the ground up. Upchain's fresh approach allowed them to take a hard look at everything from the data model, the licensing model, how they do integrations, as well as how they create and deliver implementation templates. For Upchain—the company and its PLM solution—the user is at the center of what it does and delivers.

Mr. Laslavic, in a recent CIMdata interview, stated that “...it's all about the UX [user experience] and enabling use cases in a manner that results in an intuitive experience.” Upchain's approach focuses on enabling a UX that relies heavily on the user's interaction with the PLM solution from within their native product data creation and workflow management tools. Upchain believes very strongly that the interaction with PLM should be transparent. It should be an underlying operating system, not an application. This is because users want to work natively within the applications they commonly use to get their work done and have PLM behind the scenes doing the data and process management without getting in their way. Upchain believes that good PLM should eliminate the noise of managing data—that should be transparent to the user. These are some of Upchain's main underlying tenets (see sidebar).

“Our guiding principle and vision for PLM is that it acts like an operating system—always on, always there, never worried about, and never in the way of getting the real work done. The users and the organization see the results of the applications that are built on top of it, but the PLM system itself should be invisible. The user should be able to search for parts and find them from within their applications. PLM should understand what the user's product is, as well as all of the different constituents that specify the product, in a manner that makes sense to each user within their specific context, while enabling their specific user experience and use cases.”

Mr. John Laslavic, Upchain's CEO & Founder

Upchain's application integration approach shows how simple, yet robust capabilities can be delivered and achieve value without compromise. From the start, they focused on the user's ability to get their day-to-day work done. For example, within Upchain PLM a manager who spends most of the day creating and responding to email in Microsoft Outlook or another email solution will use their email tool to review and approve data and documents. In this use case, the manager doesn't have to leave the comfort of email to review or approve—everything is accomplished within the email solution itself. All of which is managed behind the scenes by Upchain PLM. And

when they need to, the manager can easily access the Upchain platform on the web to review overall program status, review dashboards, and drill down into managed data as required. In the area of CAD data management, Upchain chose to follow the same “work within your natural environment” philosophy. To make sure that these integrations (or plugins) provide the desired UX, Upchain chose to develop them themselves. Current mechanical CAD plugins include SOLIDWORKS, CATIA, NX, and Inventor, and in support of electrical CAD, Upchain offers a plugin for Altium Designer with others under development. Their extensive and robust API is leveraged for their desktop integrations and for enterprise system integrations they leverage MuleSoft—a commercially available Enterprise Application Integration framework.



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Leveraging cloud services from AWS and Google, Upchain has been able to deliver new services quickly

Upchain users access the solution via a set of defined roles or personas—Engineer, Project Manager, Procurement, and Manufacturing Planning. These personas have a set of use cases that have been defined and enabled by the Upchain team. Again, this makes it easier and quicker to implement and adopt. It is important to note that these personas don't just support an organization's internal users, but also external suppliers and customers—all of whom play major roles in today's complex and agile value chains. It also should be noted that Upchain's enabled use cases aren't limited to specific personas. They also have been defined and enabled for cross-persona processes, such as change management and approval.

Intelligent agents and other capabilities automatically inform appropriate users when data changes. Upchain can do this because it tracks what data specific users have consumed previously. As a result, what gets communicated is exactly what has changed rather than sending a notification of a change and providing links to all the data that might have been impacted. Inherently, this again simplifies the UX, as well as streamlining the interaction and use of the solution by the different personas enabled.

Beyond rethinking the PLM UX, Upchain also took the time to architect a service-oriented and

modular solution that supports scalability and long-term resiliency. Their solution architecture is based on a multi-tenant cloud implementation. This architecture allows Upchain to use appropriate cloud services to ensure accessibility and scalability. Costs scale with the number of users so small (and large) companies can grow and shrink their deployment when and as required. Additionally, by leveraging cloud services from AWS and Google, Upchain has been able to incorporate and deliver new services and functionality quickly to its customers. Upchain's architecture is underpinned by a 16-sided data cube. This data model's 16 core objects include

Requirement, Process, BOM, Customer, Item, Project, User Profile, Supplier, Work Order, among others, and each object allows for the definition of as many relationships as needed.

This has allowed Upchain to rapidly develop new modules quickly and efficiently, as well as rapidly introduce enhancements to existing modules. Currently, Upchain makes new and/or enhanced capabilities available every two months, and this is done without changing the data model. Some recent examples include Upchain's new quality management module and enhanced Bill of Material capabilities that support different BOM views, including a service BOM.

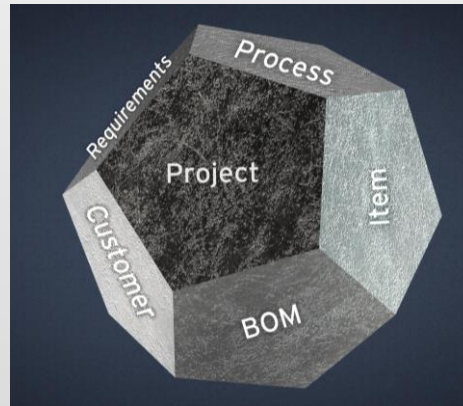


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Connect the Chain is Upchain's innovative and repeatable implementation and support methodology

Upchain's implementation philosophy and approach is refreshing as well. Building upon past experience, the Upchain team decided to employ a "land and expand" deployment approach that enables and encourages its customers to start small and grow incrementally, thus receiving value quickly. Industry-specific templates that have been designed to speed up deployment, as well as user adoption have been well received. Upchain also encourages its customers to learn and expand at a pace that is comfortable for them. Customers are taught how to implement and configure their instance of the solution using Upchain's templates. Here again is an example of how Upchain has optimized the UX. Once initial capabilities are made available, customers can then continue to configure their implementation, enabling additional capabilities, workflows, and so on. In general, customers use an agile approach to build and expand their solution over time. This avoids the disruption caused by rip and replace of existing PLM related applications, but rather incorporates and integrates the appropriate applications in a digestible and progressive manner. Upchain's overall implementation and support services are delivered under the title of "Connect the Chain" (CtC).



Image courtesy of Upchain

CtC has been designed to be an innovative and repeatable methodology that leverages a set of evolving tools and best practices to quickly and efficiently on-board and train new users to Upchain. Training is delivered via e-learning tools that closely emulate industrial users' day-in-the-life work environment. The training does not just describe what the various buttons do, but also teaches users how Upchain reduces tedious tasks and frees up time for value-added activities. Currently, Upchain reports that they are continuing to invest in CtC. It should be noted that CtC isn't just about the initial implementation support and training. It also

defines how they support their customer base—helping them evolve the usability of the delivered solution for each persona, as well as how they can gain additional return on investment as they expand the use of existing and newly delivered capabilities. Ultimately, CtC is about enabling each Upchain customer to easily evolve their instance of the solution and continue to invest, configure, and improve it. Upchain believes that continuous evolution and improvement are keys to maximizing value. This is why Upchain describes CtC as key to their customers' continued success.

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Upchain's flexible and scalable solution is easy to configure, deploy, and use

Upchain uses its solution and support model to partner with customers throughout their PLM journey. This is intended to allow their customers to minimize the technology value gap³ (i.e., the gap between what is available to implement and what has been implemented) that many organizations have historically experienced. Additionally, they report that the solution can automatically send notifications that inform customers when new capabilities are available (i.e., capabilities that might be useful but aren't currently being used). While Upchain doesn't require customers to use new capabilities, they are proactive in letting them know what capabilities would be beneficial. Upchain does this to increase the value its customer receives from using the solution. That is because customers have access to all the capabilities, even newly delivered capabilities and modules at no additional cost. This is a win-win. Customers get easy access to new capabilities and as user counts expand, Upchain's revenue increases. All of this supports one of Upchain's core mantras—easy to understand what is new and applicable, easy to gain access to it, and easy to adopt.

While Upchain doesn't offer a customization tool kit, they are delivering a flexible and scalable solution that is easy to configure, deploy, and

"Our partners want us to be their PLM experts, and that is what we are striving to be—day in and day out. This is the way everyone gets the best results. In the end, we don't want to be order takers. We want to be PLM experts who drive our solutions development in partnership with our partners [customers]. Our approach allows companies to move quickly and to continue to extend and expand the value they receive."

Mr. John Laslavic, Upchain's CEO & Founder

use—one where everyone can get value quickly and easily. Upchain sees itself as the PLM expert (see sidebar), as do their customers. Customer requests are balanced against the solution's core tenets and direction. As the PLM expert, Upchain will work through their customer's wants and often suggest other capabilities that they feel are more in line with the product's direction. This helps ensure the full customer base doesn't get weighed down with esoteric capabilities, or spend time and money switching off unnecessary menu choices as with many traditional PLM solutions. Of course, when a customer brings in a good idea, it gets implemented so all Upchain customers benefit.

At the end of the day, Upchain is focused on making PLM easy for users, not necessarily for themselves as the solution provider. They want to do the heavy lifting, so their customers don't have to. They see it as their job to make the complex simple. While they continue to add capabilities, they do so in a manner that helps customers maximize their return on investment. Upchain does this in a way that allows users to easily take advantage of the capabilities when and where most needed.

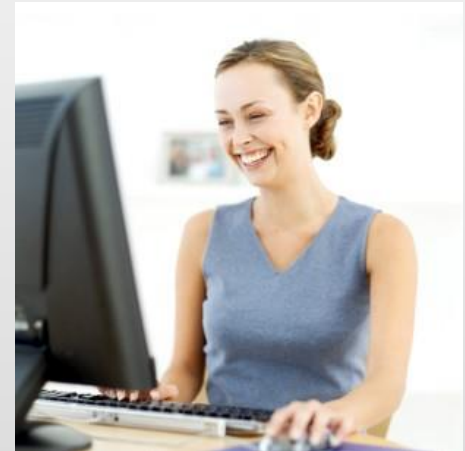


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³ <https://www.aerospacemanufacturinganddesign.com/article/amd0214-plm-value-survey/>

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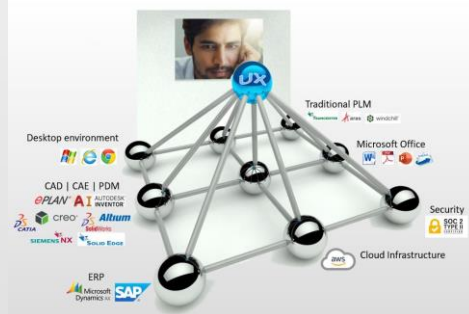
Making product data accessible throughout an extended enterprise

For years, the industry has added complexity to PLM. One only has to look at the history of ripping and replacing PLM solutions, and various studies related to the PLM value gap to understand that this is the simple truth. Complex solutions are hard to take advantage of. The need to customize to get what you really need is no longer true, and in 2020, PLM doesn't need to expose complexity. PLM solution providers like Upchain are making the complex simple so industrial companies can focus on their business, not their technical infrastructure. From its early beginnings, Upchain chose to take the hard road so that its solution would be easy to implement, use, support, and enhance.

Upchain started with a clean sheet of paper, using the cloud and modern tools and approaches to define a new user-centric solution that supports an extended set of PLM use cases while avoiding common PLM pitfalls. Upchain has architected its solution to be an operating system—transparent to the user, embedded within the commonly-used enterprise desktop tools (e.g., MS Office and multiple MCAD and ECAD solutions), and with an ability to integrate to almost any enterprise system via MuleSoft. Upchain's cloud architecture, data model, UX, and implementation and support methodology have all been designed to make the solution easy to implement and use, while delivering high-value functionality. Additionally, Upchain continuously adds new functionality, yet at the same time, simplifies the UX. Ultimately, Upchain's PLM solution has been designed to drive innovation by enabling an integrated environment that allows users throughout a value chain to work in their native applications while easily collaborating with others.

Managing complexity is the name of the game in the modern product and design supply chain world. The need to connect and collaborate across an organization's entire ecosystem, including its engineering partners, part suppliers, equipment suppliers, and customers, will make or break a company. This is what drives Upchain to make the complex simple. Steve Jobs, in a 1998 interview with Business Week, was quoted as saying, "That's been one of my mantras—focus and simplicity. Simple can be harder than complex: you must work hard to get your thinking clean to make it simple. But it's worth it in the end because once you get there, you can move mountains." Perhaps without knowing it, this has been Upchain's underlying mantra from the beginning. Making the complex simple is hard, but as Upchain's customers can attest to, when you get it right, you can change the world.

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