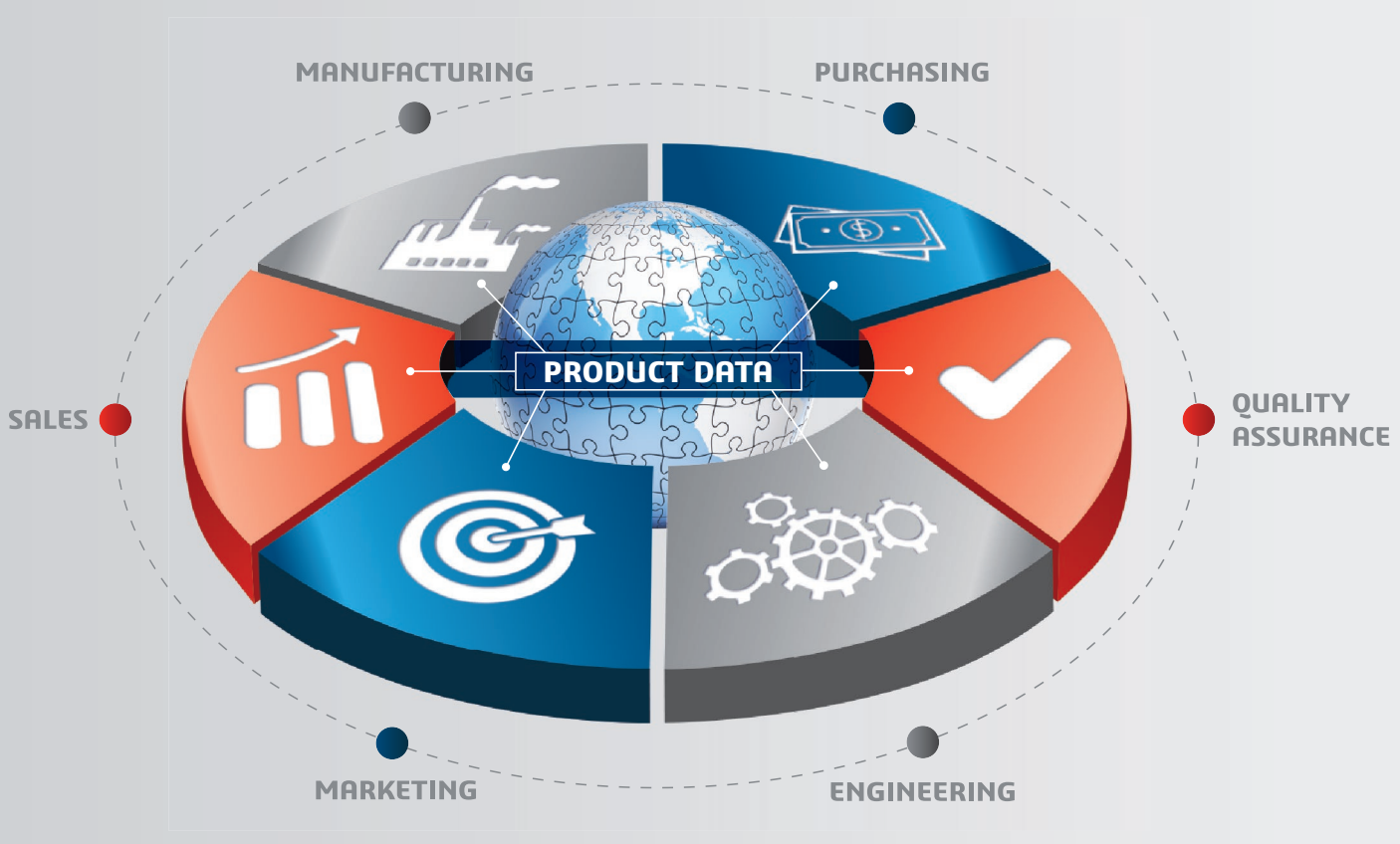


NEW METHODS OF MAXIMIZING THE VALUE OF DATA THROUGHOUT THE ENTERPRISE

White Paper



OVERVIEW

The value of product design data extends beyond its traditional use by product development organizations to nearly every aspect of the manufacturing enterprise. While effectively managing this data as part of product development through product data management (PDM) solutions carries many proven benefits, distributing product data to other departments and leveraging its inherent value for other requirements advances data management in ways that increase its effectiveness, boost organizational efficiency, foster collaboration, inspire innovation, and improve enterprise mobility. Now known as distributed data management (DDM), these innovative solutions build upon a manufacturer's investment in the creation of product design data to distribute its utility enterprise-wide, resulting in productivity gains, reduced costs, and increased competitiveness. SOLIDWORKS® DDM tools provide easy-to-use, affordable solutions that enable manufacturing enterprises to maximize the value of product design information, as well as other types of data, quickly and cost-effectively.

DISTRIBUTING PRODUCT DESIGN DATA BEYOND TRADITIONAL DATA MANAGEMENT SILOS

Manufacturing enterprises have many assets, ranging from skilled, knowledgeable employees and intellectual property to production equipment, technical systems, and distribution networks. However, in today's fast-paced digital age, a manufacturer's most valuable asset may arguably be the voluminous data housed within its departments, databases, and systems. Although most enterprises recognize the benefits of managing, mining, and utilizing data to improve efficiency and achieve a competitive edge, these efforts have largely focused on managing and leveraging data within the departments and for the applications from which the data emanates. This has led to the creation of department/function-specific data management silos, such as product data management (PDM), manufacturing resource planning (MRP), and enterprise resource planning (ERP) systems.

Even though these data silos meet the requirements of their intended purpose, and benefit individual departments and discrete business functions, they are often disconnected from each other and fail to take advantage of the potential enterprise-wide benefits associated with greater interconnection and data distribution. For example, PDM applications work well for securing and storing the intellectual property within product design data and ensuring that the correct version of a product design is released to manufacturing. These systems can also automate product development workflows, including product design/approval/release and engineering change order (ECO) processes. Yet, product design data can also be applied to MRP requirements. Supply chain management—sourcing, procurement, and inventory management—and manufacturing planning—budgeting, scheduling, and quality assurance—are functions that stand to benefit from accessing and utilizing the product design data housed within PDM

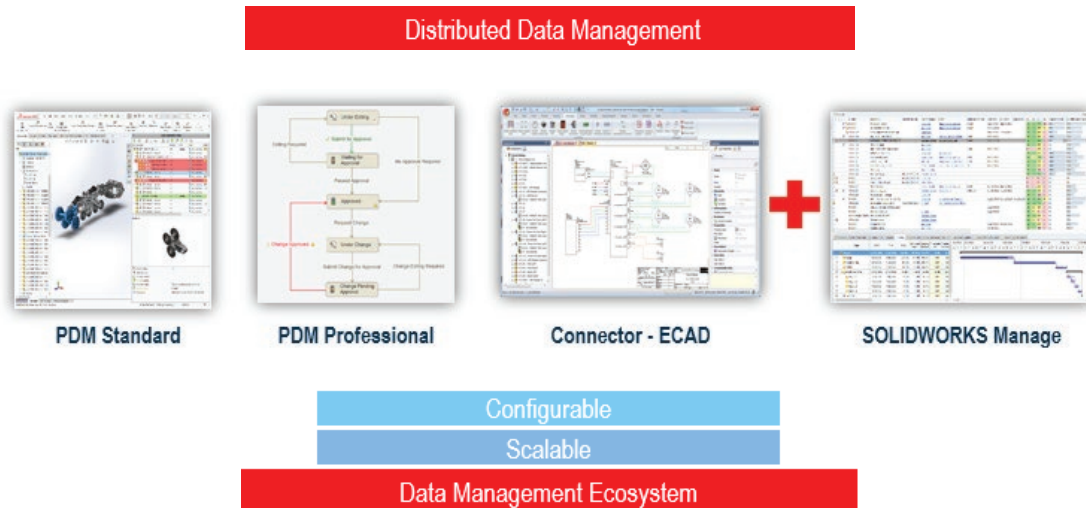
systems. Likewise, users of ERP systems that manage financial transactions, stock keeping units (SKUs), and personnel information would benefit from PDM and MRP connections.

Making connections and supporting communication in the areas in between these data silos, while possible in the past, has not been easy or inexpensive, often requiring customization, additional development, and ongoing administration. Because these systems are separate and distinct, users of one system will not necessarily be able to access or use another data silo due to differences in user interfaces, format, terminology, and even how terms are defined. Furthermore, managing projects and processes that are not directly related to each data silo but utilize the data contained within can be either problematic or impossible. Thus, configuring, generating, and publishing reports that would be beneficial to an enterprise's strategic decision-making process but not associated with an existing data silo capability presents a challenge that's not easily overcome. What's needed is a means for managing access to and distribution of data, including product design data, in a format that's useful to others across the enterprise. This paper explains how newly introduced distributed data management (DDM) solutions can help.



WHAT IS DISTRIBUTED DATA MANAGEMENT? PDM PLUS MUCH MORE

First introduced in 2018, distributed data management systems essentially tap and present the underlying data in specific silos in formats that enhance its utility for other enterprise-wide applications. In short, DDM distributes data for use by internal and external users by providing access to the most up-to-date information from anywhere and on any device with a web browser and internet connection. Because a manufacturer's product data begins in product development, a company's PDM system represents the data repository through which the widest audience of users across the enterprise can benefit.



LEVERAGING PDM DATA FOR OTHER CRITICAL APPLICATIONS

By distributing PDM data beyond product development, manufacturers can accelerate and support other critical applications that can leverage product design data. Product development information, such as bills of materials (BOMs), development timelines, and anticipated manufacturing processes, can then be used to prepare and drive other important functions, including manufacturing planning, purchasing, sales, marketing, and other product launch activities, further streamlining a manufacturer's core operations. This set of capabilities is called advanced data management.

ADVANCED DATA MANAGEMENT

In many ways, advanced data management is more clearly described as smarter data management. Advancing an organization's data management function requires moving beyond the file-based database structure of many PDM systems to take advantage of the more advanced capabilities associated with a single data management ecosystem. This approach makes it easier for personnel from different disciplines and departments to access, leverage, and utilize product design data in an easy-to-use, straightforward fashion. These extended uses range from project and process management to records management and the generation of data-driven information and reports.

MANAGING PROJECTS

Different departments within a manufacturing enterprise typically have distinct kinds of projects to manage in connection with the development and release of new and existing products. These uses are commonly served by a variety of project management point solutions and systems that: manage time through stages, timelines, milestones, and time sheets; coordinate resource utilization and capacity; and establish user tasks. With an advanced data management system using DDM tools, projects are managed in a similar way but with the important difference of tying these project management functions to the actual data (associated records, files, and deliverables), which more efficiently drives project management, with the added benefit of using the same tools to manage projects across the enterprise.

MANAGING PROCESSES

As with project management, many manufacturers use point solutions to manage various processes in different departments. Here again, advanced data management/DDM solutions can handle process management needs more efficiently and cost-effectively, enabling companies to streamline or merge related processes through the use of a single, collaborative, unifying system. By allowing personnel from different departments to configure states and decision points for any process; establish user tasks for different types of personnel, including ad hoc approvers; and associate related records and files to the process, DDM systems establish a standard enterprise-wide approach to process management.



MANAGING RECORDS

With DDM tools, manufacturers can create and manage records derived from product design files contained within a PDM system. Most PDM databases are file-based, managing a collection of files with a limited number of attributes. With DDM solutions, companies can expand upon the information contained in a PDM database to manage as many associated records or items as needed. These records can include product definition data, 3D CAD models, renderings, BOM information, and a range of related documents. Different departments can then leverage associated records that best fit their specific functional needs, advancing the efficacy of data management tools.

GENERATING REPORTS, DRIVING DATA MANAGEMENT WITH DASHBOARDS

Accessing and utilizing data derived from a PDM database, project management solution, or process management system is a much different endeavor than aggregating, communicating, and presenting that information in formats tailored for consumption by varied audiences. True advanced data management demands a DDM system that utilizes interactive graphical dashboards and displays, so that report generation is fully customizable to meet specific needs. With DDM tools you can utilize easy-to-follow dashboards to configure, generate, and publish reports that meet specific purposes and comply with unique company standards.

SEARCHING FOR COMPONENT SHAPES AND METADATA

While text-based search capabilities that seek out file names, product numbers, or other naming conventions are typically available in traditional PDM systems, advanced data management demands the ability to search for product design information using a range of features, attributes, and related data. Locating an existing product or component by searching for mechanical features and characteristics (e.g., holes, pads, grooves, etc.) and other types of associated data (known as metadata) is a more natural, effective means for finding design data for a product or part than knowing how the file associated with it is named or numbered. Geometry and metadata search capabilities can increase design reuse and decrease the proliferation of duplicate parts.

DISTRIBUTED DATA MANAGEMENT IMPROVES MANUFACTURING COMPETITIVENESS

Implementing distributed data management tools to advance a manufacturer's data management function and effectiveness carries a host of important benefits that boost productivity and enhance overall competitiveness. By establishing an integrated system for accessing and leveraging product design data, DDM solutions can generate the efficiencies and cost savings that can positively affect a manufacturing enterprise's bottom line.

GREATER EFFICIENCY SAVES TIME

An advanced data management function utilizing distributed data management tools ushers in greater efficiencies by eliminating time spent searching for existing product design data and related information. Instead of someone calling or emailing product development to request information, they can quickly and easily find the data and documents that they need to create BOMs, for example, using DDM tools. Because DDM solutions provide the structure and tools required to streamline projects and processes, manufacturers realize additional efficiencies associated with the use of a single, integrated system. Taken together, the greater efficiency related to DDM-driven advanced data management minimizes the likelihood of product development and project time overruns.

ELIMINATING ERRORS, CUTTING COSTS

In addition to cost-savings related to greater efficiencies, DDM solutions help manufacturers reduce costs associated with design errors; duplicative, unnecessary tasks; and expensive, existing data management systems. By tightening revision controls, the PDM portion of DDM reduces the volume of scrap and rework, and related costs. With improved geometry and metadata search capabilities, a DDM-based system increases the frequency of design reuse, thereby cutting the costs of part number proliferation. Lastly, as a more affordable alternative to expensive product lifecycle management (PLM) systems, whose costs typically exceed realized benefits, DDM solutions provide greater dividends and return on investment (ROI), and help manufacturers eliminate the potential for cost overruns.

EFFECTIVE COMMUNICATION SUPPORTS BETTER DECISIONS

On top of time and cost savings, a DDM-based system results in higher quality information, communication, and collaboration, all of which can inspire greater innovation and support a more strategic approach to decision making. Instead of making decisions based on someone's opinion or view, management will be able to base critical product development decisions on information and data gleaned from a manufacturer's advanced data management function. And because the system will either incorporate data generated by remote locations or keep those locations up to date regarding design changes, this improved communication and better decision-making process can be truly global.



REAP THE REWARDS OF DISTRIBUTED DATA MANAGEMENT WITH SOLIDWORKS SOLUTIONS

As a leading provider of easy-to-use design, engineering, and product development solutions, Dassault Systèmes SOLIDWORKS has introduced the industry’s first distributed data management product portfolio, which can match and often exceed the capabilities of expensive PLM systems at a fraction of the cost. This unique set of solutions enables manufacturers to take advantage of PDM, advanced data management, and powerful searching applications either individually or as a combined DDM system.

PRODUCT DATA MANAGEMENT—SOLIDWORKS PDM

SOLIDWORKS PDM solutions for product data management are fully integrated with the increasingly popular SOLIDWORKS design software, enabling manufacturers to safeguard, store, and organize product design data for maximum efficiency. These solutions also allow product development teams to collaborate more effectively. Two different solutions—SOLIDWORKS PDM Standard and SOLIDWORKS PDM Professional—are available, depending on the size and PDM needs of the manufacturing enterprise.

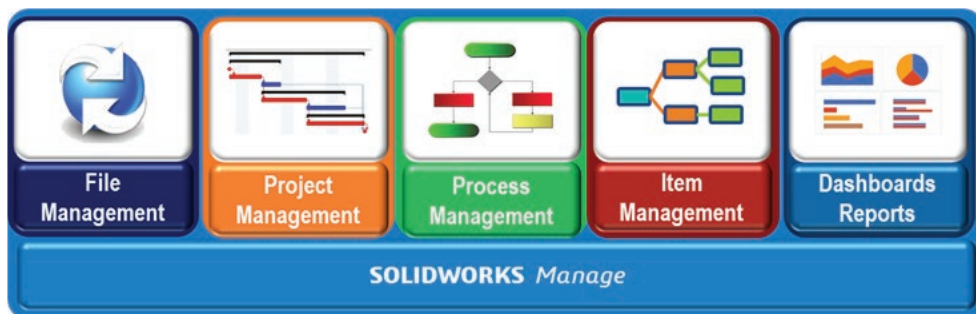
SOLIDWORKS PDM STANDARD

Included as part of SOLIDWORKS Professional design and SOLIDWORKS Premium design and analysis software, SOLIDWORKS PDM Standard is an ideal solution for smaller workgroup environments that are housed in one geographic location. The application helps designers and engineers easily and efficiently organize and manage product design and engineering data, and has an easy upgrade path if and when an organization’s needs change.

SOLIDWORKS PDM PROFESSIONAL

SOLIDWORKS PDM Professional is a full-featured data management solution for organizations, both large and small. SOLIDWORKS PDM Professional helps product development teams to more easily find and repurpose files, parts, and drawings; share design information; automate workflows; and ensure manufacturing always has the right version. The solution allows users to:

- Securely store and index design data for fast retrieval.
- Eliminate concerns about version control and data loss.
- Share and collaborate on designs with people inside and outside the organization in multiple locations.
- Create an electronic workflow to formalize, manage, and optimize development, document approval, and engineering change processes.



ADVANCED DATA MANAGEMENT—SOLIDWORKS MANAGE

SOLIDWORKS Manage is an advanced data management system that extends the capabilities of the global file management and application integrations enabled by the SOLIDWORKS PDM platform. Combining the ease of use and familiar Windows® Explorer interface of SOLIDWORKS PDM, SOLIDWORKS Manage adds advanced capabilities that allow teams throughout the manufacturing enterprise to: manage project timelines and resources; streamline complex business processes; automate records management; and aggregate, communicate, and present PDM-related information in formats tailored for consumption by varied audiences.

Project Management

SOLIDWORKS Manage provides critical information to help teams manage projects and resources.

- Manage project stages, timelines, and milestones.
- View resource utilization and capacity.
- Attach items, files, and deliverables.
- Utilize user tasks and time sheets to track progress.

Process Management

SOLIDWORKS Manage streamlines business processes, automates document creation, and brings together all involved stakeholders for new products—from sales and marketing to production and support.

- Configure states and decision points for all types of business processes.
- Attach affected items and file, and enable ad hoc approvers and user tasks.

Item/Record Management

SOLIDWORKS Manage brings together all components required for product definition—whether represented by a CAD model, drawing, document, or database record—in a single location.

- Create, edit, and compare bills of materials (BOMs) using items/records or files.
- Automatically or selectively create items/records for SOLIDWORKS configurations.
- Drive SOLIDWORKS drawing BOMs and item/record numbers.

Dashboards and Reports

SOLIDWORKS Manage provides instant access to critical information in an easy-to-consume format for better decision making.

- Create interactive graphical dashboards to display critical information.
- Configure reports to company standards and publish automatically or on-demand.

GEOMETRY AND METADATA SEARCH—EXALEAD® ONEPART

EXALEAD OnePart helps designers and engineers decide between design creation or design reuse in just one minute. EXALEAD OnePart is a business discovery application that accelerates reuse of parts, designs, specifications, standards, test results, and related data for engineering, manufacturing, and procurement activities. Leveraging the proven web semantics, analytics, and big data management technologies of EXALEAD CloudView™, OnePart locates information from multiple sources and makes it available instantly.

SEARCHING FOR DESIGN GEOMETRIES

EXALEAD OnePart extends the text- and file-based search capabilities of SOLIDWORKS PDM solutions into the realm of the 3D shapes, geometries, and mechanical features of existing designs across the entire enterprise. Even without a CAD license, users can search on geometric shape, business function, and even mechanical features, such as holes, pads, and grooves. This application can find parts, drawings, and assemblies, as well as view critical information on parent-child relationships within assemblies, enabling users to navigate down through an assembly to locate a specific part. Part discovery through 3D shape similarity and 3D mechanical feature data mining will reveal existing parts that text- and file-based searches cannot find, facilitating design reuse.



SEARCHING FOR PRODUCT DESIGN METADATA

EXALEAD OnePart can also quickly locate any type of metadata associated with existing component designs. Metadata search capabilities enable users to discover analysis and testing results, materials and sourcing data, specifications and applicable standards, and price and performance information for any part that is developed anywhere across a manufacturing enterprise. The robustness of EXALEAD OnePart's robust navigation and filtering capabilities will give anyone across the organization the ability to quickly find a suitable existing part, or information related to a particular part, in less than a minute.

MAKE DATA WORK FOR YOU WITH SOLIDWORKS DDM

The product design data housed within a manufacturing enterprise's product development function has value that extends far beyond its traditional design, engineering, and production purposes. Managing and leveraging product design data, and other types of related data, solely within the departments and for the applications from which the data emanates, results in the establishment of separate data silos, such as PDM, MRP, and ERP systems. While these data silos fulfill their intended function, they are often disconnected from one another and miss out on opportunities to leverage the data across the enterprise through greater interconnection and data distribution—opportunities that can enhance a manufacturer's competitiveness.

By implementing a distributed data management system—now possible through recently introduced SOLIDWORKS DDM solutions—manufacturers can advance their data management function by accessing, leveraging, and communicating the underlying data in these silos in formats that enhance its utility for other enterprise-wide applications. As the repository of a company's product design data, a PDM system contains the data with the greatest potential for enterprise-wide utility. Distributing product data to other departments and leveraging its inherent value for other requirements, advances data management in ways that increase its effectiveness, boost organizational efficiency, foster collaboration, inspire innovation, and improve enterprise mobility. SOLIDWORKS DDM solutions—including PDM, advanced data management, and powerful search applications—can now distribute product design data in ways that match or exceed the capabilities of expensive PLM systems, at a fraction of the cost.



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