

THE TOP FIVE REASONS FOR MANUFACTURERS TO IMPROVE DATA MANAGEMENT

White Paper

OVERVIEW

Today's manufacturers face a host of challenges related to effectively managing product design and manufacturing data, not just within product development and manufacturing departments, but across the greater manufacturing enterprise. How well manufacturing organizations manage product and production data—and leverage this data to support related functions—has a direct bearing on a manufacturer's ability to grow, as well as maintain and extend its competitive edge.

In an increasingly competitive global market, manufacturers must not only manage product and production data successfully, commonly known as product data management (PDM), they also need to effectively manage the distribution of product design and production data to related departments to improve their performance, a process known as distributed data management (DDM). This paper examines the top five reasons why manufacturing organizations should improve data management processes and the ways that SOLIDWORKS® data management solutions can help them achieve their data management and business goals.

EFFECTIVE DATA MANAGEMENT IS CRITICAL FOR SUPPORTING GROWTH AND MAINTAINING COMPETITIVE EDGE

As product development and manufacturing organizations increasingly depend on computer-aided digital technologies to design and produce products, the data on which those processes rely has become the lifeblood of these companies. And just as healthy blood flow is an indication of overall fitness and physical performance in human beings, expertly leveraged, utilized, and managed data flow indicates an organization's fitness to grow, compete, and prosper in today's global economy.

Manufacturers will enhance competitiveness and benefit from improved data management for a variety of reasons. First and foremost among these is that improved data management will boost productivity through support of greater automation and organizational efficiencies. Yet the benefits of improved data management extend beyond its capacity to increase productivity and include its ability to improve product quality, facilitate effective collaboration, boost enterprise agility and flexibility, and inspire greater innovation.

This paper will explore the reasons why better data management benefits today's manufacturing companies by examining the top five reasons why manufacturers should improve their data management function and the ways that SOLIDWORKS data management solutions can help your manufacturing company realize the benefits of PDM.

Notably, this paper will address how improved data management positively affects the operations of product development and manufacturing departments, as well as how effective data management can benefit every other function across the manufacturing enterprise, particularly through the integration of product data management and enterprise resource planning (ERP) systems.

The top five reasons for manufacturers to improve data management all stem from a manufacturing organization's ability to manage, secure, find, and leverage product data efficiently and effectively—not just in product development and production, but across the manufacturing enterprise.



TOP FIVE REASONS FOR MANUFACTURERS TO IMPROVE DATA MANAGEMENT

The top five reasons for manufacturers to improve data management—1) increased productivity, 2) improved product quality, 3) more effective collaboration, 4) enhanced organizational agility and flexibility, and 5) greater innovation—all stem from a manufacturing organization’s ability to manage, secure, find, and leverage product data efficiently and effectively—not just in product development and production, but across the manufacturing enterprise.

Boost Productivity

By improving data management, manufacturing organizations will be able to boost productivity by doing the following:

- **Automating Manual, Repetitive Tasks** – Throughout every manufacturing organization, a myriad of manual, repetitious tasks exert a real drag on productivity—tasks such as the manual creation of bills of materials (BOMs) or revision-checking on drawings. PDM tools can help you identify all of the manual, repetitive tasks in your workflows that can be automated, sped up, or eliminated, boosting productivity while establishing a more accurate, secure process.
- **Minimizing Delays, Cost Overruns** – Missing deadlines and going over budget are clear signs that your product development and manufacturing workflows are out of step and can benefit from the workflow automation that a PDM system provides. PDM tools can help manufacturers institute the automated workflows that can resolve time-intensive, costly issues and steps, and make schedule delays and cost overruns a rarity instead of the norm.
- **Integrating PDM and ERP Systems** – Many manufacturers rely on a product data management (PDM) system to manage product development and manufacturing data, and a separate enterprise resource planning (ERP) system to manage all other business-related data. By integrating PDM and ERP systems so that they work in concert as a single system, manufacturers can realize additional productivity gains.
- **Eliminating Wasteful, Redundant Processes** – Every manufacturer has legacy processes that were once useful and critical to developing and manufacturing products, but no longer serve any practical purpose. As manufacturers increasingly rely on computer-aided digital technologies to design and produce products, a PDM system can help you scrutinize your existing processes and workflows, and then eliminate, replace, or automate outdated processes by utilizing PDM to revamp your workflows.
- **Working Smarter Instead of Harder** – Getting more out of existing resources to boost productivity does not necessarily require manufacturers to force staff to work longer, harder hours. An integrated PDM system will enable staff to accomplish more in the same amount of time—not by working harder, but by working more intelligently due to the automation and structure imposed by PDM.
- **Accelerating Time to Market** – As part of the development, production, and market introduction of all new products, manufacturers lose substantial amounts of time due to confusion, questions, and miscommunications involving data. With a PDM system supporting automated, formalized workflows, manufacturers can winnow out unnecessary instances of lost time and consistently accelerate product time to market.
- **Achieving Additional Automation via API** – While a PDM system can help your manufacturing organization automate many processes, choosing an integrated PDM system with an open Application Programming Interface (API) carries the potential for automating additional processes, especially those that are unique or custom to your products and manufacturing techniques.



... A CASE IN POINT

BOOSTING PRODUCTIVITY AT CP MANUFACTURING

For more than four decades, CP Manufacturing has led the world in waste material separation technology, by designing, building, and installing hundreds of waste recycling facilities and related material separation machinery and equipment. As demand for CP's custom-engineered plants and equipment continues to grow, the need to streamline processes, increase throughput, and expand product development has become critically important for supporting rapid, ongoing growth, according to Engineering Manager Jason Kerns.

"Since our initial implementation of SOLIDWORKS tools, we've heavily leveraged the SOLIDWORKS API—particularly with respect to the SOLIDWORKS PDM Professional system—to automate a host of specific development processes, as well as to automate manual and repetitive tasks," Kerns explains. "The flexibility that we enjoy to automate processes with the SOLIDWORKS API saves us a ton of time and money."

By growing and automating its SOLIDWORKS implementation, CP has developed recycling systems four times faster, tripled the size of its manufacturing facility, doubled the size of its engineering department, and supported rapid, sustained growth. "We've had to move into a new facility that's three times as large, have doubled the size of our engineering department, and have dramatically increased product development throughput," Kerns says. "With SOLIDWORKS integrated solutions, we've been able to support rapid, sustainable growth without missing a beat, primarily because of our ability to automate sales, marketing, design, and production."

To read the full CP Manufacturing Case Study, click [here](#).

Improve Product Quality

By improving data management, manufacturing organizations will be able to sustain consistently high levels of quality by doing the following:

- **Eliminating Revision Errors** – Shoddy product quality caused by working with old, out-of-date revisions was fairly common when data management consisted of physically filing paper drawings in cabinets and drawers. With a PDM system's tighter revision controls, you can completely eliminate design errors and product issues associated with working with the wrong revision of a product design.
- **Achieving Greater Design Reuse** – Why design a new component when a perfectly good, tested design for the part already exists, buried somewhere in your product data? Of course, if you can't find an existing design, you can't reuse it. Data management tools with search capabilities can help your manufacturing organization increase reuse of proven, existing designs. As design reuse grows, product quality improves.
- **Reducing Scrap and Rework** – Design errors—whether related to use of an out-of-date revision or a new, untested design—have ramifications on a manufacturer's volume of costly scrap and rework. Any time that a manufacturer needs to rework or retrofit a part or product, the probability that the rework will negatively impact quality grows. A PDM system can help manufacturers weed out revision errors, increase design reuse, and reduce scrap and rework, all of which can help your organization improve product quality
- **Improving Handling of Engineering Change Orders** – When a design or engineering change is required after a product design has already been released for production, manufacturers issue an engineering change order (ECO). How well your organization implements ECOs—and how many ECOs are issued—has a direct bearing on overall product quality. With an integrated PDM system, manufacturers not only can execute ECOs more efficiently but also can ensure that the handling of ECOs produces the end result of improving quality



... A CASE IN POINT

IMPROVING PRODUCT QUALITY AT VERMEER

Founded in 1948 by Gary Vermeer, a farmer with a passion for innovation, Vermeer Corporation has become a global leader in the manufacture of machinery and equipment for the agricultural, forestry, excavating, mining, and drilling industries. The company's success stems from the Vermeer guiding philosophy: Find a need, then fill it by designing and manufacturing products that are built to last. To build the best possible products, Vermeer utilizes advanced design and engineering tools, including SOLIDWORKS PDM Professional software.



Vermeer implemented 300 licenses of SOLIDWORKS PDM Professional software in 2008. A specific process in which SOLIDWORKS PDM Professional pays dividends at Vermeer is automation of the company's engineering change (ECN) process. ECN management has become fully automated, tightly controlled, and virtually fail-safe because of SOLIDWORKS PDM Professional.

"Our ECN process is quite complex with a different series of tasks for various personnel," notes Greg Johnson, senior applications specialist. "All these things have to be done before an engineering change is made, with several checks and balances built into the process. With Enterprise Product Data Management, the entire process is controlled by the system, which guarantees all steps are followed and no steps are missed. The system even walks each user through the steps for which he or she is responsible. Automating this process has accelerated and improved ECN management."

By implementing additional SOLIDWORKS solutions, including SOLIDWORKS PDM Professional software, Vermeer has automated its development workflows, increased development and production throughput, shortened and formalized its engineering change process, and improved the quality of its products and documentation.

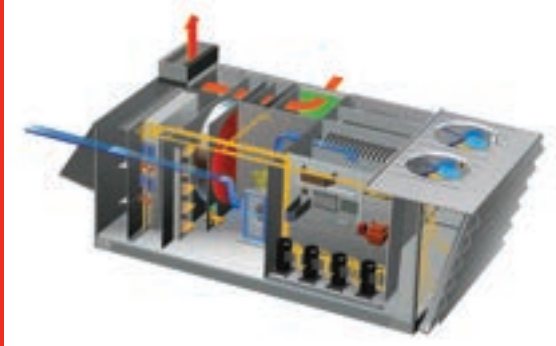
To read the full Vermeer Case Study, click [here](#).

Facilitate Collaboration

By improving data management, manufacturing organizations will be able to support more effective collaboration by doing the following:

- **Connecting Globally Dispersed Locations** – As manufacturers become more global in scope, the need to connect product development, engineering, and manufacturing groups—as well as related business functions—has become critically important for increasing efficiencies and maximizing resource utilization worldwide. A PDM system with a replicated vault is vital for connecting globally dispersed manufacturing locations and facilitating collaboration among them.
- **Integrating Communications Between Engineering Disciplines and Departments** – As more and more products include mechanical, electronic, and electromechanical assemblies and components, the need to stimulate and support collaboration between different engineering disciplines and departments is growing. An integrated PDM system can help foster interdisciplinary collaboration because it establishes a common repository for the design and engineering information required before this type of collaboration can begin.
- **Linking Product Development and Production** – Whenever product development and manufacturing departments are linked by a common PDM system, each department can collaborate more freely and efficiently. Product designers and engineers can collaborate more effectively with production specialists on the best manufacturing method, and manufacturing personnel can see and collaborate over what's coming in the product development queue.
- **Fostering Collaboration With Other Departments Across the Enterprise** – An integrated PDM system also allows manufacturers to accelerate and support other critical applications that can leverage product design data, stimulating collaboration across the enterprise. 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, estimating and quoting, purchasing, sales, marketing, and other product launch activities, further streamlining a manufacturer's core operations.

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FACILITATING COLLABORATION AT MUNTERS

Munters Corporation is the world leader in dehumidification, providing energy-efficient air treatment solutions and restoration services based on expertise in humidity and climate control technologies. Until 2007, the company's Dehumidification Division developed products through separate design groups for each market. To create a more streamlined global enterprise, management of the Dehumidification Division decided to evaluate the potential for using a product data management system to connect design groups based in Sweden, China, and three locations in the United States—Massachusetts, Texas, and Virginia.

"We needed a solution that would allow us to combine all of our engineering teams into one large, interconnected group," explains Monty Yates, a designer at the Munters facility in Texas, who served on the selection committee. "In addition, we wanted to be able to share designs, standardize portions of our products globally, and build products wherever it made sense."

Transforming several separate, autonomous product development groups into a single global organization requires a PDM system that provides tight revision control, consistent design information, and reliable replicating functionality. With SOLIDWORKS PDM Professional, the system replicates data daily from each of the five locations to the primary SQL Server™ vault in Massachusetts, providing designers anywhere in the world with access to the most current product design information.

"With SOLIDWORKS PDM Professional, we have instituted a formal workflow on a global scale," Yates notes. If a product that used to be made only in Europe is now going to enter the U.S. market, we can access the same data and follow the same workflow for production."

By deploying SOLIDWORKS PDM Professional, Munters streamlined its global development processes, increased design reuse worldwide, reduced design check-in errors by 25 percent, and realized more efficient resource utilization.

To read the full Munters Case Study, click [here](#).

Increase Agility and Flexibility

By improving data management, manufacturing organizations will be able to support increased organizational agility and flexibility by doing the following:

- **Shortening Engineered-to-Order Lead-Times** – Shortening development and delivery lead-times is a critical success factor for many manufacturers of engineered-to-order products. The automated workflows supported by an integrated PDM system can dramatically shorten both proposal and product development, giving engineered-to-order manufacturers the agility and flexibility required to compete successfully in a global competitive market.
- **Incorporating Concurrent Product Development and Manufacturing Planning** – With the agility and flexibility afforded by an integrated PDM system, manufacturing planning can begin concurrently with the final stages of product development. Because both product development and manufacturing personnel can collaborate more effectively during the latter stages of development prior to a product's release to production, they'll need less time to plan for production and have the flexibility to collaborate on and make changes through a product's release to manufacturing.
- **Developing Products and Documentation Simultaneously** – Instead of waiting until a product is manufactured to develop content for user manuals, service manuals, parts lists, and other forms of product documentation, manufacturers can leverage a PDM system to establish a concurrent workflow through which products and accompanying documentation are developed at the same time, with design changes reflected in auto-updating design data that is used for both purposes.



... A CASE IN POINT

INCREASING AGILITY AND FLEXIBILITY AT AUTOMATIC HANDLING INTERNATIONAL



Automatic Handling International, Inc. is a worldwide manufacturer of custom handling and packaging systems, serving leading companies in the pulp and paper, tissue and towel, nonwovens, fiberglass, agriculture, stone, and steel industries. While the company realized time and cost savings by moving from 2D to 3D, the ability to access the open SOLIDWORKS Application Programming Interface (API) enabled Automatic Handling to further automate workflows and processes, achieving natural synergies and resulting in a completely paperless, more efficient model-based definition (MBD) approach to production.

"Using the SOLIDWORKS API, we've leveraged SOLIDWORKS PDM Professional to combine SOLIDWORKS eDrawings® files with manufacturing and production information instructions through computer terminals in the shop—completely eliminating paper drawings, travelers, etc.," explains Media Group Manager Nathan Pienta.

"We're an engineered-to-order business with over a dozen mechanical engineers, all working on overlapping projects," Pienta continues. "The structure and control provided by

SOLIDWORKS PDM Professional workflows enable us to work more accurately and productively, using virtual documents to develop, manufacture, and assemble machines, instead of pushing paper."

"With the API, we were able to give SOLIDWORKS PDM Professional data cards their own workflows for releasing designs to manufacturing—all linked through references," explains Mechanical Engineer Phil Morris. "We put the manufacturing due dates, type of process, routing, and even paint color in SOLIDWORKS PDM Professional. When engineering releases a design to manufacturing, the system automatically and instantaneously creates the eDrawings, purchase orders, and work orders that drive production and assembly."

By selecting SOLIDWORKS PDM solutions and working with the open SOLIDWORKS Application Programming Interface, Automatic Handling has cut manufacturing release times by 80 percent, replaced paper drawings with digital 3D models for production, empowered machinists and fabricators as part of the development process, and eliminated printing, paper, and administrative costs.

To read the full Automatic Handling International Case Study, click [here](#).

Inspire Innovation

By improving data management, manufacturing organizations will be able to inspire innovation from within by doing the following:

- **Including Input From Across the Enterprise** – Innovation can come from many places, and some of the best ideas can come from the most unlikely of sources. Innovation does not come from becoming complacent—doing things the way that they’ve always been done. With an integrated PDM system, manufacturers can gather valuable input and perspectives from across the enterprise, including from those who routinely work with customers and frequently use your company’s products, helping to inspire greater innovation throughout product development.
- **Leveraging Faster, Broader Collaboration** – With the greater productivity, flexibility, and agility provided by a PDM system, manufacturers can more quickly leverage broader collaboration and more agile operations to innovate new products, pursue new markets, or do both. Successfully introducing an innovative product or product feature requires bringing it to market first, and PDM tools can help you move more quickly and decisively than your competitors.
- **Supporting More-Innovative Approaches to Product Development and Manufacturing** – A PDM system can also help manufacturers support more innovative approaches to product development as well as tap the latest manufacturing techniques. Concurrent product development—whereby all related functions are completed concurrently with the development of a product—and the use of additive manufacturing techniques are examples of the innovative approaches to product development and manufacturing that are supported by PDM.

With the greater productivity, flexibility, and agility provided by a PDM system, manufacturers can more quickly leverage broader collaboration and more agile operations to innovate new products, pursue new markets, or both.



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INSPIRING INNOVATION AT USSC GROUP

USSC Group designs and engineers world-class seating for many types of vehicles. As an industry leader, the company continues to develop the most durable and ergonomically designed seats to reduce day-to-day driver fatigue and stress with the help of a multitude of SOLIDWORKS design, analysis, product data management, and technical communication software solutions.

Since transitioning to SOLIDWORKS, USSC not only has introduced a revolutionary fire truck seat—the Valor crew seat—the company also has developed a complete line of configurable fire truck seats and is developing innovative seating products for ambulances and other rescue vehicles. “The Valor line of seating is a tremendous success in the firefighting industry, giving our customers multiple options with advanced technology and providing continuous improvement in seating for our firefighters,” explains Director of Engineering/Quality Jeff Krueger.

“Using SOLIDWORKS, we’ve quickly capitalized on the Valor’s success by introducing a full family of Valor seats to meet different needs,” Krueger adds. “We’re selling Valor seats for the driver, officer, and all crew positions, with a range of configurable options including electric seats, air-suspension seats, and mechanical-suspension seat variants. The first responder market is emerging as an area of large growth for us—and the productivity gains provided by SOLIDWORKS are helping us to quickly take advantage of new growth opportunities.”

By moving to SOLIDWORKS solutions, including the SOLIDWORKS PDM Professional system, USSC made immediate inroads in firefighting- and ambulance-seating markets, expanded its product lines quickly and cost-effectively, improved revision controls and design data management, realized higher quality, and reduced scrap and rework.

To read the full USSC Group Case Study, click [here](#).

REALIZE BENEFITS OF IMPROVED DATA MANAGEMENT WITH SOLIDWORKS SOLUTIONS

As a leading provider of easy-to-use design, engineering, and product development solutions, 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 Distributed Data Management system.

Product Data Management—SOLIDWORKS PDM

SOLIDWORKS PDM solutions for product data management are fully integrated with 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.

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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 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 enables these tasks:

- **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 or 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 or records for SOLIDWORKS configurations**
- **Drive SOLIDWORKS drawing BOMs and item or 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 also can 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 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 MANAGEMENT COMPETITIVE STRENGTH WITH SOLIDWORKS DATA MANAGEMENT SOLUTIONS

Manufacturers can transform data management from a costly, time-eating weakness into a competitive strength with SOLIDWORKS data management solutions. By improving your organization's ability to manage, secure, find, and leverage product data efficiently and effectively—not just in product development and production, but across the manufacturing enterprise—manufacturers can 1) increase productivity, 2) improve product quality, 3) facilitate collaboration, 4) enhance organizational agility and flexibility, and 5) inspire greater innovation.

Offering data management systems ranging from PDM to advanced data management to design data searching applications, SOLIDWORKS has the right data management solutions to meet your specific needs. SOLIDWORKS data management solutions can match and often exceed the capabilities of expensive PLM systems at a fraction of the cost.

To find out what's new in SOLIDWORKS data management—including new search features, conditional transition to a parent file, and Web2 enhancements—and to learn more about how integrated SOLIDWORKS data management solutions can help your company improve its data management function, click [here](#), or call 1 800 693 9000 or +1 781 810 5011.

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