

All PLM Clouds are Not Created Equal

Arena Solutions: Providing a
World-Class Cloud Solution

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PLM in the cloud has not only become accepted, it is now widely sought after in the high tech and medical device industries—with their enormous supply chains, highly regulated products, and being driven by first mover advantage. This report reviews the fundamental definitions of cloud computing, punctuates their salient differences and highlights the characteristics of world-class cloud platforms while reviewing the capabilities of the company who was the originator of multi-tenant cloud PLM—Arena Solutions.

Introduction



Today, cloud has become the go-to business platform for a myriad of enterprise applications, particularly when a global supply chain is employed. While more Product Lifecycle Management (PLM) offerings in the cloud are being announced on a regular basis, not all are equally mature with regards to the

understanding of what is involved in operating a cloud solution that offers data integrity, security, and systems availability in a multi-tenant and a truly scalable environment. CIMdata is being approached more and more frequently by customers asking if cloud PLM offerings are suitable for their businesses. We find there can be many assumptions contained within the question that are unstated and can have significant bearing upon the subsequent discussion.

CIMdata defines PLM as:

- A strategic business approach that applies a consistent set of business solutions to support the collaborative creation, management, dissemination, and use of product definition information
- Supporting the extended enterprise (customers, design and supply partners, etc.)
- Spanning from concept to end-of-life of a product or plant
- Integrating people, processes, business systems, and information

It is important to note that PLM is not merely a definition of a piece or pieces of technology. It is a definition of a business approach to solve the issue of managing the complete set of product definition information—creating that information, managing it through its useful life, and disseminating it throughout the lifecycle of the product.

Based on user feedback over the years, PLM solutions have supported a broad range of products. Examples include manufactured products, such as automobiles, computers, refrigerators, mobile phones, toys, and airplanes.

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Additionally, a number of verticals that previously had no interest in PLM are now researching it in its entirety, given the explosiveness of the Internet of Things (IoT) phenomenon. Many products today also contain software, firmware, and electronic components with data that must be managed. PLM solutions help define, execute, measure, and manage key product-related business processes. Those processes and the workflow engines that control them ensure complete digital feedback to both users and other business systems throughout each lifecycle stage.

Cloud offerings come in many forms and the cloud is embraced by companies for a wide variety of reasons. With regards to PLM, however, manufacturing companies have been slower to move to the cloud due to fears and uncertainties about the merits of placing their intellectual property (IP) into the hands of third party and off-premise providers. As security models have evolved many of the fears have been put to rest, particularly as the benefits of cloud solutions are more widely understood. Manufacturers, along with their trusted partners, constantly balance the need for protection against the need to collaborate. PLM solutions are known for being particularly focused upon access rights and permissions; however, they have historically been managed within the firewall of the company that holds the IP. What then changes when PLM goes to the cloud? How does that differ from customer relationship information, banking and financial information, and other “sensitive” data that is routinely managed in the cloud today?

This report explores the issues impacting PLM in the cloud and highlights that all clouds are not created equal. Differences that at first blush appear nuanced to the uninitiated become substantive and of consequence once the user drills deeper. Starting with a unifying point by agreeing on some key terminology used to describe the cloud, the report will then explore the Fear, Uncertainty and Doubt (FUD) factor commonly encountered when discussing cloud computing. It will then describe the characteristics shared by leading cloud solutions, followed by cautionary considerations to keep in mind when considering the use of the cloud for specific PLM environments. Included will be an analysis of how the originator of cloud PLM, Arena Solutions, fits into the picture through a review its qualifications as a world-class cloud PLM system provider.

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Cloud Terminology



In order to engage in an evenhanded review of cloud computing and PLM, it's important to first agree and have a common understanding of the key terms frequently used to describe cloud computing. This report will focus on the two high level generic terms that are commonly used: Private, and Public.

As security models have evolved many of the security fears surrounding the use of the cloud have been put to rest

Clouds can be hosted in a company's private environment or “publicly” in an environment shared with other companies

Private cloud, more appropriately understood as a single tenant hosted solution, is typically a reference to enterprise systems and applications running on servers that are not managed or operated by the user or industrial customer. The server and the software are managed “off-premise” but all of the hardware and software operates in an “exclusive” mode in that everything for a given customer is dedicated to that customer only. The hardware and software are operated as distinct to the customer and are not shared (as if it were on-premise) but managed by the third-party provider at an off-premise or “private cloud” location.

Public cloud is a reference to an environment where the hardware and the applications are “shared” by multiple customers, effectively this is a multi-tenancy environment. The applications may be supporting multiple customers; however, the data and the configuration of the solution are isolated to each customer. Adoption of the term “Public cloud” often leads to a misconception that it’s akin to a public swimming pool; everyone in the pool sees and shares everything. Fortunately, that’s incorrect, as is the notion that it is equivalent to social media platforms such as Twitter or Facebook, where individuals define who they wish to interact with. The key distinction is that it is the customer, in partnership with the cloud provider, who defines and sets user access controls. System management and administration are handled by the cloud provider, while the application configurations for customer instances are typically administered by each customer. Software updates, patches, network security, performance tuning, and so forth are handled by the cloud provider.

Most fears regarding the cloud tend to revolve around perceived loss of control and concerns about data ownership and exposure, along with perceptions of integrations being limited due to the “cloud” nature of the solutions. Some of these fears may also be aggravated by lessons learned in the whole “off-shoring” experience where companies leapt into an approach without fully understanding what was needed or required to assure success—rather simply following the cloud hype at all costs. One must first understand what a world-class cloud solution should include to determine whether the fears are justified.

What Makes a World-Class Cloud Solution?

A truly world class cloud solution will typically out perform an on-premise solution on many fronts, in part because the very nature of the cloud is that the core business revenue is generated by the cloud offering of the providers. In-house IT is a cost center, thus the investments in the infrastructure are frequently regarded quite differently. A world-class multi-tenant cloud solution will include the following best practices:

- Cost scales per user—not per deployment, takes the capital expense versus operational expense dialogs off the table with low cost of entry.
- A multi-tenant, single instance of software enables rapid scalability, supporting rapid rollouts to partners and/or acquisitions without waiting for new IT infrastructure. Eliminates need for hardware or network sizing—additional

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capacity should be instantly available to the user (not pending a multi-week change request).

- Maintains a full operations team, a dedicated security team, and a dedicated backup team—both for the solution and for the physical security of the data centers that includes material breach and penetration testing.
- Conducts testing and validation of solutions in cooperation with the product development team for scalability, security, and standards
- Performs upgrades on a regular schedule minimizing data migration issues and system downtime. The upgrade process will be built into the solution design.
- Redundancy practices for all aspects of the solution including data center redundancy.
- Disaster recovery includes distinctly separate data centers in multiple geographic regions to properly support maintaining uptime in the event of a localized natural disaster.

Achieving most or all of these objectives is typically very costly for individual companies striving to maintain on-premise solutions, especially when it comes to maintaining in-house IT expertise. With cloud providers, these best practices are core competencies and are the lifeblood of their business.

Other key aspects of a cloud offering include supporting customer needs for responsive and adaptive scalability to support shifts in the user base or business needs, such as mergers and acquisitions, or short-term project fluctuations. Configuring solutions in the cloud should be easy and directly meet customer needs. Finally, enterprise cloud solutions should not introduce any tenant-to-tenant exposure of business data or IP.

Cloud provides adaptive scalability to support shifts in the user base or business needs, such as mergers and acquisitions, or short-term project fluctuations

Reported Cloud Benefits

With PLM cloud solutions, it is important not to assume that all solutions will have equivalent capabilities or benefits just because they are cloud-based. Customers should perform due diligence to determine how the application works, how secure it is, and whether it can scale to meet their evolving business requirements—both up and down.

PLM cloud solution providers may not always be transparent regarding their upgrade practices, so it is critical to ascertain whether software upgrades and patches are included with the service and determine if there are any extra fees required to perform upgrades. Private cloud solutions typically come with fees for upgrading, while public cloud solutions typically include new releases at no cost. The variability on the frequency of upgrades and the complexity of the upgrade process are significant. One solution provider may have one to two upgrades per year that require data to be exported and migrated, while another provider may have four or more upgrades per year that are less invasive, yet offer significant functionality enhancements. The impact of these upgrades on solution integrations (e.g. ERP and CRM) should be reviewed to ensure upgrades will not break the integration or can easily be configured to ensure

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continued integration success. Also be concerned with how the solution provider guarantees the integrity of the data model and the APIs.



Other considerations include: How does the solution provider enable the customer to evaluate the impact of applying configuration changes or upgrades? Does your cloud instance have a complete backup or mirrored instance that can be used for evaluation purposes? If the solution provider is applying updates automatically to all customers simultaneously,

Many considerations impact the cloud decision

as is the case with Arena Solutions, how does the provider enable a smooth transition? Does the provider give advance notice for planning? Do they ensure that enhancements to existing functionality are fully backwards compatible? For heavily regulated companies, do they provide a methodology to effect medical validation? Can you instantly add large numbers of new users with the flip of a switch, or do you have to wait for the solution provider to set up additional capacity and engage a battery of consultants? These are only made possible when employing a multi-tenant single instance of software solution.

A critical aspect of ease of use includes the initial time to implement and total cost of ownership (TCO), essentially comparing the ‘lease’ vs. ‘buy’ models. Customers should consider the cost of the solution and model (e.g. Software as a Service or “SaaS”), the initial implementation complexity and related costs along with the customer’s ability to own the solution configuration after going live—without having to rely on technical experts, programmers or other external consultants. With a well-established and flexible PLM cloud offering, you should have the ability to immediately leverage a user-ready environment to pilot, configure, and add data to “go live” quickly. A good cloud solution should enable customers to manage business process changes without having to manage server environments or technical code. By focusing upon the business processes of a PLM deployment instead of technical or consulting resources, cloud deployments should provide significant reductions in cost and in time to deploy.

Arena PLM Cloud Solution

Founded in 2000, Arena initially focused on helping SMBs manage their Bills of Materials (BOMs) and their basic product development processes (primarily engineering). Since its inception Arena has invested in expanding the scope of their solutions to address both the needs of their customers and customers’ supply chains alike, so that they now can provide comprehensive PLM solutions for companies of all sizes.

Over the years, Arena has taken a forward thinking, pragmatic approach to addressing the business challenges of manufacturing companies. They understand the challenges of creating, managing, and leveraging dynamic supply chains and have incorporated the appropriate architecture and technologies to address these issues.

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Arena PLM's scalable secure cloud solution has evolved to meet the demands of any size company from SMBs to multi-billion dollar global enterprises. Their robust multi-tenant infrastructure maximizes performance, reduces cost and automates recovery while providing frequent enhancements that drive increased value for innovative customers.

Arena was developed from the ground up over fifteen years as the originator of multi-tenant cloud PLM solution, well before it became popular to consider cloud-based models. Arena PLM is architected to leverage high security availability and failover, while providing flexibility to manage user access and business processes with minimum effort and without any programming.

Data protection takes place in multiple forms. First of all, Arena Solutions organizational controls are verified to comply with Statement on Standard for Attestation (SSAE) 16 / SOC 1 Type 2 controls. Their data centers are secured with biometric controls and segregate server cages from other software vendors. Arena has invested in state-of-the-art firewall and network communication encryption (e.g. data encryption at rest and in transit) and in security protocols, including tracking usage via IP addresses to permitted corporate IP addresses. Arena routinely leverages independent third-party penetration services to make sure that it continues to stay on top of the most current security threats. Physical redundancies exist in the form of routers, disks, and controllers; power sources; and load balancing. Their infrastructure, security, and network teams work hand-in-hand with the product development teams to assure that every release provides high availability. Arena contracts to a SLA of 99.5% and has consistently exceeded this guarantee.

Arena has built easy to deploy integration solutions to share data with both upstream and downstream business systems such as ERP (e.g. NetSuite, QAD, Oracle, MS Dynamics, SAP, Sage), MCAD (e.g. SOLIDWORKS), EDA (e.g. Cadence), and component compliance and availability (e.g. Supplier Item Lookup for Octopart, SiliconExpert and Q Point Green Data Exchange). Their solutions connect seamlessly to pass product record data and eliminate errors caused by manual data entry, while ensuring information is accurately shared in real-time with related systems.

System updates or upgrades are a joint effort between Arena's development and system teams to be sure that upgrades are introduced without customer disruption and that the data models, security models, and system performance are not compromised. In addition to the teams that work to keep the Arena cloud up and running 24/7, Arena provides service teams to support customer needs for application functionality and medical device validation in support of applicable Food and Drug Administration (FDA) regulations (e.g. 21 CFR Part 820 and Part 11).

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With on-premise solutions, most system failures impact the individual company, although it could reverberate through to supply chain partners—and their partners as well. With cloud solutions, a failure might affect every customer, and the cloud provider's business would not survive a security or system failure if

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they had immature or inadequate systems and processes in place. Unlike certain PLM companies that have joined the cloud bandwagon in recent years, Arena was the first to architect their solution 100% as a SaaS solution, and has amassed over 15 years of research and development experience. This has resulted in a history of success with a subscriber base fast approaching 1,000 active customers in 79 countries.

The majority of Arena's customers are in high tech, medical device, and consumer electronics industries, and they serve increasingly more global enterprises that have thousands of users across their internal and external supply chains. As a practical matter, if the user is involved with the outsourcing of embedded complex electronics with a high mix of technologies and high rate of change—irrespective of industry—Arena should be on their short list. Arena has evolved from being primarily an SMB PLM solution to a serious PLM cloud contender for even the largest multi-national enterprises.

Conclusion

The bottom line is that Arena's PLM cloud solution maintains system availability. Stability and security are greater than the capabilities of most on-premise PLM customers and their respective internal IT staffs. Arena Solutions is continuing to expand its PLM capabilities as a cloud platform with frequent enhancements and new product offerings every year. (See CIMdata Product Review on Arena Solutions for more on their PLM offerings). Arena Solutions is one of the few PLM offerings that delivers on the promise of providing a secure, multi-tenant cloud solution.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata's services, visit our website at <http://www.CIMdata.com> or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.

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