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I-deas 11 NX Series Moves Closer to a Merged NX Product

By David Cohn

In April, UGS PLM Solutions released I-deas 11 NX Series. This is the third release of the former SDRC product since the company was acquired by EDS in 2001 and is yet another step along the path towards eventually merging the Unigraphics and I-deas products into a single unified digital product development solution.

Although it's been nearly four years since we last looked at I-deas in detail (see *EAREport* April 2000), the product configuration remains unchanged. There are three core modeling offerings that differ in licensing and the extent of the data management capabilities they include. I-deas Core Master Modeler (\$8,000) provides a floating license to which customers can add Assembly and Drafting licenses to meet their

needs. I-deas Product Design Package (\$11,000) is a single user bundle of Modeling, Assembly, and Drafting. I-deas Artisan (\$4,995) is targeted at mid-range pricing opportunities and provides only minimal data management. To these, customers can then add any of I-deas' many other optional products.

Since our last detailed article, however, we have reported on the merger

and the planned product roadmap (*EAREport* August 2001), the first joint meeting of the combined Unigraphics and I-deas users groups (*EAREport* June 2002), the first release of Unigraphics NX (*EAREport* November 2002), and the release of Unigraphics NX2 (*EAREport* September 2003). On the eve of the release of I-deas 11 NX Series, we spoke with George Rendell, director of product management at UGS PLM Solutions about the new release of I-deas.

With this release, the company continues to keep the promises it made to its customers when it first announced the planned merger of the two products. UGS PLM Solutions has clearly demonstrated its ability to bring the best of Unigraphics' and I-deas' functionality together while continuing to enhance both products. For I-deas 11, the company's main goals were to deliver enhancements that improve the productivity of I-deas customers and to move I-deas closer to the eventual merged product. According to Rendell, UGS has been documenting and analyzing workflows from a number of its key customers across different industries in order to develop new features and functions and improve the I-deas user interface to reduce the steps needed by users to create or make engineering changes in their designs. Many of the enhancements in

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I-deas 11 NX Series come directly from those studies. The enhancements span almost all of the I-deas product modules with the exception of the two CAM modules (which are in maintenance mode) and sheet metal (which has one enhancement).

Modeling and CAE Enhancements

I-deas 11 NX Series provides a new type of 3D section view that allows users to annotate parts and assemblies in 3D space. This new capability is compliant with the American Society of Mechanical Engineers (ASME) Y14.41 standard that was published in August 2003. The Y14.41 standard establishes requirements, and references documents applicable to the preparation and revision of digital product definition data, referred to as data sets.

The 3D section capabilities are not particularly new. Many applications enable users to create straight or stepped section cuts through 3D models to reveal internal details. In fact, I-deas has had this capability for several releases in its Master Notation module, which lets users define the equivalent of 2D views in the 3D environment. In that module, defined views can be named and stored within the part or assembly. What's new in I-deas 11 is the persistence of the resulting section cut so that the user can annotate directly on those 3D sections. Those sections can include 3D cross-hatching, dimensions, and notations. I-deas 11 also includes a new 3D cutting plane symbol and provides for user-defined symbols in 3D. Canon, an I-deas reference account that traditionally has relied on 2D drawings for its documentation, plans to move one of its divisions entirely to 3D annotation over the next year.

According to Rendell, another area that generates a lot of user requests is the fillet function, and for this release UGS has added a new command to create a fillet tangent to three surfaces. This capability is particularly useful in the automotive, consumer electronics, and high-tech industries. The new fillet algorithm supports variable radius filleting, deriving the radius from the geometry and swallowing the middle surface chain. In addition, the defining surfaces do not need to be connected. I-deas 11 also provides a new user interface for the modification of mixed variable radius and edge-based fillets, and users can modify a constant fillet to a variable radius fillet, and vice versa. The new filleting tools are particularly useful for users who need to modify a fillet that they did not create.

The newly combined edge-based and surface-based fillet algorithm interface greatly improves workflow. For example, six years ago, an automotive manufacturer spent three weeks to completely fillet an engine core. After adding fillets and modifying surfaces to get the desired contour, the designers could only fillet approximately 93% of the part, relying instead on manufacturing to complete the process. This same company, working with a pre-release version of I-deas 11 NX Series, was able to completely fillet the engine core part to a higher percentage of completeness, and to do so in only two hours.

UGS has also done quite a bit to improve its open part modeling by enhancing I-deas' Material Side Single Operator framework. Material side operators allow the user to define the side of the material they want in an open part situation, which is a particularly strong capability of I-deas for automotive body in white and consumer electronics applications. The ability to use open surfaces or open quilts of surfaces has long been available within I-deas, and users can define the material side even if the material is a zero thickness, so that open surfaces can be used for other solid modeling operations. The new release makes the ability to define the material side available within all Boolean commands and commands such as loft and sweep, rather than requiring the operator to define the material side via a separate command.

Among enhancements to assembly modeling, the biggest change is a unique modify reflection capability that enables changes to the reflection type, reflection plane, owner, and reflected assembly name. Users can add and remove reflection members. The new assembly reflect capabilities include positional associativity, so that users have the option of updating the position of reflected instances when the source objects move. Reflection relations are displayed in the part browser and I-deas can detect and prevent cyclic dependencies.

Also new in the assembly area is the ability to include faceted parts either from I-deas Graphics or as imported JT files. Those faceted parts can then be used for doing measurements and performing interference checks. The use of faceted data results in a four to five times performance improvement compared to doing a precise interference check but does not calculate interference volume nor create any interference geometry.

UGS PLM Solutions has also made what it describes as secondary-level enhancements to I-deas' 2D drafting package. Two-dimensional drafting, while historically a strong area in I-deas, is becoming less

important as more customers move to the program's Master Notation tools. But I-deas 11 adds approximately 25 new 2D drafting capabilities including new diameter and slot options, the ability to filter only solid faces to dimension, the ability to reattach and reassign dimensions, multiple fonts in notes, and 2D dynamic display performance improvement.

Another traditional strength of I-deas has been its powerful digital simulation capabilities, and here again I-deas 11 provides some notable enhancements for pre-processing, response analysis, and post-processing related to both the NX Nastran solver and MSC.Nastran. I-deas 11 provides new ways to automatically collapse short curves and narrow sections and to merge sections that are too tight, to create appropriate sized meshes, giving the user additional tools to clean up problem mesh areas without having to rely on manual methods. The new release also provides a new tetrahedron meshing assistant that uses I-deas program files to automate the meshing for certain types of parts. The laminates product, which hasn't been updated for a few years, has a new user interface that makes it easier for users to define plies of different types of materials and then perform CAE analysis on those materials.

NX Nastran is now integrated as an I-deas task, which improves the pre- and post-processing integration of I-deas with the NX Nastran solver. Users can also now prepare, solve, and load results for NX Nastran directly within I-deas. In addition, enhancements to the interoperability between I-deas' forced response functionality (NX Response Analysis) and NX Nastran will provide streamlined usability between both products. NX Response Analysis has a user-friendly graphical user interface that lets users simulate various types of operational events. Using modes calculated by either NX Nastran or MSC.Nastran, stress responses and fatigue damage can be predicted, enabling users to look for problems with parts and assemblies that may be moving at near their natural frequencies.

The Merger Roadmap

So where is I-deas 11 along the I-deas/Unigraphics product merger roadmap? In 2001, UGS articulated a three-year product plan in which I-deas and Unigraphics would eventually come together as a single NX product. Since unveiling that plan, UGS PLM Solutions has released two versions of I-deas prior to I-deas 11 NX Series. At the same time, the company introduced another release of Unigraphics and the first two versions of NX, the NeXt-generation software platform for bringing together the strengths of Unigraphics and I-deas into one coherent

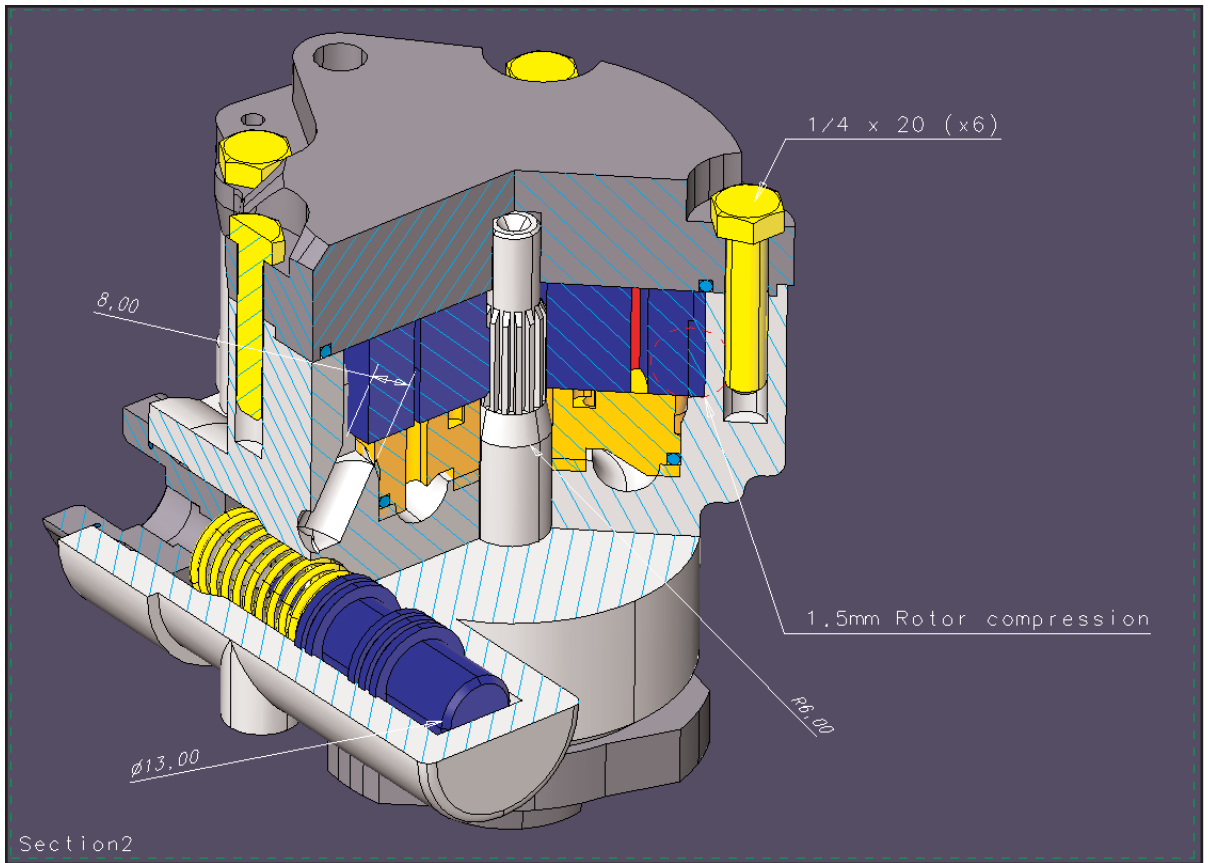
suite of products supporting the full spectrum of product development processes. (See *EAReport* September 2003 for a detailed NX roadmap.)

As we stated last year, to make NX work, UGS has had to deal with some very difficult problems, well beyond mere geometric compatibility. In addition, the company counts as customers two of the largest automakers in the world, each with billions of dollars of legacy data, as well as other large customers including some of the world's biggest consumer electronics companies. In spite of all the obstacles, UGS PLM Solutions is less than a year away from its goals and has delivered on all of its stated milestones.

As was true for its previous two releases, I-deas 11 doesn't focus on the migration of its users as much as continuing to build the underpinnings of the product, leveraging the core competencies within Unigraphics and I-deas as the company evolves toward a single NX offering.

With the release of I-deas 11 NX Series, there are several notable development efforts that continue to move I-deas forward within the NX strategy. For example, NX CAM is now integrated with I-deas so that users can take advantage of that application. "Any I-deas CAM user today can swap out their I-deas CAM license for an NX CAM license," said Rendell, and because of the interoperability between I-deas and NX, they can use NX CAM as their manufacturing solution while continuing to use I-deas for design.

UGS has also developed MIAdmin, a specialized data management migration utility that lets users scan, analyze, and update data in multiple I-deas Team Data Manager (TDM) installations to facilitate the migration of existing I-deas data into a Teamcenter PLM solution. In addition, two new migration customization audit tools will help customers analyze their existing Open I-deas applications and I-deas program file utilities. The Open I-deas API is used by some of the company's largest customers, who develop Java or C++ code to interface with I-deas. The I-deas program files provide sophisticated macro capabilities that allow a wide range of users to record interface steps. The audit tools will help these customers prepare to move their customized code into the NX environment. For example, the Open I-deas API audit tool shows the customer's existing custom code and all the I-deas API calls in that code along with suggested mappings of those calls into the NX API and the appropriate programmer-level documentation for those NX API calls. The audit tools will enable customers to understand what they'll need to



The persistent nature of I-deas' new 3D section view lets users annotate directly on 3D parts and assemblies. Sections can include 3D cross-hatching, dimensions, and notations.

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360-733-0711

Engineering Automation Report
711 Chuckanut Drive N.
Bellingham, WA
98229-6921
+1-360-733-0711
fax 360-733-2964
www.eareport.com

Cyon Research Corporation
8220 Stone Trail Drive
Bethesda, MD
20817-4556 USA
www.cyonresearch.com

do to port their custom code well in advance of the transition.

Finally, UGS will also provide I-deas users with an NX quick tour, a self-guided tutorial that allows I-deas users to get acquainted with NX terminology differences and processes. Any I-deas customer with an active maintenance plan can get a copy of the current version of NX (or switch licenses of modules, if they so desire). The quick tours are provided via the Web and walk users through the creation of the same parts many had previously created during their initial I-deas training.

Meeting Customers' Needs

UGS is providing the flexibility needed to make it possible for customers to move to NX based on their individual needs rather than based on a specific timeline. Rendell noted that some customers are in the process of moving to NX 2. "We expect to really see people start to make the move at the end of this year and the

beginning of next year as NX 3 gets deployed."

While many people, particularly competitors, expressed doubts when the planned merger of the two products was announced, UGS PLM Solutions is now clearly on the verge of complete success. It has met all of its milestones to date and has had very little customer attrition in the interim. Rendell notes that UGS has lost very few customers. The few that have dropped their maintenance contracts have done so primarily for economic reasons rather than because they switched to a different product.

Nor has the series of company name changes had any noticeable effect. "I think the I-deas customers got a little jaded about us changing the company name," said Rendell. If anything, the most recent sale by EDS will give some of the large I-deas customers additional flexibility on the services side as well as with their Teamcenter deployment. ■

Contact: www.ugsplm.com