What's the Cost of **Disconnected Tools** to Your Business?

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Tech-Clarity

Get Even More Value from IT

Hidden Costs

How much do disconnected tools cost your business?

Historically, most companies have relied on multiple disconnected tools to get the job done, particularly in product development and manufacturing. IT then invests significant effort to integrate them. Interestingly, Top Performing companies say that reducing manual efforts and non-value-added work is most important for successful product development and manufacturing software. To achieve this, they point to solutions that easily integrate. This leads to the question, should companies invest in best-of-breed solutions they must integrate or adopt an integrated platform? Do the benefits of adopting best-of-breed point solutions outweigh the cost of working with disconnected tools?

About the Research

Based on a survey of 187 IT, product development, and manufacturing professionals, this research study examines these questions. It looks at what IT needs to be successful in their job and how they can provide the most value to their company, including product development and manufacturing teams. It reveals best practices for overcoming the costs of disconnected tools and how to empower IT to focus more energy on the tasks that offer the most corporate benefit and make them even more successful.

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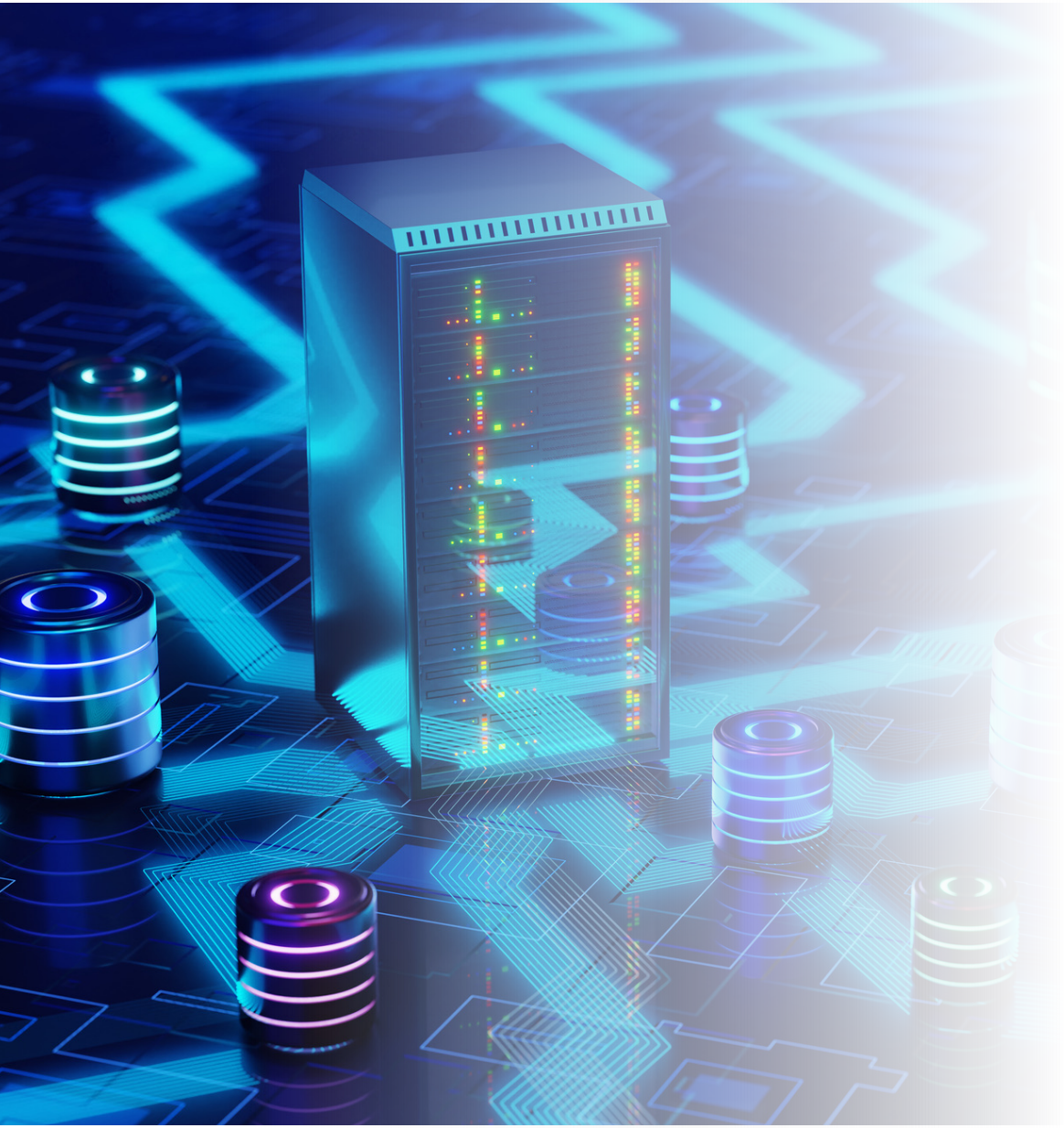


Executive Summary

IT's Role in Competitiveness

Companies must be as efficient as possible in today's competitive global environment. Many are turning to digital transformation to achieve greater efficiencies, leading them to rely on IT to execute. Yet, IT must deal with many issues that hold them back. They rate the time and effort required to integrate software applications as the top issue consuming their time, taking them away from enabling business strategies.

Product Development & Manufacturing

The right software solutions empower engineering and manufacturing and are critical to a digital transformation strategy. To be successful, product development and manufacturing need their software to reduce manual efforts and non-value-added work to help them meet time to market goals, improve quality, and lower costs. This requires integrated solutions, yet IT rates integrating software solutions as the top challenge of implementing product development and manufacturing solutions.

Does Best-of-Breed Still Work?

The challenges associated with disconnected tools lead to the question, what's better, a best-of-breed or integrated platform approach? Historically, best-of-breed solutions were preferred. While individual tasks benefit, to achieve the efficiencies promised with digital transformation, manage product complexity, and respond to competitive pressures, the entire product lifecycle, from design to production, should be considered. The lack of integration across tools creates bottlenecks and breaks the digital thread, negating potential time savings when improving a single task. Further, IT rates the efforts required to integrate solutions as the top challenge associated with a best-of-breed approach. To overcome this, most of those using best-of-breed solutions believe adopting a platform of integrated tools will help.

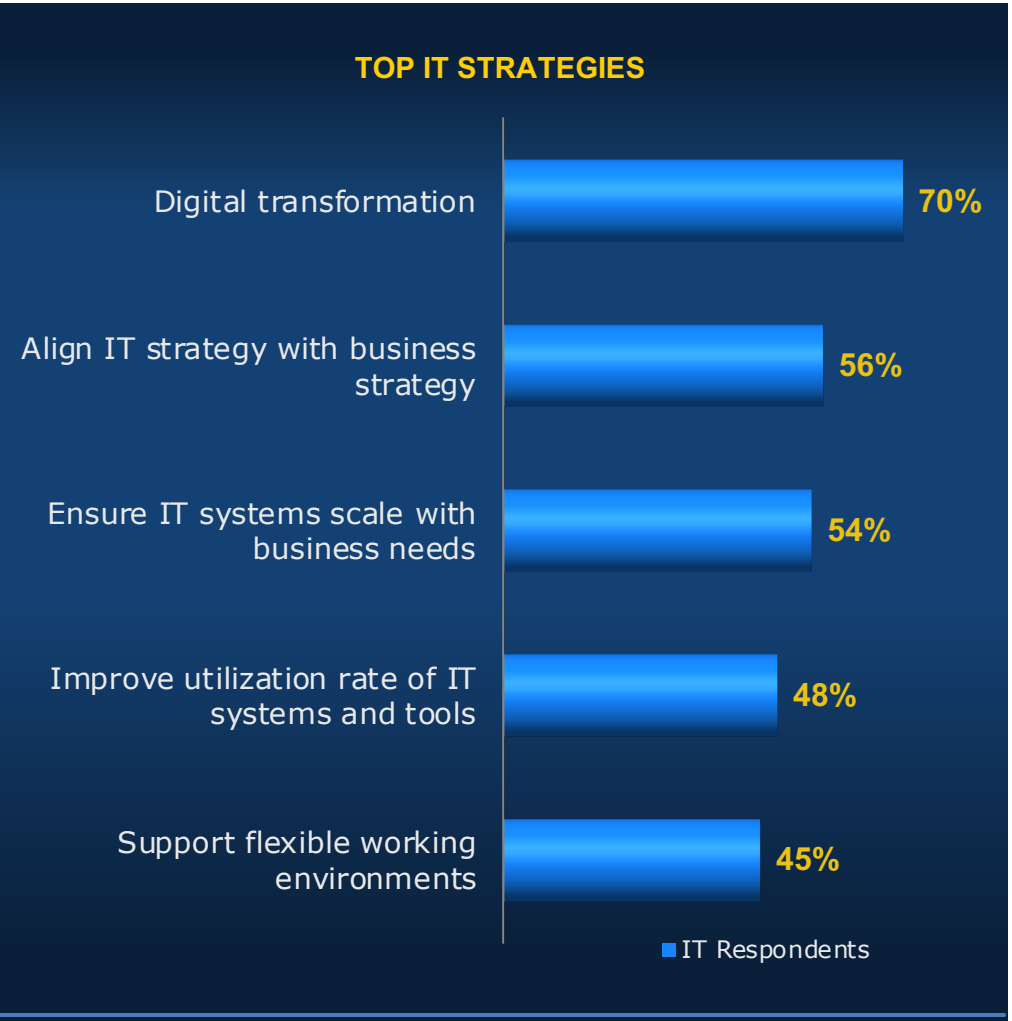
Integrated Platforms

Those who use an integrated platform, validate this idea as 99% of those using an integrated platform report advantages over other approaches. These advantages lead to improved product quality, greater efficiency, greater ability to scale the business, lower product cost, and better business agility.

With a platform, IT can avoid wasting time managing complex compatibility matrixes and integrating software. Instead, they can focus on activities that increase their visibility as a corporate strategic asset.

99% of those using an integrated platform report advantages over other approaches.

IT Is Critical to Business Strategy Execution



41% of executives attribute digital transformation as a top business factor driving long-term success.

Top IT Strategies

The role of IT has evolved from a tactical "order-taker" delivering on requirements provided by business leaders to a more strategic one. Now IT is more likely to collaborate with business leaders to help identify and define business problems.[1] The top IT strategies reflect this more strategic focus.

Digital Transformation

Digital Transformation has enabled many companies to achieve efficiencies that are hard for competitors to match.[2] As such, Tech-Clarity's research finds that 41% of executives attribute digital transformation as a top business factor driving long-term success.[3] Consequently, many executives place high importance on digital transformation, making it a priority for IT.

Successful digital transformation relies heavily on implementing the right technology. However, it is a considerable undertaking as true digital transformation impacts all business processes and requires a deep understanding of company processes, bottlenecks, and optimization opportunities. Implementation requires a significant IT investment. It is also a journey, requiring continuous improvement to realize the highest levels of efficiency.

Enable the Business

IT must ensure its strategies align with business goals. They must meet today's business needs and consider future needs to ensure that whatever they implement doesn't limit the business and will scale as it grows. They also need to ensure that what they implement provides value so the company realizes the expected return on the investment (ROI). Finally, they need to ensure that they can support a variety of environments across all company locations, including those working from home or on the road.

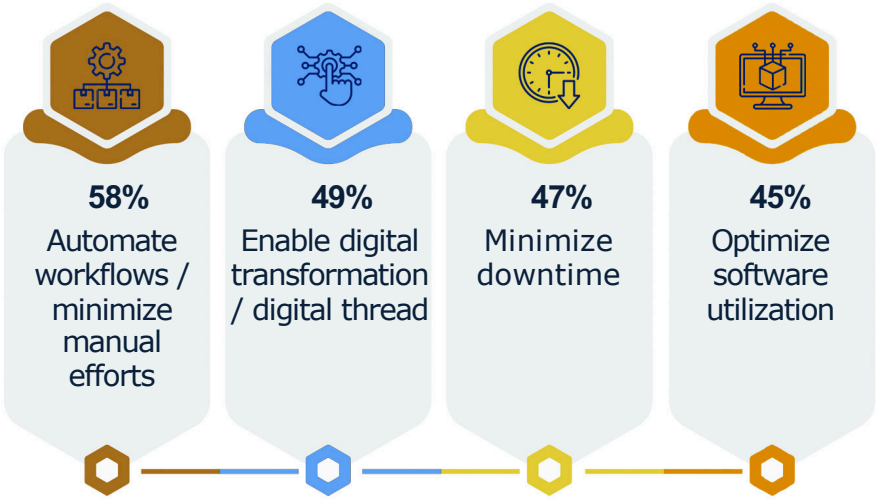
Address IT Bottlenecks to Ensure Success

What Holds IT Back?

Unfortunately, there are several issues that consume IT time, impeding progress on successful strategy execution (see lower graph).

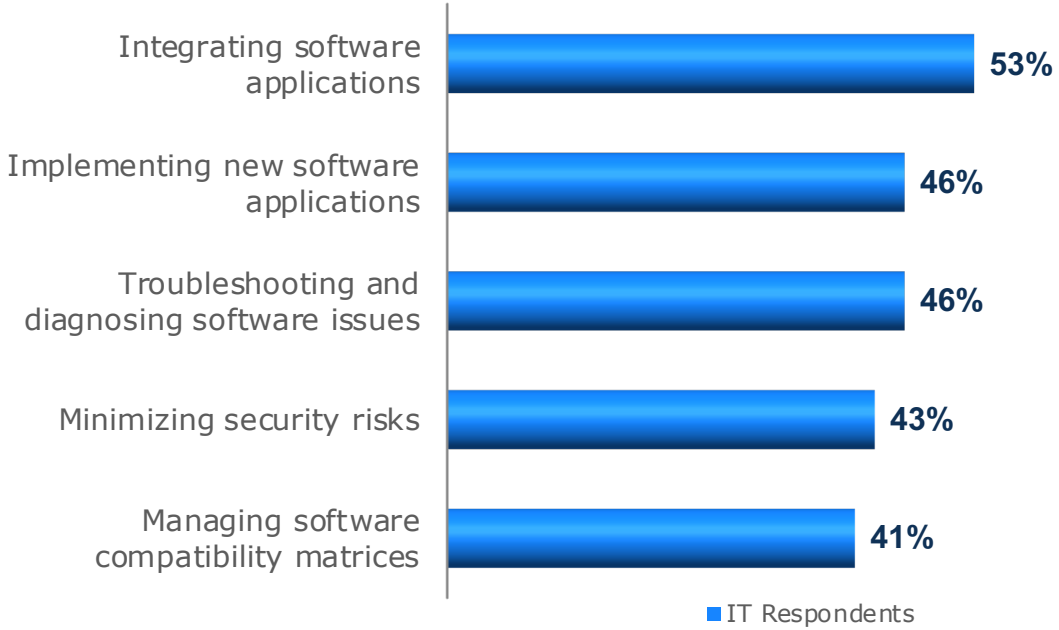
IT respondents report that the top issue that holds them back is the time they waste integrating software applications. It takes significant effort to configure, write custom code, and troubleshoot issues to integrate applications not designed to work together. Then any change, upgrade, or patch install risks breaking the integration. Implementing software, troubleshooting, and minimizing security issues also consume valuable IT time. Managing compatibility matrices is also a major effort, but if not done well, it can break integrations or cause downtime if an update introduces an incompatibility.

MOST IMPORTANT FOR IT TO BE SUCCESSFUL



* Percentages represent IT respondents

TOP ISSUES THAT HINDER STRATEGY EXECUTION



IT Success

Instead, IT should focus on activities that will keep them successful in their jobs: automating workflows, enabling digital transformation and a digital thread, minimizing downtime, and optimizing software utilization. These critical IT activities will support the execution of the top strategies, positioning IT as a strategic enabler of the business strategy.

Minimizing the challenges will free them up to focus on them. Let's look at some best practices implemented by Top Performing companies to overcome these challenges and position IT for greater success.

Identifying Top Performers

How Top Performers Were Defined

To define Top Performing companies, Tech-Clarity identified the top 25% of companies who rated themselves as outperforming their competitors in metrics that indicate business success. These metrics were:

- Revenue growth over the last 24 months
- Profit expansion over the last 24 months
- Percent of sales from new products less than three years old
- Product cost reduction over the last 24 months

Tech-Clarity researchers then focused on what Top Performers do differently compared to Others to identify best practices and develop recommendations.

The Top Performer Advantage

Top Performers use the right practices and technology to get better results. The first table compares the percentage of Top Performers to Others who rated their company's performance as 'Excellent' or 'Very Good.' Top Performers are 94% more likely to excel at staying within their IT budget and 47% more likely to achieve the expected ROI with their acquired software tools.

Impact on Engineering and Manufacturing

The result of Top Performers' IT investments contributes to greater efficiencies in the engineering and manufacturing departments. The second table compares the percentage of Top Performers to Others who rated their company's software solutions as 'Extremely' or 'Very' Effective. Engineering and manufacturing at Top Performing companies operate more efficiently, contributing to better business results.

PERCENTAGE RATING THEIR COMPANY PERFORMANCE AS 'EXCELLENT' OR 'VERY GOOD'

METRIC	TOP PERFORMER	OTHERS
Stay within IT budget	84%	43%
Meet department needs with acquired software	80%	47%
Achieve expected return on investment (ROI) with acquired software tools	70%	48%

PERCENTAGE RATING THEIR SOFTWARE SOLUTIONS AS 'EXTREMELY' OR 'VERY' EFFECTIVE

METRIC	TOP PERFORMER	OTHERS
Finding product data	76%	50%
Meeting time-to-market goals	80%	49%
Keeping product data accurate / up-to-date	74%	50%
Leveraging product data from one stage to the next	84%	47%
Providing correct product information to manufacturing	76%	51%
Managing engineering changes	78%	50%

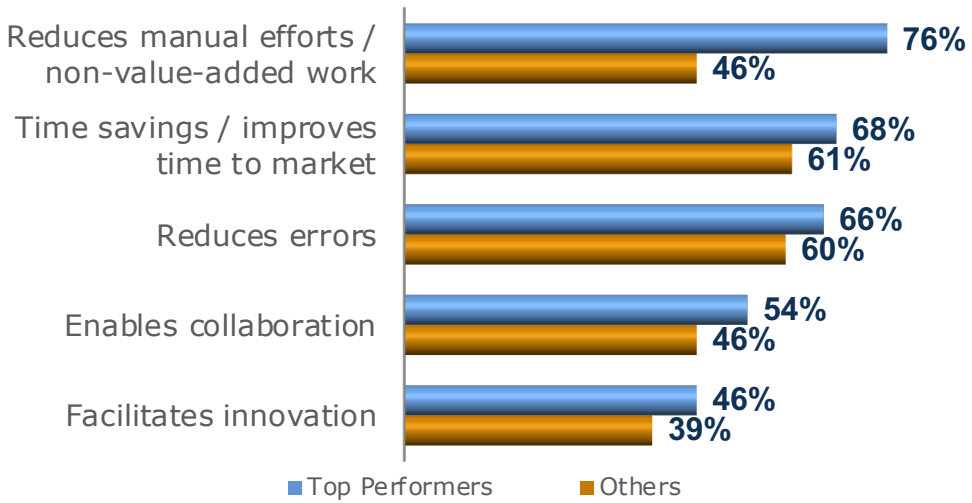
Product Development and Manufacturing Software

Efficiency Is Critical

Top Performers are 65% more likely than Others to point to automation as most important for software to be successful in Product Development and Manufacturing (see lower graph). They want to minimize manual efforts and non-value-added work. This empowers teams to focus more on activities that improve product value, ultimately contributing to product profitability. This is a major reason Top Performers are more likely to find their solutions more effective.

Automation makes it easier to meet time to market goals. Less manual effort also leads to fewer errors, which consumes time, adds cost, and impacts quality. Software that improves collaboration also improves efficiency as hand-offs will be smoother, changes can be managed better, and there is less risk of working with outdated information.

MOST IMPORTANT FOR PRODUCT DEVELOPMENT & MANUFACTURING SOFTWARE SUCCESS



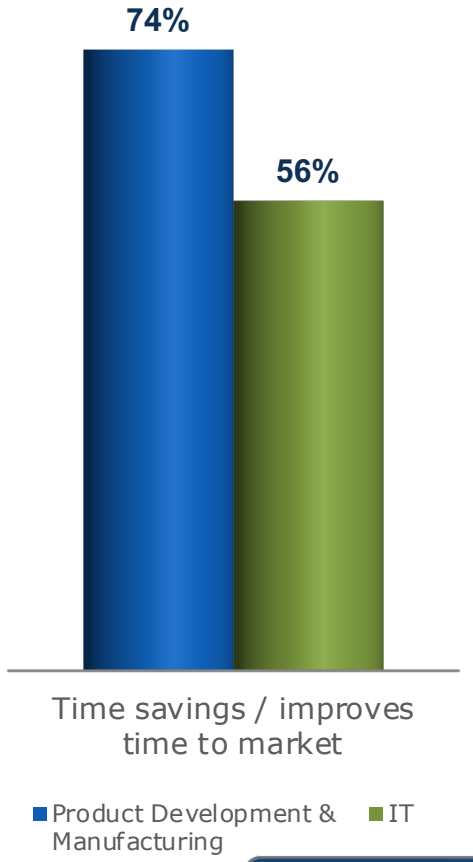
All of this can help teams focus more effort on innovation, particularly software that guides decisions and allows teams to easily explore more ideas.

Don't Underestimate Time Pressures

Interestingly, product development and manufacturing are 32% more likely than IT to rate time savings as important to their success. This emphasizes the significant pressure product development and manufacturing feel to meet tight deadlines. It also indicates that IT may have less visibility to this pressure or may not realize how significant it is. It also reveals that product development and manufacturing will be most excited about software when they understand how it will save time during their day-to-day work.

Automation empowers teams to focus more on activities that improve product value.

MOST IMPORTANT FOR PRODUCT DEVELOPMENT & MANUFACTURING SOFTWARE SUCCESS

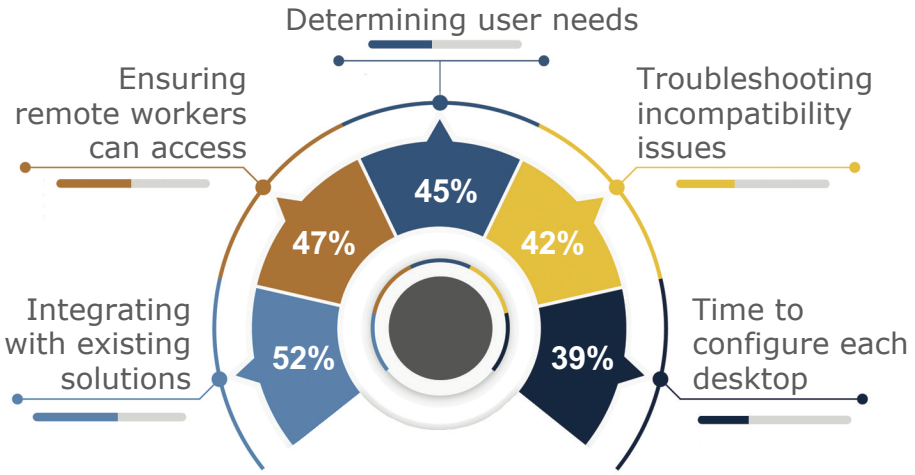


Product Development & Manufacturing Requirements

Not Just Easy Software

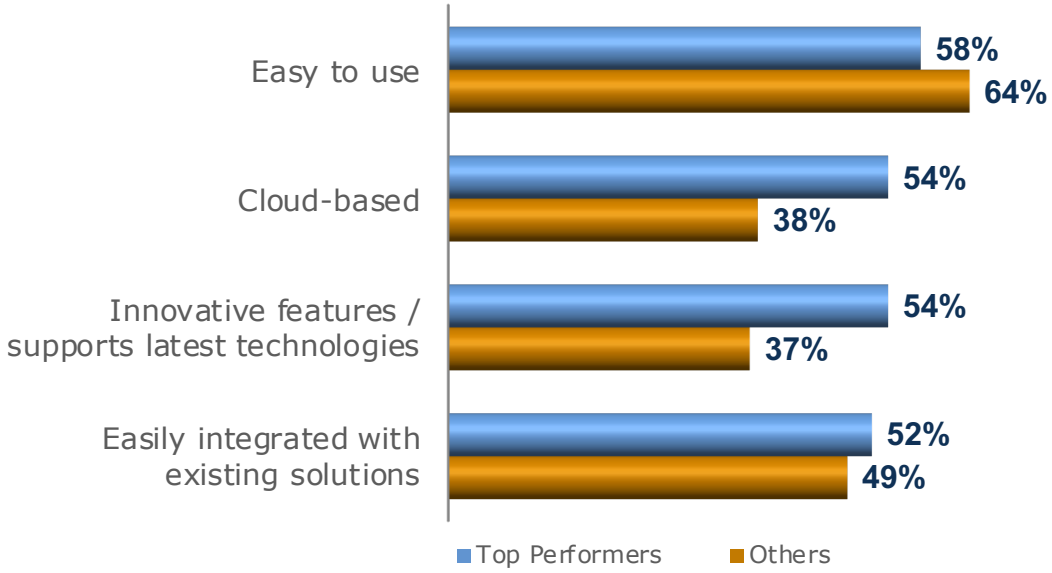
Companies identified several software qualities that make it a success. Regardless of performance, all companies value ease of use. However, beyond being easy, Top Performers appreciate several other software qualities that contribute to greater automation and efficiency (see lower graph). Top Performers are 42% more likely than Others to value cloud-based software and 46% more likely to regard innovative features and support for the latest technologies as requirements for success. Software stays current on the cloud, so teams benefit from new features right away. Enhancements may improve workflows or leverage new technology, like Artificial Intelligence (AI), to automate tedious tasks. The cloud also streamlines collaboration as real-time product data can be shared with a link, avoiding errors due to outdated data.

BIGGEST CHALLENGES OF IMPLEMENTING PRODUCT DEVELOPMENT AND MANUFACTURING SOFTWARE SOLUTIONS



* Percentages represent IT respondents

SOFTWARE QUALITIES NEEDED TO MEET THE SUCCESS REQUIREMENTS



Top Performers also want their software to easily integrate with existing solutions. This allows greater automation, streamlined workflows, and a digital thread. It can also be an advantage of a cloud platform that offers integrated tools.

IT Challenges

While software is a critical enabler for product teams, 98% of IT respondents experience challenges implementing it. The biggest challenges involve integrating software with existing solutions, ensuring everyone has access, determining what users need, and managing compatibility matrices. This is consistent with the top challenges that hinder IT strategy execution. With better ways to overcome these challenges, IT will be better positioned to ensure teams have the software they need to be successful.

Now let's examine the impact of a best-of-breed approach.

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Is Best-of-Breed Still the Best Approach?

Best-of-Breed Approach

Historically, best-of-breed point solutions were considered an ideal approach. However, as the pace of innovation accelerates, products and development environments become more complex, and time to market pressures increase, many companies have turned to digital transformation to improve internal efficiencies. Can a best-of-breed approach support this?

Best-of-Breed Challenges

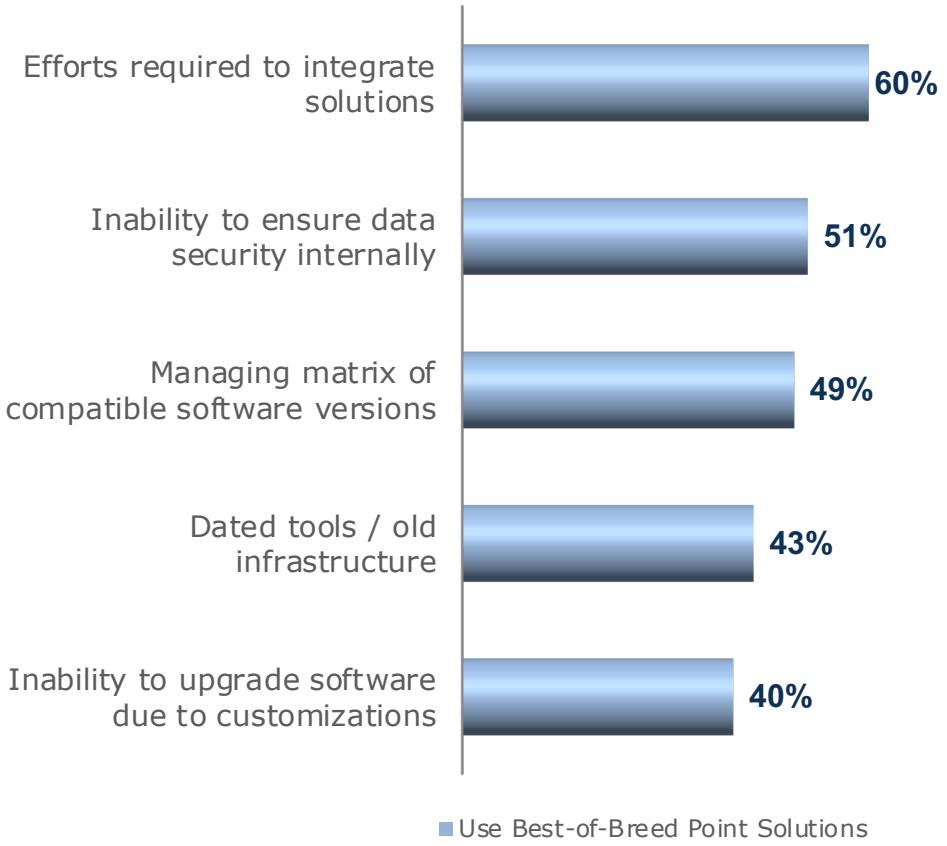
All IT respondents at companies that take a best-of-breed approach report challenges. The graph shows the top ones. IT reports that these challenges consume 60% of their time, taking them away from strategic activities that are more critical for job success.

Individual best-of-breed solutions should be integrated to achieve the efficiencies required to be competitive in today's market and support digitalization. However, as previous sections revealed, integrating solutions is difficult and time-consuming, particularly in a best-of-breed situation where the disconnected solutions were not necessarily developed to work together. IT also must invest significant time managing compatibility matrices. Ensuring compatibility plus integration efforts mean they cannot upgrade regularly, so teams are left with older tools, preventing engineering and manufacturing from taking advantage of the latest software enhancements that could improve their efficiency.

On top of that, ensuring data security is challenging. One reason is that because it is hard to collaborate, data is often emailed, especially when working with third parties. Once it has been emailed, a company no longer has control over who sees or accesses it, putting intellectual property (IP) at risk.

IT respondents report that the challenges associated with a best-of-breed approach consume 60% of their time.

BIGGEST IT CHALLENGES ASSOCIATED WITH BEST-OF-BREED



Best-of-Breed Impact on Users

Best-of-Breed User Challenges

While users can benefit from individual best-of-breed solution solutions, product development and manufacturing users also experience many challenges (see graph).

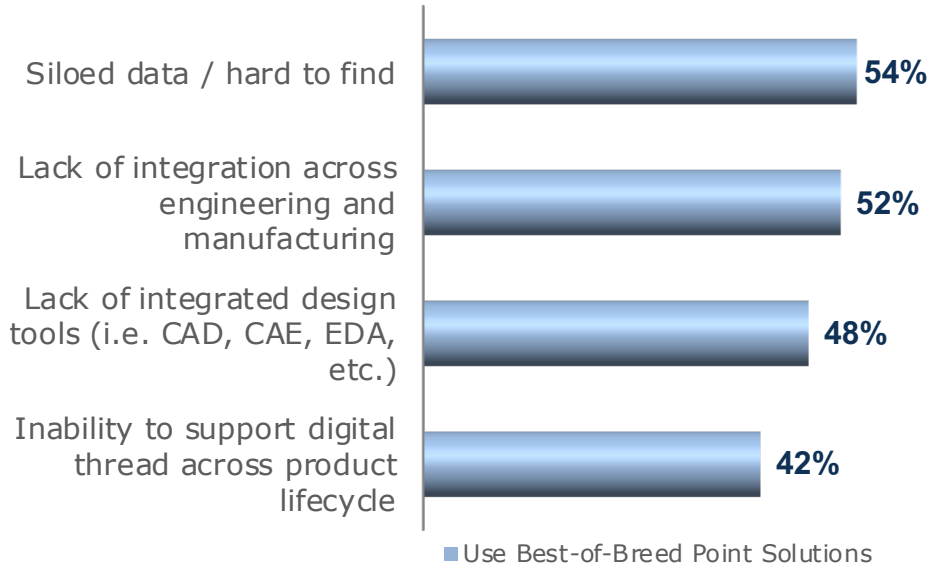
Because best-of-breed solutions are disconnected and harder to integrate, data becomes siloed. This increases non-value-added work as teams search for information they can't find and waste efforts on outdated data, leading to rework and errors. This does not support the requirements engineering and manufacturing need to be successful. The lack of integration makes it harder to hand off designs to the next stage, ensuring all data is current. Teams waste even more effort recreating product data because they cannot easily reuse it across tools across the lifecycle.

Business Impact

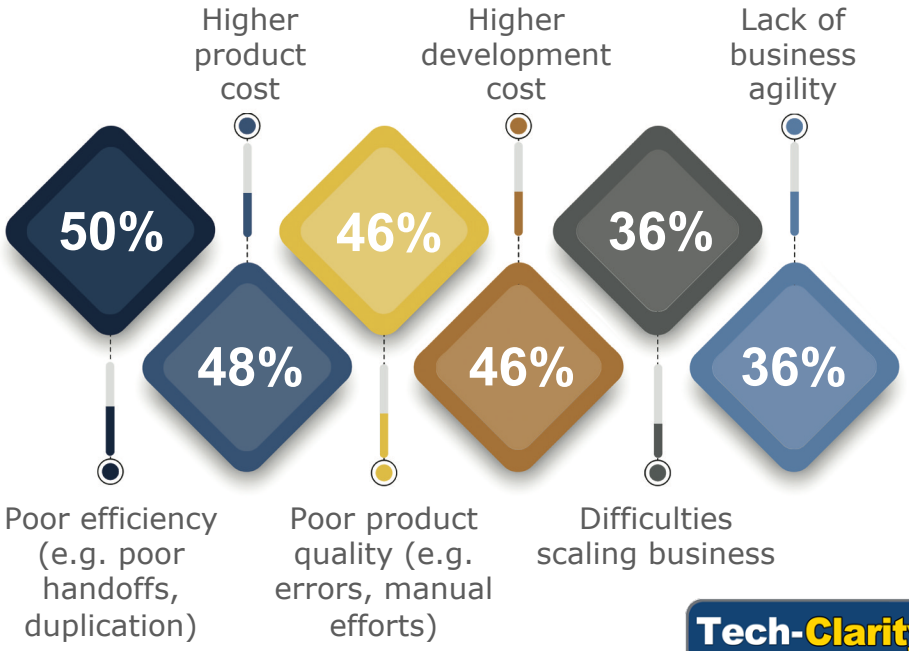
These challenges create a significant business impact (see lower graph). Non-value-added work, poor hand-offs, and duplicated efforts waste time and hurt efficiency. Longer development times lead to higher development costs. Plus, manual efforts increase the risk of errors, hurting quality. Errors result in scrap and rework, increasing product costs. Plus, late in the lifecycle, solutions are limited to what's easiest and fastest, which can also mean higher costs.

When the company is stuck with older technology and inefficient processes, adapting the software to new needs becomes harder. This creates difficulties in scaling the business or quickly adapting to changing market dynamics.

BEST-OF-BREED BIGGEST USER CHALLENGES



BUSINESS IMPACTS OF THE BEST-OF-BREED CHALLENGES



* Percentages represent those using best-of-breed solutions

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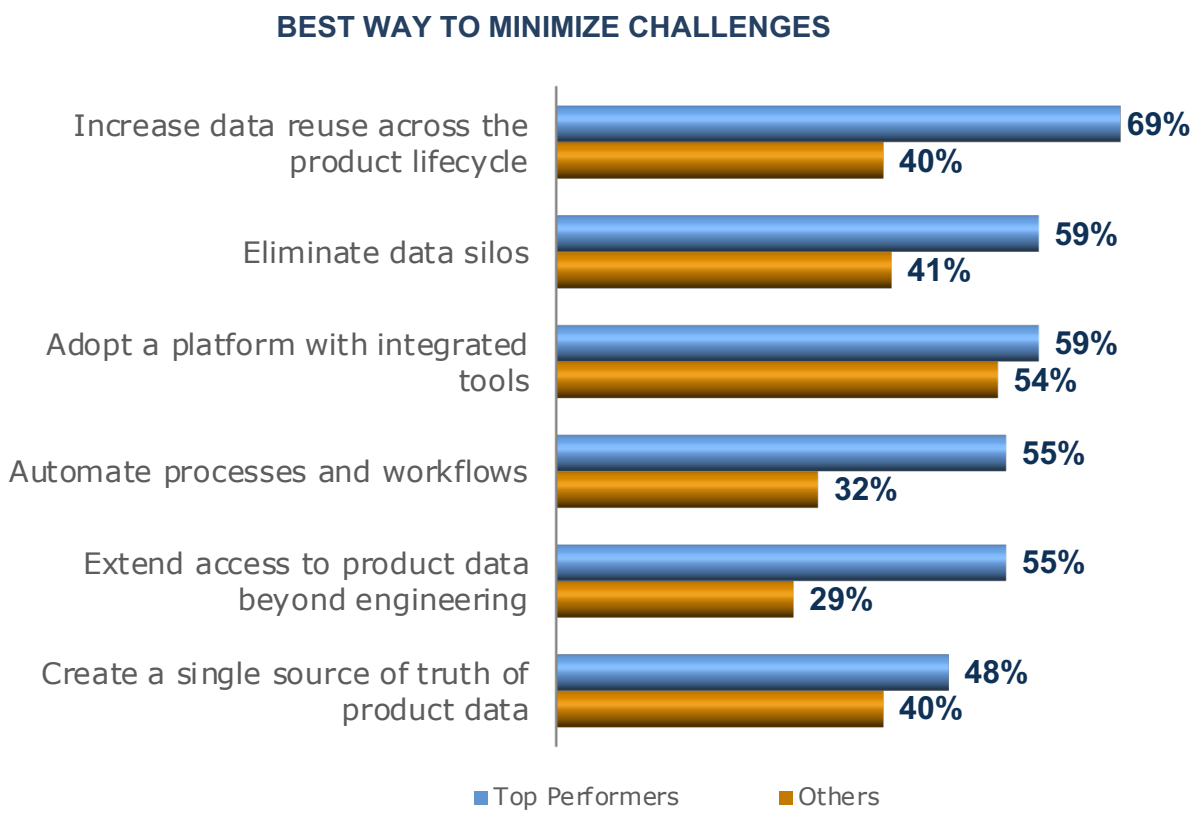
Overcoming Best-of-Breed Challenges



The platform should provide a single source of truth that eliminates data silos and connects it across the lifecycle.

Integrated Platform

Companies using best-of-breed solutions believe that an integrated platform is the best way to minimize the associated challenges. However, for Top Performers, it is more than just using a platform, but using the right platform in the right way (see graph).

The platform should provide a single source of truth that eliminates data silos and connects it across the lifecycle. In this way, data can be reused, saving time, improving efficiency, and reducing the risk of errors.

Processes can then be automated, further improving efficiency. The data should also be accessible beyond engineering so downstream departments like manufacturing can access it easily. This will support seamless hand-offs, and manufacturing will not have to question if it has the latest version.

Now let's examine the experiences of those using an integrated platform to validate how well it works for them.

An Integrated Platform Solves Many Challenges

Advantages of an Integrated Platform

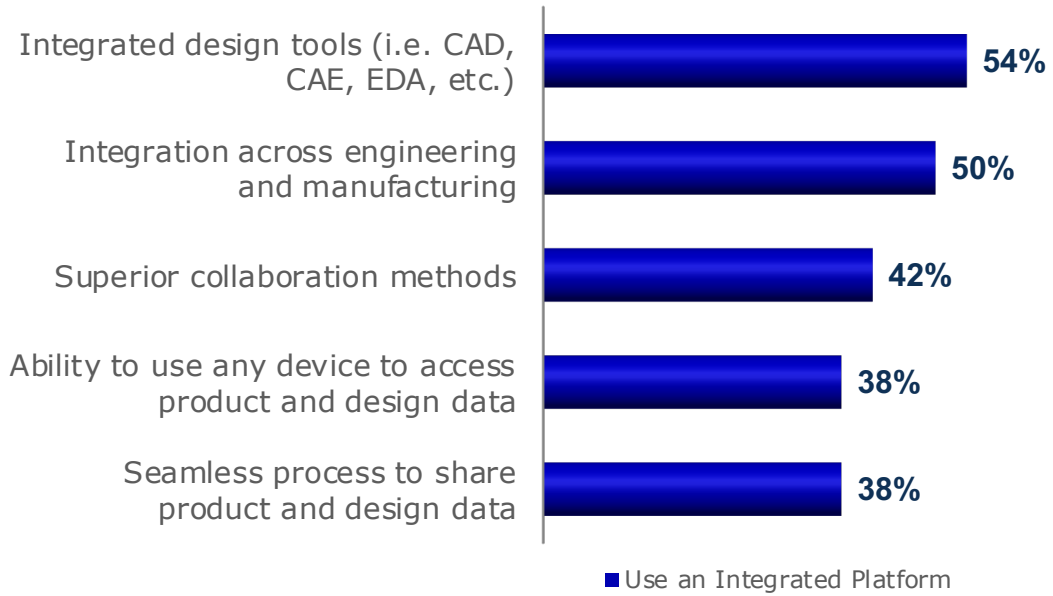
Those using an integrated platform validate that it solves both the challenges associated with a best-of-breed approach and the biggest challenges of implementing product development and manufacturing software (upper graph). In fact, 99% of those using an integrated platform report advantages over other approaches.

An integrated platform makes it easier to integrate design tools and connect engineering and manufacturing. This leads to improved collaboration and easier methods for sharing product and design data, including on any device.

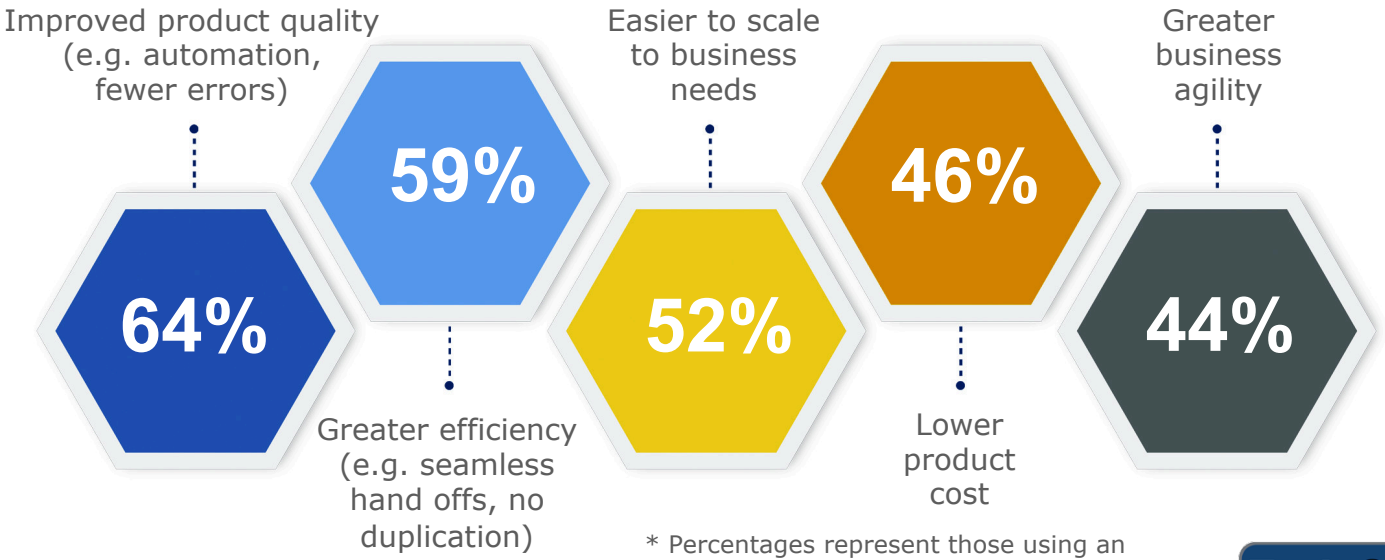
Integrated Platform Business Impact

Users of an integrated platform report that the advantages lead to higher quality, greater efficiency, and lower product costs. It is also easier to scale to business needs by adding additional functionality and adjusting the number of seats as business needs evolve. Greater business agility is also possible due to streamlined workflows and superior collaboration.

BIGGEST ADVANTAGES ASSOCIATED WITH INTEGRATED PLATFORM



IMPACT OF THESE ADVANTAGES ON THE BUSINESS



* Percentages represent those using an integrated platform

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IT Advantages of an Integrated Platform

Focus More Time on Adding Value

While users enjoy many benefits with an integrated platform, IT benefits too as all IT professional using an integrated platform report advantages over other methods (see graph).

The most common advantage is greater security, particularly when working with third parties. With a cloud-based integrated platform, third parties can access real-time design data via a link, and the company never loses control over it. When the partner finishes work, the company can turn off access.

IT also doesn't waste time managing complex compatibility matrices, which they consistently report as challenging. They can support users better as teams can stay current with the latest technology since they are not held back by customizations that prevent upgrades.

The result is that IT can focus more energy on value-added work that supports the business strategy and the activities that make IT an even more successful strategic asset for the company.

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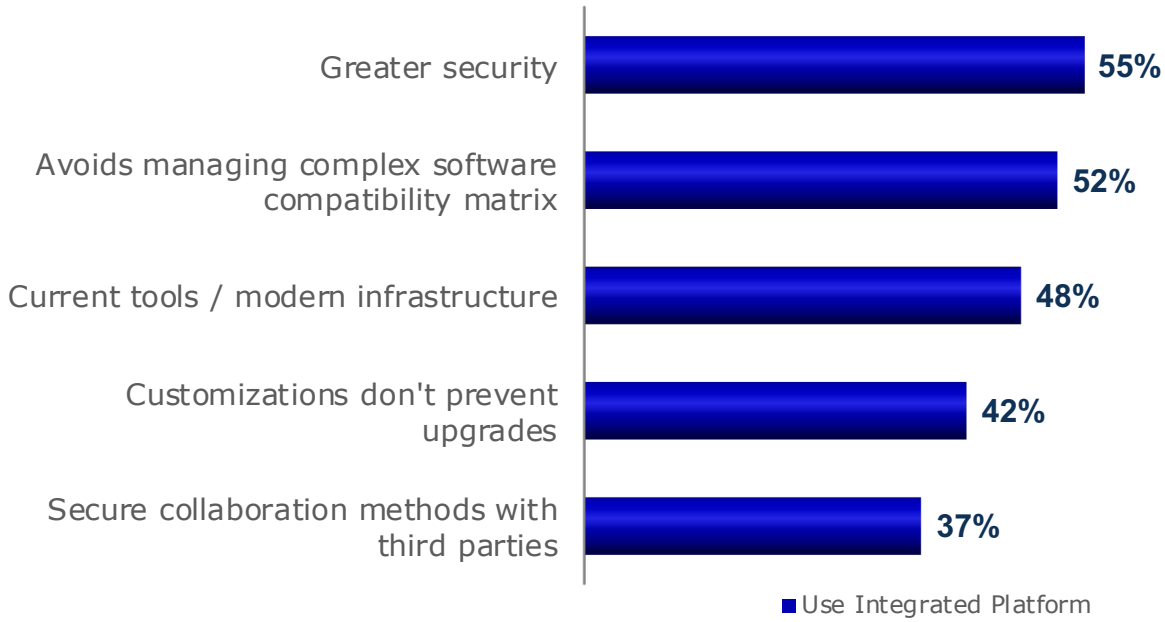
BIGGEST IT ADVANTAGES ASSOCIATED WITH INTEGRATED PLATFORM



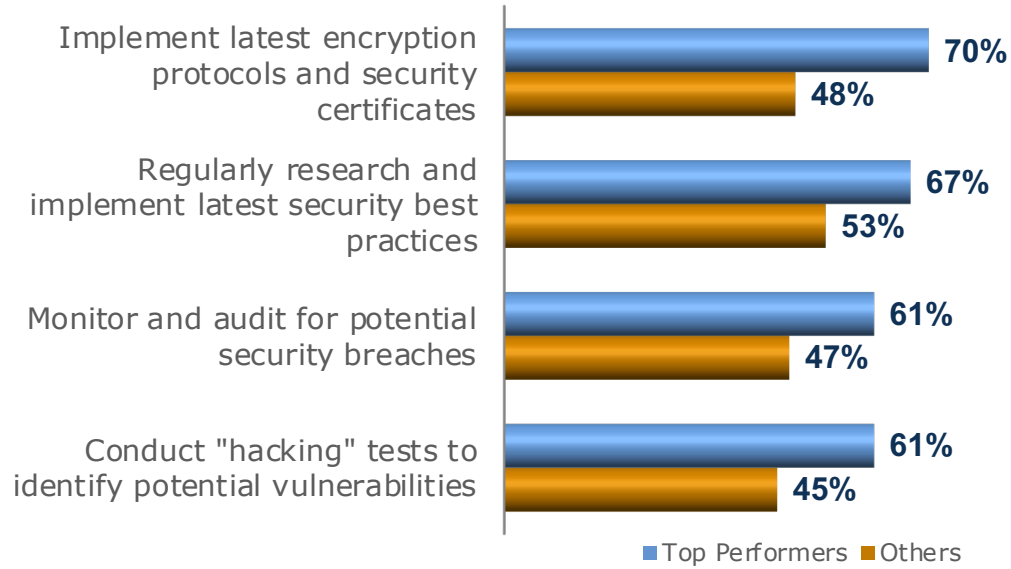
What It Takes to Keep Product Data Secure

Security

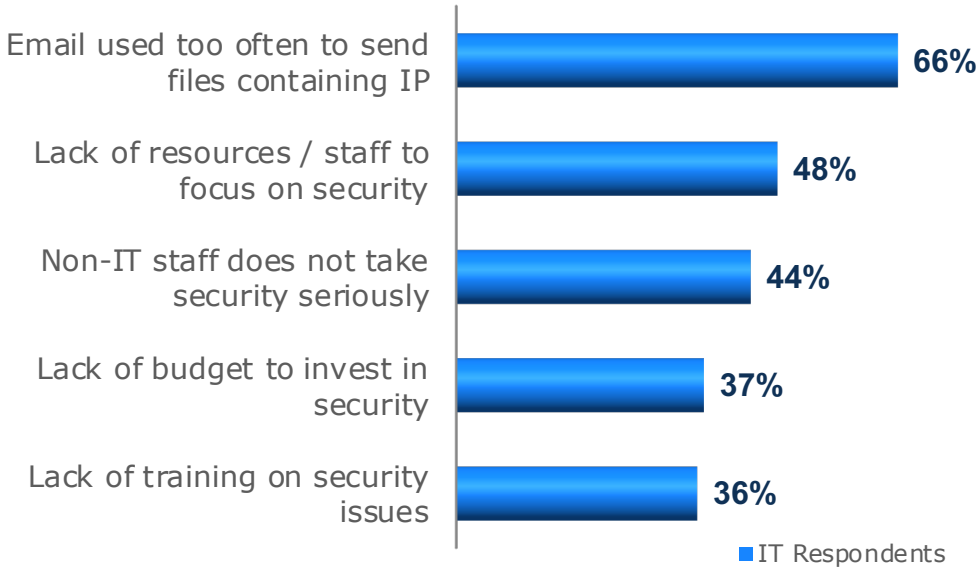
Security is so important; let's explore it further. While IT views improved security as the top advantage of an integrated platform, security concerns hold some back.

Some have concerns that the cloud poses risks to IP; yet 69% of IT respondents believe that cloud vendors can dedicate more resources to security than they can themselves. Further, 44% of IT respondents believe that the cloud makes working with third parties more secure. Email is used too often to share data, creating a significant security vulnerability (lower graph). The graph reveals other top security vulnerabilities, which show that it is hard to enforce internal security processes and takes many resources in both time and budget.

WAYS TO ENSURE DATA SECURITY



FACTORS CONTRIBUTING COMPANY'S SECURITY VULNERABILITIES

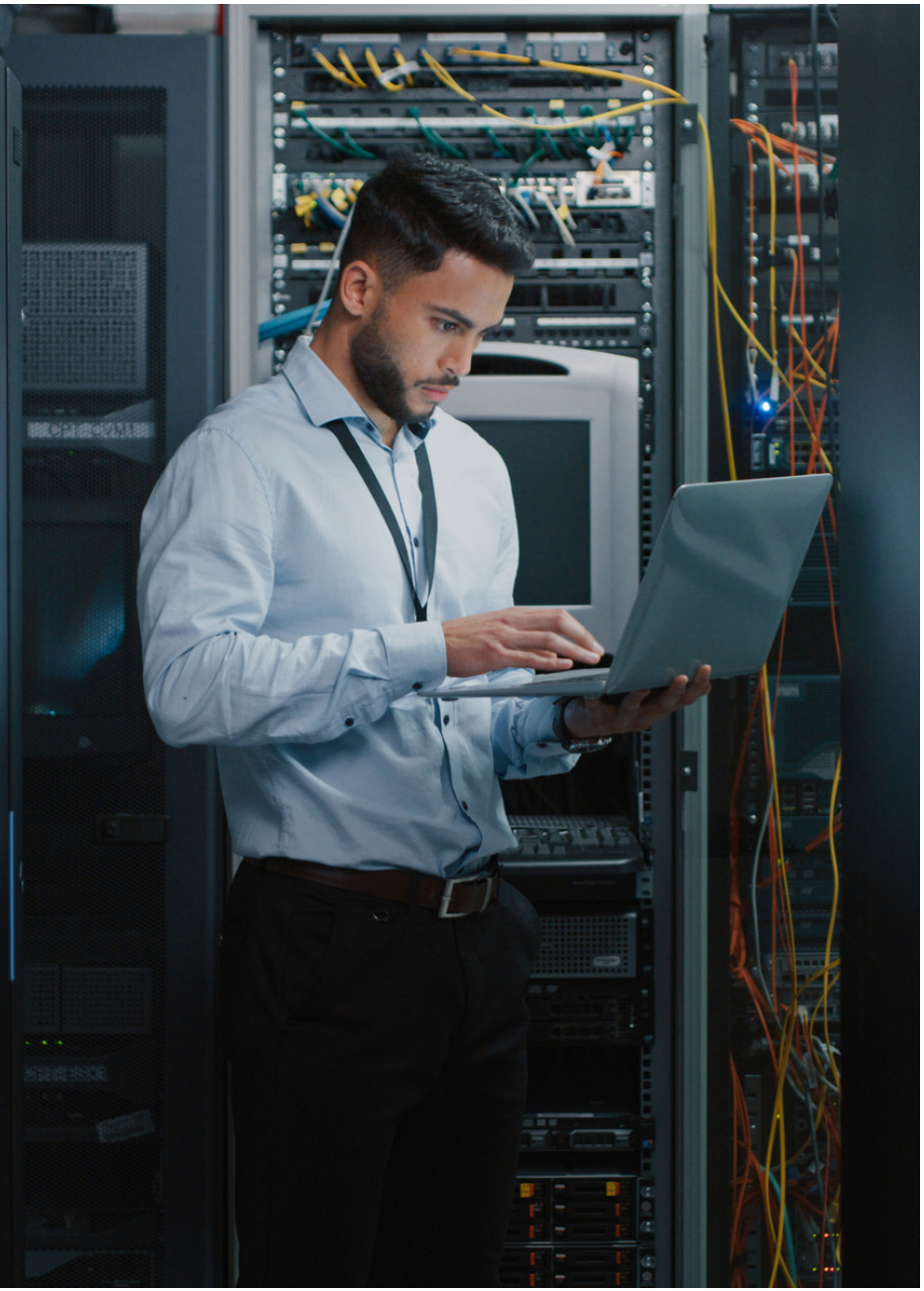


Why Is Security Hard?

Examining Top Performers' practices shows how much effort it takes to protect data (see upper graph). Of those that find the frequency of their security activities adequate, 82% say they conduct them daily or weekly. This significant time investment is likely why 80% cite the lack of resources or budget as contributors to their security vulnerabilities. Those who feel they do enough to keep data secure report having 6.5 people spending 73% of their time on security. Based on the average cost of IT staff in the US,[4] this is a $653,935 annual investment to keep data secure.

With numbers like this, we can quickly see why a software vendor with a dedicated security budget may be better positioned to handle these activities. Without this considerable expense, companies can invest this part of their IT budget in other ways to support business strategy execution.

Recommendations



Recommendations and Next Steps

Based on industry experience and research for this report, Tech-Clarity offers the following recommendations for IT staff:

- Ensure the success of product development and manufacturing software by focusing on automation to reduce manual efforts.
- Keep in mind the significant time pressures faced by product development and manufacturing teams. Connecting time savings to any new software solution will encourage their adoption.
- Consider the benefits of an integrated platform over a best-of-breed approach. Technology advancements over the last several years have led to powerfully capable integrated platforms that will not have the drawbacks of disconnected tools.
- Recognize that digital transformation is not just a technology solution. An integrated platform can help, but implementation is critical. It should increase data reuse across the product lifecycle, eliminate data silos, automate processes and workflows, extend access to product data beyond engineering, and create a sign source of truth.
- Do not underestimate the efforts required to successfully implement digital transformation. It may require rethinking processes and significant effort to understand processes, bottlenecks, and opportunities for improvement. This will be an ongoing continuous improvement journey. By offloading more tedious tactical tasks, IT can focus more energy on the more strategic work that will enable digital transformation.
- Recognize the significant efforts required to keep data secure to determine if those resources would be better spent supporting the company's core business.

About the Research

Data Gathering

Tech-Clarity gathered and analyzed responses to a web-based survey from 187 manufacturers. Survey responses were collected by direct e-mail, social media, and online postings by Tech-Clarity.

Industries

The respondents represent a broad cross-section of industries. 30% were from Industrial Equipment, 23% High-Tech, 20% Consumer Products, 14% Automotive, 9% Aerospace & Defense, 10% Life Sciences, and others.*

Company Size

The respondents represent a mix of company sizes, including 13% from less than $50 million, 17% between $50 million to $100 million, 17% between $101 million to $250 million, 21% $251 million to $1 billion, 22% $1.1 billion to $5 billion, and 7% greater than $5 billion. 2% did not disclose their company size. Company sizes were reported in US dollar equivalent.

Geographies

Responding companies report doing business in North America (63%), Europe (61%), Asia (40%), Australia / Oceania (21%), Latin America (19%), Middle East (14%), and Africa (13%).*

Title

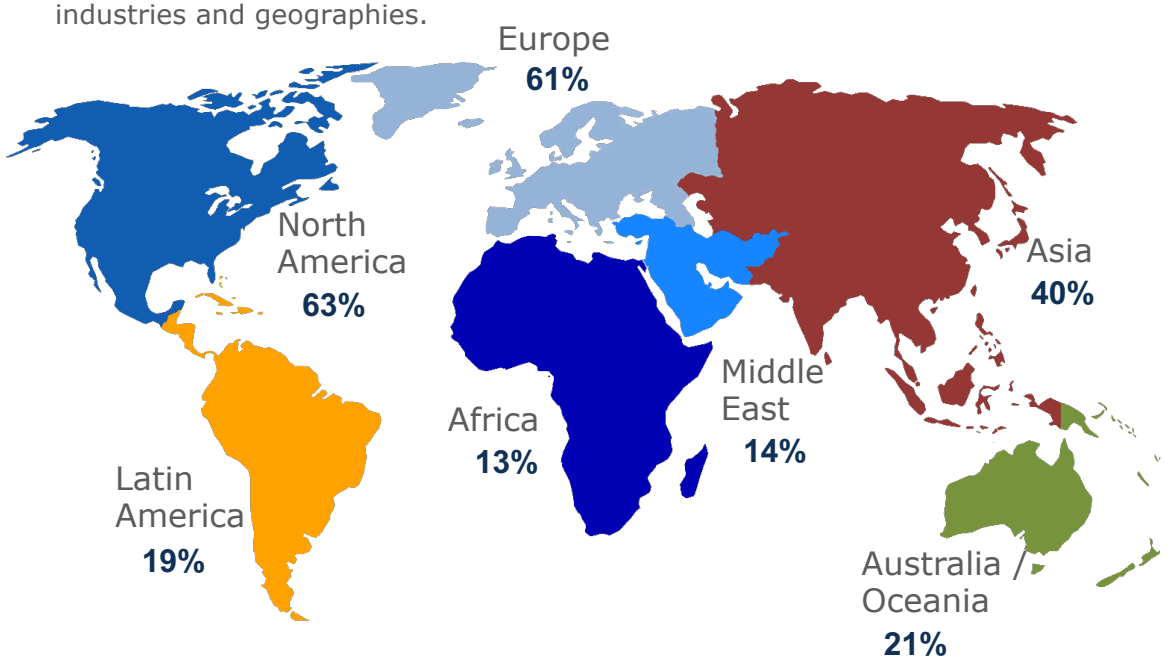
The respondents were comprised of 13% Executive, 14% Vice President, 29% Directors, 27% Manager, and 18% individual contributors.

Organizational Function

Of the respondents, 27% were in Information Technology (Corporate IT), 21% Product Design/Engineering roles,18% Manufacturing IT / Operations Technology (OT), 13% Manufacturing,9% CAD/PLM/PDM Administrator, and the remainder were from a variety of other roles including General Management, Manufacturing Engineering, and more.

* Note that the values may total greater than 100% because companies reported doing business in multiple industries and geographies.

The respondents represented a mix of industries, company sizes, and geographies.



Acknowledgments

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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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