How to Stop Missing Product Development Due Dates

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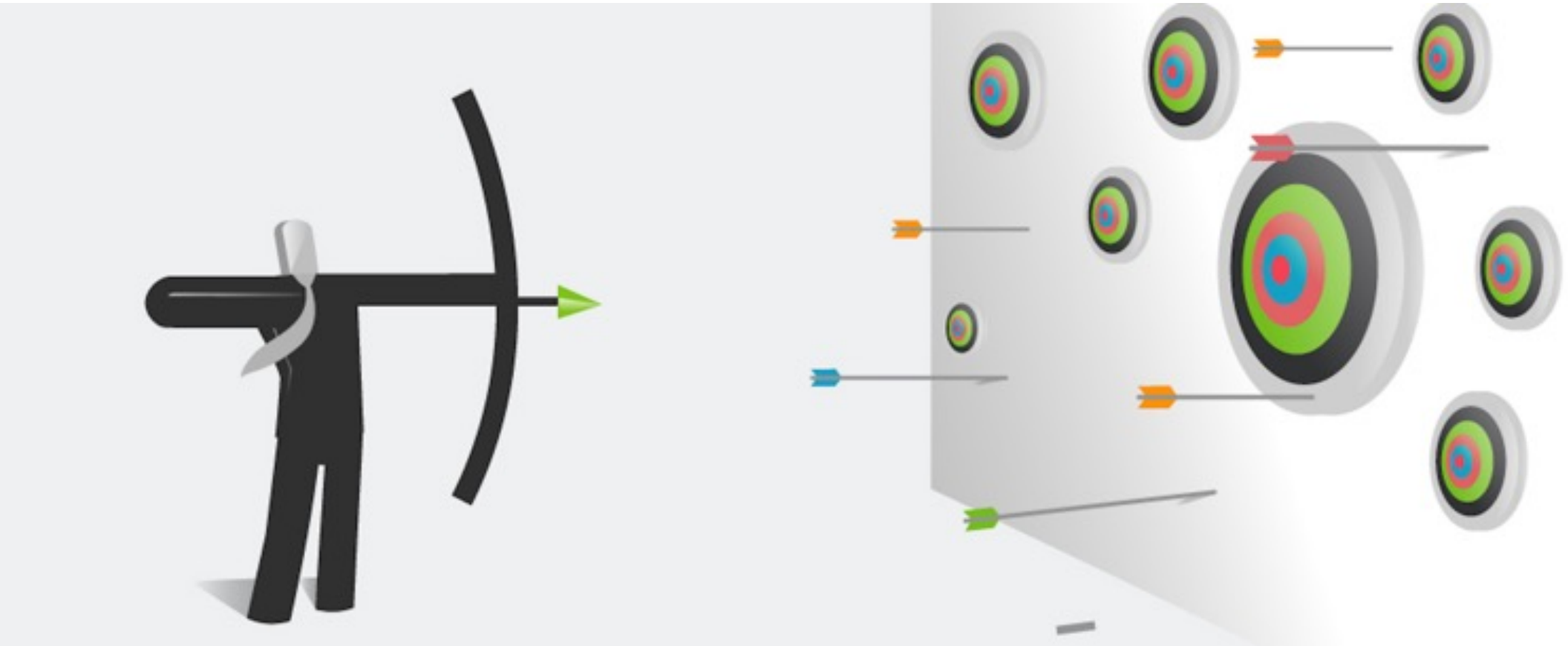
Tech-Clarity

How to Stop Missing Product Development Dates

Beyond Engineers' Non-Value-Added Time

A recent Tech-Clarity survey finds that engineers waste about one-third of their time on non-value-added work[1]. That's more than a day a week! Much of that time, the study finds, is lost as a result of poor data management. Further, over one half of the respondents say that eliminating manual data management tasks would lead to faster time-to-market.

Is individual engineering productivity, however, the key to improving time-to-market? What role does overall new product development efficiency play in hitting product development due dates? We surveyed over 160 companies to find out.



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Executive Overview

Manufacturers Consistently Miss NPD Targets

New product development (NPD) speed and agility have a clear impact on competitiveness and product profitability. Unfortunately, an earlier Tech-Clarity study found that manufacturers miss project launch dates 45% of the time[2]. The research also showed that time-to-market demands had increased for about two-thirds of manufacturers.

Engineering Inefficiency is a Big Issue

Part of the problem is engineering inefficiency. Our surveys consistently find that engineers waste about one-third of their time on non-value-added (NVA) activities. In fact, our most recent research shows that only 54% of an engineer's time is spent on innovation and actual design work[1]. Clearly that has an impact on missing product development due dates, and our reports share clear ways that companies can improve engineering efficiency.

Identifying Best Practices in NPD

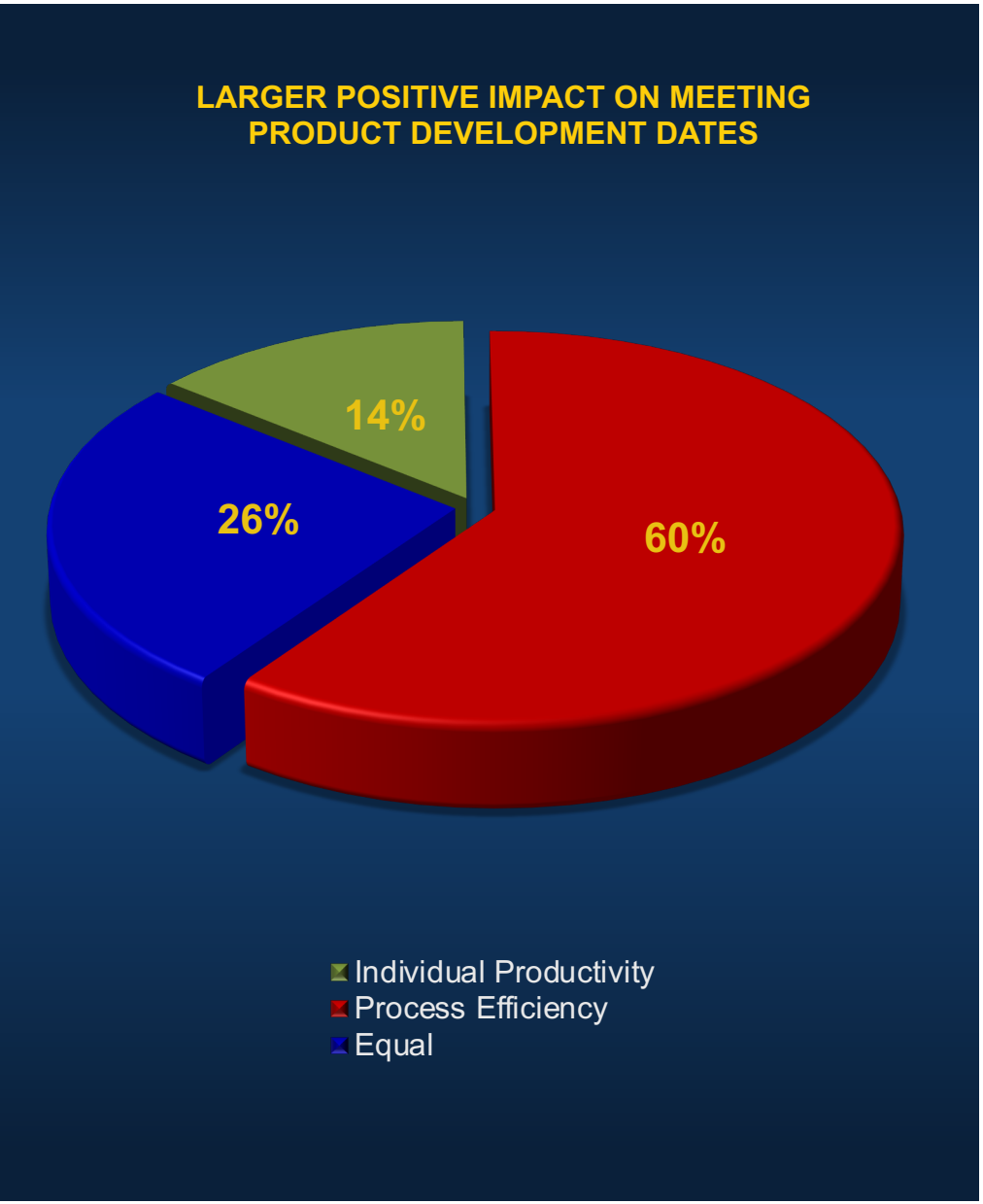
Is improving engineering efficiency enough to solve the long-time issue of missed product development dates? We believe there is more to this puzzle. We analyzed survey responses from 167 companies and identified those that were better able to develop products rapidly and efficiently while maintaining product development agility. Then, we analyzed what these "Top Performers" do differently than the poorer-performing "Others."

Top Performers Streamline NPD with a Cohesive Digital Thread

Researchers found that the Top Performers are more likely to streamline their NPD process by creating digital continuity. In specific, they are twice as likely as Others to have full digital data continuity across phases or steps in their product development process. In a related finding, they are 37% more likely to leverage a common data model across the stages of new product development. This common product definition with full digital continuity creates a cohesive digital thread. The report explains these findings in depth and shares additional capabilities that Top Performers have mastered more than Others. Read more to learn how your company can improve NPD performance and profitability.

Top Performers are more likely to streamline their NPD process by creating digital continuity and a comprehensive data model across product development phases and steps – **a complete digital thread.**

Individual Productivity or Process Efficiency?



Time-to-Market Takes More Than Individual Productivity

First, let's be clear that manufacturers can't choose between individual engineering efficiency and product development speed and agility. They are clearly inextricably related. NPD relies on efficient and effective engineering, but developing a successful product requires input and coordination from multiple disciplines, departments, and the supply chain. Process and project-level challenges can cause productivity loss on a grand scale.

Process Efficiency Outweighs Individual Productivity

When it comes to meeting product development due dates, inefficient NPD processes can make even the most efficient engineering teams miss time-to-market objectives. Researchers asked what has a larger positive impact on meeting product development due dates:

- Productivity of individual contributors (designers, engineers, etc.)
- Overall process efficiency (workflows, project execution, collaboration, coordination, working as a team, etc.)
- Both equally

Only 14% of the respondents indicated that individual productivity had the most significant impact, although about one-quarter of respondents believe it has the same impact as NPD process efficiency. The majority state that overall process efficiency has a greater impact. But that doesn't mean efficiency should be ignored. Instead, the results show that process inefficiency significantly compounds the issue of wasted time in engineering and causes companies to miss their product time-to-market goals. Manufacturers need both; higher levels of process efficiency and individual productivity.

The Impact of Product Development Efficiency

The Value of Time-to-Market

The adage says that "time is money." In NPD, that translates to time-to-market drives profitability. Manufacturers recognize that they get a "first mover's advantage," including higher market share and price premiums, by getting to market before their competitors. For some companies, missing a product development window may have even more severe consequences because they miss new product introduction opportunities at specific industry events or seasons. To quantify this, respondents from this survey say missing product development due dates negatively impacts profitability by 37%, on average.

Opportunity to Improve

In the same way that NVA engineering time can be reduced, wasted calendar time in NPD can be eliminated. In fact, survey respondents said that, on average, they believe their company could reduce their design and development timelines by 39%, which could cut time-to-market by one-third.

Opportunities from Improvement

Survey participants were asked what value improved NPD efficiency would bring. About one-half say that they would deliver the product sooner, but improving time-to-market isn't the only path to increased profitability. About the same number say they would spend more time designing for excellence, which includes design for cost, quality, manufacturability, and more. There is more than one way that freeing up NPD time can add value and drive higher profitability.

On average, companies believe they could reduce their product design and development timelines by 39% - that could cut time-to-market by **one-third!**

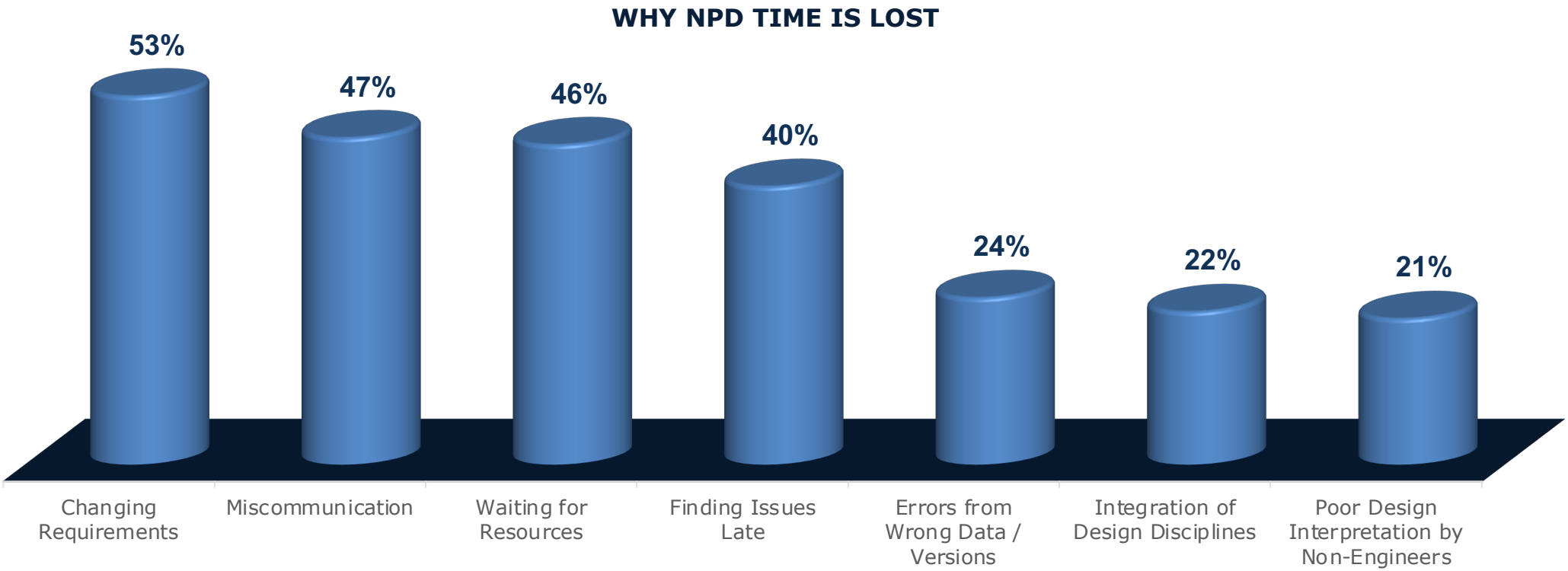
Process Efficiency from Better Collaboration and Coordination

Streamline Project Coordination, Handoffs

In order to improve, it's important to understand where time is lost and can potentially be recovered. Respondents report that their companies lose significant new product design and development calendar time at the project level. These losses are due to issues that cross-departmental boundaries and require project-level coordination (see chart next page). This helps explain why process efficiency has such a large impact on meeting time-to-market targets.

Improve Collaboration

Researchers also examined the product design and development circumstances that lead to significant lost calendar time. The key reasons that time is lost are related to poor communication and coordination. Miscommunications and waiting for resources are both reported by about one-half of respondents. The top issue is changing requirements, which may overlap with other items in this list because requirements are poorly communicated, leading to late discovery of errors or disconnects. There is a clear need to improve the way companies coordinate project resources and collaborate.



Process Efficiency from Data Management

Centralize Data

Researchers also examined project and data management challenges. The top challenges for both show that data management needs to improve in order to improve new product development performance. The top project-related issues that waste calendar time in NPD directly relate to centralized information. Over one-half (59%) of respondents say they waste time collecting information / data to make changes, and 42% waste time understanding the impact of change on other components / interdependencies.

Consolidate Data into a Common Model

The top data-related issues that waste calendar time in new product design and development highlight the need for a common data model that spans the product lifecycle. The challenges include preparing data for other departments / uses (36%), lack of data continuity (34%), and manually combining data (26%). A cohesive product data model relieves these issues.

The challenges reported highlighted the need for a centralized, cohesive product data model to drive process efficiency that leads to improved time-to-market.

How Can Companies Improve NPD Performance?

The Top Performers are the **24%** of respondents with the greatest ability to develop products with **speed, efficiency, and agility.**

Identifying Top Performing Product Developers

Researchers used a benchmarking process we call "Performance Banding" in order to discover best practice NPD processes and technology. They reviewed performance against a number of metrics that represent success in NPD. Then, they created an aggregate metric across these, and identified approximately the top one-quarter and labeled them "Top Performers" and the rest "Others."

For this study, researches benchmarked representative respondents' NPD capabilities as compared to their competitors, specifically their ability to:

- Develop products rapidly **(speed)**
- Adapt to changing customer / market needs **(agility)**
- Develop products efficiently **(productivity)**

Identifying Best Practices

After identifying a logical performance cutoff at 24% to identify the Top Performers and the Others, researchers analyzed the practices and capabilities of the leading companies in order to make recommendations to others. Read on to find out what they learned.

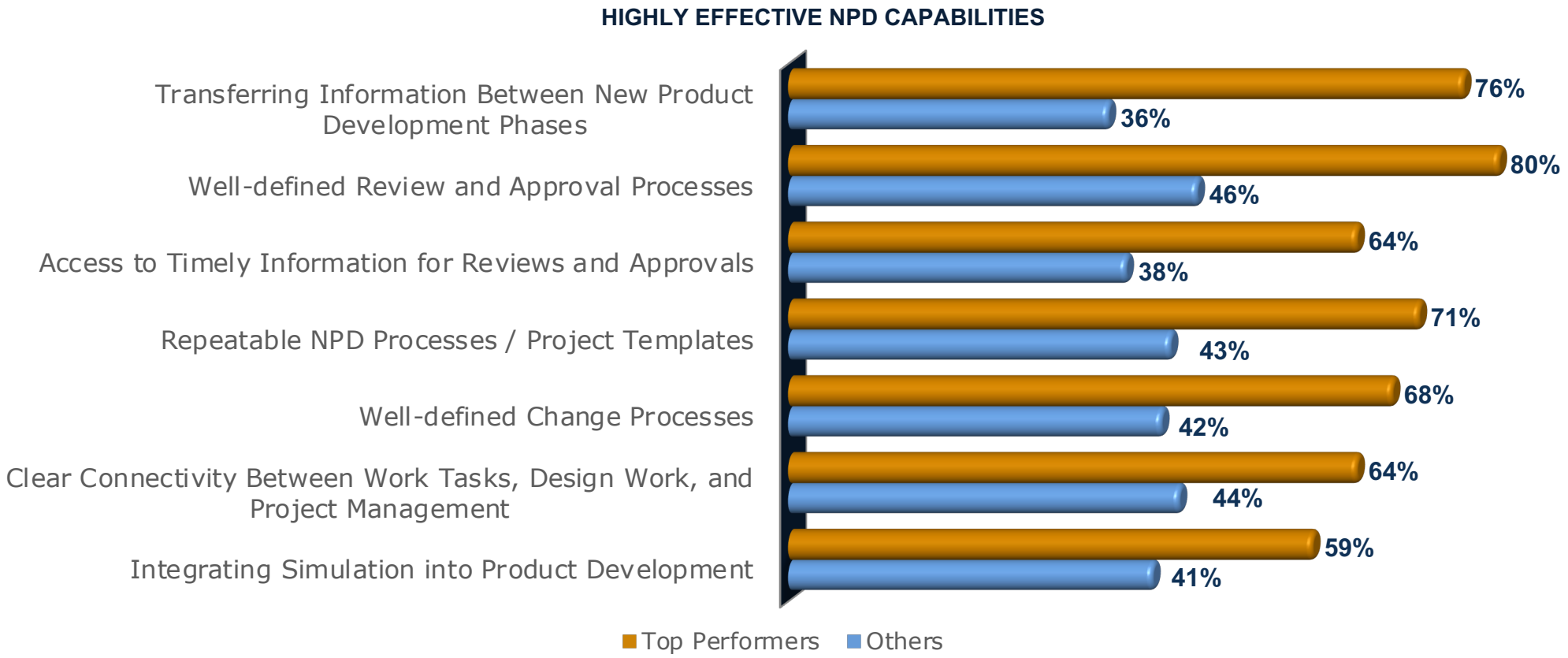
Top Performers Have Better NPD Coordination, Collaboration

Top Performers Have Better NPD Capabilities

Researchers asked respondents how effective company processes are for a number of important capabilities in product design and development. They discovered that the Top Performers are much more likely to be "Very Effective" or "Highly Effective" at most of these processes as compared to Others. This confirms that these capabilities lead to better NPD performance.

The Leaders Have Streamlined New Product Development

The biggest differences correlate well with the areas where companies lose significant product development time. Those areas are the ones that cross departmental boundaries and require project-level coordination. The most differentiating capability is better transferring information between new product development phases. Top Performers are more than twice as likely to have strong capabilities at streamlining information across product development.



Top Performers Have Digital Data Continuity

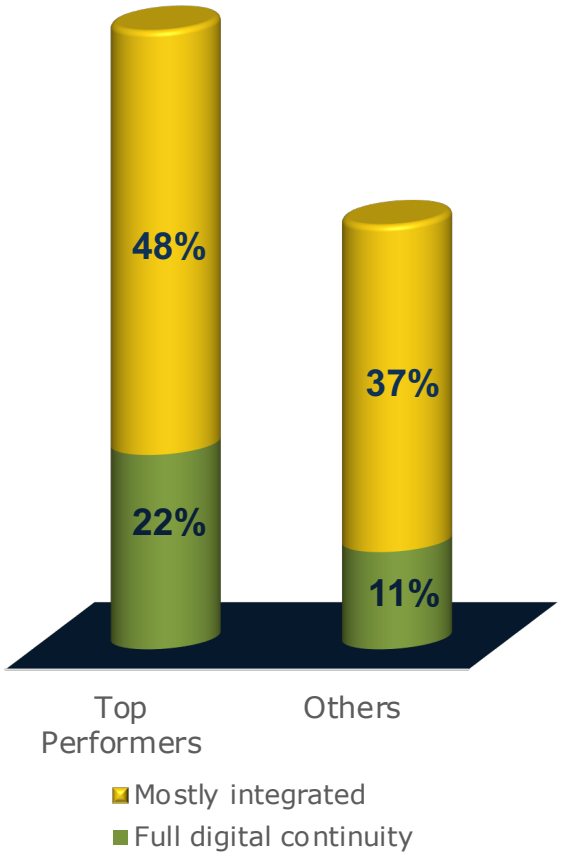
Create Digital Data Continuity Across Phases / Steps

Let's focus on the most differentiating capability, transferring data between new product development phases. The survey data doesn't show significant differences in the types of technology that companies use. For example, Top Performers and Others use Product Lifecycle Management (PLM), Product Data Management (PDM), and other collaborative solutions. It does, however, show differences in how the technology is applied. Top Performers are more likely to leverage PLM as a platform that creates digital continuity throughout NPD.

Develop Cohesive Product Data

Researchers asked how integrated product design data is between steps or phases in the product lifecycle. They found that Top Performers are twice as likely to have full digital continuity – a complete digital thread. Over two-thirds of Top Performers have mostly integrated data between phases, or full digital continuity. Over one-half of Others, however, have disconnected, loosely, or only somewhat integrated data between steps in their lifecycle. This approach is highly inefficient and error-prone. The Top Performers' approaches, on the other hand, show the clear advantage of digital data continuity, a complete digital thread, in improving product development outcomes.

DATA INTEGRATION BETWEEN STEPS / PHASES



Top Performers Have a Cohesive Product Data Model

Maintain a Holistic Product Definition

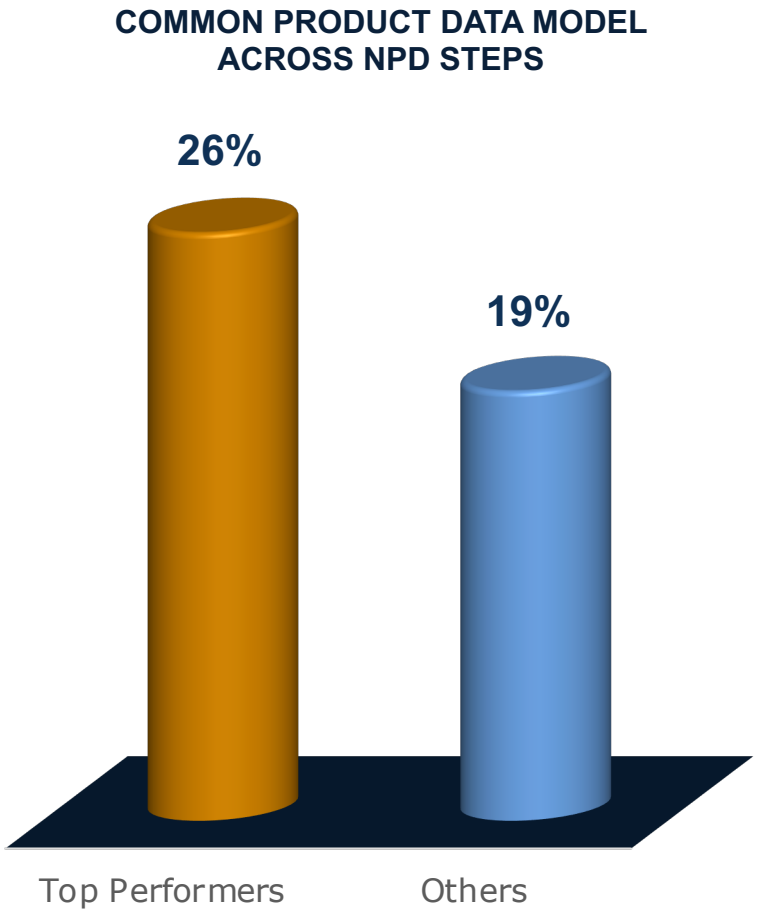
Researchers further asked how companies typically share and/or reuse design data across the stages of new product development. They found that Top Performers are 37% more likely to be able to append design data directly to data from prior steps, directly incorporating and extending design data from prior steps.

Top Performers more frequently have a single data model that allows engineers and others to directly add their information to the product design, keeping a central, contextual view of the product. Others, though, take a much more disjointed approach.

Develop a Cohesive Digital Product Record

Having a common data model that spans the product development lifecycle improves speed, reduces errors, and encourages collaboration. This allows Top Performers to avoid many of the handoff, data gathering, and collaboration challenges identified early.

Others, on the other hand, are about twice as likely to reference data from prior steps by outputting data from one design stage and using it as a reference to manually create the next step. This process leverages disparate data models, an inefficient and error-prone approach that discourages reuse and makes incorporating design changes downstream extremely challenging.



Recommendations and Next Steps

Improve Product Development Capabilities, Drive NPD Results

Clearly, manufacturers can't choose between engineering efficiency and product development speed, productivity, and agility. They need both. In addition to reducing non-value-added work in engineering, they must adopt the Top Performers' best practice processes in order to improve new product development speed, efficiency, and agility.

The challenges and benchmarked capabilities lead us to recommend that manufacturers should streamline new product development with full digital continuity on a common data model, creating a complete digital thread to improve NPD performance. To do this, they should adopt best practice processes and technology.

Streamline Processes and Transitions

Manufacturers should streamline transitions between project phases by:

- Implementing formal, cross-departmental processes
- Providing cohesive design and product development data needed for reviews, approvals, and change management

Leverage a Product Innovation Platform

Manufacturers should leverage a product innovation platform that streamlines product development by:

- Providing a common data model and digital data continuity across product design and development phases
- Promoting communication and collaboration across departmental boundaries and encouraging project-level coordination

Product innovation platforms support project and process improvements, support digital data continuity, and enhance collaboration. In addition, leading solutions also integrate directly with a wide variety of engineering tools while offering process and data management benefits. This makes product innovation platforms the ideal way to support NPD because they drive individual productivity and project level / process level speed, efficiency, and agility. Manufacturers that leverage both of these benefits have a significant NPD advantage over their competitors.

Product innovation platforms are the ideal way to support new product development because they drive both **individual productivity** and **NPD speed, efficiency, and agility**.

About the Research

Data Gathering

Tech-Clarity gathered and analyzed 167 responses to a web-based survey of companies that design and/or develop products. Survey responses were gathered through direct e-mail, social media, and online postings by Tech-Clarity and Dassault Systemes.

Industries

The respondents represent primarily process manufacturing industries. 28% were from Industrial Equipment / Machinery, 20% Automotive / Transportation, 18% Aerospace / Defense, 11% Architecture / Engineering / Construction, 11% Energy / Utilities, 10% Building Products & Fabrication, 10% Consumer Products, 10% Electronics / High Tech, 10% Life Sciences / Medical Devices, and others.*

Company Size

The respondents represent a mix of company sizes, including companies employing less than 10 employees (11%), 11 to 100 employees (31%), 101 to 500 employees (17%), 501 to 1,000 employees (7%), 1,001 to 10,000 employees (16%), and over 10,000 employees (18%).

Geographies

Responding companies report doing business in North America (58%), Western Europe (37%), Asia (22%), Eastern Europe including Russia (15%), Australia (11%), Middle East (11%), Latin America (8%), and others including Africa.*

Company Role

79% of respondents design and develop products. The other 21% provide engineering or designs services that help companies design and develop products.

Role

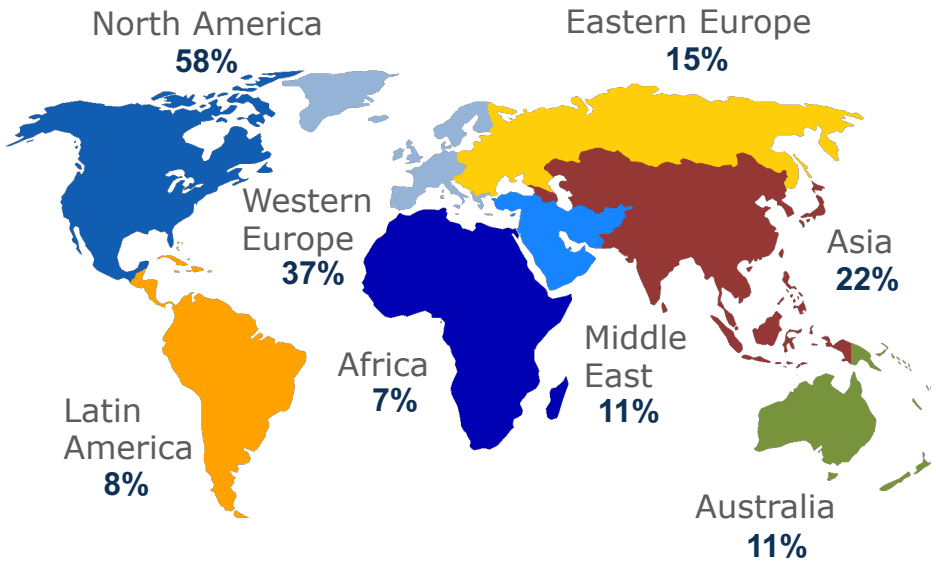
The respondents were comprised of 59% individual contributors, 20% Manager level, 14% Executive or VP Level, 5% Director level, and 2% other.

Organizational Function

Of the respondents, 47% were in Product Design / Engineering roles, 15% in Manufacturing, 7% in Project / Program Management, 7% in Industrial / Manufacturing Engineering, and the remainder were from a variety of organizations including Quality, General Management, Information Technology (IT), and others.

* 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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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.

References

1) Michelle Boucher, "How to Reduce Non-Value-Added Work in Engineering," Tech-Clarity, 2021.

2) Jim Brown, "7 Ways to Outperform Your Competitors in New Product Development," Tech-Clarity, 2017.

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