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The Future of CoCreate

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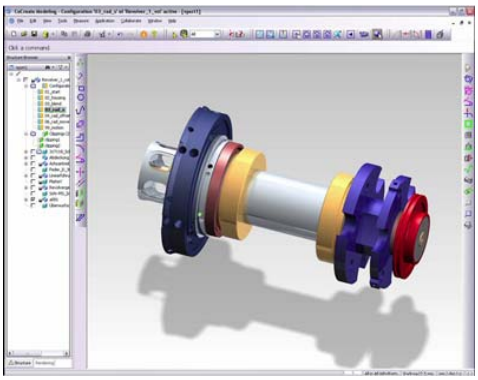
June 26, 2008—When Parametric Technology Corporation announced its intentions to buy CoCreate in October 2007, cynics naturally assumed that PTC intended to phase out CoCreate's OneSpace Designer (formerly called Solid Designer) and convince customers to buy Pro/ENGINEER instead. Like Computervision customers before them, CoCreate customers were expected to become a cash cow to fund PTC's other acquisitions and technology developments.

The cynical view isn't without some justification. Since the early 1990s, CoCreate (formerly the mechanical CAD software subsidiary of Hewlett-Packard) positioned itself as the anti-Pro/E CAD software. Pro/E employs dimension-driven features in sequential order to create and modify part geometry. CoCreate's solid-modeling software stores no features or history but instead enables designers to push and pull individual part faces to achieve a desired shape. PTC calls CoCreate's approach "explicit solid modeling," while Pro/E's approach is called "parametric solid modeling."



The user interface of PTC's CoCreate Modeling 2008 CAD software. (Click image for an enlarged view.)

When I've written about CoCreate in the past, I have received passionate letters and e-mails from CoCreate customers excoriating Pro/E for being too hard to use and inflexible. Some designers feel strongly that so-called explicit modeling works best for them. But the great majority of CAD system buyers don't agree. Pro/E outsold CoCreate's 3D CAD systems 10 to 1. Consequently, most other CAD software developed since the mid-1990s, including CATIA V5, SolidWorks, Solid Edge, and Autodesk Inventor, employs the dimension-driven approach invented by PTC.

In competing with CoCreate and other explicit modelers of the early 1990s, PTC vigorously advocated its feature-based approach. That PTC would embrace explicit modeling seems a little like Hillary Clinton endorsing John McCain.

A Change of Heart
At the 2008 PTC User conference in Long Beach, California, PTC executives went to great lengths to express their support for CoCreate's software along with Pro/E. PTC claims that it now offers designers the best of both approaches: Pro/ENGINEER, the best parametric modeler, and CoCreate Modeling, the best CAD system for explicit modeling.

PTC argues that Pro/E is the right CAD system for companies that:

- Capture intended product behavior in the model

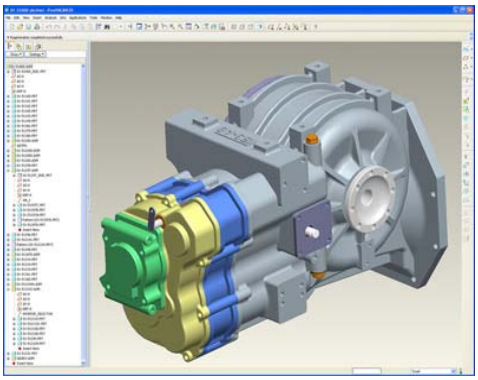
- Employ design automation
- Create families of similar products
- Optimize product-development processes

PTC believes such companies design products that are “highly engineered” and are based on one or more “common platforms.”

PTC says CoCreate is the best software for companies that want to:

- Quickly and easily create 3D designs
- Avoid defining parameters and features
- Create and modify models through direct interaction with geometry
- Make radical changes without thinking about their impact on the model’s design history

PTC claims that CoCreate customers “create new designs from scratch” and have design schedules “measured in days or weeks” instead of the months required for Pro/E designs. PTC also envisions that customers might use CoCreate to modify data from discontinued CAD systems or make small changes to Pro/E models required for machining or tool design.



An assembly model of a transmission shown in Pro/ENGINEER Wildfire 4 (Click image for an enlarged view.)

PTC says it plans to continue to improve CoCreate Modeling along with Pro/E. In a presentation to analysts and media representatives, Martin Neumüller, director of product management for the CoCreate family of products, said the 2008 release contains 1,350 improvements and 510 new functions. The most significant of these are:

- Improved editing of 3D curves and surfaces
- Form-feature patterns
- Better surface blending
- Section views associated with the model
- Shaded views on drawings
- Automatic updating of sheet-metal models and tooling after material-thickness or manufacturing-process changes
- Assignment of material thickness and bending information on imported sheet-metal models.

In addition to improving the CoCreate CAD software, PTC intends to integrate CoCreate with its Windchill PDMLink

data-management software. PTC plans to have what it calls the “first phase implementation” of a “workgroup manager” for PDMLink by 2009. A more sophisticated implementation is planned for 2010. Workgroup managers enable CAD applications to check 3D models and associated drawings into PDMLink while maintaining the relationships among files.

With the 2009 release of CoCreate (expected late in 2009), PTC plans to enable Pro/E to open CoCreate files directly and vice versa. This exchange will be enabled by embedding Pro/E’s Granite kernel into CoCreate, according to Mike Campbell, PTC’s senior vice president of desktop products. PTC doesn’t currently plan to replace CoCreate’s proprietary version of what was originally Spatial’s ACIS kernel with Granite. Granite will be used only as a medium for exchanging geometry with Pro/E.

Of course, since CoCreate knows nothing about dimension-driven features, Pro/E models read by CoCreate will consist only of geometry. Conversely, CoCreate models read by Pro/E will appear as featureless solids in Pro/E assemblies. What’s not clear is what will happen to Pro/ENGINEER models if a designer reads one into CoCreate, makes changes, and writes it back into Pro/E. Will the feature information be lost in the round trip?

PTC also plans direct links between CoCreate and PTC’s Arbortext and Itedo publishing applications. These will enable Arbortext users to make sales literature and technical manuals that are actively linked to CoCreate models. When CoCreate models are updated, the changes will be reflected in the Arbortext documents. No dates have yet been set for this integration.

Campbell says PTC would like to incorporate explicit-modeling capabilities into Pro/E. Currently, Pro/E has what Campbell calls “tweak features” that enable designers to deform geometry locally. Tweaks still appear as objects in Pro/E’s history tree and their effects depend on where in the tree they occur. Using CoCreate technology, Campbell would like to enable PTC customers to make changes independent of the regeneration history.

None Too Soon

PTC is framing explicit versus parametric modeling as a customer choice. But in fact these technologies are converging. Siemens has introduced what it calls “Synchronous Technology” that enables designers to make changes using either explicit or dimension-driving techniques in the same CAD software. (See “Siemens PLM Software Says Its New Synchronous Technology is a Game-Changer.”) Dassault Systèmes has promised a similar new development in CATIA V6 called “Live Shape.” (See “CATIA V6: FUD and Promise, Part 1.”) And smaller companies such as Kubotek and SpaceClaim are developing novel methods for creating shapes that appear to meld both parametric and explicit approaches.

To remain competitive, PTC needs to combine the best of both Pro/E and CoCreate in a single product. CAD buyers overwhelmingly prefer not to employ multiple modeling systems to get their work done. Large companies are pressuring individual divisions to standardize on a single brand of CAD software. The acquisition of CoCreate is a step in the right direction for PTC, but the company’s R&D teams have more to do.

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