CIMdata®

Driving Connected Data and Process Management with Autodesk Vault PLM

Supported by Autodesk Vault and Autodesk Fusion Manage

Key Takeaways

The value of data management and connected processes cannot be understated. The more connected an organization's people, processes, and data are, the more competitive they will be.

The quality of data is fundamental to training accurate and robust artificial intelligence (AI) models that will facilitate the discovery of meaningful patterns, insights, and correlation, enabling more informed decision-making.

Many companies are wary of deploying large-scale complex PLM solutions due to high costs, large numbers of resources required, lengthy deployments, and disruptions to their business, instead preferring more flexible solutions, which are easier, faster, and less expensive to deploy.

Autodesk Vault PLM combines Vault Professional with Fusion Manage to provide enterprise-wide collaboration across the product lifecycle—from engineering and supply chain to quality and manufacturing.

Introduction

In today's rapidly evolving manufacturing landscape, many companies are challenged with disconnected data management and process challenges. Organizations often rely on outdated, disconnected legacy systems, home grown bespoke solutions, and an assortment of network drives and spreadsheets to manage their design data. This fragmented approach leads to manual error-prone workarounds with groups working in isolation. At CIMdata, we often see these divides between engineering disciplines such as mechanical, electrical, embedded electronics, and software. The lack of cohesive data management also hampers collaboration across other functional areas such as manufacturing, quality, procurement, the supply chain, service, and sales.[1]

These data silos and disconnected processes result in operational inefficiencies that drive up the costs of designing, manufacturing, and servicing products. Data should be a valuable resource, but in these environments, has instead become a burden to the organization. People are unable to find up-to-date data in a timely fashion and are forced to perform manual and redundant tasks, resulting in delays, poor allocation of resources, and an overall lack of productivity. To overcome these disconnects, employees must resort to a heavy use of emails, non-value-added manual handoffs, extra meetings, and duplicate data entry, which leads to many inefficiencies, delaying time-to-market, degrading quality, raising costs

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to do business, and potentially impacting current and future customers. Moreover, the inability to connect the right data with the right people can impact compliance and lead to potential legal and financial risk.

Effective change management suffers when data is siloed and systems are not connected, resulting in downstream errors that are more time-consuming and costly to rectify. Organizations face difficulty identifying root causes of recurring quality issues, leading to persistent defects and rework, scrap, and warranty issues. When quality management processes are disconnected from product design, additional defects and a high cost of poor quality are inevitable. Supplier collaboration also becomes inefficient, further exacerbating these challenges. The lack of real-time visibility into data hampers decision-making, as organizations struggle to gain useful insights and make informed, data-driven decisions. This inability to respond agilely to rapidly changing business and technological landscapes puts organizations at a disadvantage when opportunities or existential threats arise.

The increasing complexity of smart, connected products amplifies the need for connected data management practices. Organizations must manage more electronics and embedded software, adding to the volume and complexity of data. Customers now demand more "optionality," a trend towards more personalized products with features tailored to their specific needs. Without connected data management processes, meeting these customer demands becomes nearly impossible, leading to customer dissatisfaction. To leverage future technologies such as digital twins and artificial intelligence, strong data management practices are essential.

Many companies in the short-term overcome their inefficiencies by throwing more people at the problem. However, not every company has that luxury and as products get more complex and the amount of data increases, it is not a sustainable solution. Eventually, it is no longer feasible nor economically viable to manage this growing complexity by solely increasing headcount or implementing more point solutions.

Driving Connected Closed-Loop Data Management

When additional resources and workarounds no longer suffice, an organization suffering from poor data management and sub-optimal processes will ultimately realize they have reached an inflexion point, beyond which the lack of a modern connected product lifecycle management (PLM) strategy will become a major constraint on future growth.

The obstacles in their path—fragmented data, isolated teams, and disconnected workflows—highlight the need to continually digitally transform how they work from a people, process, and technology point of view. In CIMdata's view, recognizing these challenges is the first step toward preparing an organization for positive change. This strategy is not only relevant for those optimizing a multi-disciplined engineering team but can be even more valuable to the extended enterprise across all functions that touch the product lifecycle in a flexible, connected closed loop.

Cloud-based PLM can be used to manage and share data across functions and processes. This fundamentally changes how operations are conducted and value is delivered. Teams gain access to the latest accurate data at the right time, enabling them to collaborate. When this happens, data silos are dismantled and improved workflows lead to efficiencies, enhanced data management, and streamlined processes. This typically results in better business outcomes such as reducing time on non-value-added tasks, improving quality, bringing products to market faster, and improving a company's resilience and agility to respond to market threats and opportunities.

When companies do decide to deploy PLM, or in many cases re-deploy PLM because the legacy solution did not keep pace with the organization's needs nor have the ability to integrate with other business systems. Another concern is the risk associated with a large-scale deployment, which typically includes

extensive migrations of data and massive training needs. This will be accompanied by large budgets, many resources required, lengthy deployment schedules, and disruptions to business. While this may be necessary given the circumstances, some organizations prefer more flexible solutions, which are easier, faster, and less expensive to deploy.

Autodesk Data and Process Management Capabilities

Autodesk provides solutions that help customers connect their people, processes, and data. This commentary focuses on Autodesk Vault and Autodesk Fusion Manage.

Autodesk Vault Professional for Product Data Management

Autodesk Vault is Product Data Management (PDM) software designed to help organizations efficiently manage their design and engineering data. By enhancing collaboration and providing control over product development processes, Autodesk Vault ensures that engineering teams can work more effectively and productively. The software seamlessly allows multiple users to access and collaborate on projects in real time. This is particularly beneficial for distributed teams, ensuring that everyone has access to the most up-to-date design and engineering data.

One of the key strengths of Autodesk Vault is its deep integration with various Autodesk design tools, including Inventor, AutoCAD, Revit, Moldflow, and 3DS Max. These integrations facilitate smooth data flow and interoperability between different software, making it easier for design teams to manage their projects. Configuration management features, such as check-in and check-out, ensure that teams can access the latest versions and revisions of files, enabling concurrent design efforts across multiple teams. Autodesk Vault maintains a comprehensive history of all changes, allowing users to restore previous versions and perform side-by-side comparisons, which is invaluable for quality control and troubleshooting.

Autodesk Vault also excels in supporting engineering change management processes. This ensures that all stakeholders are promptly informed of changes, facilitating a smooth change management process across teams. The software's capabilities extend to release management, where it tracks the status of work from in-process to review, release, and obsolescence stages. Moreover, Autodesk Vault creates and maintains both an engineering Bill of Materials (eBOM) and a manufacturing Bill of Materials (mBOM), preserving the relationships between items and allowing users to traverse these relationships.

Vault Professional connects teams with multisite, multi-CAD collaboration, while Vault PLM combines these features with additional PLM capabilities offered by Autodesk Fusion Manage.

Autodesk Fusion Manage for Product Lifecycle Management

Autodesk Fusion Manage is a cloud-based PLM solution that extends beyond the PDM capabilities of Autodesk Vault. It connects people, processes, and data across the extended enterprise. While Autodesk Vault excels in managing design and engineering data, Fusion Manage offers a comprehensive suite of capabilities designed to connect the entire product lifecycle. The main advantage of using Autodesk Vault in conjunction with Autodesk Fusion Manage lies in their integration, which enables organizations to implement connected, closed-loop processes. This integration enhances efficiency and coordination across various stages of the product development lifecycle, from initial design to final delivery.

Autodesk Fusion Manage is hosted on Amazon Web Services (AWS), which ensures robust performance, scalability, and security. Fusion Manage is easily configured to suit a company's specific data and workflow processes. It is also based on open restful APIs, which allows extensive integrations with other systems such as multi-CAD including CAD, CAM, CAE, and PCB systems, as well as Enterprise Resource Planning

(ERP), and Customer Relationship Management (CRM) platforms. This flexibility ensures that Fusion Manage can fit seamlessly into existing IT infrastructures, enhancing connectivity and data flow across different departments.

Autodesk Fusion Manage supports applications for the extended enterprise such as supply chain management, quality management, new product introduction and others. It facilitates supply chain collaboration by managing Approved Manufacturer Lists (AML), automated supplier reviews, and providing real-time status updates on parts availability. This level of visibility and coordination helps organizations optimize their supply chain operations.

Quality management is a notable example of where Autodesk Fusion Manage stands out. It supports a range of quality processes, including Corrective and Preventive Actions (CAPA), Failure Modes and Effects Analysis (FMEA), Supplier Corrective Action Requests (SCAR), Return Material Authorizations (RMA), and compliance traceability. Many companies are looking to connect their quality process with their change management PLM processes to improve their cost of quality. By creating a closed-loop between quality management and design, Fusion Manage ensures that quality issues are promptly addressed and integrated back into the design process, leading to continuous improvement and higher quality products. CIMdata is impressed with the quality management capabilities in Autodesk Fusion Manage. The platform also supports New Product Introduction (NPI) processes with phase-gate milestone tracking, color-coded GANTT charts, real-time status updates, and task notifications, enabling better project management and timely product launches.

Autodesk Vault PLM Brings it all Together

Integrating Autodesk Vault with Autodesk Fusion Manage supports more comprehensive closed-loop processes within the product lifecycle. Data managed in Autodesk Vault, particularly from Autodesk Inventor, flows seamlessly into Autodesk Fusion Manage, ensuring continuity and coherence in data management and process control. The integration with Autodesk Vault through its open API ensures a seamless transition from PDM to PLM, allowing organizations to leverage their existing data and workflows while expanding their capabilities to cover the entire product lifecycle.

Autodesk Vault PLM combines Vault Professional with Fusion Manage to provide enterprise-wide collaboration across the product lifecycle—from engineering and supply chain to quality and manufacturing. Autodesk Vault PLM can adapt to the changing needs of an organization, enabling it to start with one PLM process at a time and scale up by adding more users and processes as needed.

Conclusion

Connecting the enterprise with strong data management processes is essential to thrive in today's fast-paced, data-driven world. The value of data management and connected processes cannot be understated. The more connected a company is with strong product data, the more competitive they will be with better collaboration, more streamlined and efficient processes, improved quality, more informed decision-making, greater customer satisfaction, and resulting in better top and bottom-line results. As artificial intelligence impacts the way product data is used, the quality of data becomes critical. The quality of the data is fundamental to training accurate and robust artificial intelligence (AI) models that will facilitate the discovery of meaningful patterns, insights, and correlation, enabling more informed decision-making.

Autodesk Vault PLM provides an intuitive SaaS Cloud solution that enables companies to connect product design and manufacturing. Its Quality Management workspace provides connected product development with closed-loop quality management. In addition to improving the cost of quality, CIMdata believes this

can drive greater visibility across the extended enterprise and more awareness to the importance of quality. Autodesk Vault PLM's cloud-based solution built on open APIs connects business systems that can connect data, people, and processes with the flexibility to adapt to changing business needs. CIMdata finds Autodesk Vault PLM to be quite configurable and is impressed with its level of functionality, flexibility, and ease of use. CIMdata encourages companies looking for flexible data management and the ability to connect their organization's product development processes to consider evaluating Autodesk Vault PLM.

About CIMdata

CIMdata, a global strategic management consulting firm, provides services designed to maximize an enterprise's ability to design, deliver, and support innovative products and services. For more than forty years, CIMdata has provided industrial organizations, providers of digital technologies and services, and investment firms with world-class insight, expertise, and best-practice methods on a broad set of product lifecycle management (PLM) topics and the digital transformation they enable. CIMdata also offers research, subscription services, publications, and education through certificate programs and international conferences. To learn more, visit www.CIMdata.com or email info@CIMdata.com.