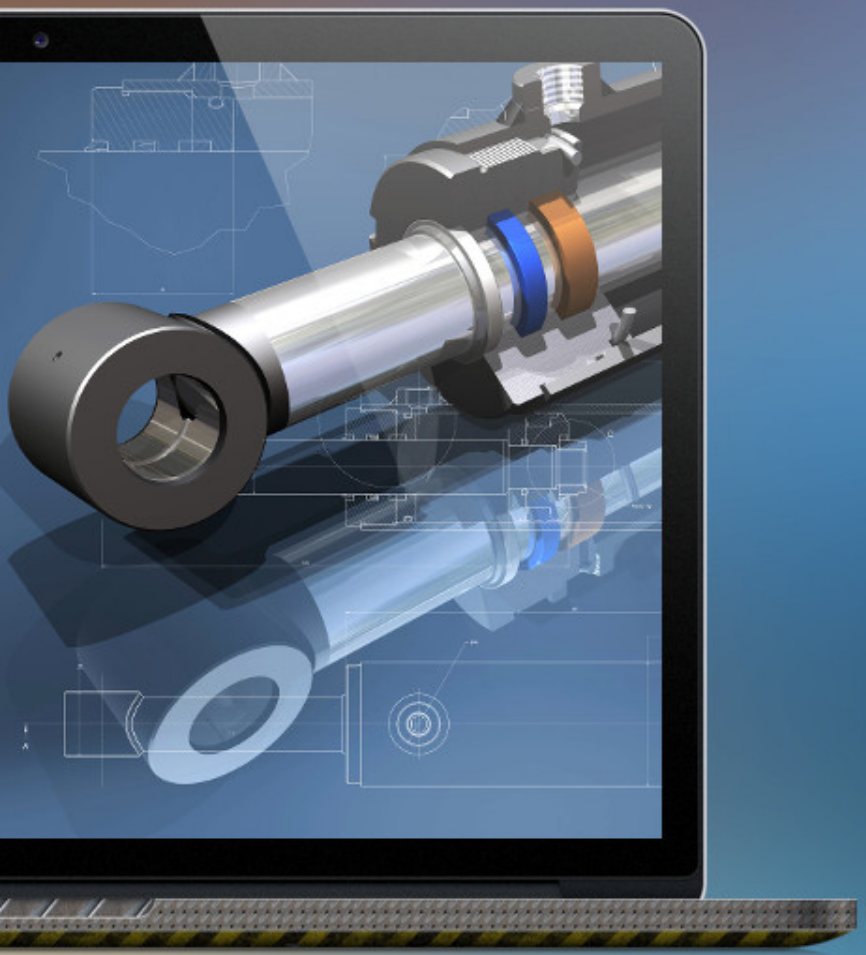


The How-to Guide for Transitioning from 2D CAD to 3D CAD

Michelle Boucher | Vice President | Tech-Clarity

The Importance of Engineering Investments

What strategies will your company use to improve profitability? Is engineering a part of it? If not, it should be.

To boost profitability, companies work hard to win over customers with great products. Unfortunately, creating great products isn't easy. Global competition makes it hard to stand out. To be successful, products must be innovative and high quality, yet priced competitively without negatively impacting margins. While balancing these often-conflicting requirements is already a challenge, companies must also race against the clock to beat the competition.

Engineering is key to accomplishing these goals, and having the right tools is essential for success. Plus, as the world evolves, the tool that was right 10 years ago may no longer be ideal. Today, engineers need tools that will manage rising product complexity, adapt to increasing customer expectations, and support new technologies as they become available. If you find your engineering tools are holding you back, it may be time for a change. When that time comes, what steps should you take to ensure the quickest return on your investment (ROI) for your new CAD tool?

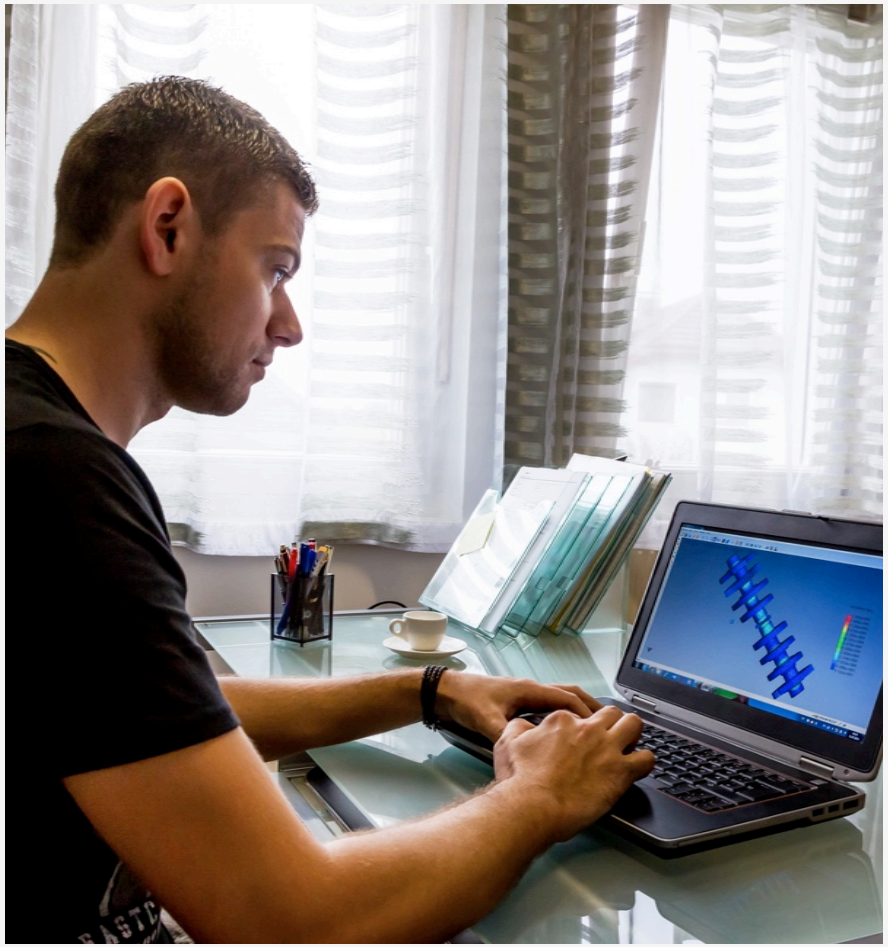
This e-book identifies best practices for migrating to a new CAD tool. It serves as a how-to guide to help companies achieve a positive ROI, as quickly as possible.

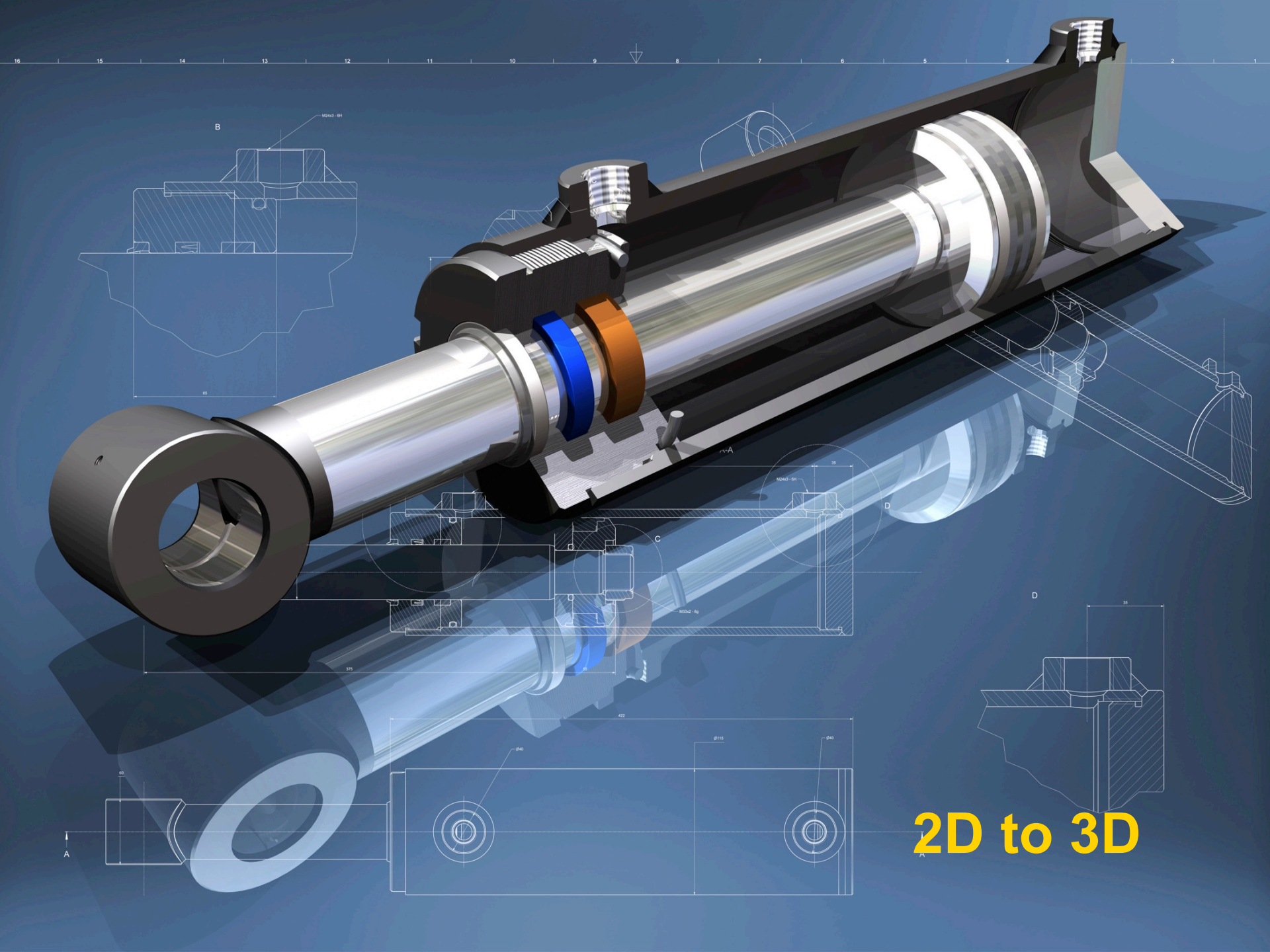
About the Research

Based on the results of a Tech-Clarity survey of over 230 manufacturers, this e-book shares best practices for adopting a new CAD tool. The research examined three different types of migrations:

- Transitioning from 2D CAD to 3D CAD
- Migrating from 3D CAD to a new 3D CAD
- Adopting model-based definition (MBD)

Each eBook in the series focuses on a single type of migration. **This eBook focuses on the transition from 2D CAD to 3D CAD.**




2D to 3D

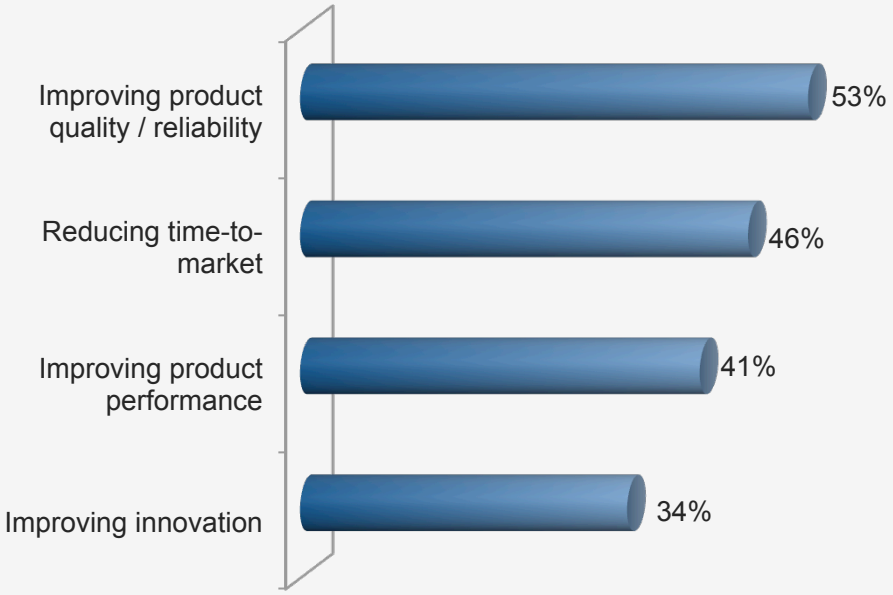
Why Change From 2D to 3D?

While 2D offers a lot of simplicity, going to 3D CAD can offer multiple benefits:

- Find problems earlier during design by checking for interferences.
- Identify quality problems and improve performance by conducting virtual tests.
- Evaluate more design iterations to arrive at a more innovative solution.

Benefits like these will help you bring better products to market and do an even better job of meeting customer needs. Plus, by catching problems earlier, you can minimize time spent fixing products late in the development lifecycle. This not only saves costs, but will help you get to market sooner.

Since interpreting 2D drawings requires specialized skills, an added benefit of a 3D model is that it makes visualizing the product simpler. So even nontechnical staff, suppliers, and customers can provide feedback more easily.

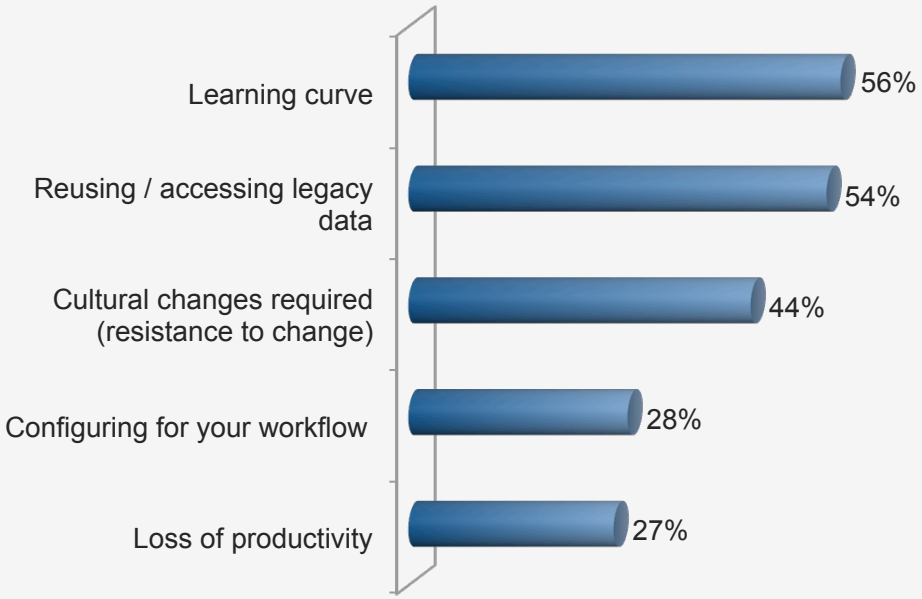


Investment Drivers for Companies Going From 2D to 3D

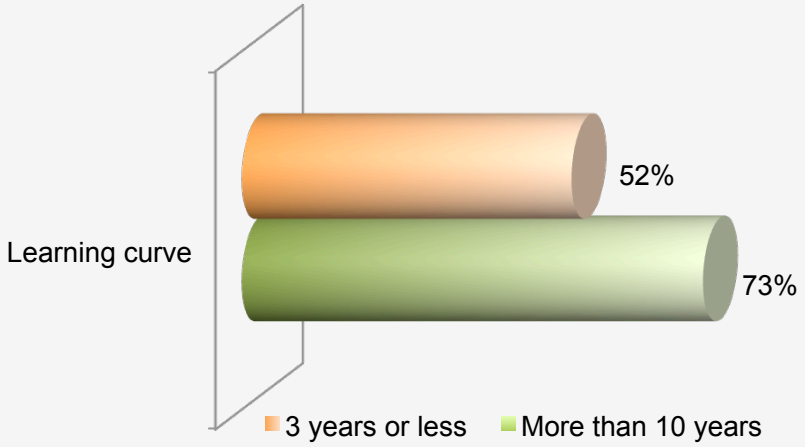
The above graph shows what's driving engineering investments at companies who have gone from 2D to 3D. What's interesting is that these drivers are all benefits that can be realized by going to 3D CAD.

Plan to Avoid Common Challenges

With any change, there are bound to be some challenges. By identifying them in advance, you can plan for them. This way you can either minimize their impact or even avoid them altogether. The graph below shows the top challenges companies report when they go from 2D to 3D.



Top Challenges Going From 2D to 3D



For anyone who has looked at 3D tools in the past and was concerned about the learning curve, there is good news. Those who have switched to 3D more recently are 38 percent less likely than those who made the change 10 years ago to report that the learning curve was a top challenge. This demonstrates how much easier CAD tools have become over the last decade. It also reflects the significant investments CAD vendors have made to improve ease of use.

To make the transition easier, there are several best practices you can adopt.

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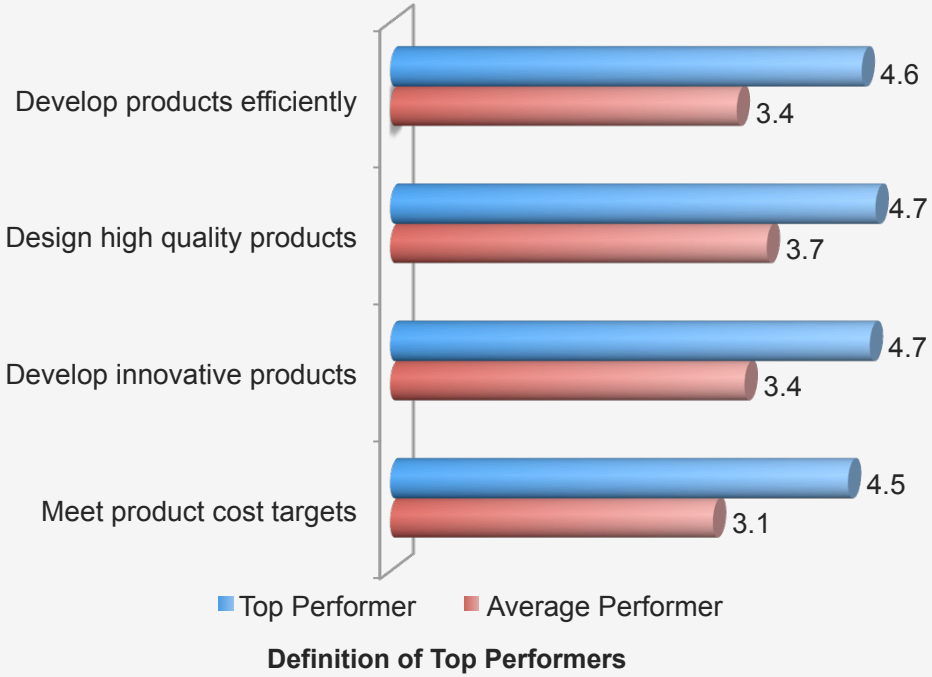
Identifying Top Performers

To understand which practices work best, Tech-Clarity identified top performing companies. Top performers were defined as those who do better than their competitors. Companies ranked themselves on a scale of 1 to 5, with 5 meaning significantly exceeding competitors. The graph shows the respective average scores for each group, as well as the metrics used.



Definition of Top Performers

Top performers enjoy a competitive advantage by efficiently developing products that are higher quality, more innovative, and cost effective.

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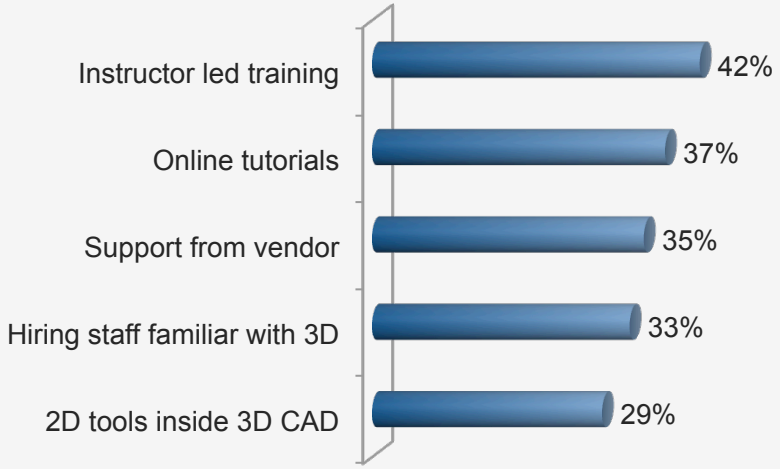
Best Practices to Successfully Go to 3D

Regardless of performance, those who have gone through a transition agree on what's most helpful. Training resources come out on top. Considering that the learning curve is the biggest challenge, it makes sense to focus on training to ensure a more successful transition. Interestingly, results show that management often underestimates training needs.

While 3D offers many benefits, it does require a slightly different thought process. If engineers are prepared with design approaches for 3D models and given an overview of software functions, adoption will be easier. Training can come from instructors or online tutorials. It can also come from the vendor through technical phone support or on-site support.



What Was Most Helpful When Going From 2D to 3D?

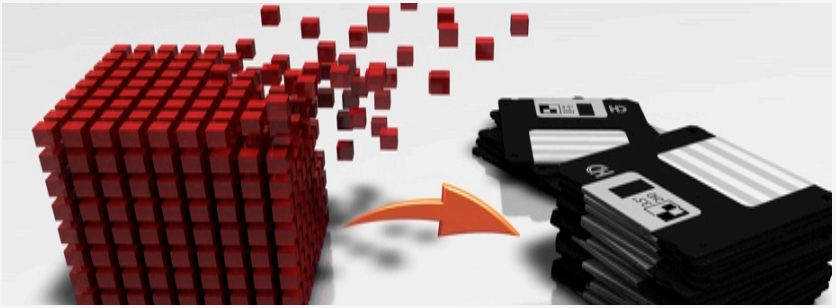
Beyond training, hiring the right skill sets can help too. People already familiar with 3D can act as mentors and points of contact for questions.

Several CAD vendors also embed 2D tools inside their 3D tool to help ease into the transition. This can help with 2D legacy data as well. Some vendors may also offer 2D tools that are compatible with their 3D tools so companies can enjoy the benefits of 3D, while still using 2D when it makes sense.

Develop a Plan for Legacy 2D Data

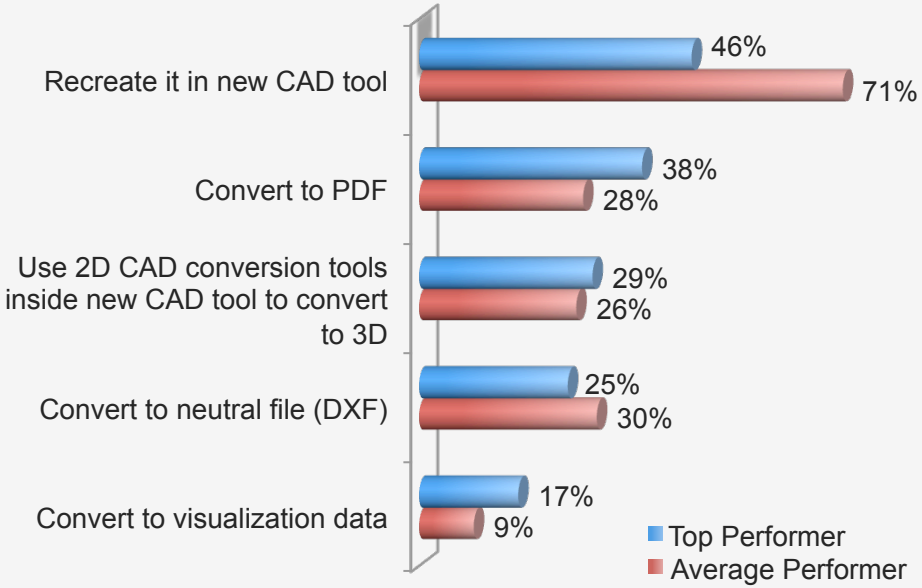
Considering that concern with legacy data is also a top challenge, it should receive some attention. When Top Performers are compared to average performers, the most striking difference is that average performers are much more likely to go directly to recreating their 2D legacy data in the new CAD tool. Top performers, however, use a variety of methods. This indicates they take a more strategic approach by determining which format will be most useful for a given file going forward.

✓ Companies report converting 43% of their 2D legacy data.



"I recommend storing released 2D drawings in a CAD-neutral format (PDF). It is easy to automate and it makes it easier to switch CAD systems when the time comes."

~ Vice President of Manufacturing, Electronics Manufacturer



Approach With Legacy Data

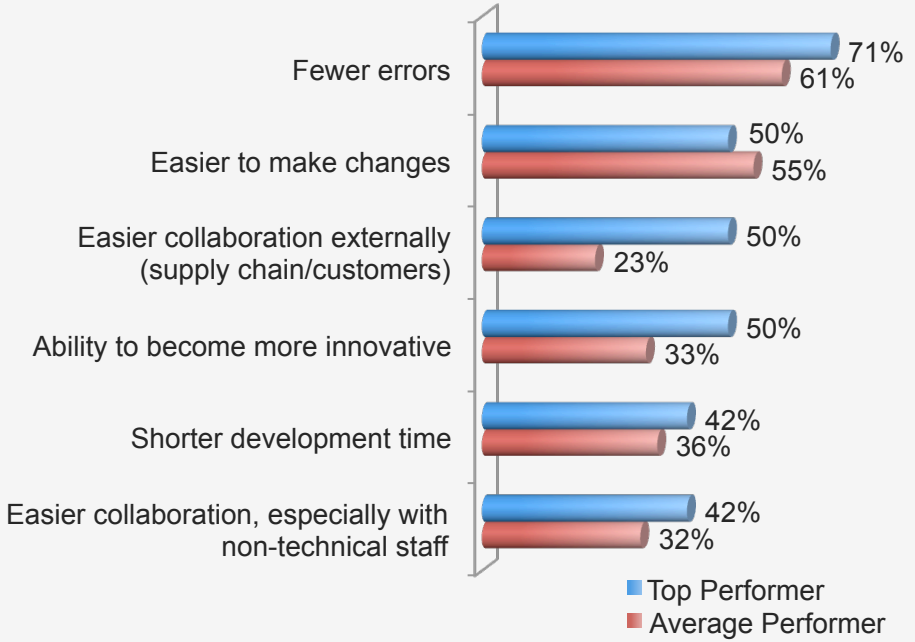
Benefits of Transitioning to 3D CAD

The most exciting part of the results is the number of benefits companies enjoy by transitioning to 3D CAD. Regardless of performance, companies report many benefits, but Top Performers experience even more. Both groups report fewer errors and easier changes.

However, Top Performers seem to use their CAD tool more strategically. In addition to using it as a design tool, they also view it as a helpful collaboration tool. Consequently, they get more feedback on the design, and can take advantage of the collective expertise of the product team. This creates more opportunities to catch problems and improve quality and performance.

Innovation is another area where they see more value. Top Performers use their 3D tool to evaluate multiple iterations to ultimately arrive at a more innovative design. Again, the result will be better quality and performance, which in turn means happier customers and more revenue opportunity.

The takeaway is that Top Performers are more successful at meeting the goals that drove their investment in the first place.



Biggest Realized Benefit by Transitioning to 3D

✓ Top Performers take a more strategic approach with their CAD tool, viewing it as more than a design tool.

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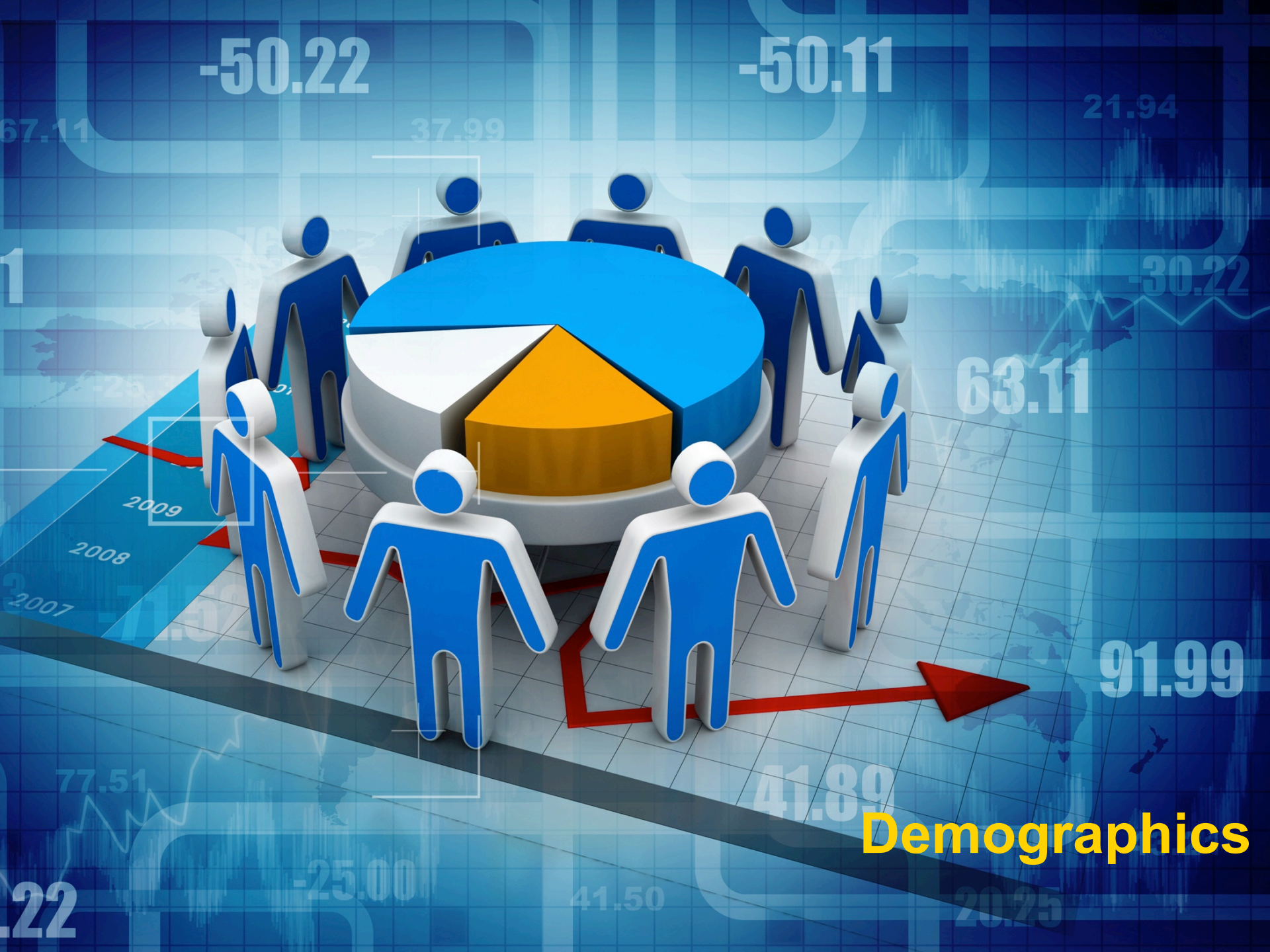
Recommendations for 2D to 3D

For a successful transition from 2D CAD to 3D CAD, consider the following:

- ✓ If you are looking to improve product quality, consider a switch to 3D CAD.
- ✓ Prior to the transition, put together a plan to avoid common challenges that arise when switching to 3D. This way, you can minimize them, or even avoid them altogether.
- ✓ Do not forget to address training needs. There are a variety of training options that companies find helpful.
- ✓ Put together a plan for legacy data. Consider what really needs to be re-created in 3D. In many cases, other formats such as PDF or visualization tools will work just fine. It is likely that you will need to convert less than half of your data.
- ✓ While design is the primary use for CAD, with 3D you can use it for much more. As a result, you can enjoy better collaboration and higher levels of innovation.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2009
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2007
91.99
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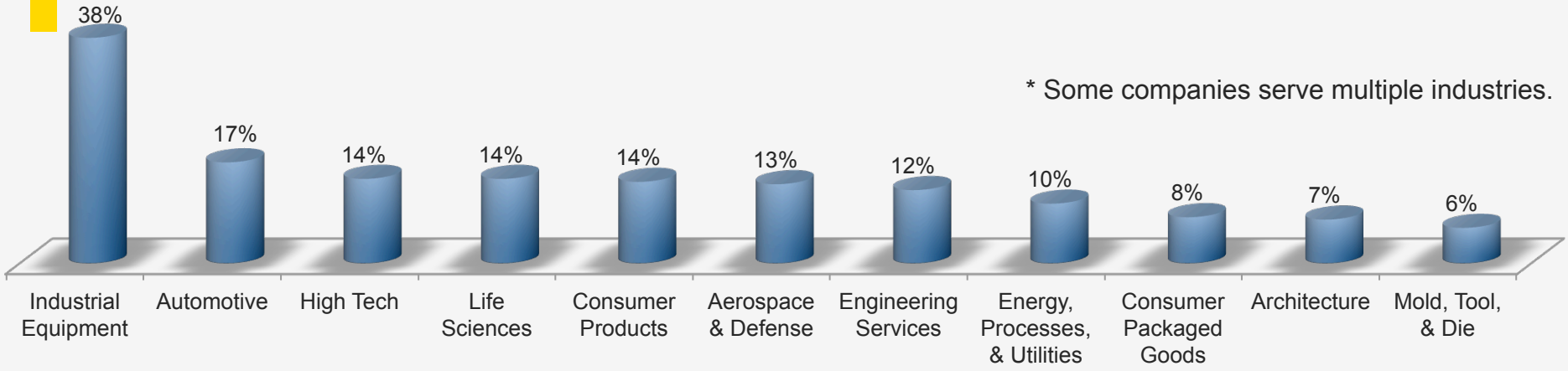
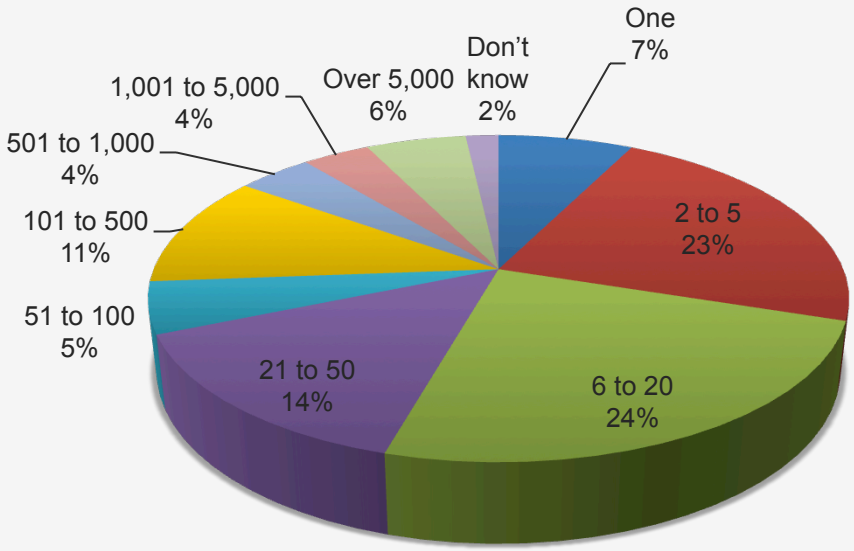
Demographics

Industry and Size

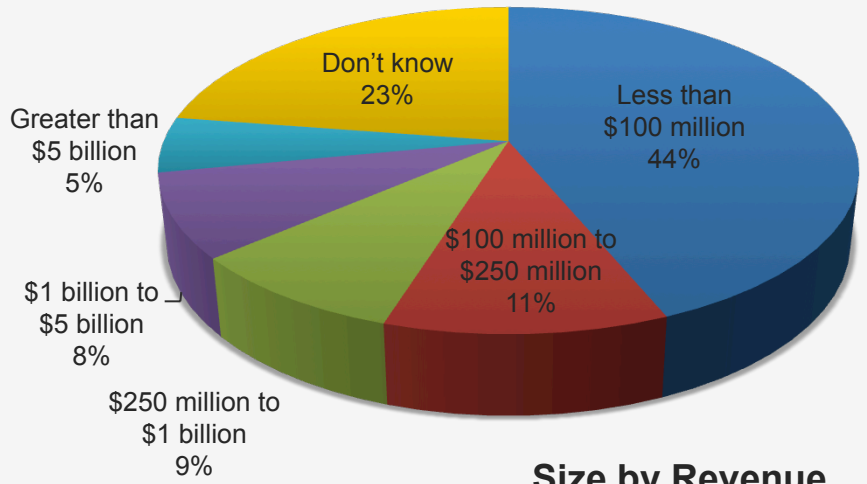


* Some companies serve multiple industries.

Industry*



Number of Engineers



Size by Revenue

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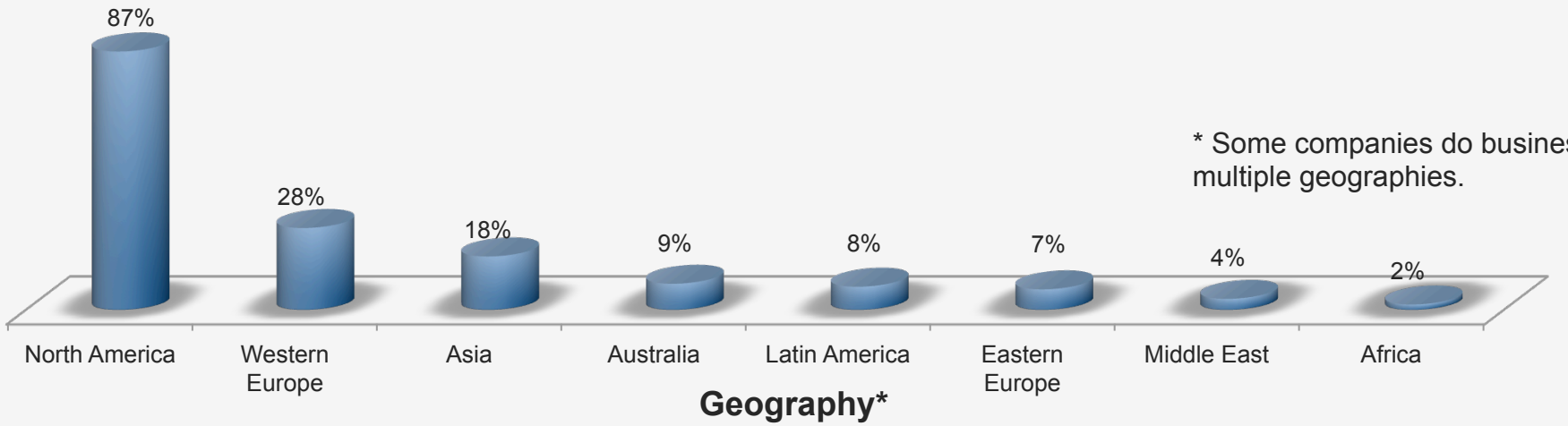
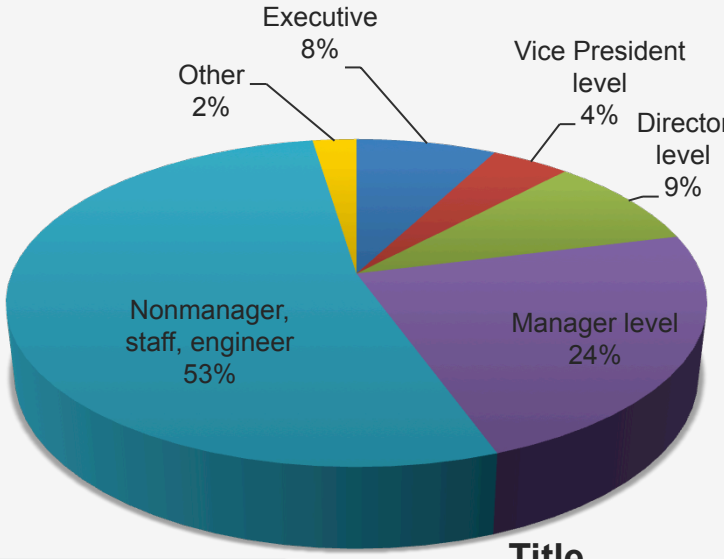
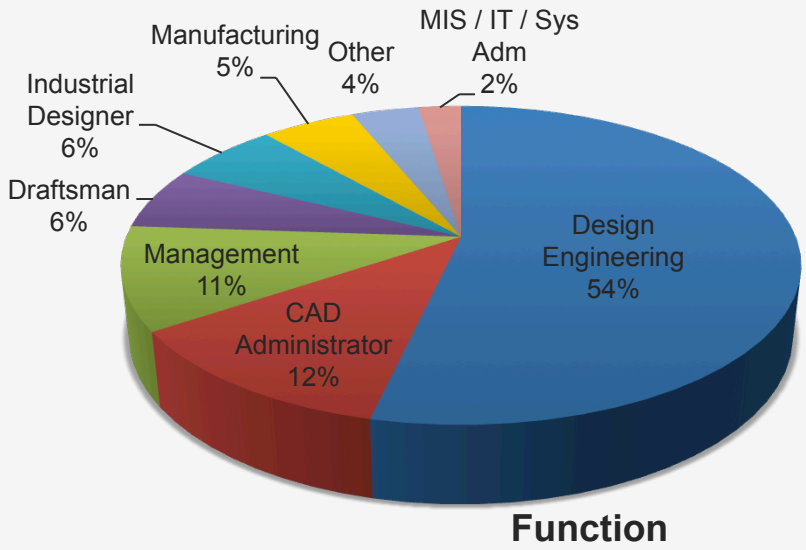
Geography and Role



* Some companies do business in multiple geographies.





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About the Author

Michelle Boucher is the Vice President of Research for Engineering Software for research firm Tech-Clarity, an independent research and consulting firm that specializes in analyzing the business value of software technology and services. Michelle has spent over 20 years in various roles in engineering, marketing, management, and as an analyst.

Michelle has broad experience with topics such as product design, simulation, systems engineering, mechatronics, embedded systems, PCB design, improving product performance, process improvement, and mass customization. She graduated magna cum laude with an MBA from Babson College and earned a BS in mechanical engineering, with distinction, from Worcester Polytechnic Institute.

Michelle is an experienced researcher and author. She has benchmarked over 7,000 product development professionals and published over 90 reports on product development best practices. She focuses on helping companies manage the complexity of today's products, markets, design environments, and value chains to achieve higher profitability.

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