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# BEYOND ORDINARY PLM: BEST PRACTICES FOR A HOLISITC, QUALITY-FIRST PLM STRATEGY

January 2023

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Customer expectations have evolved tenfold over the past few years, and product development tactics must evolve with them. Best-in-Class companies set themselves up to exceed customer expectations by leveraging comprehensive product lifecycle management (PLM) capabilities to boost product quality, reduce operating costs, and make data-driven decisions. This report demonstrates how prioritizing quality in your PLM strategy can lead to greater business outcomes.

## The Best-in-Class Recognize That Traditional PLM Strategies Fall Short

Consumers and businesses crave new products that solve their day-to-day challenges, and after the revolution of customer experience over the past few years, modern buyers have higher expectations than ever before. Manufacturers need processes in place to get high-quality products and services into the market as quickly and as cost effectively as possible. Product lifecycle management (PLM) helps manufacturing organizations collaborate internally across all stages of product development and deployment to do just that, but with the new customer dynamics of today's business environment, traditional PLM isn't enough.

Aberdeen's latest research with 200 PLM decision-makers shows that adopting a holistic, quality-first PLM strategy can improve decision-making to reduce operating costs, stay on top of new trends, and solve customer problems before they arise. Aberdeen's study, which investigates how top performing organizations leverage PLM technology to support quality management processes, includes manufacturing organizations from five key industries:

- High Tech, **37%**
- Automotive, **30%**
- Industrial, **27%**
- Aerospace & Defense, **13%**
- Medical Devices, **13%**

Best-in-Class companies, defined by Aberdeen as the top 20% of organizations in the study based on performance in four key business metrics (see sidebar), provide a model for all manufacturers to follow. The Best-in-Class are more likely than All Others to address quality during

The Aberdeen maturity class framework is comprised of three groups of survey respondents. This data is used to determine overall company performance. Classified by their self-reported performance across several key metrics, each respondent falls into one of three categories:

- **Best-in-Class**: Top 20% of respondents based on performance
- **Industry Average**: Middle 50% of respondents based on performance
- **Laggard**: Bottom 30% of respondents based on performance

There may be references to a fourth category, All Others, which is Industry Average and Laggard combined.

## Best-in-Class Defining Metrics

**Avg. % of products that meet quality targets at design release**
- Best-in-Class: **78%**
- All Others: **64%**

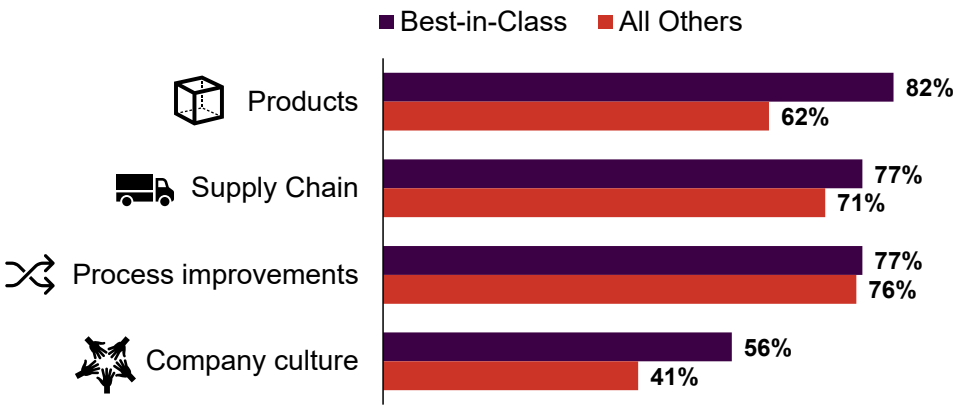
**Avg. % of products shipped with zero defects**
- Best-in-Class: **80%**
- All Others: **52%**

**Avg. year-over-year decrease in the cost of non-quality**
- Best-in-Class: **39%**
- All Others: **2%**

**Avg. year-over-year increase in customer satisfaction**
- Best-in-Class: **51%**
- All Others: **8%**

product development before it becomes an issue in supply chain/material sourcing or manufacturing (Figure 1).

**Figure 1: Product Quality is a Priority for the Best-in-Class**




**% of respondents targeting each area for quality improvements**

n = 200, Source: Aberdeen, January 2023

Best-in-Class companies are 32% more likely to target products for quality improvements (82% vs. 62%), meaning their quality initiatives revolve around activities such as increasing or maintaining standards, meeting customer requirements, and reducing product cost. They are also more likely to focus on improvements in company culture to boost quality in their organizations, indicating that they are committed to ingraining quality across all parts of the business.

With a focus on product quality and the systems and support to enable quality insights across the product lifecycle, manufacturers can develop strategies to:

- Make quality improvements before products leave the factory.
- Leverage product performance data to improve customer satisfaction.
- Identify areas for new product and upgrade opportunities.

## Why You Should Prioritize Quality in PLM

PLM covers a wide range of processes and touches many areas of the business, so it's important to build a PLM strategy that meets business needs on a holistic level. Best-in-Class companies are 26% more likely to adopt a holistic quality strategy where people, processes, and products are considered together rather than independent factors.

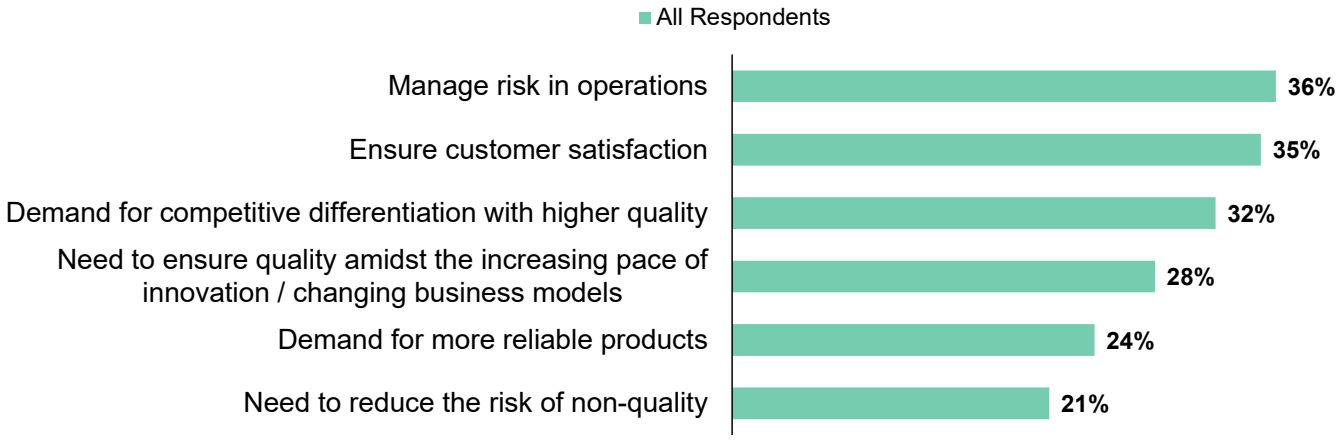
Best-in-Class companies are

**26%**

more likely to **adopt a holistic quality strategy** where people, processes, and products are considered together rather than independent factors.

Zooming out to identify what's going on in the market that is driving the need for change, it's clear that many of the top pressures are business problems that integrating quality into PLM can help solve (Figure 2).

**Figure 2: Market Pressures Reveal Applications for a Quality-First PLM Strategy**




n = 200, Source: Aberdeen, January 2023

Integrating quality into PLM helps manage operational risk across all areas of the product lifecycle by providing visibility into achievements against compliance goals at all stages. A quality-first PLM strategy also provides visibility into quality once products leave the factory, allowing manufacturers to monitor product performance and connect quality initiatives to improvements in reliability, functionality, and resulting customer satisfaction.

Competitive differentiation and the increasing pace of innovation require faster speed-to-market and sign-off on new product introductions (NPIs). When decision-makers have access to all quality data across the product lifecycle, they can make faster decisions to stay ahead of their competitors and act on innovative opportunities. Lastly, reducing the risk of non-quality requires businesses to think ahead and mitigate product issues later in the product lifecycle that could result in recalls or warranty redemptions. Visibility into quality data at all stages allows engineers to effectively evaluate previous quality issues and prevent them in the future.

The number one pressure shifts depending on industry (see sidebar). High Tech, Industrial, and Med Device manufacturers are in line with the total sample in the stress of managing risk in operations, automotive

## Top Market Pressure by Industry

**High Tech:** Manage risk in operations, **44%**

**Automotive:** Ensure customer satisfaction, **35%**

**Industrial:** Manage risk in operations, **45%**

**Aerospace & Defense:** Demand for competitive differentiation with higher quality, **35%**

**Medical Devices:** Manage risk in operations, **46%**

*% of respondents in each industry rating the pressure as one of their top 3*

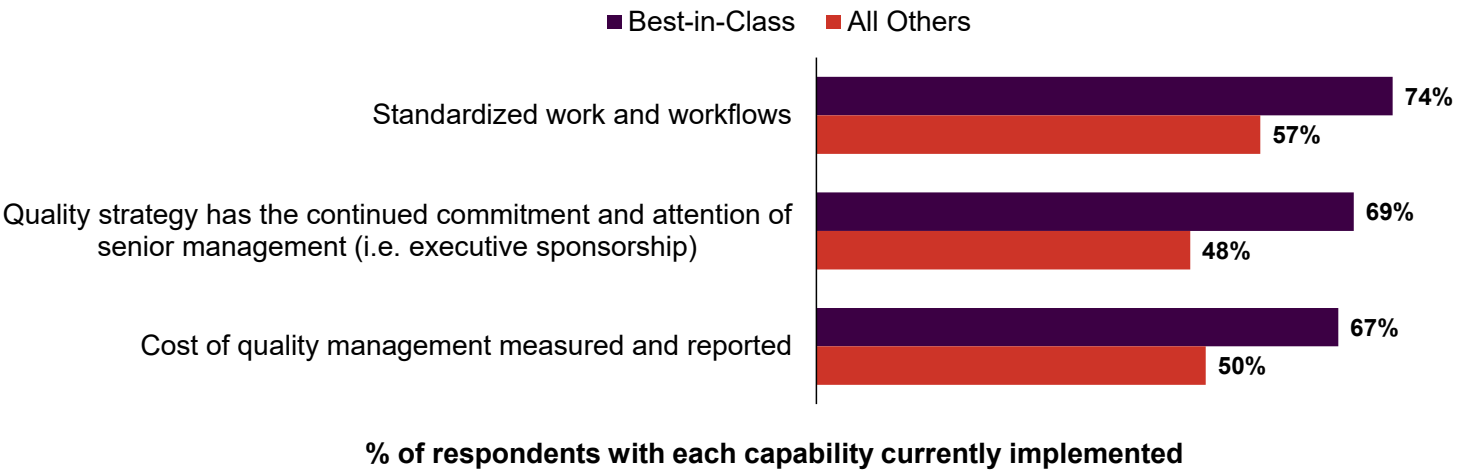
manufacturers feel more pressure to ensure customer satisfaction, and A&D manufacturers are concerned with the competitive business environment. Whichever pain point they are feeling most intensely, all industries can benefit from collecting, analyzing, and leveraging quality data across the product lifecycle.

## Developing a Quality-First PLM Approach

After covering why building quality into your PLM strategy is important, it's time to consider how to get there and what to do once you've achieved your goal of a quality-first PLM approach. Best-in-Class manufacturers provide a model of best practices to follow when it comes to investing in critical capabilities and supporting technologies as well as leveraging quality in PLM for decision-making and compliance.

When looking at the pillars of a Best-in-Class approach to quality and PLM, there is a clear focus on standardization, leadership, and measurement (Figure 3).

**Figure 3: Best-in-Class Quality Management Capabilities**




n = 200, Source: Aberdeen, January 2023

Standardization lays the groundwork for scalability. As companies look to grow and add new products or expand their global reach, they need standard processes and workflows to quickly bring operations up to speed. Standardization is also important for compliance to ensure there are no deviations from the approved workflow.

When you have leaders who value quality and see it as a competitive advantage, that's when your business can really start prioritizing quality and measuring its impact on business success. Aberdeen's study reveals that 74% of leaders at Best-in-Class companies are committed to quality

versus only 50% of leaders at other companies. These leaders are the champions for better training around quality assurance, investments in new technology to support quality initiatives, and building a culture of quality within the organization.

Quality impacts all areas of the product lifecycle from design to materials to production to field use, which means that there are many areas where a focus on quality can help cut costs. Measuring both the cost of quality and the potential for reductions in the cost of non-quality by preventing defects, recalls, or warranty redemptions helps advocate for further investments in quality. Tracking quality metrics throughout the product lifecycle develops a cycle of continuous improvement so leaders can identify areas where quality can improve performance, make changes, measure the impact of those changes, and repeat to keep increasing quality, speed, and accuracy while reducing costs.

Best-in-Class companies see the value in software applications to enable these critical capabilities (see sidebar).

**Best-in-Class companies are**

# 49% more likely

**to utilize PLM applications than All Others to support quality management** (67% vs. 45%).

PLM applications are essential for planning, tracking, and measuring product behavior at all stages of development. The Best-in-Class also invest in BI to help analyze quality data throughout the product lifecycle and visualize it for business leaders. Supporting applications like QMS, SCM, MES, and ORM help to manage quality and safety during supplier selection and production. These applications are best utilized when integrated with PLM to share data across stages of development.

Not every software application is created equal. Your business should determine which criteria you value the most and search for solutions that fit your needs. Compared to All Others, Best-in-Class companies care much more about criteria that will help them prepare for growth (Figure 4, next page).

# 74%

of leaders at Best-in-Class companies are committed to quality versus only 50% of leaders at other companies.

## Software Applications to Support Quality Management

**BI - Business Intelligence**
- ► Best-in-Class, **67%**
- ► All Others, **60%**

**PLM – Product Lifecycle Mgmt.**
- ► Best-in-Class, **67%**
- ► All Others, **45%**

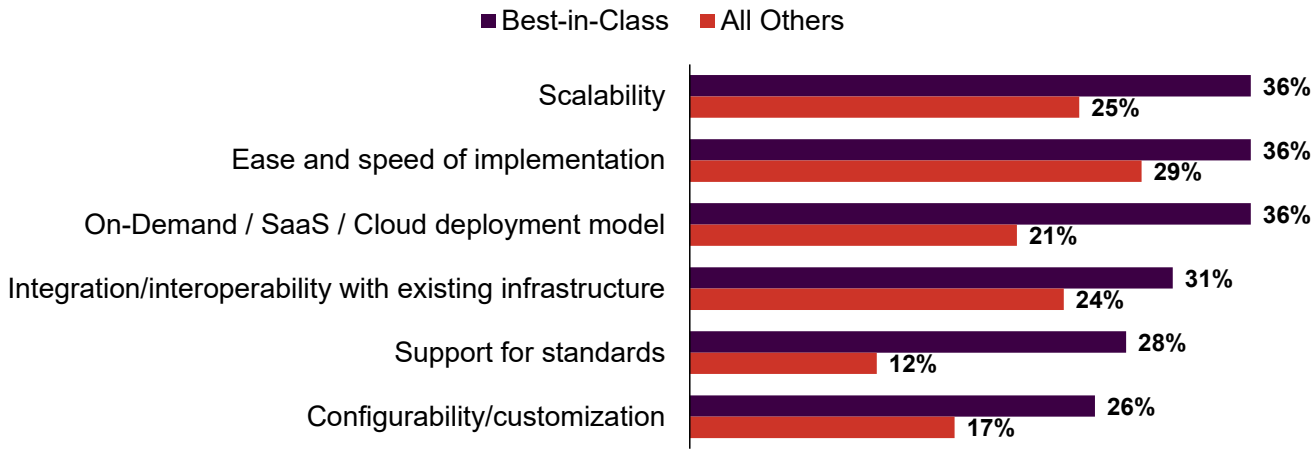
**QMS - Quality Mgmt. System**
- ► Best-in-Class, **67%**
- ► All Others, **50%**

**SCM - Supply Chain Mgmt.**
- ► Best-in-Class, **64%**
- ► All Others, **50%**

**MES - Manufacturing Execution Mgmt.**
- ► Best-in-Class, **62%**
- ► All Others, **48%**

**ORM - Operational Risk Mgmt.**
- ► Best-in-Class, **62%**
- ► All Others, **52%**

**Figure 4: Criteria for New Solutions to Support Quality Show the Best-in-Class Plan Ahead for Future Business Growth**




**% of respondents rating each as one of their top 4 decision criteria**

n = 200, Source: Aberdeen, January 2023

As manufacturers add factories and personnel or conduct mergers and acquisitions, PLM solutions that improve scalability can easily expand data collection capabilities and accessibility across new teams. Ease and speed of implementation and customization are helpful in deploying existing solutions for new teams as well as bringing new solutions on board quickly. Support for standards is also extremely helpful in a PLM solution that monitors every aspect of product development to ensure compliance with environmental, safety, and corporate-mandated quality rules.

Cloud solutions improve scalability by reducing the costs and complexity associated with installing or removing physical servers. Among the many benefits of cloud-based solutions is the storage and pricing flexibility. You only pay for what you need, so as your business grows, you can start small and add more storage as needed to house and process product and quality data. Integration is critical for visibility and reduces errors from manually transferring data from one solution to another.

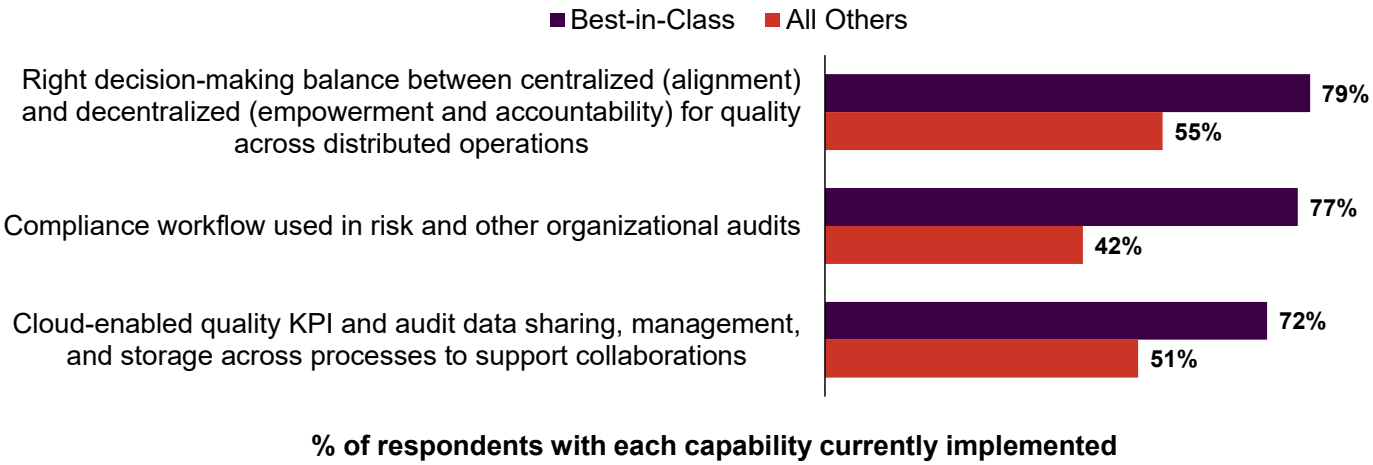
As you build your quality-first PLM strategy, be sure to select the solutions that are right for your business while keeping in mind which capabilities and functionality are associated with greater business success.

**As manufacturers add factories and personnel or conduct mergers and acquisitions, PLM solutions that improve scalability can easily expand data collection capabilities and accessibility across new teams.**

## Elevating Beyond Ordinary PLM with Faster, Data-Driven Decision-Making

Once you have a quality-first PLM strategy in place, it's time to put those processes, capabilities, and technologies to work. In addition to ingraining quality into their processes and tech stack, Best-in-Class companies are more likely to leverage quality insights for decision-making. They have developed top-up and bottom-down decision-making processes to effectively manage their operations, standardized their compliance workflows, and established KPI-sharing channels for better collaboration (Figure 5).

**Figure 5: Best-in-Class Decision-Making Capabilities**




n = 200, Source: Aberdeen, January 2023

The digital thread that PLM weaves between the areas of the business is a natural enabler for decision-making. Best-in-Class companies lean toward a combination of top-down and bottom-up decision-making to incorporate both enterprise-level and team-level needs. These business and team leaders all need access to quality data, and PLM provides a window into that from all angles.

Utilizing your quality-driven PLM strategy to strengthen compliance helps reduce operational risk and reduce costs of non-compliance, two of the top market pressures manufacturers face. Quality data provides actionable insights into which processes are meeting compliance standards and which are not, allowing business leaders to shift operations accordingly before receiving audit penalties.

Cloud-enabled data sharing, made possible through SaaS solutions and integration, supports data-driven decision-making by giving business

leaders the tools and channels to gather more information before taking action. They can monitor quality KPIs and audit results to identify where and when adjustments need to be made to avoid non-quality issues, schedule predictive maintenance, and plan for future NPIs or upgrades. With access to real-time metrics, business leaders can get ahead of changes in customer expectations or product performance issues to ensure customer satisfaction and loyalty.

## Performance Benefits of Integrating Quality into PLM

As a result of the quality-first PLM strategy that Best-in-Class companies have adopted, they are more likely to generate products that meet customer expectations (Table 1).

**Table 1: The Best-in-Class Are More Likely to Hit Product Targets**

| Product Target | *% of products meeting targets at design release* | |
|---|---|---|
| | **Best-in-Class** | **All Others** |
| Product revenue targets | **77.7%** | **64.9%** |
| Product cost targets | **75.8%** | **61.6%** |
| Product launch dates | **75.7%** | **62.9%** |

Staying ahead of the pace of innovation and leveraging data collected from customers and products in the field has allowed top performers to know what their customers want and need. This has helped them develop products that customers are more likely to buy, increasing their likelihood of hitting their revenue targets. Meeting their cost targets allows manufacturers to give their customers a price point that meets their expectations. By producing higher quality products on time and at lower costs, Best-in-Class companies are able to stay ahead of their competitors.

A focus on quality improves more than just products. Best-in-Class manufacturers are also seeing advantages over All Others in business quality performance metrics (see sidebar). Their holistic, quality-first PLM strategy results in greater efficiency in the factory, better relationships with clients outside the factory, and more opportunities for developing innovative NPIs in the future.

The benefits for the Best-in-Class don't stop there. They are also ahead of All Others in their annual improvements in business metrics, showing their commitment to excellence and continuously working to stay ahead of

**Compared to All Others, Best-in-Class companies have:**

**51%**

more customers that use them as a certified supplier

**51%**

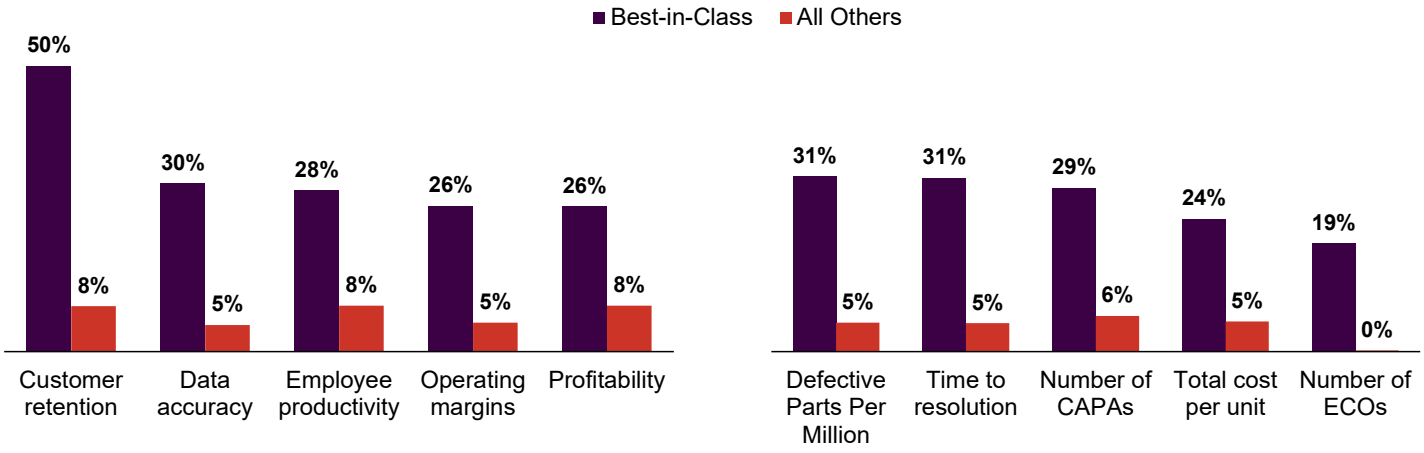
more NPIs that achieve time, volume, and quality targets

**45%**

greater overall equipment effectiveness (OEE).

their competition. The Best-in-Class work year-over-year to achieve happier customers, greater efficiency, most trusted data, and higher profits (Figure 6).

**Figure 6: How Companies Utilize IoT in the Service Environment**




n = 200, Source: Aberdeen, January 2023

The set of metrics on the left of Figure 6 shows the areas where the Best-in-Class saw positive increases over the past year. It's no surprise that happier customers are more likely to make repeat purchases, resulting in higher annual customer retention increases. With PLM acting as a single database for collecting, storing, and analyzing all forms of product data, the Best-in-Class are seeing greater year-over-year improvements in data accuracy. By spending less time reconciling data from multiple systems and fixing manual errors, employees at Best-in-Class manufacturers can focus on more valuable activities, thus increasing their productivity over the past year. Greater employee productivity and OEE along with other quality-related cost and time savings contribute to improvements in operating margins and, in turn, increases in overall profitability.

The set of metrics on the right of Figure 6 shows the areas where the Best-in-Class saw positive decreases over the past year. Commitment to better quality at all stages of the product lifecycle results in fewer defects, fewer corrective and preventative actions (CAPAs), and fewer engineering change orders (ECOs). Reducing the amount or resources spent on these time-consuming, costly errors helps reduce the total cost per unit and wasted raw materials. Additionally, Best-in-Class companies experience 5.2x greater year-over-year decreases in time to resolution than All Others (31% vs. 5%). This demonstrates the impact of Best-in-Class decision-making capabilities and the value of empowering business leaders to not only identify opportunities but also act on them.

Best-in-Class companies experience

**5.2x**

greater year-over-year decreases in time to resolution than All Others (31% vs. 5%)

## Key Takeaways & Recommendations

A holistic, quality-first PLM strategy improves the overall health of the business by giving business leaders the data and the tools they need to make better, more informed decisions across all stages of product development. When reflecting on how manufacturers can keep quality at the forefront of their PLM strategy, there are three points to remember:

- Standardization, leadership, and measurement are foundational building blocks of a strong relationship between quality and PLM. A comprehensive PLM solution that promotes business growth is the cornerstone.
- Greater visibility into quality data across the product lifecycle opens doors for better understanding of customer needs and creates the channels to convey them back to development teams. Best-in-Class companies have capitalized on this to achieve greater business performance across a myriad of KPIs.
- The Best-in-Class don't stop when they've arrived at the top of the food chain. They keep innovating and improving their processes and products to deliver value for their customers and stay ahead of the competition.

As consumers and businesses continue to evolve, manufacturers need to prioritize quality throughout the product lifecycle to cut costs, solve customer problems, detect changes in buying behavior, and innovate to exceed expectations. Companies that follow in the footsteps of the Best-in-Class are better positioned for growth and success with today's modern customers.

## Related Research

- The Four Building Blocks to Unleashing Continuous Innovation; April 2022
- Bringing Cloud-Based Innovation and Efficiency to Manufacturers; March 2022
- Digital Transformation in Manufacturing and Engineering: Accelerate Time-to-Market, Increase Quality, and Reduce Costs; December 2021
- Weaving Quality into the Digital Thread; March 2020

## About Aberdeen Strategy & Research

Aberdeen Strategy & Research, a division of Spiceworks Ziff Davis, with over three decades of experience in independent, credible market research, helps **illuminate** market realities and inform business strategies. Our fact-based, unbiased, and outcome-centric research approach provides insights on technology, customer management, and business operations, to **inspire** critical thinking and **ignite** data-driven business actions.