KALYPSO
A ROCKWELL AUTOMATION BUSINESS

Next Gen PLM in CPG Our Point of View

Product Lifecycle Management (PLM) is the core backbone of any robust R&D department. Ever since Chrysler used PLM to build the Jeep Grand Cherokee in 1992, PLM systems have been providing value to companies by increasing product innovation and decreasing time to market. However, a PLM implementation can be an arduous endeavor, often involving long-term projects with large teams and even larger data migrations. But the value can be transformative.

In the past three decades, technology has exploded and we see companies struggle every day with what to do next. We are often asked how a company can leverage their existing technology and data to create new value. *Can PLM be leveraged in a digital world of AI and the Metaverse? How can PLM continue to increase our speed to market? What new value, if any, can one still glean from their PLM system?* So, we partnered with Jim Brown of Tech-Clarity and over 150 leading CPG firms to find out.

The research provided some valuable insights, including:

1. PLM has provided great value through improved product quality, product innovation and faster product development. But respondents feel PLM has even more untapped value by connecting PLM to more people, processes and technologies.

2. Most companies have more than one PLM system and the majority have not been updated in years. The memories of long, troubled integrations are still fresh and do not want to be revisited.

3. The top-performing CPG companies not only have fully-digitized data and processes, but they also view their PLM as a strategic platform that helps drive innovation across the firm, not just in R&D.

4. The top-performing CPG companies have integrated their PLM systems to leverage leading capabilities like digital twins and simulation models.

Helping R&D departments transform how they approach and execute product development is how Kalypso made its name. But unlike many company PLM systems, we have continued to evolve, learning how to connect our expertise to other aspects of the digital thread. Kalypso has since incorporated product development and R&D data throughout the digital value chain to transform how companies discover, create, make and sell products. I challenge you to think beyond your original PLM use cases and connect PLM to the digital age.

After reading this article, you may be invigorated to update and enhance your current PLM systems to unlock new value. In that planning process, I encourage you to not only think about the business and IT needs, but also consider those often overlooked but critical elements: **data standards, data governance and organizational change management (OCM)**. All three are critical aspects of an implementation or upgrade. Ensuring your people, processes and data are prepared for any amount of change will only shorten your learning curve, bringing that new value closer to today.

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THE STATE OF **PLM IN CPG** 2022

JIM BROWN
President, Tech-Clarity

Tech-Clarity

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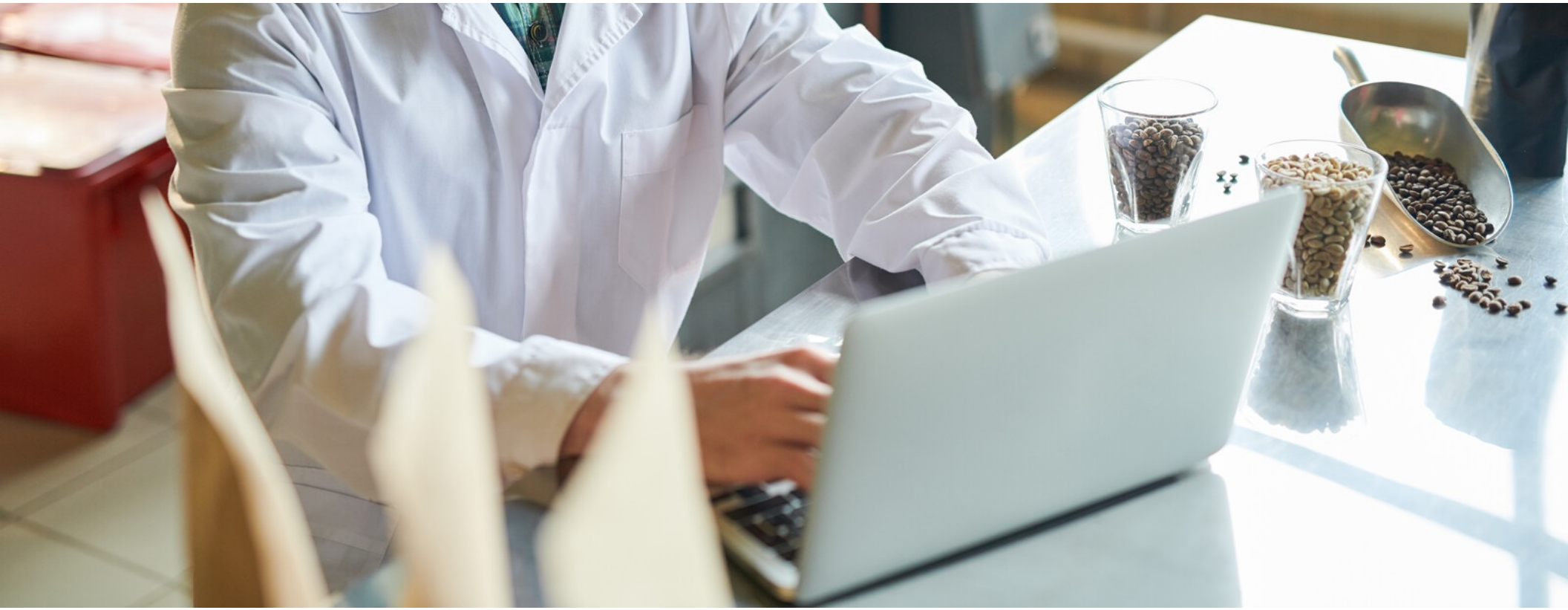
Is PLM Meeting Its Potential?

PLM: Innovation Platform or Product Governance Utility?

Product Lifecycle Management (PLM) promises enhanced product innovation and faster time to market, leading to higher market share and increased profitability. Who doesn't want these strategic, top-line benefits?

PLM implementations, however, typically focus on increasing control, compliance, governance, quality, and product development efficiency. Those are valuable benefits, but are they enough? Is PLM living up to its potential? And is PLM ready to support today's digital transformation strategies? We surveyed over 150 consumer packaged goods (CPG) companies to find out.



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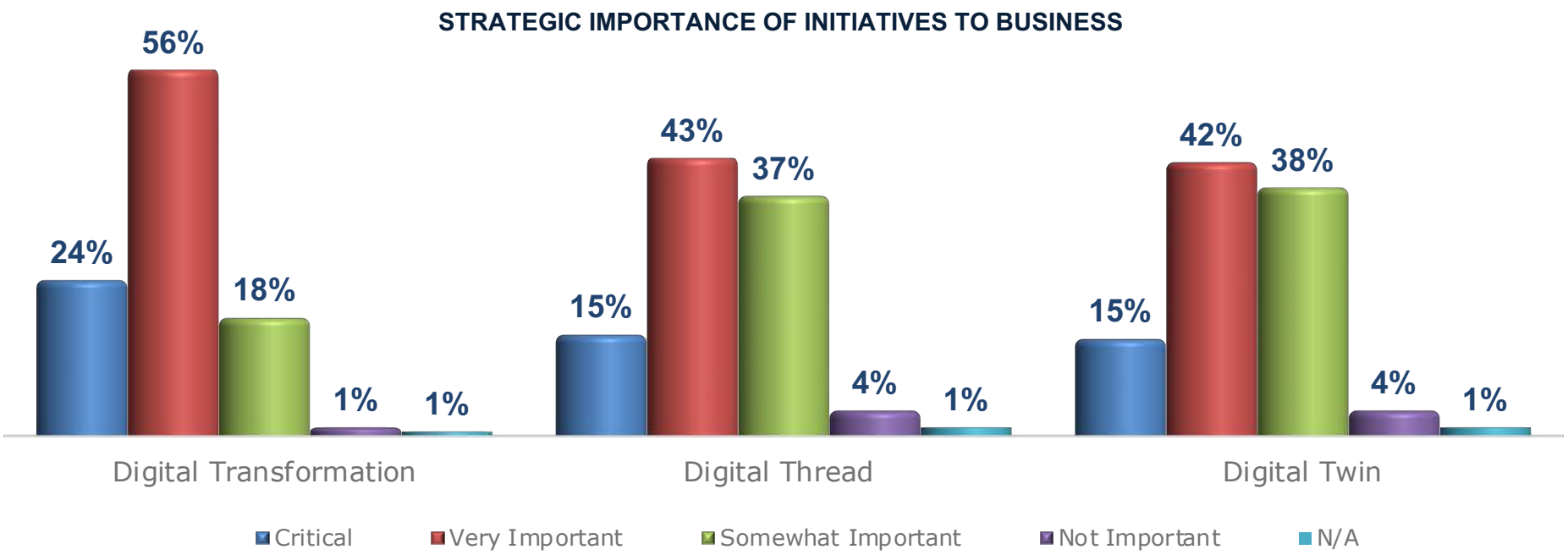
The Digital Transformation Imperative

Digital Transformation is Strategic

Our 2019 research on executive strategies[1] found that 95% of companies say that digital transformation is either critical or important to their company's long-term success and profitability. This new, CPG-specific survey shows that a full 98% of companies say that digital transformation is important to their company strategy. About one-quarter say that it's critical. We believe that CPG companies that don't digitally transform will be at a significant product innovation and product development disadvantage that results in decreased profitability.

Digital Thread and Digital Twin are Important Transformation Initiatives

"Digital transformation" is a very broad strategy, typically consisting of a series of supporting initiatives. Researchers asked about the strategic importance of two such initiatives that provide significant value to manufacturers, the digital twin and the digital thread. Respondents report similar levels of importance between the two, with the majority saying that both are critical or very important to their business. With these business imperatives in mind, we focused on how PLM supports these digital initiatives and other valuable business objectives.



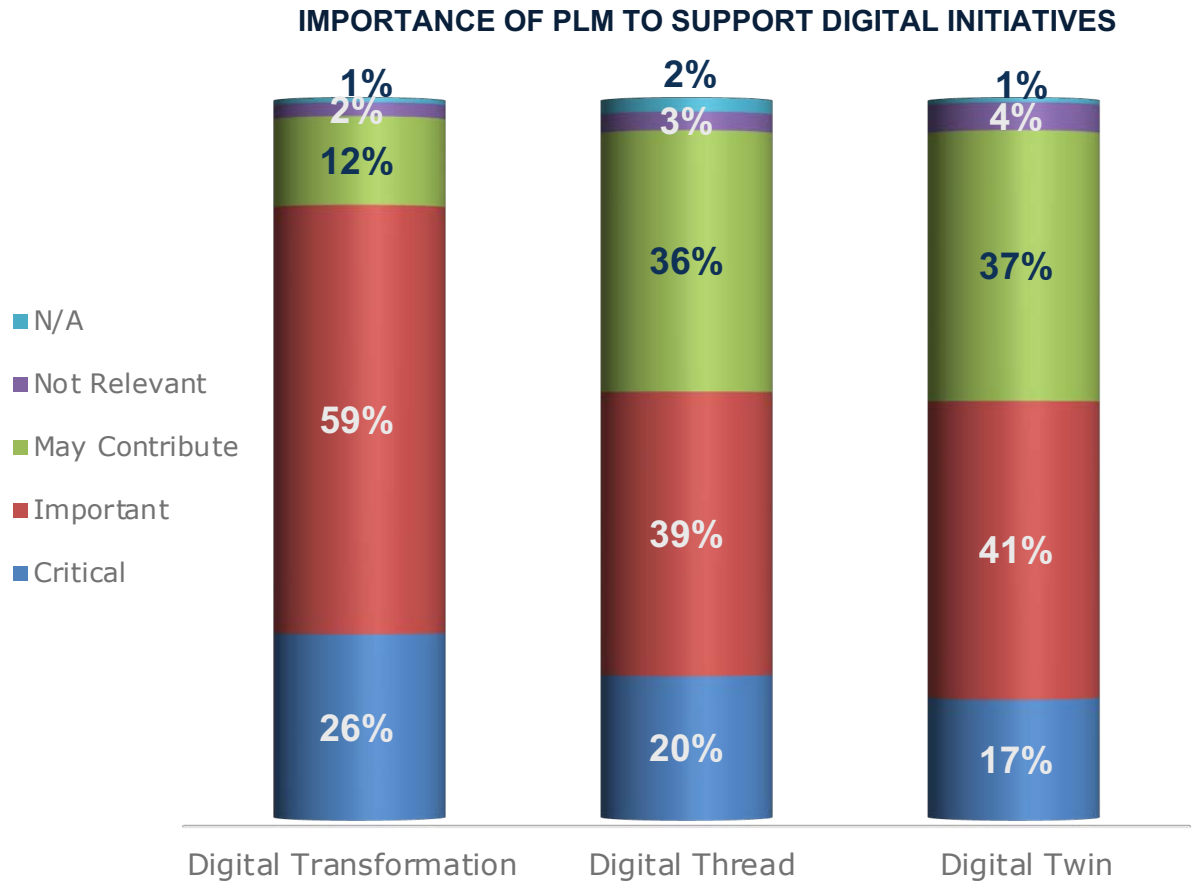
PLM Plays a Vital Role in Digital Transformation

Support Digital Transformation

PLM is the backbone of the digital enterprise. Respondents rated the importance of PLM to the strategic initiatives discussed above. A full 85% of companies see PLM as critical or important to digital transformation, and one-quarter say it is critical. On the other hand, only 3% see it as not important or relevant to supporting this strategic business imperative.

Support Digital Threads, Twins

The conclusion that PLM plays a vital role in digital transformation is supported by its importance for digital thread and digital twin initiatives. Over one-half of CPG companies say that PLM is important or critical to supporting the digital thread. Respondents report very similar views on the importance of PLM to support digital twin initiatives. The findings confirm our experience that PLM is an important part of digital transformation in the CPG industry.



The findings confirm our experience that PLM is an important part of digital transformation in the CPG industry.

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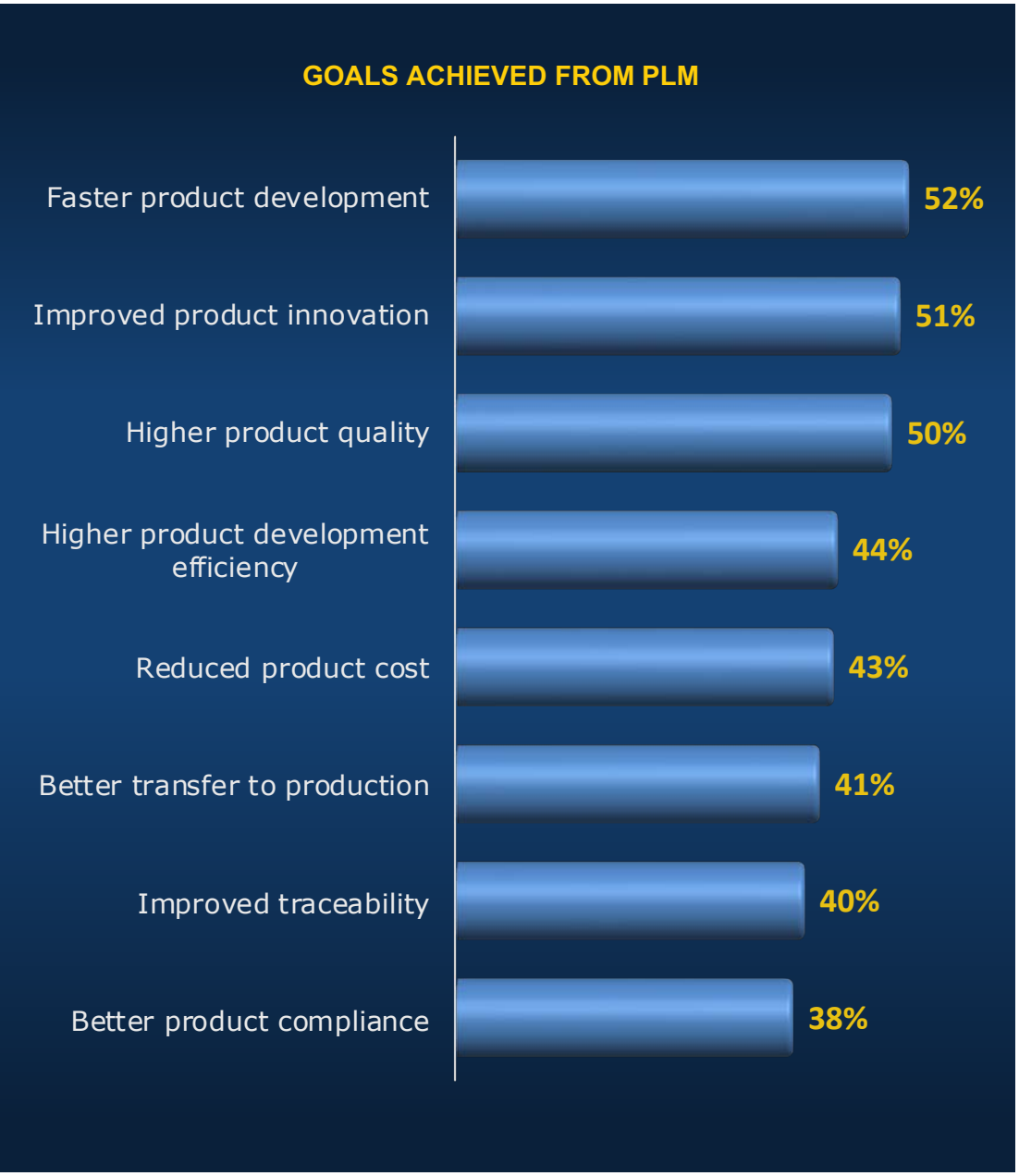
PLM Provides Multi-Faceted Business Value



Achieve Top-Line Benefits

CPG companies surveyed for this study were asked what goals they have achieved from PLM. The top two benefits, faster product development and improved product innovation, can lead to higher market share and greater revenue. Increased quality may also help improve sales and the top line. About half of the CPG companies polled report they receive each of these benefits.

Drive Bottom-Line Value

Beyond top-line benefits, CPG companies report cost savings including higher product development efficiency and reduced product cost. These reduced costs create bottom-line profitability improvements.

Operational Benefits

Beyond direct revenue and cost impacts, companies report a variety of other valuable benefits, including better handoff to manufacturing, improved traceability, and improved product compliance. These improve operations and likely further impact top-line and bottom-line value.

Overall, the results show that PLM provides top-line, bottom-line, and operational benefits.

PLM provides top-line, bottom-line, and operational benefits. What's most notable, perhaps, is the aggregate value achieved because companies report receiving (on average) more than three of these benefits per company.

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The Untapped Value of PLM

Extend PLM

CPG companies can achieve greater benefits if they extend their PLM systems to more people, greater functionality, and additional processes. The most commonly reported driver of significant new value for CPG companies is extending PLM to more people. In many cases, this may be possible with their existing PLM solutions. The same is likely true for extending PLM to more processes. For some, they may also be able to implement capabilities in their existing system that are currently going unused.

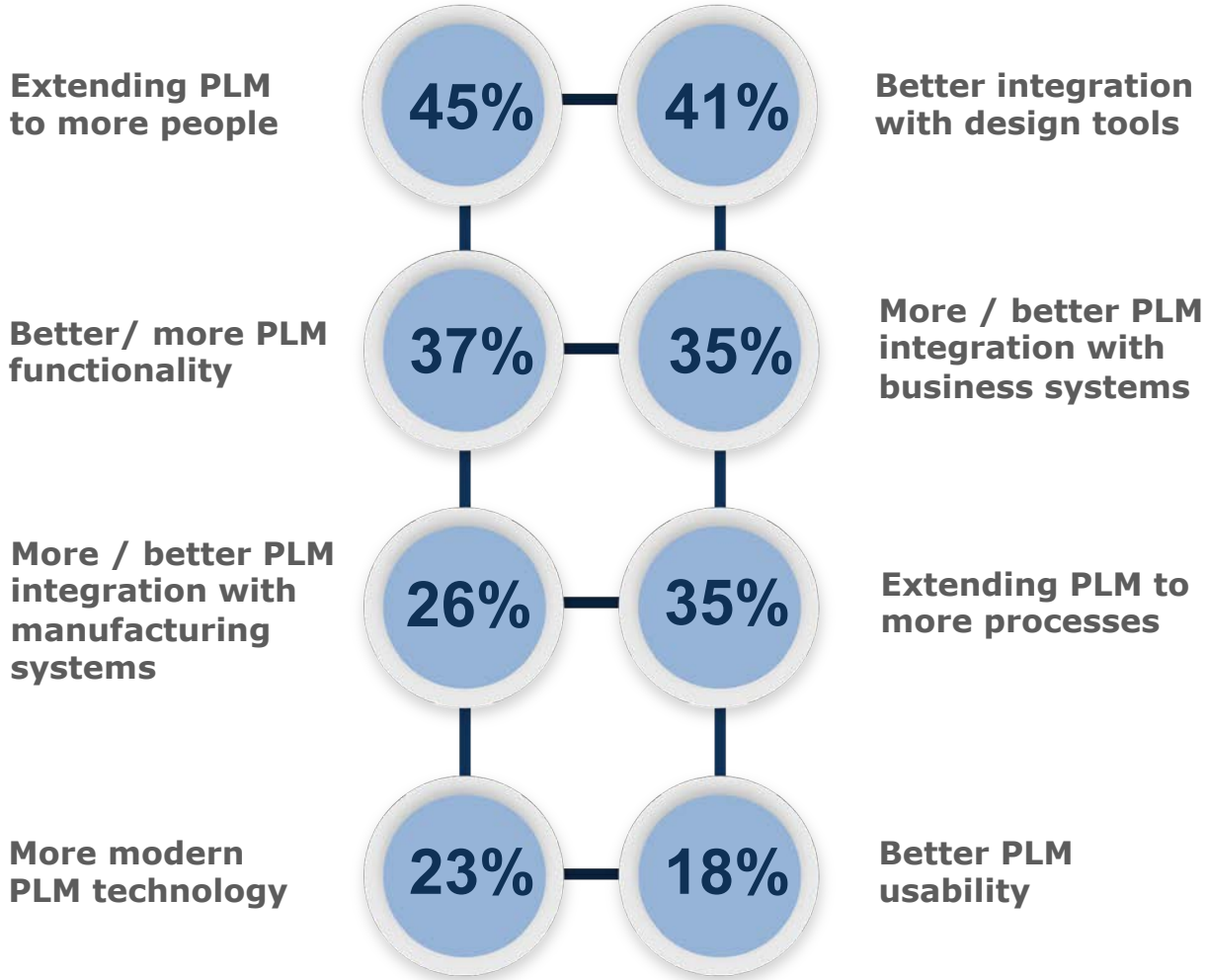
Improve Integration

In addition to extending PLM, or perhaps supporting it, is better PLM integration. Between one-third and one-half say that better integration with design tools would add significant value. Integration increases efficiency, collaboration, and the ability to iterate design options. This integration may include formulation, packaging, label design, and CAD tools. Beyond tool integration, many companies report they would gain higher value with better / more integration with business systems, which likely includes ERP and potentially others like CRM and MES.

Other Improvements

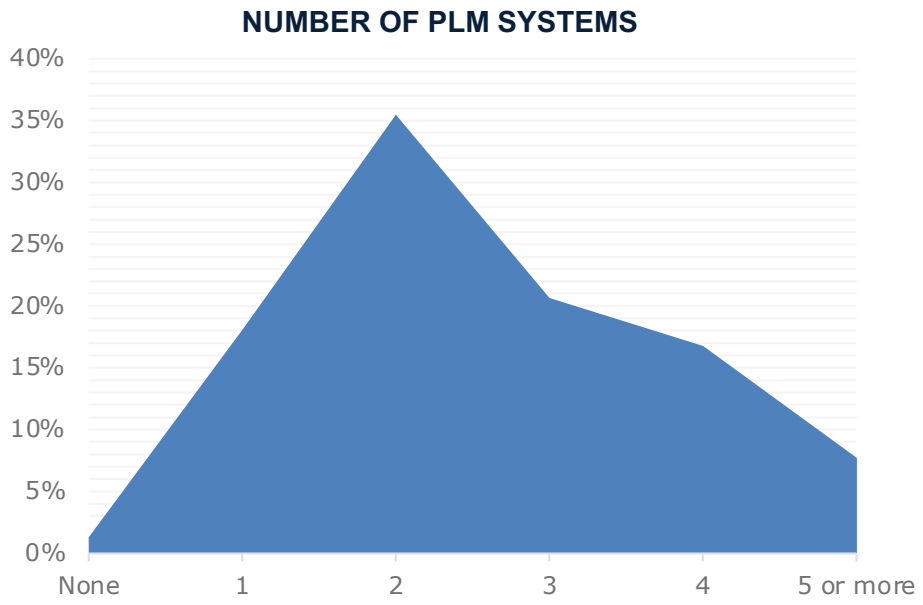
There is significant untapped value in most current PLM implementations.

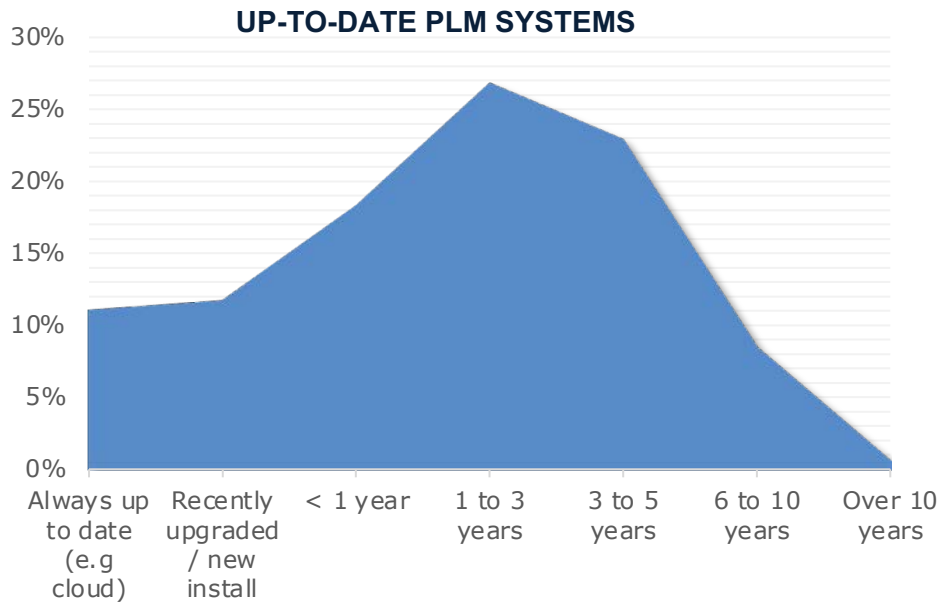
POTENTIAL SOURCES OF SIGNIFICANT NEW VALUE



There is significant untapped value in most current PLM system implementations.

Extending PLM Value Requires Vision





Fragmented PLM Systems

Despite the potential for greater business value, the current state of PLM in many CPG companies is not currently conducive to achieving those benefits.

On average, the companies surveyed have 2.5 PLM systems. In fact, almost one-half of surveyed companies report they have three or more PLM systems. Fewer than one in five surveyed companies have a single PLM system. Whether this is due to point solutions or the result of mergers and acquisitions, companies will face difficulty extending PLM value without consolidating systems.

Outdated PLM Systems

Outdated PLM systems also create challenges for companies that want to extend PLM value. About one-third of CPG companies have a primary PLM system that has not been upgraded for more than three years. Less than one-quarter have a system that was implemented or upgraded within the last year. This may be due to a variety of factors including dead-end customization. Whatever the reason, CPG companies will find it hard to extract significantly greater value from outdated PLM systems.

Fewer than one in five surveyed companies have a single PLM system.

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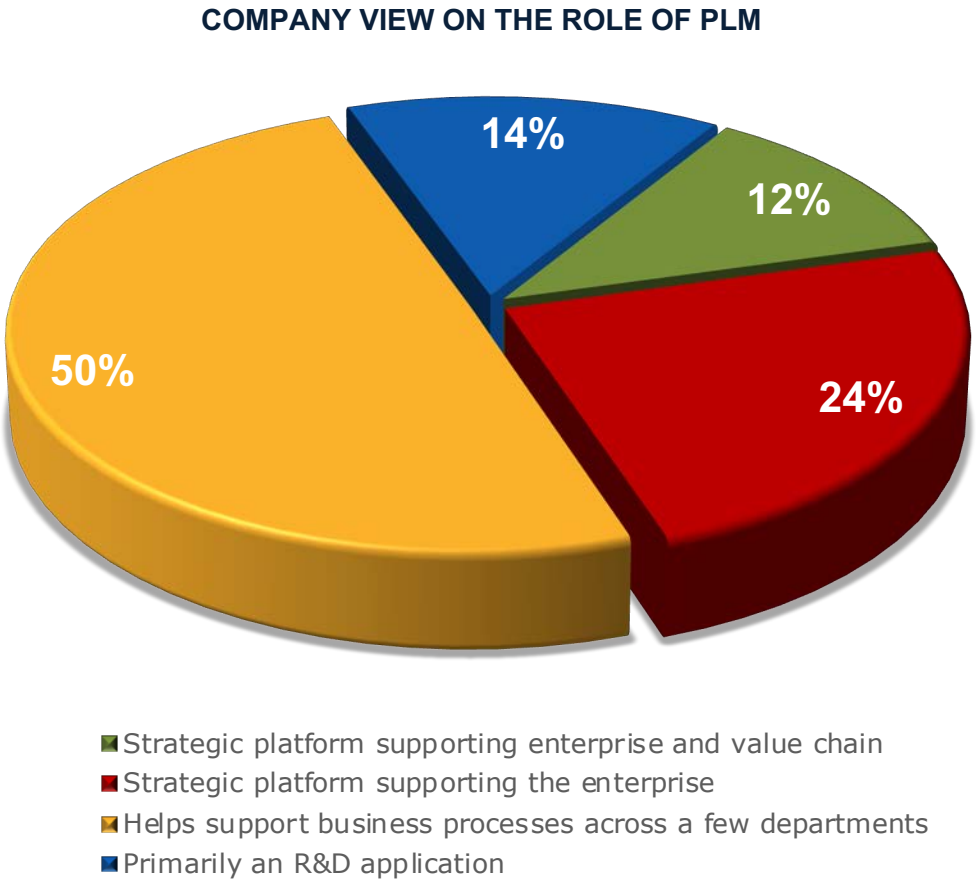
Extending PLM Value Requires Vision



Limited View of PLM

Another challenge companies face is perception. Despite the evolution of many leading PLM systems to more mature product innovation platforms, about two-thirds of CPG companies see PLM as a solution that only supports a few departments or an R&D application. Only about one-third view PLM as a platform and only about one-third of those (12% overall) see it as one that extends beyond the enterprise into the value chain. CPG companies limited perceptions of PLM will limit the value they can achieve.

> CPG companies limited perceptions of PLM will limit the value they can achieve.

PLM Implementations Must be Made Future Ready

Current PLM Systems Meet Current Needs

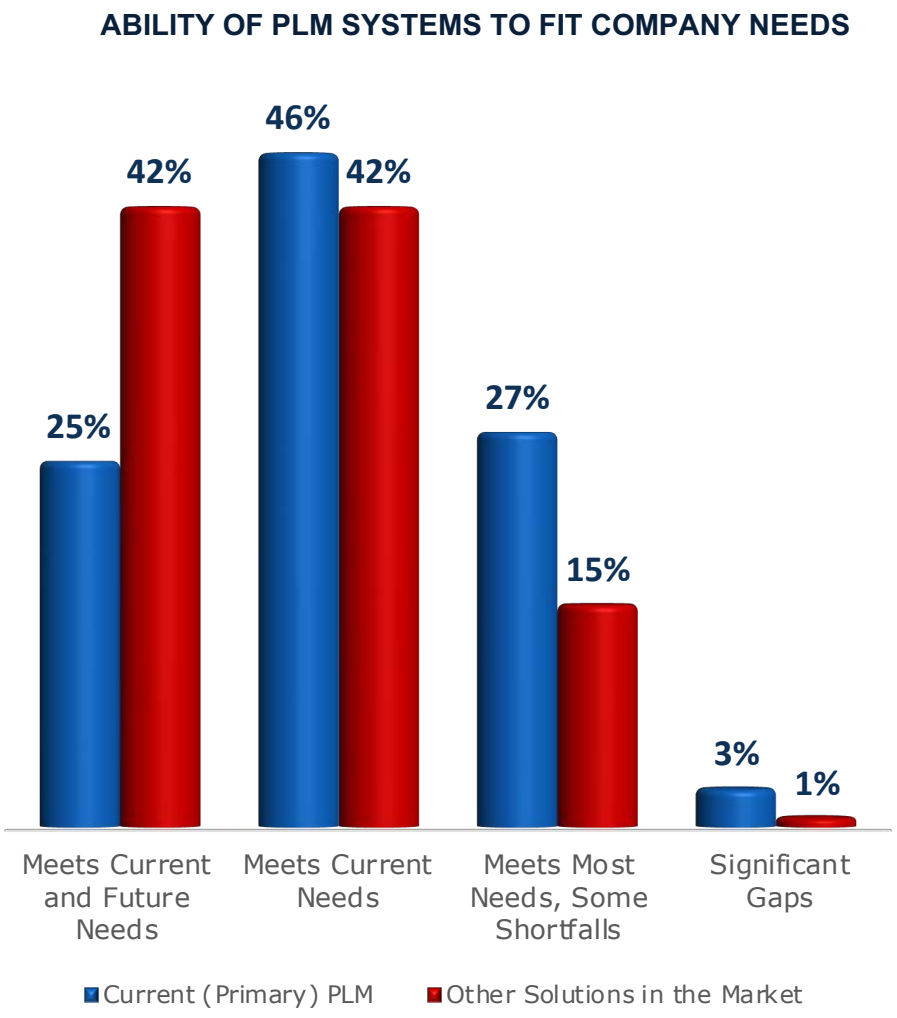
CPG companies believe their system, or others in the market, are sufficient. Very few CPG companies see significant gaps in their primary solution to support their current needs. Almost three-quarters of CPG companies believe their PLM systems cover today's needs, and a full 84% believe there are solutions in the market that are satisfactory.

Only one-quarter of CPG companies believe their current systems will meet both current and future needs. PLM needs are changing as PLM evolves to become the product backbone of the digital CPG enterprise.

Current PLM Systems Don't Meet Future Needs

Even as companies report their current needs are covered, PLM needs are expanding. For example, PLM needs to do more in order to act as the digital product backbone to support digital transformation. Only one-quarter of CPG companies believe their current systems will meet both current and future needs. Less than one-half of these companies believe that current PLM solutions on the market are capable.

PLM needs to evolve. Even companies that feel their system meets current needs will need to change their PLM system to be ready for the future.



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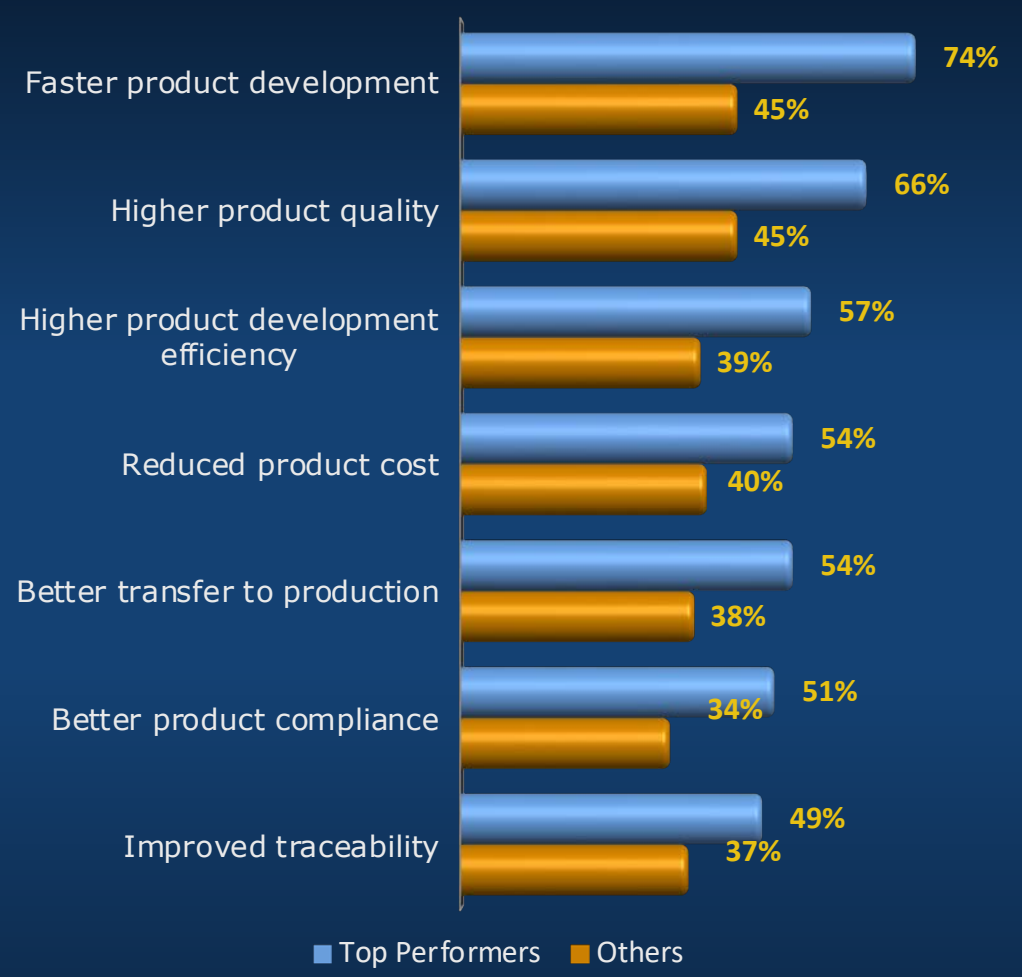
Identifying Top Performing CPG Product Developers



Top Performers are the **top 23%** of respondents in their ability to develop quickly and efficiently develop innovative, compliant products. These companies have achieved greater value from PLM.

Benchmarking Product Development Performance

Researchers used a benchmarking process we call "Performance Banding" in order to understand the best practices approaches, processes, and technology employed by companies with the highest product development performance. Analysts looked at performance against a number of metrics representing successful new product development, including:

- Developing innovative, differentiated products
- Developing and launching products quickly (speed)
- Developing and launching products efficiently (effort)
- Developing and producing compliant products

Then, they created an aggregate metric across these self-reported metrics and labeled the top 23% of companies "Top Performers" and the rest "Others."

Evaluating Best Practices

Once the Top Performers were identified, researchers determined what the higher-preforming companies do differently than the rest. The differences were examined to identify practices that may contribute to their increased product development performance. The following pages share these findings.

Leaders Achieve Higher PLM Impact

The Top Performers, those that report better product development performance, have achieved PLM goals more frequently. In particular, about three-quarters have gained faster product development due to PLM. They also report receiving a greater number of benefits, as the Top Performers (on average) reported over four benefits while others reported just under three.

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Adopt More Digital Product Design Approaches

Digitalize Product Design Data

Researchers investigated how digitalized companies are in product design and development. First, companies were asked how digital their product design data is. Almost three-quarters of Top Performers report they have mostly or fully digital data. Top Performers, in fact, are more than twice as likely to have fully digital data.

Digitalize Product Design Processes

In a similar way, companies were asked how much they have digitalized their company's product design processes. Again, Top Performers are more digital. Over two-thirds of the leading companies have mostly or fully digitized processes, and they are more than twice as likely to have fully digital processes.

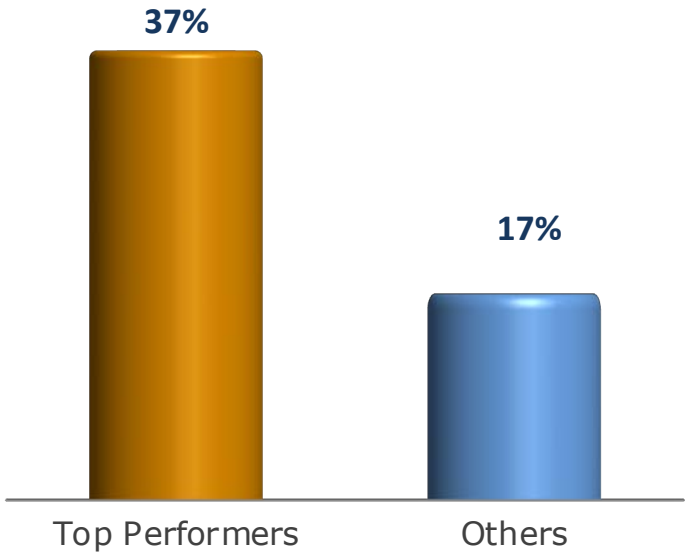
Definitions

Note that the definition of "digital data" used is data in a database that can be accessed by any application. Digital data does NOT include files that must be opened by a specific tool. It does NOT include data that is embedded in documents, forms, files, CAD models, or scanned data.

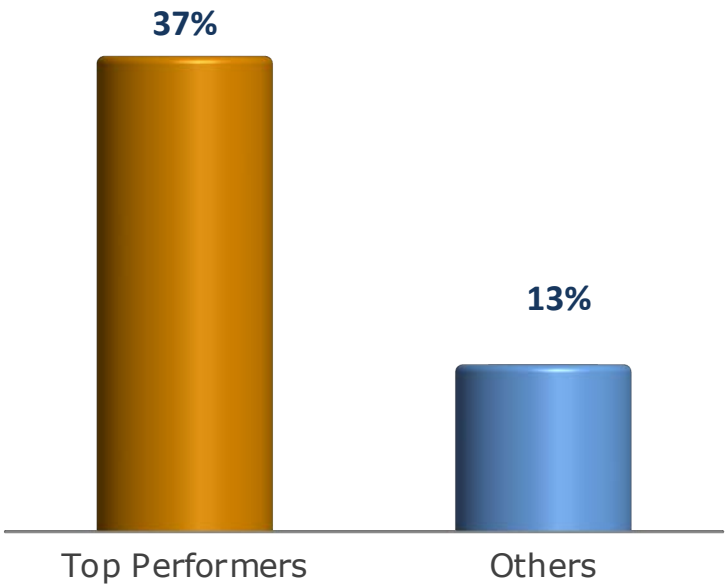
The definition of "digital processes" are those that are executed based on computer-managed workflows and tasks. An example of this kind of process would be managing design changes and approvals. Using the findings and based on these definitions, researchers concluded that digital product data and processes help drive higher product development performance.

Researchers concluded the digital product data and processes help drive higher product development performance.

FULLY DIGITAL DATA BY PERFORMANCE CLASS



FULLY DIGITAL PROCESSES BY PERFORMANCE CLASS



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Be More Strategic About PLM

Leading companies not only view PLM more strategically, they aim to get greater strategic value from it.

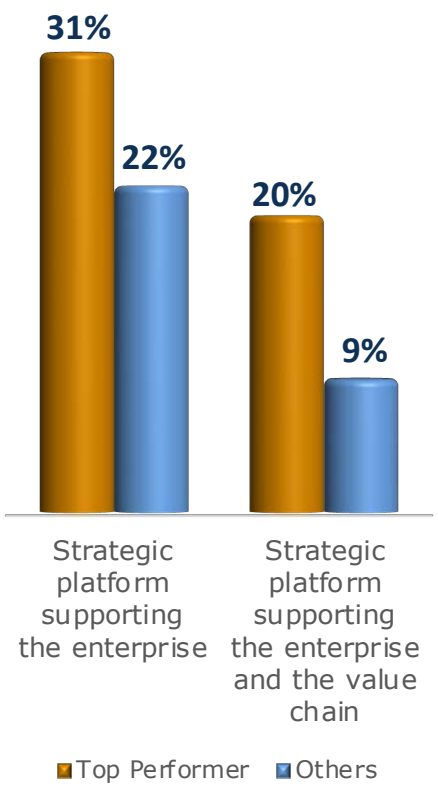
Recognize PLM as a Production Innovation Platform

Although CPG companies generally view PLM less strategically, the leaders are more likely to view it as a product innovation platform. Over one-half of Top Performers see PLM as a strategic platform that supports the enterprise. That view is 65% more common in Top Performers than Others, who are more likely to see it as a solution that helps a few departments. In addition to supporting the enterprise, Top Performers are twice as likely to see PLM as a strategic platform that supports the enterprise and the value chain. It appears that the leading companies expect more from PLM.

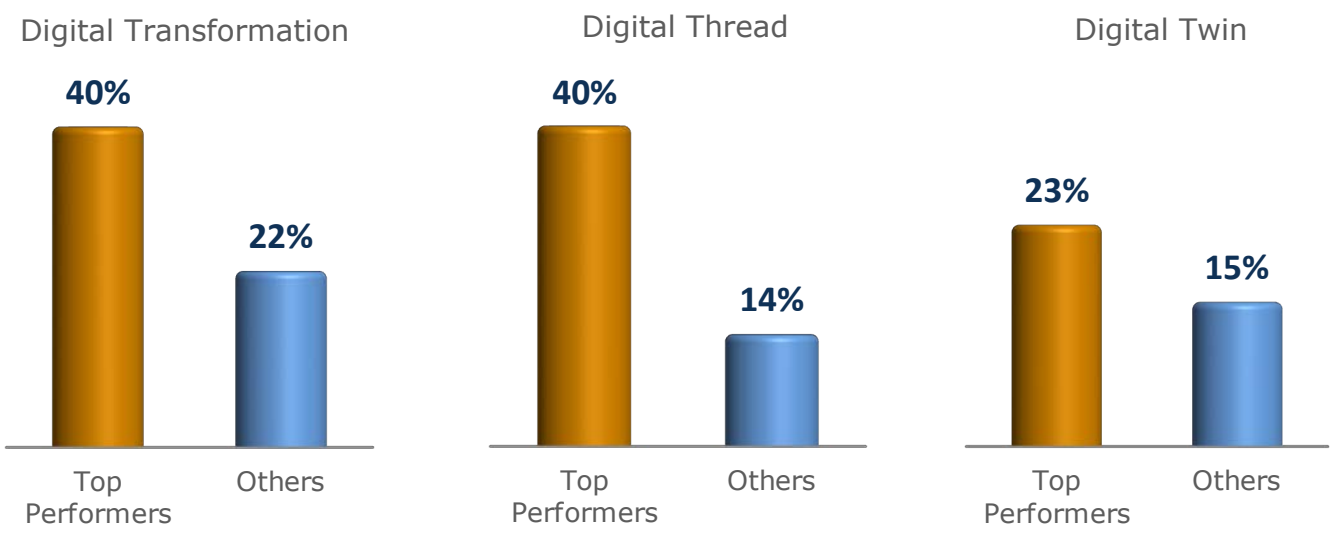
Leverage PLM Value Strategically

In addition to viewing PLM as a strategic platform, Top Performers apply PLM more strategically. They are almost twice as likely to see PLM as critical to supporting digital transformation, almost three times more likely to view it as critical for the digital thread, and about 50% more often say it is critical to supporting the digital twin. The leading companies not only view PLM more strategically, they aim to get greater strategic value from it.

COMPANY VIEW ON THE ROLE OF PLM BY PERFORMANCE BAND



PLM VIEWED AS CRITICAL TO SUPPORT DIGITAL INITIATIVES BY PERFORMANCE BAND



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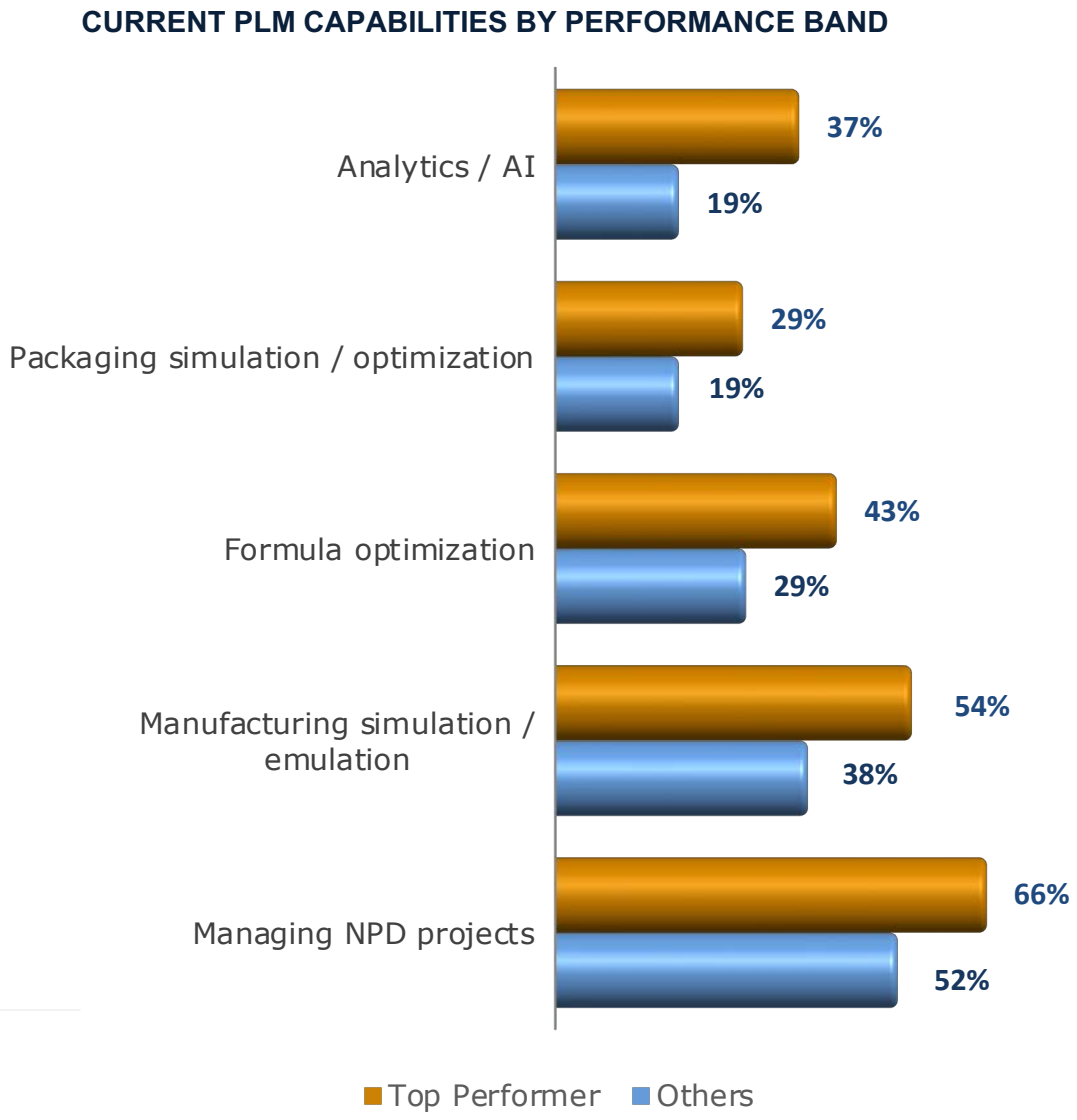
Utilize PLM More Broadly

Use More Advanced PLM Capabilities

Top Performers use more of what PLM has to offer. What sets Top Performers apart the most is not what they use the most. It's what they more commonly use than the Others. The chart below is sorted by the responses that most differentiate the Top Performers, highlighting the largest differences between Top Performers and Others. The researchers found that the leading product development companies use more PLM capabilities than their poorer performing. They also use more advanced PLM capabilities. For example, Top Performers are much more likely to use advanced analytics, simulation, and optimization capabilities.

The correlation between extended PLM use and higher product development performance is clear.



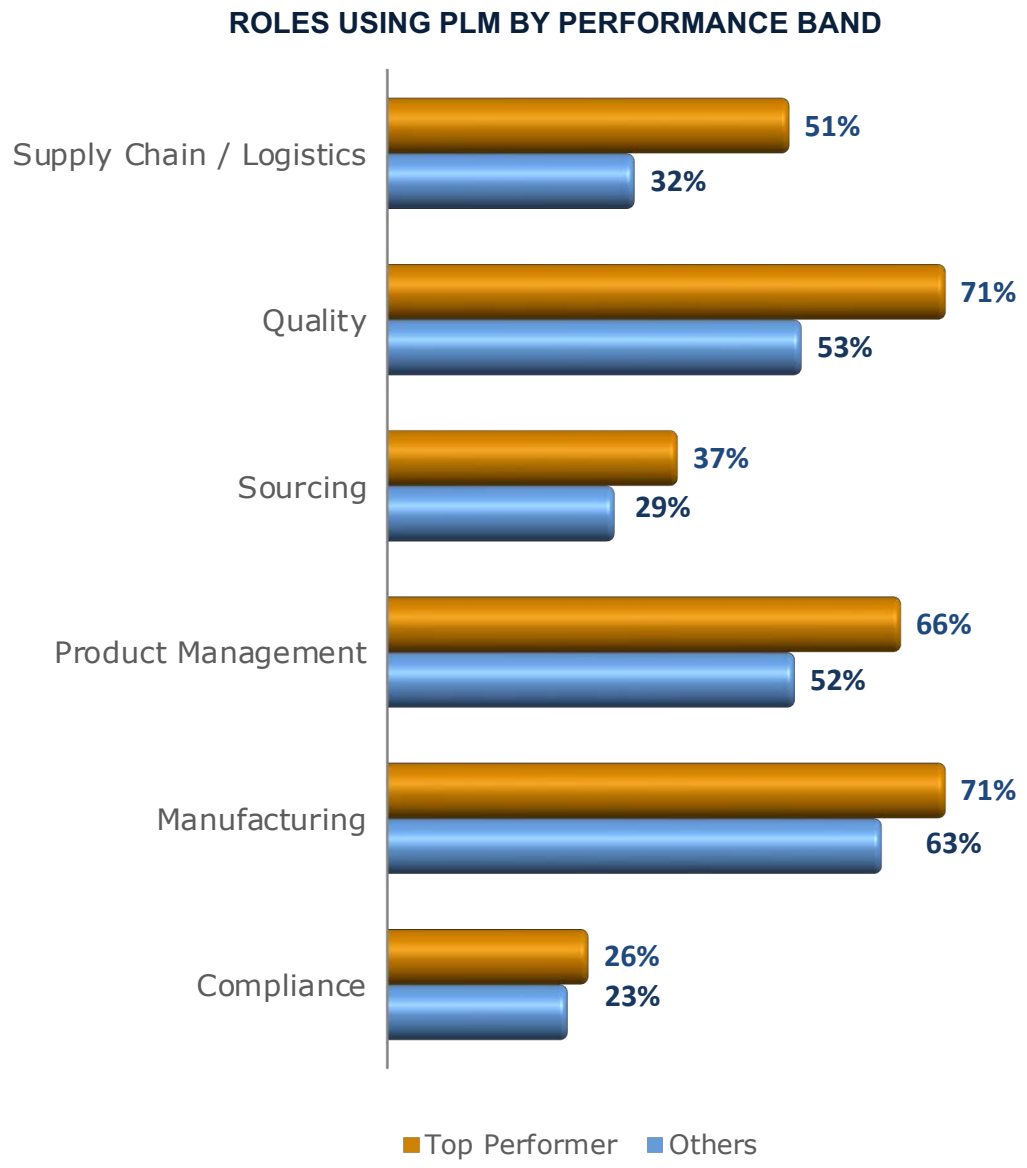
Utilize PLM More Broadly

Extend PLM to More Functions

In addition to using more of what PLM has to offer, the Top Performers extend their solution more broadly across their enterprise. Top Performers are more likely to have users in departments outside of R&D, in particular, Supply Chain / Logistics, Quality, and Sourcing. They also have significant use in Manufacturing and Product Management, which likely adds significant value but is not uncommon in poorer-performing companies.

It's not clear whether Top Performers gain higher value because they extend their PLM use or whether they have extended it because they've seen the value, but the correlation between extended PLM use and higher product development performance is clear.

Top Performers are more likely to have users in departments outside of R&D.



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Take Advanced Approaches to Product Definition

More Cohesive Product Models

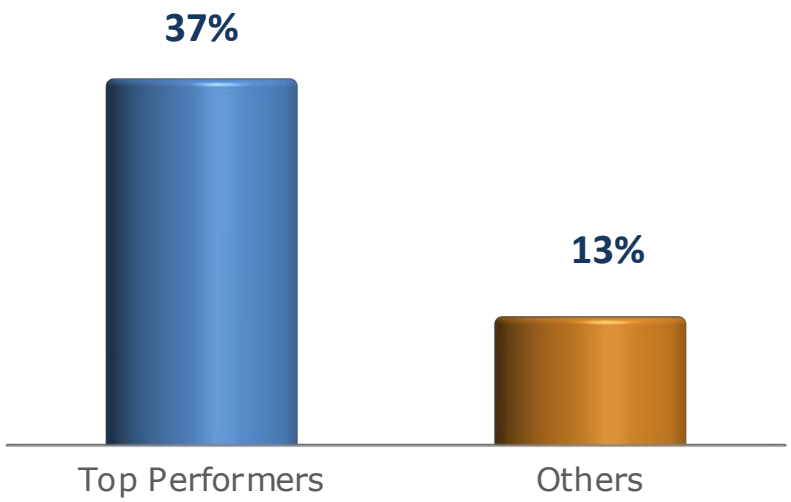
With a better understanding of how Top Performers use PLM, researchers focused on uncovering related best practices. Respondents shared how integrated their company's design data for a typical product is, for example the relationship between formulation, packaging, and labeling. Top Performers are almost three times as likely to have design data integrated across all disciplines, while Others are more likely to focus on only some disciplines.

More Integrated Production Processes

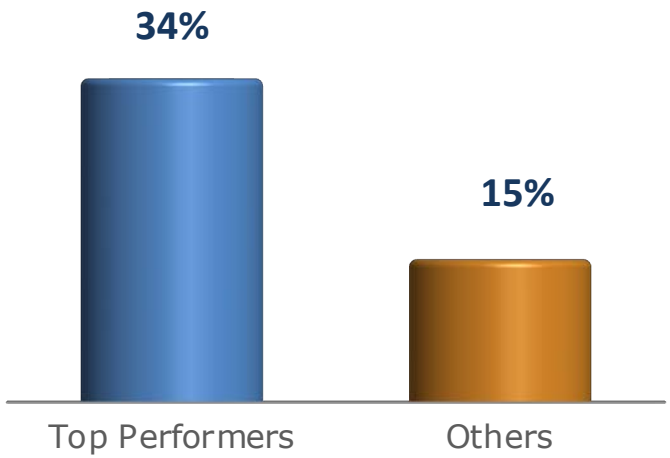
Participants were also asked how they use product design data to develop production processes. The options offered were levels of maturity, including; reviewing product spec documents, copying from a digital product model, adding production data to shared product model, or developing localized product/production models. Again, Top Performers took a more integrated approach. They are about twice as likely to develop localized product/production models such as general and site recipes in a product/production model.

Top Performers take a more integrated approach to modeling products across all design disciplines and manufacturing instructions, including localized models for individual sites.

INTEGRATED DESIGN DATA ACROSS ALL DISCIPLINES BY PERFORMANCE BAND



PRODUCT MODELS LOCALIZED AND INCLUDE PROTECTION PROCESSES BY PERFORMANCE BAND



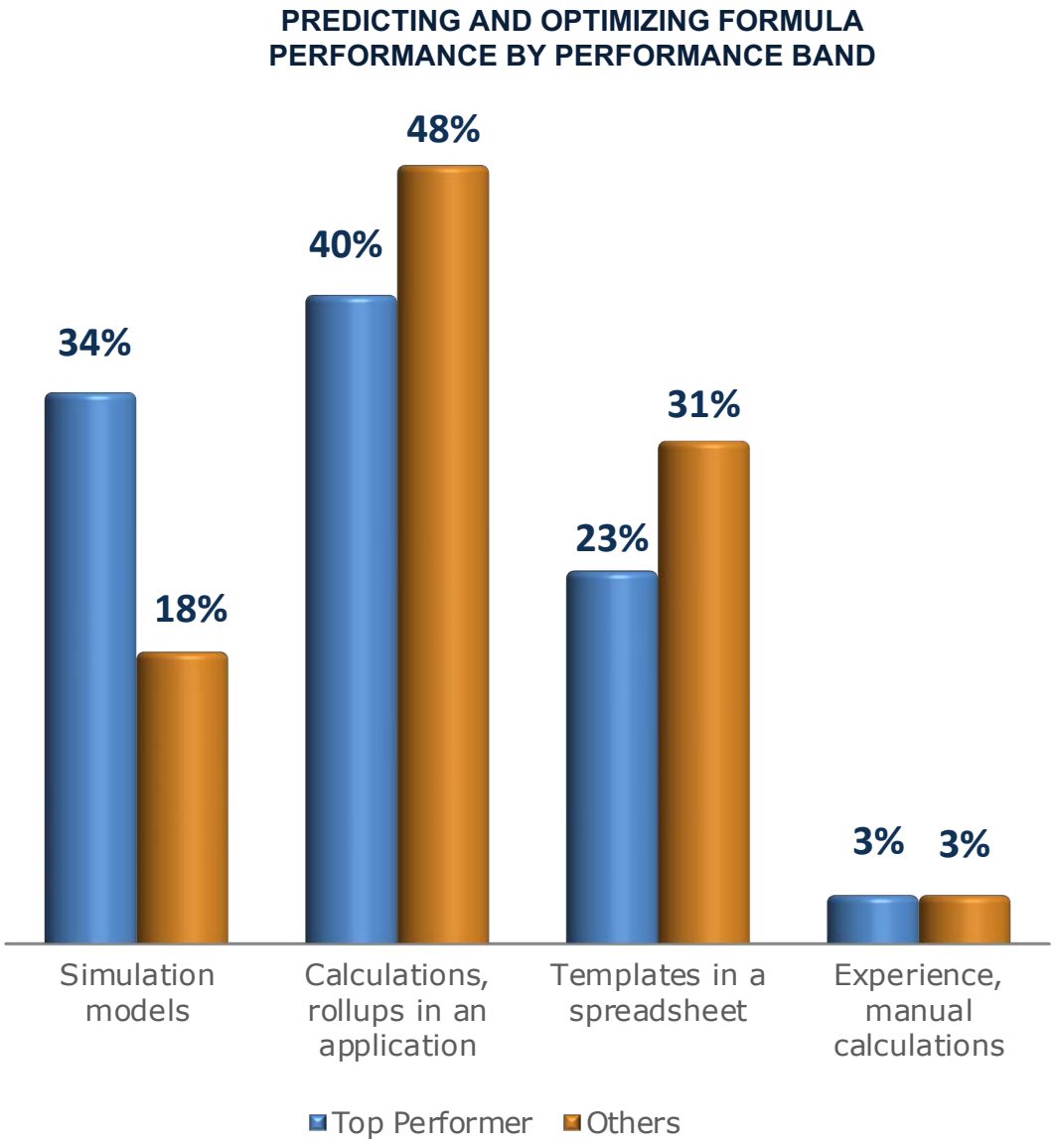
Leverage Advanced Product Formulation Techniques

More Advanced Formulation Capabilities

Perhaps one of the most important capabilities in a CPG company is the ability to optimize formulas. Formulations are a critical driver of product performance and typically have to be optimized across a number of competing factors ranging from performance characteristics to cost and compliance attributes. Given the importance, researchers took a deeper look into this capability.

Respondents were asked how their company predicts and optimizes formula performance by selecting the closest description to our maturity options. Top Performers are almost twice as likely to use simulation models to predict and optimize formula performance.

Top Performers take more advanced approaches to developing and optimizing formulations, leveraging more advanced technologies.



The State of PLM Implementations

Top Performers Put More into PLM

Top Performers spend a lot of time and effort to get the value they want from PLM. Our research found that PLM implementations of the leading companies had some things in common. While these approaches may not be commonly considered best practices, for example customizing PLM versus using it out-of-the-box, they reflect the current reality of PLM in CPG. It's important to note that these practices are likely more costly in direct expenses, time, and resources and new approaches, such as cloud solutions, may be more favored by enterprises moving forward.

Top Performers PLM Systems are Different

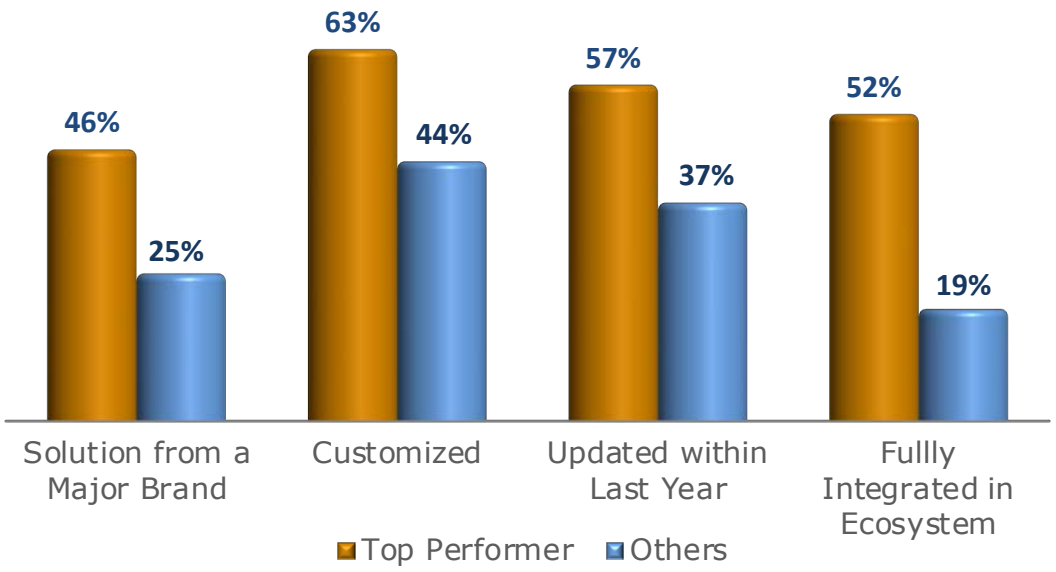
Top Performers are almost twice as likely to have invested in a PLM system from a major brand*. That is the most common approach, held by about one-half of Top Performers.

The leaders have also modified their systems to meet their needs. About two-thirds of Top Performers have customized their PLM systems, and over one-quarter have heavily customized it.

Top Performers have kept their systems up to date. About one half of Top Performers also have up-to-date systems, less than one year old. On the other hand, about one-third of Others have systems that are over three years old.

Lastly, Top Performers have more integrated ecosystems for product innovation and product development. They are almost three times as likely to have PLM integrated with other systems that support designing, developing, producing, and commercializing consumer packaged goods.

THE STATE OF PLM BY PERFORMANCE BAND

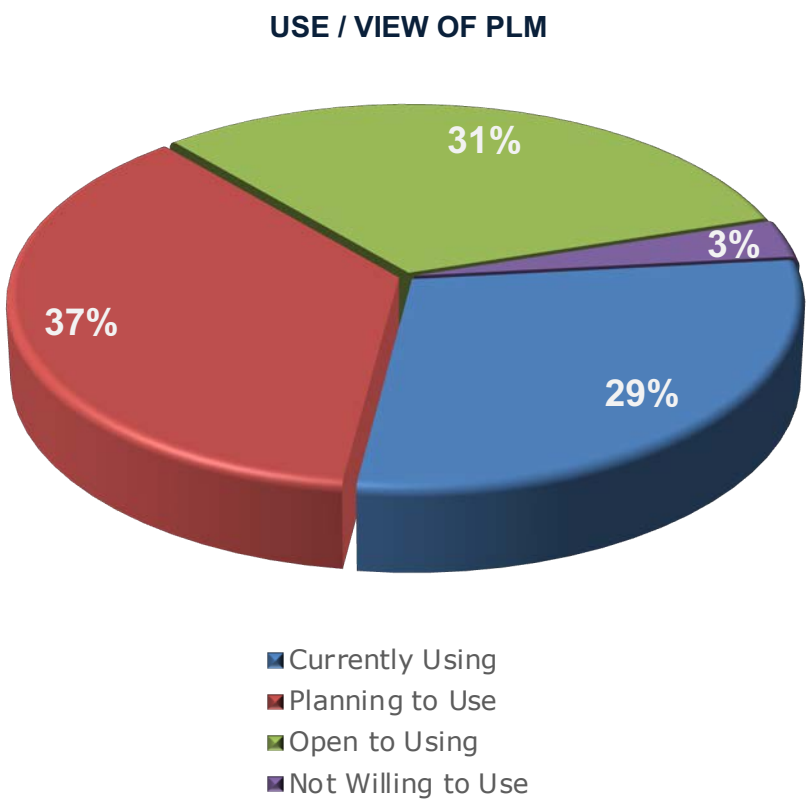


Top Performers' systems have some commonalities, although not all of them (for example customization) are commonly considered best practices.

*See About the Research

Tech-Clarity

Move to the Cloud



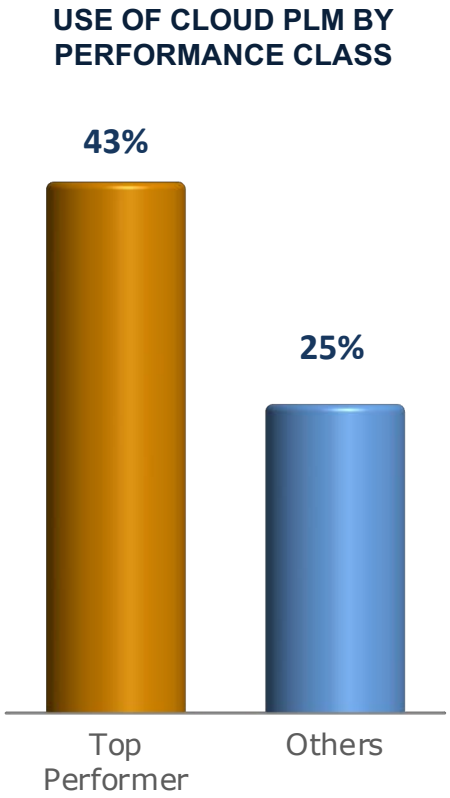
A significant shift to the cloud is underway and the leading companies are embracing cloud PLM.

Cloud is More Favored Than Currently Implemented

The software industry as a whole is experiencing a significant shift to the cloud. Given this, researchers investigated CPG companies' usage and views on cloud PLM. The findings show that the CPG industry favors the cloud for PLM. Only a small portion, 3% of CPG companies, say they are not willing to use cloud PLM. In fact, just under one-third say that they are already using cloud PLM. The survey did not ask if the cloud solution was their primary PLM system, so the percentage of CPG companies using the cloud as their main PLM solution may be lower. Regardless, this suggest a significant shift to the cloud.

Leaders Moving Faster

Despite the fact that cloud PLM is relatively new, Top Performers are 72% more likely to have embraced it. Although it may be too early to correlate Top Performers' use of the cloud with their higher level of performance, it's a statistic to watch over time and clearly shows that the leaders believe in the cloud. As stated above, the survey did not specify whether this was the primary PLM system. Our experience leads us to believe that the percentage currently using cloud PLM solutions as their primary PLM solution is lower.



Conclusions

Top Performers Show That PLM Systems Can Deliver More Value

PLM provides significant top-line, bottom-line, and operational value for CPG companies. Surveyed companies report multiple business benefits ranging from time-to-market improvements to increased compliance and traceability.

Even with the high level of value realized, there is more to be achieved by extending PLM further. Top Performers set the stage to show how Others can get the most of their current PLM investments. Top Performers, more than Others:

- View PLM as a strategic platform for product innovation
- Recognize the value of PLM internally and in the value chain
- Extend PLM to more departments
- Digitalize data and processes
- Use more (and more advanced) PLM capabilities
- Use more advanced data modeling and simulation capabilities

PLM Systems Must Evolve to Support Digital Transformation

The majority of CPG companies believe their existing PLM systems are adequate for their current needs. But they also recognize that PLM is vital to achieving their highly strategic, digital transformation initiatives. The current status quo of using multiple systems, which are typically customized and not fully integrated into the ecosystem, is an inhibitor to achieving digital transformation and extended value. Not surprisingly, the majority of surveyed participants don't believe their current PLM system will meet their company's future needs.

Top Performers point the way toward the future of PLM. They adopt PLM as a platform for the enterprise and supply chain that is more integrated, more advanced, more widely adopted, and kept more current. It's important to note that the systems have typically been heavily customized, and not everyone can afford the tradeoffs between customization, cost, and keeping implementations up to date. But they are rewarded with better innovation, product development, and compliance – all of which help drive higher profitability.

The Future is Bright, But There is Work to be Done

PLM is already driving a lot of value, but the status quo finds most CPG companies unprepared for the future. PLM needs are changing, and PLM must adapt and evolve. CPG companies that want to retain or improve their product innovation performance must continue to improve their PLM implementations and capabilities.

About the Research

Data Gathering

Tech-Clarity gathered and analyzed responses to a web-based survey from over 155 companies that design, develop, produce, and/or commercialize consumer packaged goods. Survey responses were collected through direct e-mail, social media, and online postings by Tech-Clarity, Kalypso, and 3rd party data collection services.

Industries

The respondents represent a cross-section of CPG industries. 45% were from Food and Beverage, 14% Household Products, 13% Pharmaceuticals, 10% Cosmetics, 10% Plastics, 7% Nutraceuticals, and 6% Tobacco.*

Company Size

The respondents represent a mix of company sizes, including 6% from companies with over 10,000 employees, 12% with 5,001-10,000 employees, 40% with 1,001-5,000 employees, 37% with 501-1,000 employees, and 5% with 101-500 employees.

Geographies

Responding companies report doing business in North America (71%), Western Europe (50%), Asia (24%), Australia (11%), Eastern Europe (10%), Latin America (9%), and Africa (7%), Middle East (3%).*

Role

The respondents were comprised of 8% Executive, 39% Directors or VP Level, 26% Manager level, and 27% individual contributors.

Organizational Function

Of the respondents, 47% were in Manufacturing roles, 25% Formulation, 13% Project Management, 11% Process / Production Engineering, 5% Packaging Design, 5% General Management, 3% Information Technology (IT), and others including Quality /Compliance, Label Design, Analyst/Simulation Expert, and Marketing.

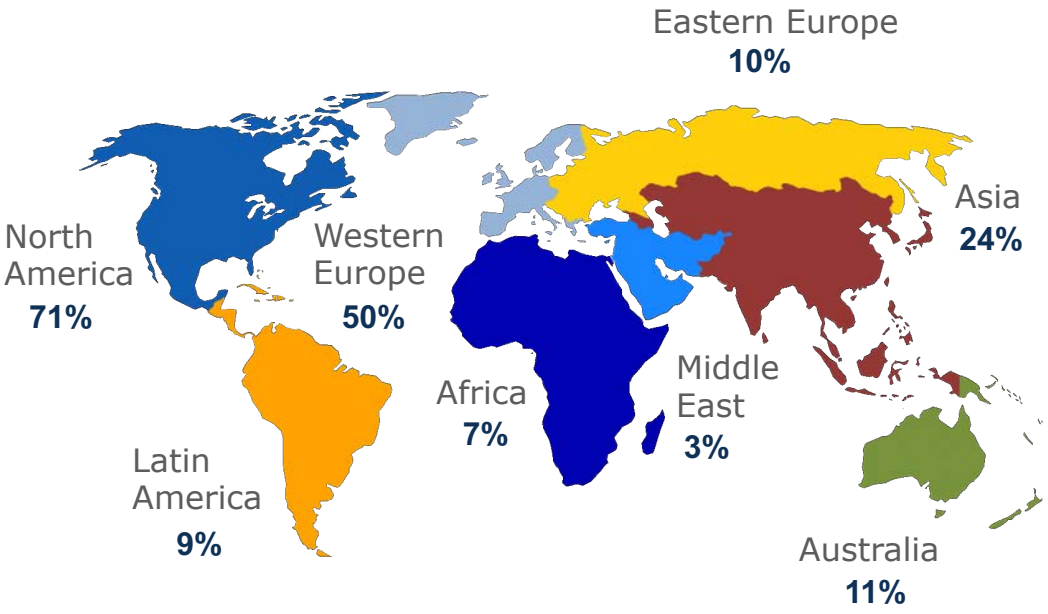
Company Activities

Responding companies reported doing activities in Manufacturing (93%), Formulation (77%), Process /Production Design (46%), Packaging Design (38%), Label Design (32%), Commercialization (30%), Material Supply (19%), and Primary Research (6%).*

Definitions

Examples of major brands used in the survey include Dassault Systemes, Oracle, SAP, and Siemens.

* Note that the values may total greater than 100% because companies reported doing business in multiple industries 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) Jim Brown, Executive Strategies for Long-Term Business Success, Tech-Clarity 2019.

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