REDUCE WASTED TIME IN CAD DESIGN

Winning the Engineering Productivity Challenge

START

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Reducing Non-Value-Added Time in CAD Design

Avoiding the Five Most Common Time Wasters

How can companies improve data management to avoid the five most common CAD design time wasters and win the engineering productivity challenge? Improving design data management maturity, enabled by PDM and PLM solutions, helps reduce non-value-added time and increase engineering productivity.

START

OBJECTIVE

Avoid the time wasters to meet design due dates

CAUTION

Companies waste **15%** of engineering time on non-value-added data management

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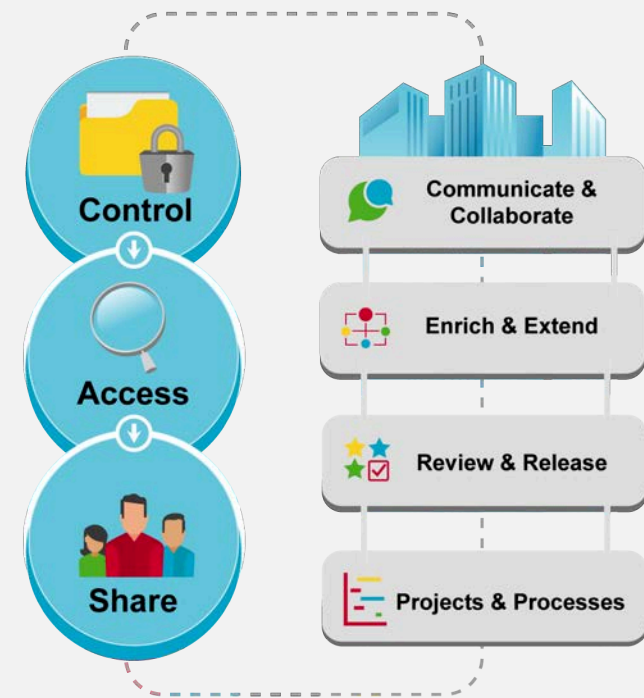Tech-Clarity

Engineers Don't Have Time to Waste

Too Much Spent Time on Non-Value-Added Data Management

Product and product development complexity have increased while time-to-market goals have become more aggressive. The combination of these two trends puts a significant squeeze on the time available for engineers and designers to design and document their inventions. Unfortunately, companies waste an average of 15% of their engineers' time on non-value-added data management tasks. Almost one-third of these companies spend over 25% of their engineers' time this way.[1] That's one out of every four days wasted on data management efforts that could be better spent innovating.

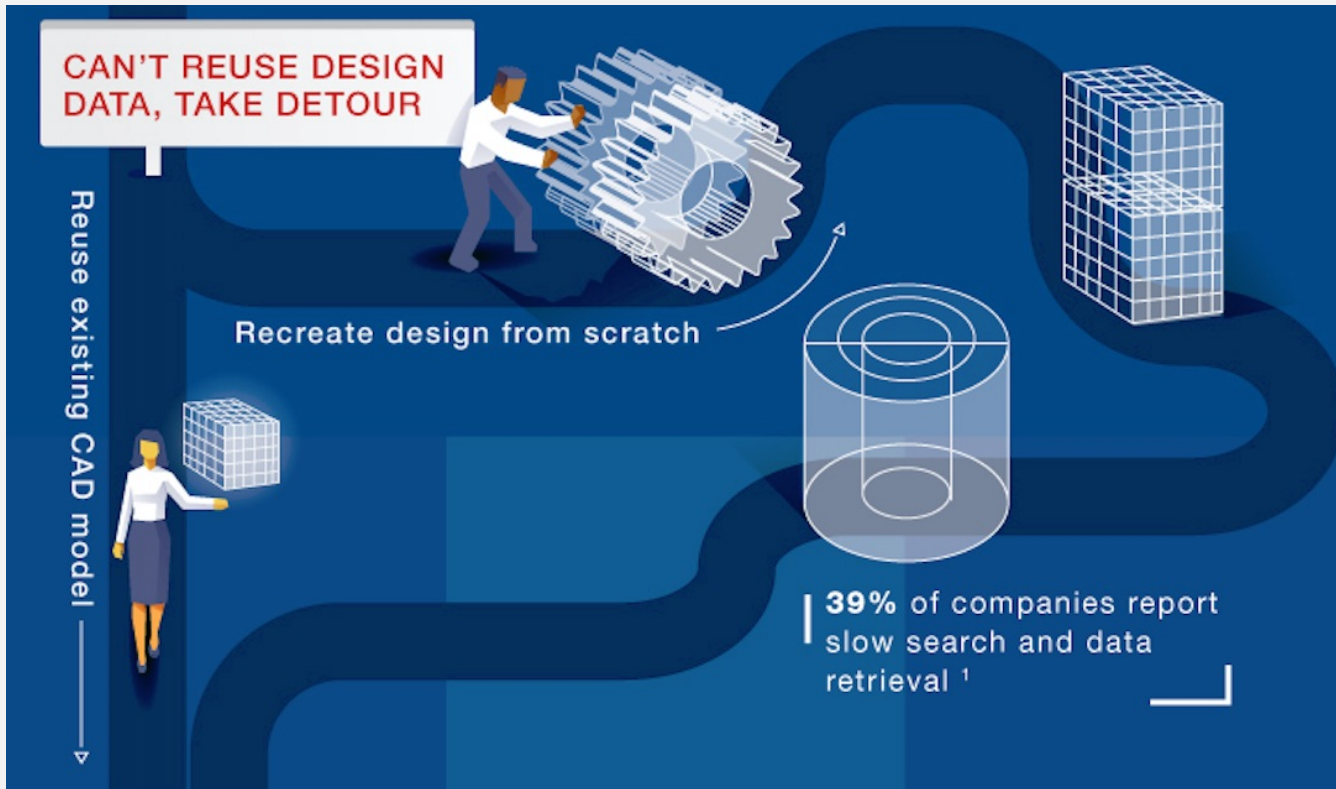## Design Data Management Maturity Relieves the Pressure

What if companies could give that wasted time back to their technical personnel? That's exactly what leading companies do. Our research shows that Top Performing companies – those that are better able to quickly and efficiently design high quality, innovative products – spend 25% less time on nonproductive data management tasks.[2]

What enables these companies to perform better than their competitors? These leaders are more likely to have adopted more mature data management capabilities[1] and use more structured, collaborative data management solutions including Product Data Management (PDM) and Product Lifecycle Management (PLM).[2] Let's take a look at how these solutions help engineers avoid wasting precious design time by allowing them to control, access, and share design data.

Top Performing companies spend **25%** less time on nonproductive data management tasks.[2]

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Time Waster 1 – Can't Find and Reuse Data

CAN'T REUSE DESIGN DATA, TAKE DETOUR

Recreate design from scratch

Reuse existing CAD model

39% of companies report slow search and data retrieval [1]

Top Performers are **2.7** times as likely to be "very effective" at finding the data they need.[2]

Unable to Find Design Data

The most common challenge engineers face across our surveys is the inability to quickly search and retrieve data. Time spent searching for data is frustrating and takes away from valuable design time. Even more wasteful, when people can't find a design, they are more likely to start from scratch and redesign a part or assembly. This not only wastes the engineer's time but also adds additional cost downstream.

PDM / PLM Adds the Ability to Control, Access, and Share Design Data

Design data management, whether it's a PDM system or part of a broader PLM solution, ensures that CAD designs are under control and can be retrieved as needed. The ability for engineers to quickly access information based on a range of criteria is essential to effective design productivity. Once accessed, the data should be readily available to reuse to meet new design criteria without reinventing the wheel. Excessive search and retrieval times will not be tolerated and will drive inefficient behavior.
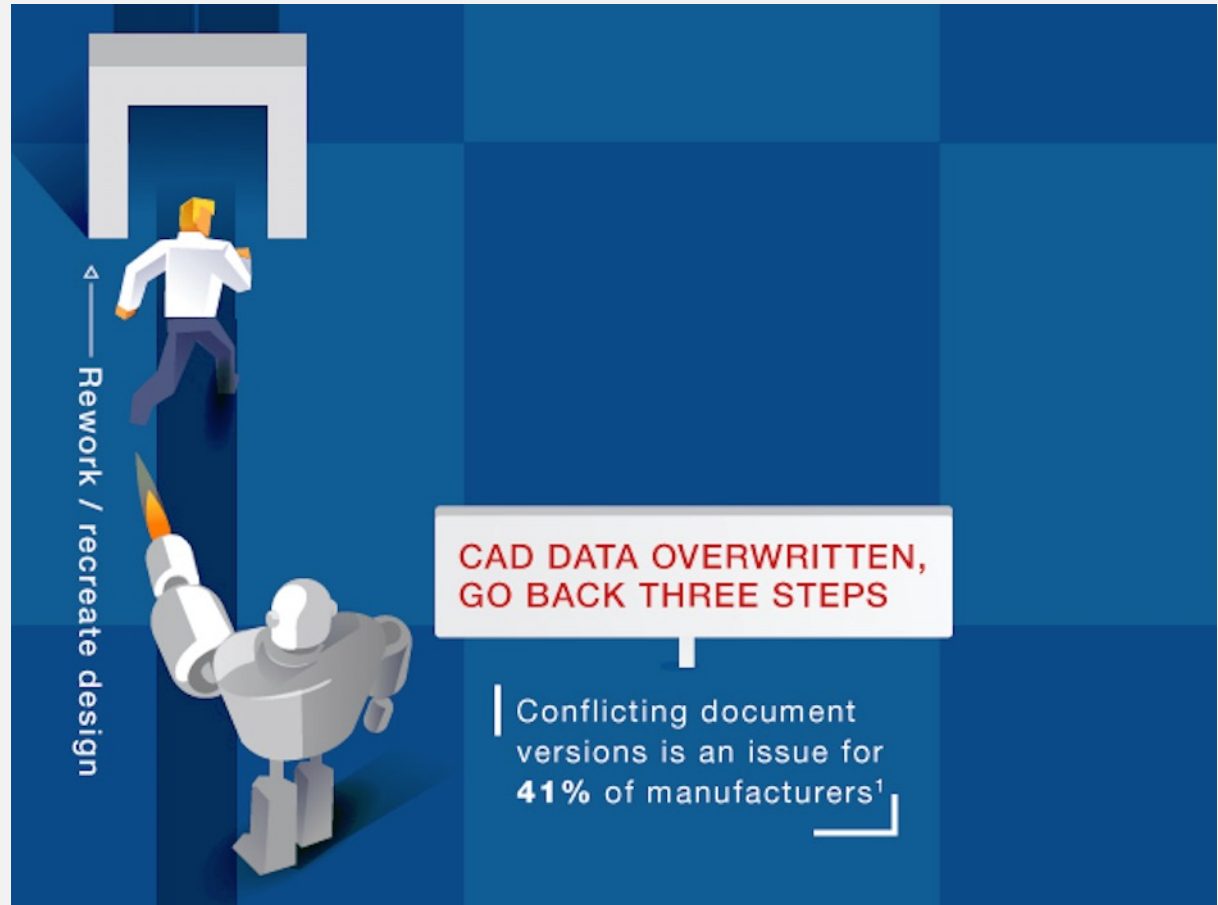
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Time Waster 2 – Lost CAD Designs

CAD Data is Not Controlled

The most basic data management requirement is keeping data under control. Without control, the game is lost from the start. Nothing is more frustrating than having a design deleted or overwritten by somebody else. Hours or days of design time is wasted and innovation may be lost.
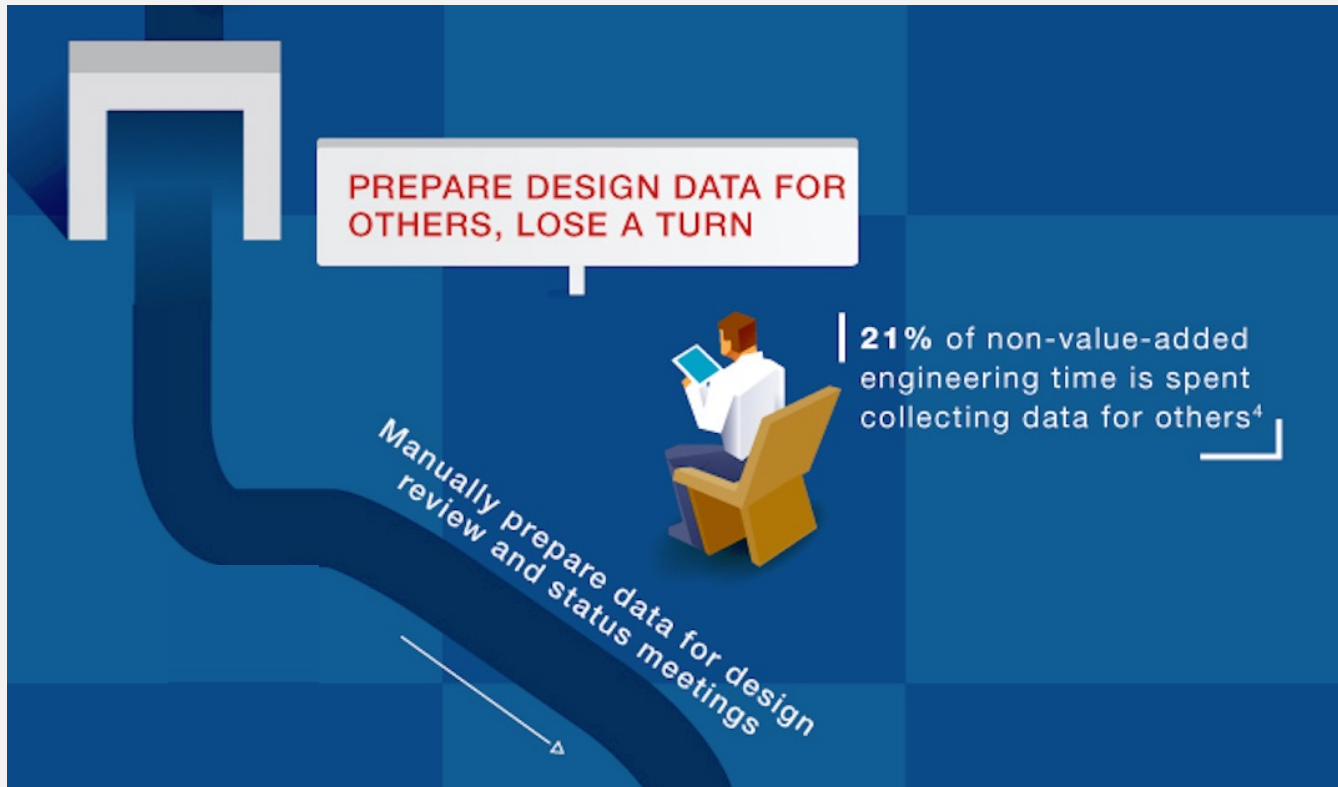
PDM / PLM Puts CAD Data Under Control

An effective data management system provides essential data access and update controls. These systems ensure that CAD models are secure from deletion and provide access control rights to make sure that only the right people access designs. Having an effective way to ensure that others can't inadvertently overwrite data, such as check-in/check-out capabilities and version control, are critical even for a single engineer to prevent accidental loss of intellectual property.

Rework / recreate design

CAD DATA OVERWRITTEN, GO BACK THREE STEPS

Conflicting document versions is an issue for 41% of manufacturers[1]

Top Performers are **37%** more likely to use design data management to archive designs.[3]

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Time Waster 3 – Preparing Data for Others

PREPARE DESIGN DATA FOR OTHERS, LOSE A TURN

Manually prepare data for design review and status meetings

21% of non-value-added engineering time is spent collecting data for others[4]

Difficulty Sharing Data Outside of Engineering

Engineering data is in high demand outside of Engineering. Engineers frequently have to prepare their CAD models for consumption by others. Manually creating drawings, translating models for downstream use, prepping visuals, or simply finding designs for others takes time and interrupts the creative process. As the appetite for 3D across the business continues to increase, for example to fuel sales presentations or virtual reality service procedures, this problem will become even more challenging.

PLM Streamlines Sharing and Provides Self Service

Design data management systems automate common data sharing tasks so that frequently used derivatives are generated automatically and made available to those who need them. For example, design check-in could trigger the creation of thumbnails and design formats to be used downstream. Beyond creating these deliverables, PLM systems are built to control access beyond Engineering and integrate with downstream people and systems. Eliminating the need for manual effort to share data is a high priority to ensure engineering efficiency.

> Top Performers are **68%** more likely to use design data management to collaborate with third parties including suppliers or customers.[3]

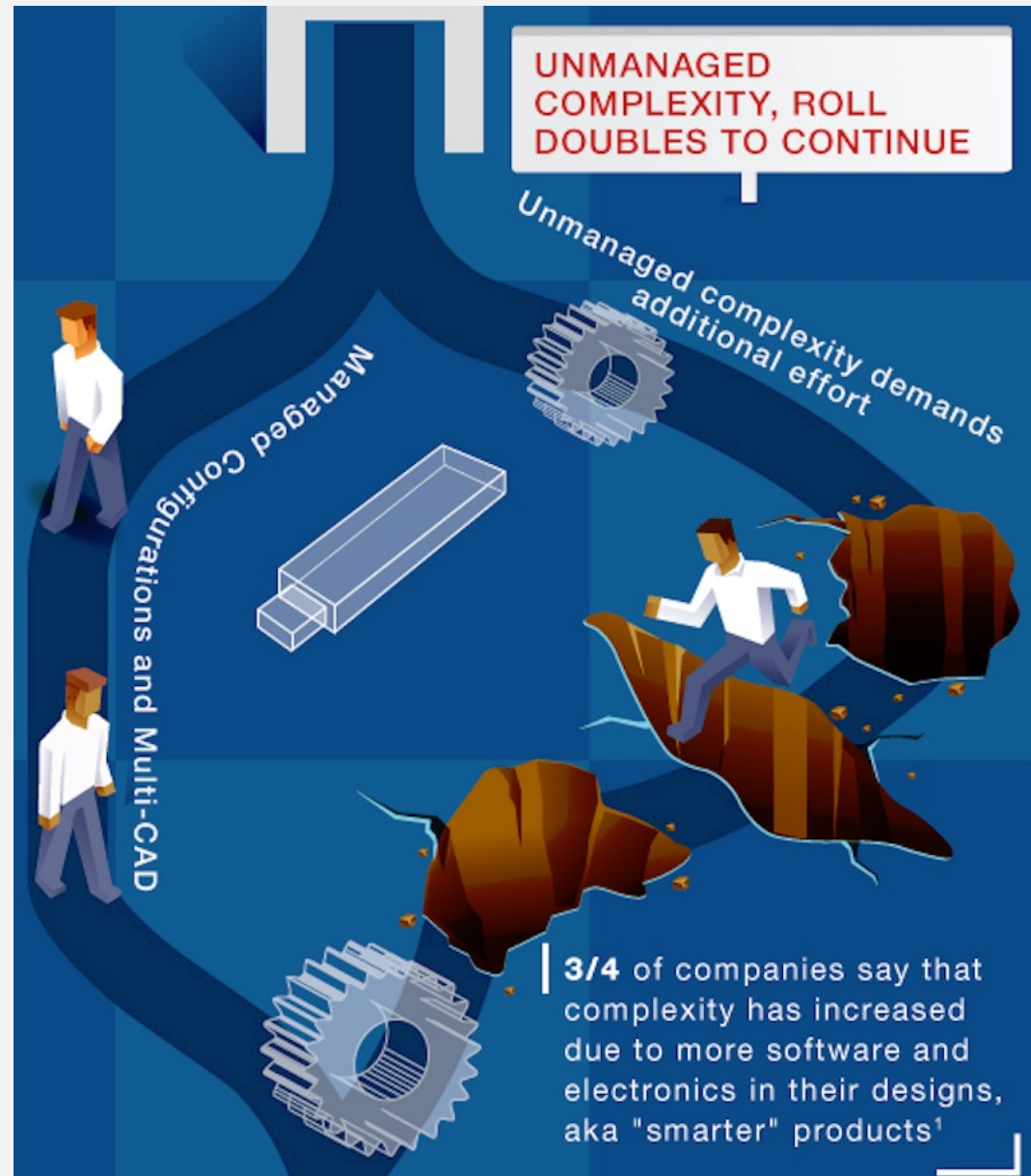Tech-Clarity

Time Waster 4 – Managing Complexity

Complexity is Increasing

Engineers recognize that complexity is increasing all around them. Products are becoming more complex, whether they are becoming "smarter," incorporating new materials, or leveraging new manufacturing techniques. Beyond that, customization is on the rise and product lifecycles are getting shorter, demanding greater control and reuse. At the same time, supply chains are getting more dynamic, with many companies changing design partners and suppliers more frequently. All of this complexity increases the likelihood for inefficiency and errors.

PDM and PLM Manage Complexity

PDM systems are designed to manage multiple product configurations effectively. They keep CAD models and assemblies under control, including the incorporation of third-party CAD in a variety of CAD formats, and ECAD designs for smart products. PLM systems can go further to help manage complex enterprise and supply chain relationships, coordinating data and tasks across the virtual enterprise required to design many of today's products.

Top Performers are **23%** more likely to use design data management to manage revisions.[3]

UNMANAGED COMPLEXITY, ROLL DOUBLES TO CONTINUE

Unmanaged complexity demands additional effort

Managed Configurations and Multi-CAD

3/4 of companies say that complexity has increased due to more software and electronics in their designs, aka "smarter" products[1]

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Time Waster 5 – Managing Change

Change Management Takes Up too much Time

Nothing is more important, and more time-consuming, than managing engineering changes. Keeping all parties involved, informed, and coordinated around engineering changes takes significant time and effort. Getting it wrong wastes time, energy, and money. It can also put a big dent in customer satisfaction. Our research consistently shows engineering change is a significant challenge that impacts efficiency. Today's increased complexity, shortened lifecycles, and increased customization will continue to put pressure on coordinating changes internally and across the supply chain.

PDM and PLM Streamline Change

Although a robust engineering change process is beyond the scope of most basic PDM systems, an extended PDM or PLM system includes effective change management. Ideally, the change ties back to the source of the change, such as a requirement change or issue report such as a CAPA. Then, it should tie through the approval process and integrate with the systems needed to execute the change. At a minimum, however, it is critical that the data management system controls and documents the engineering change in context of the CAD models.

Ineffective change management leads to errors and rework

SHARED THE WRONG DATA WITH MANUFACTURING, GO BACK

Top Performers are **26%** more likely to use design data management for engineering change control.[3]

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Conclusions and Next Steps

Avoid Time-Wasting Traps through Better Practices

The time-wasting events highlighted in this eBook are some of the most common issues we find in our research, but they are only a sample. The key to avoiding wasteful traps and gaining more productive design time is adopting mature design data management practices. With these better practices in place, companies are more likely to be able to meet their product development targets and win the CAD design challenge.

Put in Place the Right Design Data Management Technology

Mature design data management goes hand-in-hand with design data management technology. It's essential for companies to control, access, and share CAD data effectively whether the system they choose is basic PDM or a more capable PLM system.

Get Started, Take Advantage of the Benefits

Companies that don't have an effective PDM or PLM system in place are putting their design efficiency – and more – at risk. Rising complexity across product, product development, and other dimensions is increasing data management challenges, the potential for issues, and the need for design data management systems. Even for small teams, these systems provide structure and value that helps drive better design and business performance so companies can win at the CAD design game.

DESIGN COMPLETED, COLLECT BONUS

WIN

Congratulations
You completed your design on time

Companies with effective design data management capabilities spend **25%** less time on nonproductive data management tasks[2]

Top Performers are more likely to use more structured, collaborative data management solutions including PDM and PLM.[2]

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Acknowledgments

About the Author

Jim Brown founded Tech-Clarity in 2002 and has over 30 years of experience in the manufacturing and software industries. Jim is an experienced researcher, author, and speaker and enjoys engaging with people with a passion to improve business performance through digital enterprise strategies and supporting software technology.

Jim is actively researching the impact of digital transformation and technology convergence in the manufacturing industries.

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Tech-Clarity is an independent research firm dedicated to making the business value of technology clear. We analyze how companies improve innovation, product development, design, engineering, manufacturing, and service performance through the use of digital transformation, best practices, software technology, industrial automation, and IT services.

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1) Brown, Jim, "Design Data Management Maturity Improves Profitability," Tech-Clarity
2) Brown, Jim, "Best Practices for Managing Design Data ," Tech-Clarity
3) Additional analysis of unpublished data from "Design Data Management Maturity Improves Profitability," Tech-Clarity

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