Digital Transformation Starts at Home:

How and why to standardize on one CAD platform

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In May 2008, *Industry Market Trends* published an article outlining how sections of a major new aircraft had reached the assembly plant with wiring flaws, which caused a production halt. Executives at the aircraft manufacturer blamed the fiasco on the failure of different plants to use the same design software. It was an expensive lesson, costing thousands of jobs, and forcing the company not only to reduce its profit forecasts by $6 billion, but also to close multiple plants.[1]

While this is an extreme example, it demonstrates the risks that arise when a manufacturing project relies on multiple CAD systems for modeling, configuration management, test, analysis, and other important product development functions. So-called CAD chaos has a price as large as it is far-reaching, whether it occurs at an aircraft manufacturer in 2008 or at a mid-size business in 2021 that finds itself redoing expensive tooling and disappointing an important customer.

CAD chaos can also have consequences that are less tangible, such as stifling innovation in the very place it should be occurring. Most manufacturers believe that one key to staying ahead in highly competitive markets is to drive more innovation into their products and processes. The goal is not innovation itself, but the potential impact that innovation can have on the business.

Consolidating on one CAD system cannot guarantee that original and productive ideas will suddenly emerge in greater numbers, but it does create an environment more conducive to exactly that. Too often, however, companies essentially take themselves hostage by putting some of their most valuable intellectual property (IP) - the data, calculations and models underlying successful products – in several CAD systems. Employees seeking to make the most of this IP find themselves up against the barriers of rework, data translation, and the damaging effects of innocent human error.

The problem also extends to resource flexibility and the projects the company decides it can take on. Consider a company with 50 engineers. Twenty engineers are highly experienced on one CAD system, 20 on another, and ten on a third. If a critical project requires 30 engineers, that means at least ten of them will use a CAD system other than the one where they have the majority of their experience.

At this point the company faces several unpalatable choices. They can decide not to do the project because they don't have the engineering talent ready, which hurts the business. They can decide to do the project knowing they'll be less efficient, and that this efficiency gap might lead to a host of unwelcome follow-on impacts, ultimately effecting the project's ROI. Either way, the company is worse off than if each of the engineers were 'fluent' in the same CAD package.

Companies living with CAD chaos also pay a range of stiff financial and strategic prices: license and maintenance fees for each software package; training and library support cost for each; impaired collaboration; processes that encourage mistakes and demand manual rework; and lost opportunity as users spend their time on idiosyncratic homegrown workflows.

That's merely what happens inside the business. Take a minute to imagine if one of the issues above causes a problem that makes its way unnoticed into a company product, into the marketplace and into the hands of customers. Now the company potentially faces an uptick in warranty costs, a threat to their market position, and the unsettling realization that somehow, somewhere their design process contributed to the problem.

IMPACT OF CAD CHAOS

- License and maintenance fee for each software package
- Training and library support for each
- Manual rework
- Impaired collaboration
- Processes that encourage errors
- Lost opportunity as users carry out idiosyncratic homegrown processes

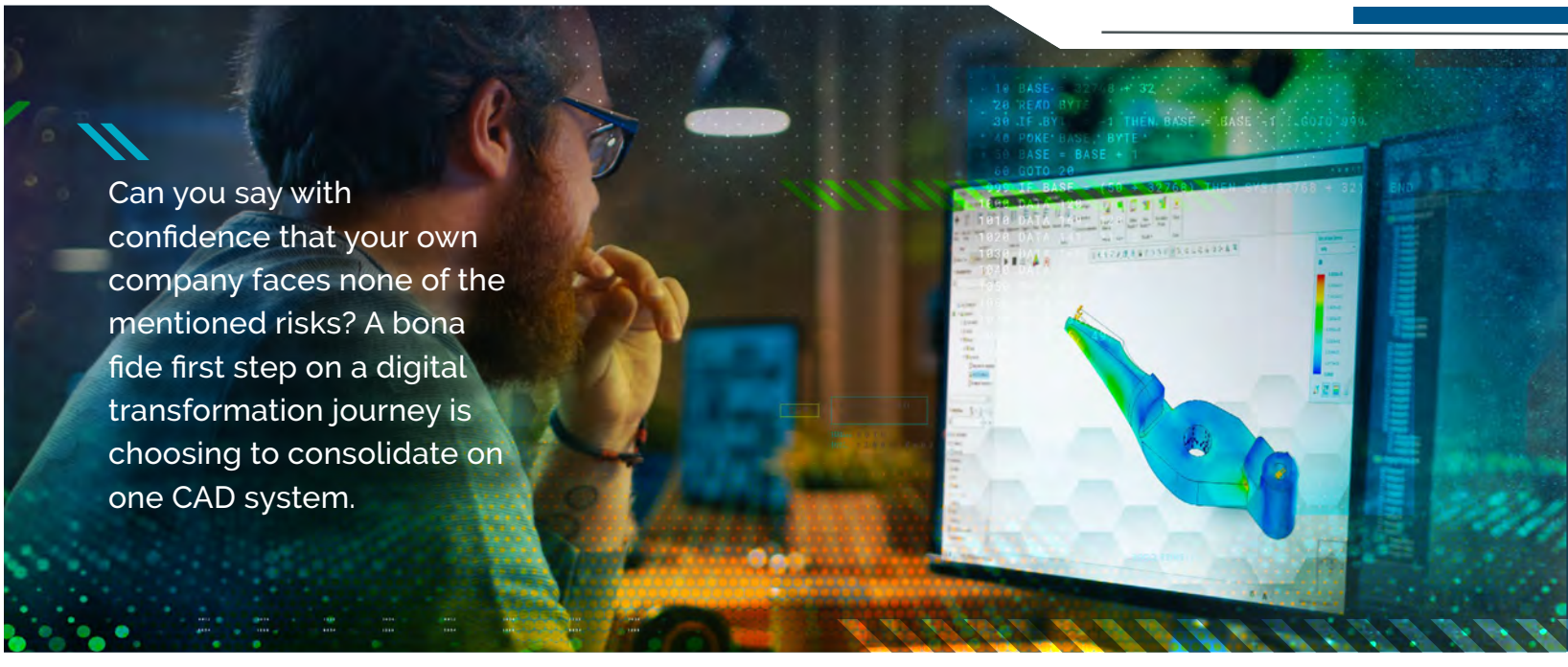
TALES OF CAD CHAOS

- Industrial designers at a manufacturer used one tool because of its surfacing abilities, abilities that were of little comfort to the design engineers who had to recreate the model in the tool they used. The result? Two groups at odds, a workflow filled with obstacles, and deadlines that have become no more than a suggestion.

- One company 'has always done it this way': one tool for drawings, one for models, and a third for manufacturing. A single change causes a ripple of changes, a process characterized by miscommunication between the company's various functional experts and a host of manual updates at the worst possible time. That $10K tooling that has to be thrown away? Just a cost of doing business.

Digital Transformation

PTC defines digital transformation (DX) as a broad business strategy, applicable across all industries, to solve traditional business challenges and create new opportunities through the use of technology. Consolidating on one CAD tool can be a critical part of any company's digital transformation plan. This is one moment when variety should not be the spice of the corporate digital life. Having all digital data in the same format is more valuable and more healthy for the business than not. With one CAD system, a consistent single digital thread weaves its way through the entire design environment supporting efforts to cut costs, reduce mistakes, get to market faster, spur innovation, and help valuable employees work together more effectively. Below are the major steps to take on your journey.



Three Steps Towards CAD Consolidation

QUANTIFY THE WASTE

CAD consolidation is as much about good management and prudent stewardship of resources as it is about technology. Spend time looking at your processes, figuring out the time sinks of data translation and model recreation, and determine what they are costing in salary, time, manual effort, repetitive tasks, squabbling between teams as to who will do the tedious work, mistakes, and opportunity cost. Imagine a work environment without any of those items and see what it would mean for your situation. Collaboration is hard enough without adding the burden of competing tools.

PREPARE FOR THE EMOTIONS

Change is not easy. Hallway mutterings can erupt into “But I won’t be as productive if you make me switch tools. I know this tool!” Listen but stand firm. A well trained user on one tool will experience a downturn in productivity as that person adjusts to the new tool. In our experience, however, this is a short term problem. An early-career engineer may protest as well, but it’s worth considering whether that person has attained fluency in the preferred tool or knows it just well enough ‘get stuff done’. Don’t allow dire forecasts of productivity drops to intimidate you. In the words of one executive, you can become very good at doing something wrong. Moreover, proper training on new CAD software may well make users far more productive on the new platform than they ever were on the old.

TAKE THE SAME APPROACH FOR FEATURE BATTLES

It's no secret that CAD tools inspire fanatic commitment. Our experience suggests that it is futile to try to win over staunch adherents by pitting the major tools against another. We've even seen users who are shown how a task can be completed in much less time with fewer clicks reject that evidence and support their preferred tool even more fiercely for that same task.

Still, users will demand you do your technical homework..

Make sure the new tool can accomplish the same design tasks as the other tools, presumably with the same or fewer steps

Find common user complaints that the new tool would resolve.

Enlist the support of influential users by emphasizing to them the breakthrough or unique capabilities the new tool offers.

EMPHASIZE EXECUTION

If you're fortunate, you may be able to migrate to a new, standardized 3D CAD platform by simply starting all new projects on the new software. More likely, your company is like many others in that 80 percent of the work that design engineers do involves modifying or leveraging existing designs. It's critical that those designers be able to leverage data from other tools during the migration. Your new CAD tool should have multi-CAD as a core capability, both to meet the immediate needs of the migration and for the follow-on, inevitable multi-CAD demands of working with vendors, customers, and partners.

Follow the Golden Rule and treat your users as you would like to be treated during a transition. Plans for training, documentation, and support must be in place to help users become acclimated and productive as fast as they can. At a minimum your plan should include on-demand and live user training in several formats and be easily accessible to users. Make sure you understand what help is available inside the software, ideally in a context-sensitive menu at the right-click of a mouse button.

CAD – More than just a design tool

Technologies are reinvigorating every step of product development, from how engineers create designs to the review process and even model validation. Companies have the right to expect that their product design software not only keeps up, but that the company behind the product has a robust, long-term roadmap and a history of investment. The vendor must be as committed to their product as you are to your business.

Consider Creo. Creo is a full-featured professional 3D CAD solution used by a vast cross-section of companies and has been for three decades. Or, as we like to think of it, Creo is the standard in industries from aerospace to health care to consumer goods. Now with major releases yearly, easy-to-learn Creo comes in the most scalable range of 3D CAD product development packages and tools in today's market.

CREO

CREO OFFERS THREE STRATEGIC ADVANTAGES:

- A single design environment in a single software package
- Multi-CAD capabilities
- Releases with a consistent record of significant advances, all integrated into the core of the product.

SINGLE DESIGN ENVIRONMENT

A single, integrated design environment means maximum efficiency and easy access to a variety of capabilities – instead of the need to switch back and forth between various software packages for specialized capabilities. A designer working in Creo could go from initial concept all the way to CNC toolpaths or to print-checking a final model to be additively manufactured in polymers or metal. That same designer could get real-time feedback on her design as she was evolving it – without leaving her design environment or even opening another window. When she wants to share models with downstream users, the augmented reality capabilities in each seat allow her simply to email a link to each stakeholder's phone. That's the strength of the digital thread, an area where Creo enjoys a best-in-class reputation.

MULTI-CAD

Do not allow multi-CAD challenges to break your digital thread. With Creo, your users can master multi-CAD. This is an inevitable and critical part of any consolidation effort as your users transition their models and data from one system to another – or a customer's model from one system to another. Creo's Unite technology makes it seamless to import, open, fix, update, and save other CAD files in all the major CAD systems. You don't even need those systems' licenses. The flexible modeling capabilities in Creo also allow users to work directly on geometry without having to know how the model was built.

RELEASES WITH SIGNIFICANT ADVANCES

Creo has been delivering value to customers for decades. Each release has significant advances in performance, productivity and technology delivered on an annual cadence. As companies work to bring their products to life digitally, they're turning to Creo's real-time simulation, design for additive manufacturing, and more immersive, efficient, and secure collaboration using cloud-based augmented reality. Creo's generative design capabilities are simply the latest addition to a market-leading product with decades of investment behind it.

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DIGITAL TRANSFORMATION

Digital transformation starts at home, with time and effort spent getting your digital house in order. For many of you that will mean consolidating onto a single CAD platform. Like any major project you'll need to stay the course, remain focused, and anticipate pushback. The rewards will be a business better positioned to produce top-quality, innovative products that get to market faster. The time to act is now.

Need more information? **CONTACT US** →

Creo is the 3D CAD solution that helps you accelerate product innovation so you can build better products faster. Easy-to-learn Creo seamlessly takes you from the earliest phases of product design to manufacturing and beyond. You can combine powerful, proven functionality with new technologies such as generative design, augmented reality, real-time simulation, additive manufacturing and the IoT, to iterate faster, reduce costs and improve product quality. The world of product development moves quickly, and only Creo delivers the transformative tools you need to build competitive advantage and gain market share.

[1] David R. Butcher / Industry Market Trends, May 8, 2008