TRANSPARENT DATA MANAGEMENT FACILITATES INNOVATION IN CONCEPTUAL DESIGN

White Paper

Creating innovative product ideas requires an effective, unobtrusive approach to managing conceptual design data. Because conceptual design is a fast-paced, constantly-changing process, during which designers utilize trial-and-error approaches and "what if" scenarios to gain the understanding that leads to innovation, it requires a transparent data management solution. Instead of thinking about or anticipating what data needs to be saved and managed—like when using existing data management tools that focus on the later phases of product development and production—designers working on concept development must be free to investigate multiple approaches, evolve innovative ideas, and explore various concepts, with all data capture and management taking place in the background. By automatically and transparently performing all data management operations in the cloud, the SOLIDWORKS® Conceptual Designer solution liberates designers from traditional data management distractions, while simultaneously capturing, saving, and managing all conceptual design activity—including concept ideas, conversations, and design reviews—for future use, development, or adaptation.

IMPROVING CONCEPTUAL DESIGN THROUGH TRANSPARENT DATA MANAGEMENT

Managing design data represents a double-edged sword for designers who are charged with creating innovative design concepts. On the one hand, design engineers need to capture and save the new product concepts that they create for ongoing and future development. On the other hand, however, working with existing data management tools can actually impede conceptual design activity. Because available data management approaches require conceptual designers to perform a range of manual steps—such as checking-in, checking-out, completing data cards, and saving various versions of concept files—they can disrupt creative flow and get in the way of evolving and refining new design ideas into viable product concepts. In a fast, hectic, and free-flowing collaborative conceptual development environment, a designer's focus should remain fixed on developing innovative concepts instead of being continually disturbed by the need to perform frequent administrative, information entry, or data management tasks. Yet, designers involved with conceptual design still need to be able to easily find existing concepts for more detailed design, transparently ensure that conceptual design data is saved for future use, and efficiently review conceptual design data for archiving—thus, the double-edged sword.

In addition to subjecting conceptual designers to onerous, repetitious distractions, traditional data management solutions often carry access limitations that are an obstacle to collaborative communications. Typically, a designer can log into data management systems only using his or her office workstation. This effectively restricts access to conceptual design data to daytime hours from a single platform that resides at one location. In today's fast-paced competitive market, accessing conceptual design data solely from an office workstation during business hours represents an unnecessary, productivity-dampening bottleneck. Inspiration can strike at any moment, and designers, and their collaborators, need to be able to access design concepts and data anytime, from anywhere, and on any digital device.

Making data management completely transparent and data access fully ubiquitous enhances, facilitates, and accelerates the development of innovative design concepts. With a cloud-based conceptual design environment like SOLIDWORKS Conceptual Designer, manufacturers can eliminate the limitations, restrictions, and pain associated with using traditional data management solutions for conceptual design, while ensuring that all of the valuable concept development activity—the successes, the failures, and the potential adaptations—are captured, saved, and maintained for future use.
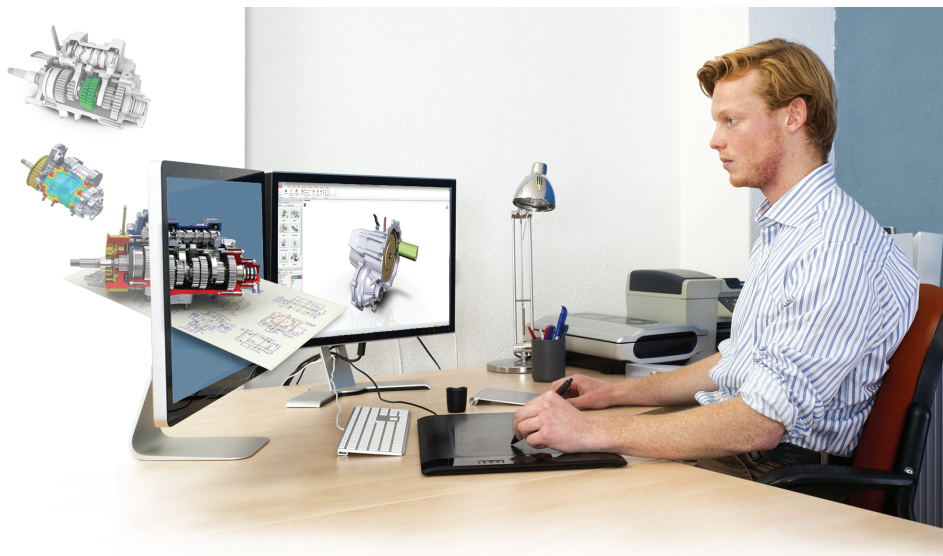
WHY IS MANAGING CONCEPTUAL DESIGN DATA IMPORTANT?

If data management gets in the way of conceptual design, why do we need it? Conceptual design requires data management tools because the process is more efficient and effective when concept data is properly managed. Although initial concept development moves at an extremely rapid pace with frequent misses due to ideas that just don't pan out, designers still need to make sure that concepts are saved and easily accessed for continued development. While detailed design will typically only take place on one or two final concepts, manufacturers need to be able to retain and access all conceptual design activity to uncover innovations that are either overlooked or have potential in other applications.

Engaging in conceptual design without data management solutions can lead to a number of problems, ranging from failing to capture, and missing out on, an innovative product idea to inadvertently overwriting and/or deleting files or folders and the innovative concepts contained within them. Conceptual design activity has great value—not just for current applications but also for potential future uses or adaptations. Capturing conceptual design activity while alleviating the pain of traditional data management is critically important to maximizing the effectiveness of this vital product development function.

TAKING THE PAIN OUT OF DATA MANAGEMENT

Traditional approaches to managing design data are generally tedious, restrictive, and infrastructure-intensive, making them inconvenient—even painful—for conceptual designers to use. While the conventional, manual approach to data management may be adequate for routine, everyday product development, the requirements to manually check in, check out, save, and update files, and corresponding fields, can ultimately impede the creative flow of conceptual design activity and prevent the interactive collaboration that generates innovation. Conceptual designers need to be able to freely create, evaluate, and share innovative product concepts with customers, partners, and colleagues, without having to worry or think about the ramifications of finding and using a particular file version or saving the file to a local drive, network location, or data management system.

Other sources of conventional data management pain include the time, infrastructure, and resources needed to implement, support, and administer these systems, as well as difficulties related to finding a particular file and the potential for lost/overwritten data. Most data management systems require a dedicated drive, server, or vault for warehousing data. Maintaining and safeguarding on-site data infrastructures is not only costly in terms of equipment and hardware, it's also resource-intensive. A full-time administrator is often required to oversee and maintain user and access rights for traditional data management systems, which typically leads to difficulties in supporting varying levels of access among internal and external collaborators across multiple teams developing multiple concepts.

What today's conceptual designers really need is a completely transparent data management system that facilitates rather than obstructs collaboration during the development of innovative product concepts. They must focus on the contributions of customers, the insights of field personnel, and the suggestions of colleagues as they apply these inputs to a particular design concept instead of expending any thought on the data management consequences of what they are doing. In short, the cure for data management pain is transparent data management.

HOW TRANSPARENT DOES DATA MANAGEMENT NEED TO BE?

When applied to data management, the term "transparent" has a completely new meaning. In many situations, "transparent" is defined as "clear enough to see through" or "open, clear, or easily understood." In the case of managing conceptual design data, the word "transparent" carries more of a connotation of being "invisible" to the user—operating effectively behind the application in the background with minimal user involvement. Data management becomes transparent when it functions with as little user interaction with the data management system itself as possible, allowing conceptual designers to direct their full attention and concentration on the development of innovative product ideas and concepts.

Seamless Capture and Management of All Data

For a data management system to be transparent enough to meet the needs of conceptual designers, it must seamlessly and automatically save and manage all design data and collaborative communications. The system must be able to capture and retain all conceptual design activity, including sketches, models, drawings, simulation runs, markups, comments, and conversations, without requiring the conceptual designer to do anything, automatically saving all work at the end of the design session. Instead of handling all the different types of data that can be utilized in a collaborative conceptual design space separately, the system should seamlessly manage all concept data at the global project level.

Hidden—Practically Undetectable by Users

A transparent data management system should be completely hidden from and practically undetectable by the conceptual designer. It must function much like a recording device, capturing valuable conceptual design activity—saving, tagging, and indexing it for future use—while remaining totally out of the purview of the user. Conceptual designers shouldn't have to worry about turning the data management system on or checking the models in or out. Creating a new concept model should get it started, and the only indication to the user that a data management system is running is the ability to easily find and open an existing concept model when beginning a new session.

Embedded as Part of Modeling Application

In order to be completely transparent, data management must be embedded as part of the conceptual design modeling application rather than operate as a separate program. The conceptual designer shouldn't have to switch back and forth between applications or leave his or her modeling environment to either access or save work. A transparent data management system should always be operating within the designer's development platform, so that when he or she clicks the "save" button, all of the different data management functions take place behind the scenes, without interrupting the designer's modeling work by taking him or her to a different window or application.

Fast, Easy Search Capabilities

Although conceptual designers should not be able to detect almost all of the operations of a transparent data management system, they still need to access the data associated with current and past projects. Because these files reside in the cloud instead of on local and/or network drives, designers and engineers need fast, robust, and easy-to-use search capabilities for identifying and accessing specific projects. A transparent data management system should support implicit and explicit tagging, filtering, and indexing capabilities so that not just designers but their chosen group of collaborators can quickly search for, locate, and open various data files related to design concepts by simply typing a search term and using tag filters to access indexed data.

Always Accessible

When data management becomes transparent, it allows data access to become ubiquitous, giving designers and their collaborators the ability to access and work with conceptual design data anytime, from anywhere, and on any digital device. It doesn't matter if members of a collaborative design team use a workstation, a laptop, a tablet, or a smartphone to interact with conceptual design data. The ability to transparently manage design data, which is accessed in different ways by various contributors, in the cloud is critical to supporting new design paradigms that incorporate social innovation into the development of new product concepts.

Secure and Protected

Transparent data management does not mean that the information is open and accessible to the world—only that the management of conceptual design data is invisible to the user. A transparent data management system still requires built-in access management controls and a secure, cloud-based architecture to ensure that valuable conceptual design data will be safeguarded using the same security and firewall protections currently provided by a manufacturer's private network. Keeping conceptual design data safe from hackers is critically important to securing and

protecting the innovative ideas and concepts that add to a manufacturer's valuable intellectual property.

No Infrastructure Required

Data management also becomes transparent when it takes place in the cloud, because this eliminates the expense of purchasing, housing, and maintaining the costly computer hardware, solution, and equipment necessary to support traditional data management infrastructures. Instead of making significant capital expenditures to support the storage, networking, and security needs of most data management solutions, manufacturers can leverage the excess capacity of the cloud to transparently manage conceptual design data. By taking advantage of cloud-based assets—providing comparable levels of performance, security, and reliability—product development organizations can more cost-effectively deliver an effective, transparent data management system, with zero infrastructure costs.

Effortless Administration and Management

Transparency in data management extends to the effort required to set up, administer, and manage the system. A transparent data management system should not require an army of consultants or programmers to implement, nor a full-time administrator to manage. Installation should be a quick and easy-to-follow process that can be accomplished with as little effort as possible by the designers and engineers who will access and use the system. Managing different levels of user access rights to a collaborative design space should be simple and straightforward. Once established, management of the conceptual design data created in the collaborative modeling environment should take place in the background—in the cloud—outside the focus of design engineers.

SOLIDWORKS CONCEPTUAL DESIGNER—CLOUD-BASED PLATFORM BRINGS TRANSPARENT DATA MANAGEMENT TO CONCEPTUAL DESIGN

Dassault Systèmes has addressed all of the requirements for transparent data management with the release of SOLIDWORKS Conceptual Designer. This flexible, cloud-based, single modeling environment leverages the power of the Dassault Systèmes **3D**EXPERIENCE® platform to facilitate innovation in new concept development through the inclusion of an embedded, transparent data management system. By freeing conceptual designers from the pain and inconvenience of traditional data management methods—and supporting data management of collaborative design activity—the solution allows manufacturers to realize a development environment that sharpens designer focus with laser-like precision on the creation of innovative concepts while removing the burden of worrying about data management tasks.

Transparent, Seamless, and Hidden in the Cloud

The data management capabilities of SOLIDWORKS Conceptual Designer are completely transparent, seamless, and hidden in the cloud. Designers can use this new modeling tool to create innovative product concepts without having to worry about data management considerations. The only data-management-related tasks that conceptual designers need to complete are to invite customers, partners, and colleagues to their collaborative workspace, tag concepts with identifiable names, and intermittently click the save button in the solution's intuitive 3D dashboard. The application will do the rest, capturing, retaining, and managing valuable development information in the cloud. By eliminating the pain of data management, SOLIDWORKS Conceptual Designer helps designers keep innovation top of mind.

Find Data Quickly and Easily

With SOLIDWORKS Conceptual Designer, searching for, locating, and accessing conceptual design projects and data is fast and practically effortless. Utilizing integrated search tagging, filtering, and indexing capabilities, the solution makes it extremely easy to search for and find current and past conceptual designs without having to go through the rigmarole of traditional data management systems. Users can filter results by what, where, when, why, and how to quickly find the right project. In addition to facilitating access to data by conceptual designers, SOLIDWORKS Conceptual Designer provides web-browser-like search capabilities to extended design teams or communities, so customers, colleagues, and collaborators have ready, reliable access to pertinent conceptual design data.
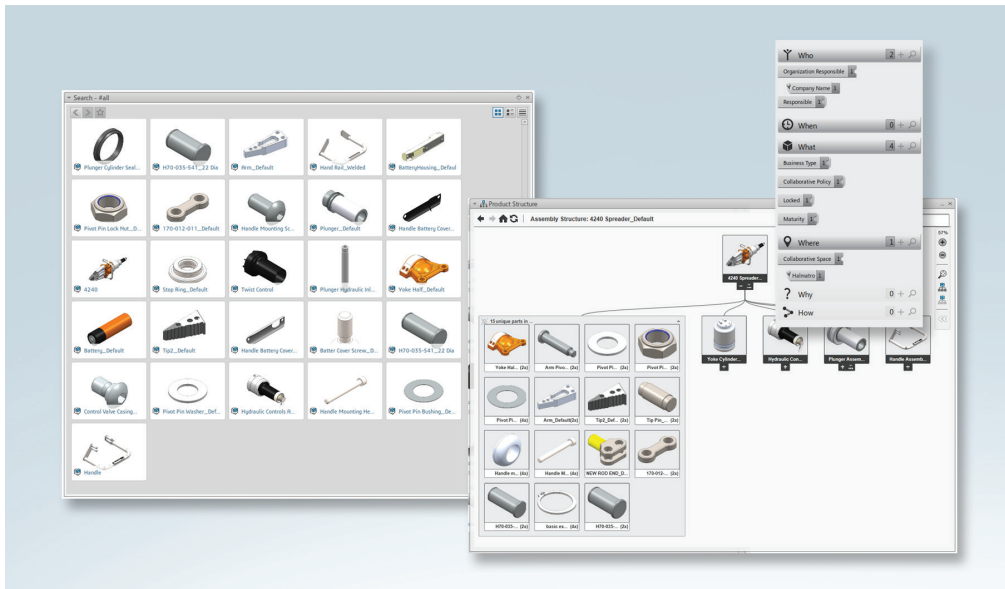
Capture All Conceptual Design Activity

SOLIDWORKS Conceptual Designer makes data management automatic by capturing, retaining, and managing all design data, collaborative communications, and conceptual design activity without the need for repetitive user intervention. The system saves all data, including sketches, models, drawings, simulation runs, markups, comments, correspondence, and conversations without requiring the conceptual designer to do much more then click the save button every once in a while. Automatically managing all the different types of data that can be utilized in a collaborative conceptual design space —including valuable input from a range of varying perspectives—is a significant advantage to ongoing and future concept development.

Accessible Data Drives Collaboration

In addition to transparently managing conceptual design data, SOLIDWORKS Conceptual Designer drives collaboration without borders by enabling flexible access to conceptual design data 24 hours a day, seven days a week, from any browser-supported digital device. The ability for designers to give customers, distributors, and other collaborators managed access to conceptual design data anytime, from anywhere, and on any digital device—including workstations, laptops, tablets, and smartphones—enhances productivity and incorporates social innovation into new concept development. Meanwhile, the solution's embedded data management capabilities automatically capture all collaborative exchanges and information for future use.

Secure, Cloud-Based Storage

Using SOLIDWORKS Conceptual Designer, manufacturers can take advantage of secure, cloud-based storage and management of conceptual design data, and avoid incurring the infrastructure costs that are mandatory for traditional data management systems. Why would anyone choose the expense of purchasing and housing the computer hardware, software, and equipment necessary to support data management, storage, networking, and security needs when they can take advantage of existing cloud-based assets? Because SOLIDWORKS Conceptual Designer carries zero infrastructure costs, product development organizations can realize improved performance, security, and accessibility at a dramatically reduced cost by leveraging the solution's cloud-based data management capabilities.

Easy to Use and Administer

SOLIDWORKS Conceptual Designer makes transparent data management easy to implement, administer, and maintain, with no training, setup, or infrastructure requirements. For example, setting up the data management requirements for a collaborative workspace is as easy as inviting others to the virtual design community and establishing user access rights for each team member. Designers can choose to grant collaborators the following access rights: contributor–view content and comment; author–create and edit content, and comment; leader–create, edit, and manage content, and comment; and owner–manage the collaborative space in its entirety. These access permission levels can be adjusted per collaborative space and project, providing the flexibility that manufacturers need to involve the most suitable contributors in the development of specific ideas and concepts.

Protects and Safeguards Data Management

With SOLIDWORKS Conceptual Designer, manufacturers can eliminate the pain of traditional data management while enjoying the same level of data protection and control. The solution's built-in access management controls and secure, cloud-based architecture mean that a company's valuable conceptual design data and evolving intellectual property will be safeguarded from hackers and competitors through the use of the same security and firewall protections that they currently utilize. The only difference in the way that SOLIDWORKS Conceptual Designer operates from a data security standpoint is that it utilizes the cloud for storage and management of data instead of a server or drive. All of the other data protections and controls are virtually the same.

SOLIDWORKS CONCEPTUAL DESIGNER TRANSPARENTLY MANAGES DATA SO YOU CAN FOCUS ON CONCEPTUAL DESIGN

Including transparent data management as an integral part of conceptual design activities can help manufacturers more efficiently and effectively drive innovation in product development. By providing conceptual designers with one less thing to worry about, incorporating the contributions of collaborators as managed data, and retaining innovative concept information for future use and adaptation, manufacturers can leverage transparent data management capabilities to expand the range of ideas, inputs, and inspirations that influence conceptual design, leading to increased levels of innovation. SOLIDWORKS Conceptual Designer brings the benefits of transparent data management to today's product development enterprise.

By liberating conceptual designers from the distractions inherent to traditional data management tools and injecting the inputs of customers, distributors, colleagues, and other collaborators into the concept development mix, SOLIDWORKS Conceptual Designer provides the transparent data management capabilities required to support a new conceptual design paradigm. Leveraging the powerful Dassault Systèmes **3D**EXPERIENCE platform, SOLIDWORKS Conceptual Designer supports an exciting new approach to conceptual design that incorporates transparent data management and social-networked design communities into a single modeling and concept evaluation environment that can serve as a catalyst for increased innovation in new product development.

To learn more about how SOLIDWORKS Conceptual Designer can help you take advantage of transparent data management to drive conceptual design, visit **www.SOLIDWORKS.com** or call 1 **800 693 9000** or **1 781 810 5011**.

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