

FINAL THOUGHTby **Tim Thomas, CEO, PARTsolutions**

The Evolution of Engineering

We've come a long way since the days of the drafting board, when engineers and designers spent the bulk of their time with pencils in-hand. With its clear structure, this method was — for many years — the only proven method. It was also however, very time-consuming, requiring a great deal of preparatory work as well as in-depth knowledge of “best practices.”

2D computer aided design rocked the engineering world. Engineers and designers could now quickly create geometry without being totally dependent on “tribal knowledge.”

Next, 3D computer aided design reshaped the landscape again. With its “easier than 2D” mantra, the 3D master model concept enabled engineers and designers to see geometrical “volumes,” while offering more flexibility with several design methodologies. These methodologies were left to the designer to figure out, as each tool had its own “we're better because our tool doesn't allow you to do it that way” message. Design time was minimized with more intuitive operation, and the workflow was less rigid by eliminating the need for a standalone 2D CAD system.

However, problems persist in this approach, as companies standardized their best practices on the functionality of the tool of choice, rather than spend time optimizing their processes, independent of tool functionality. The approach leads to huge investments in CAD specific training, and limits a company's leverage when considering changes to those CAD dependent failing processes.

Over the last several years, there has been a fundamental shift in the way engineers are designing products. The need for lower product costs and faster time-to-market have placed a great deal of demand on product designers to work faster and smarter to produce designs that are more easily, quickly, and cost-effectively manufactured.

As a result, most manufacturers have adopted a PLM strategy centered on an integrated product model that incorporates manufacturing data. When combined with a 3D part catalog management solution, product designers and engineers are given direct access to catalog and custom parts directly from within their design (CAD) environment. This allows for design benefits like allocation of classes via clustering, readout of geometric attributes, sketch help, and geometric search according to previously found objects — all of which have a profound impact on design time.

What's more, 3D part catalog management complements PLM by enabling parts

or commodity reuse. By enabling configuration of 3D parts in native CAD formats within a larger PLM context, it also allows designers the confidence to find, reuse, and control standard parts more effectively. The reuse provided by CAD-native 3D part catalogs can be expected to reduce both IT management and overall product costs including design, manufacturing and support costs.

Yet, even with a 3D part catalog in place, engineering still may not know which parts are preferred, leading designers to specify duplicate components in their designs that are not approved by procurement or that are introduced in a way such that they become new components (in other words, new part numbers) that have to be sourced. The net result is an increase in direct material spending, adding not only to the cost of product development, but ultimately to the overall cost of goods sold (COGS) for the business.

Fortunately, the next evolution in design is “Purchineering,” a symbiosis of standardized purchase processes and the application of preferred components by the engineering team. This newest concept in engineering is the first to impact not just designers and engineers, but the entire company.

From a design perspective, a formal policy of parts standardization and emphasis on use of parts from an approved parts list (APL) for certain commodities, allows for stability in the ongoing cataloging of parts and gives designers the ability to find approved standard parts fast and with confidence. Not only does this reduce product development time, it also provides direction to the designer and eliminates a constant need to “reinvent the wheel” or redesign. It also affords suppliers and partners with the ability to easily cross-reference this information.

What's more, by offering the ability to put more controls in place between purchasing (buyers) and engineering (specifiers), silos within a company are integrated, enabling companies to negotiate volume prices with strategic suppliers from which a company buys. This can have a particularly significant impact when considering that a 400 percent delta between high and low price for the same part is typical.

It has been said that “there are no shortcuts in evolution.” But perhaps when it comes to the advancement of design...there just might be a shortcut or two.

Tim Thomas is CEO of PARTsolutions, a provider of solutions to enhance the product lifecycle management environment. More information at www.partsolutions.com.