

USHERING IN A NEW ERA OF PRODUCT DEVELOPMENT

CLOUD-NATIVE SOLUTIONS DRIVE AGILE PROCESSES
AND REAL-TIME COLLABORATION



INTRODUCTION

Is Your Upcoming Product Launch at Risk?

It's not uncommon to read about product launch failures in today's headlines. In February 2022, Cruise, the autonomous vehicle subsidiary of General Motors, introduced its robotaxis to the San Francisco public. Shortly after, the California Department of Motor Vehicles suspended the driverless taxis due to several mishaps, including hitting a pedestrian.¹ In 2016, Samsung launched the Galaxy Note 7 smartphone. More than 2.5 million units were recalled a few months later due to a battery flaw which caused the device to catch fire.²

How can manufacturers avoid these failures and reap the rewards of innovation?

Greater visibility into [design for manufacturability \(DFM\)](#) and quality issues early in the product development cycle may have enabled General Motors' and Samsung's teams to prevent their products from malfunctioning.

To minimize risks and achieve commercialization success, organizations must rethink traditional product development practices and embrace more modern approaches. This is especially critical in today's global economy, as companies now deal with increased competition, evolving regulatory requirements, supply chain disruptions, and a shift to a virtual workforce.

In this ebook, we explore how cloud-native solutions provide manufacturers a more agile and collaborative framework to efficiently execute product work and accelerate innovation.

New Product Development Stats

- Approximately 40% of developed products do not hit their commercialization targets^{3,4}
- Only 55% of product launches take place on schedule⁵
- 69% of new medical products are late to market, and the average schedule overrun is 25%⁶

NEW PRODUCT DEVELOPMENT (NPD) COMPLEXITIES AND CHALLENGES

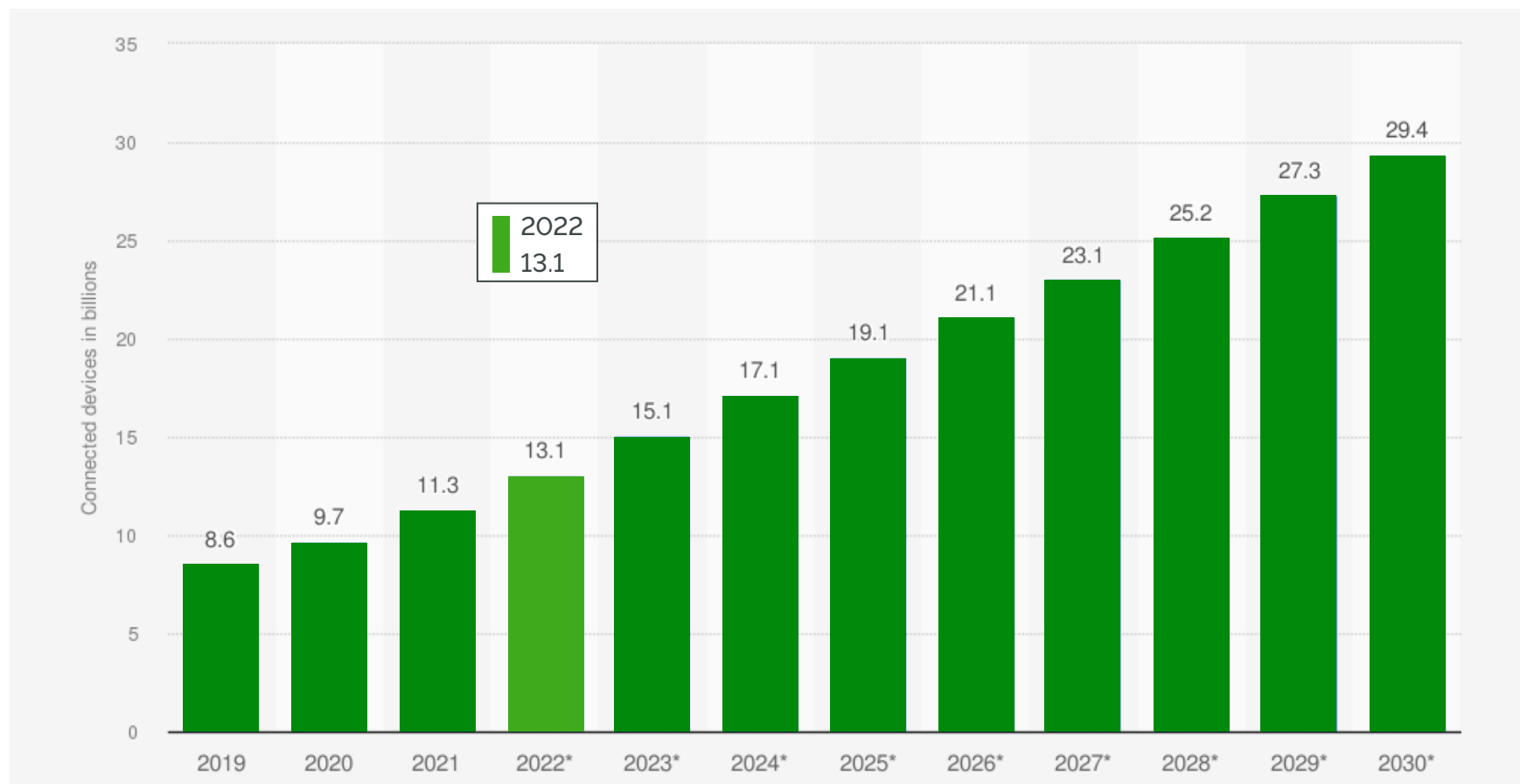
Increased Global Competition

Now more than ever, manufacturers are under extreme pressure to reduce their NPD cycle time and get products to market faster. Due to globalization, companies are facing greater competition and must deliver products at just the right time and price to gain first-mover advantages. Working under tighter schedules and greater cost constraints requires teams to resolve design and quality issues early on and make decisions quickly.

Technological Advancements

To meet consumer demand for tailored experiences, innovators are leveraging software along with advanced technologies like the [Internet of Things \(IoT\)](#), sensors, and artificial intelligence (AI) to design smarter, more connected products. Due to the complexity of these products, [original equipment manufacturers \(OEMs\)](#) must outsource more design and production work to contract manufacturers, sub-tier suppliers, and other specialists in the field. Involving them throughout the entire NPD process is critical to help circumvent interoperability and manufacturability issues that could delay product launches.

Number of IoT connected devices across all industry verticals worldwide is forecast to reach 29 billion by 2030.



*Source: [Statista](#)

Evolving Regulatory Landscape

Due to emerging technology and the global push for more environmentally friendly products, the regulatory world is changing at a rapid pace. Industry regulations and standards are constantly updated to address new product performance, safety, security, and sustainability criteria. Consequently, manufacturers must regularly reevaluate their design, validation, and production processes to keep up with evolving requirements and ensure compliance.

Implementing strong [design controls](#) and [corrective and preventive action \(CAPA\)](#) processes is a necessity for life sciences manufacturers looking to comply with the quality system directives set forth by the [FDA](#) and [ISO](#). They must also gather and maintain more extensive clinical evidence to support the product's safety and performance claims and comply with the latest European Union (EU) medical device regulations (e.g., [MDR](#) and [IVDR](#)). Ensuring proper security controls and protection for the export of [ITAR](#)- and [EAR](#)-related data is a priority of companies in the aerospace and defense industry. And companies across all sectors must source compliant components and materials if they want to adhere to environmental regulations such as [REACH](#), [RoHS](#), and [WEEE](#).

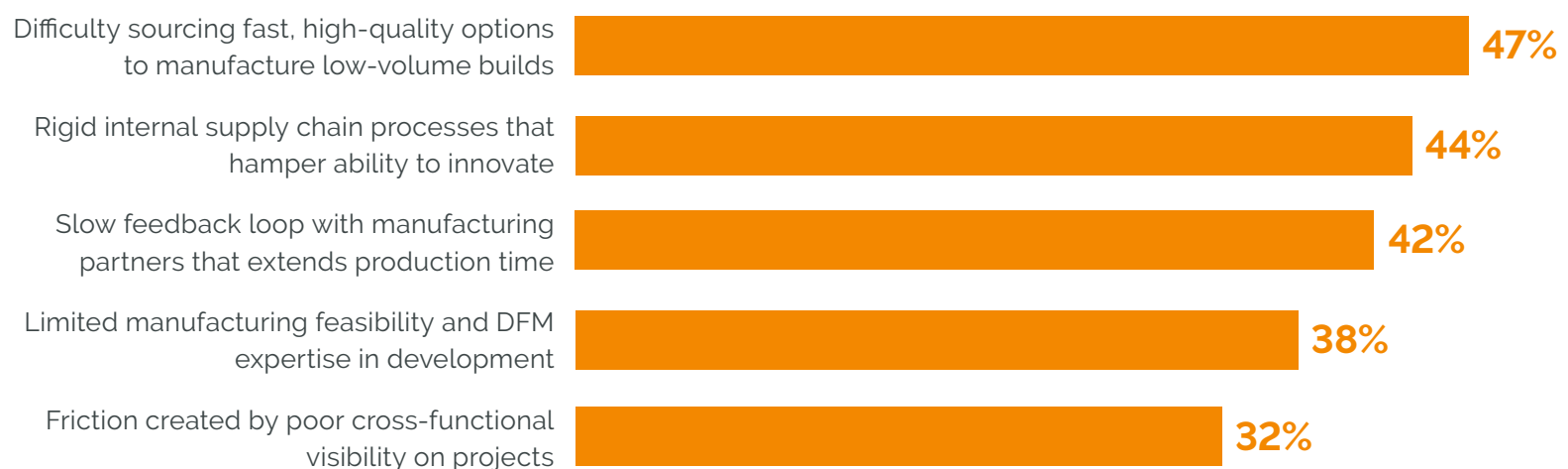
In essence, having a system to effectively track, manage, and report compliance evidence for these various regulations is critical to helping companies meet their NPD timelines and fulfill commitments to customers.

Business Shifts

Economic headwinds are impacting consumer demand and manufacturers' ability to source parts and get products to market. More companies are having to lay off some of their workforce to address shrinking demand in our weakened economy. These conditions ripple through the entire supply chain, putting an additional strain on companies' abilities to deliver products to market.

To compound matters, many companies have adopted remote work practices as a result of the COVID-19 pandemic. With internal and external teams scattered across the globe in multiple time zones, it is harder to keep everyone on the same page throughout the NPD process.

What barriers does your organization face with new product innovation?

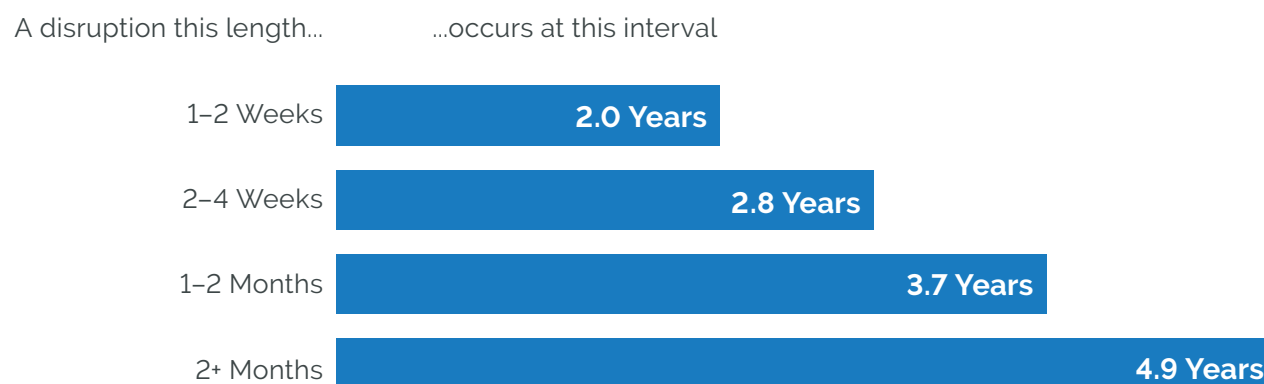


*Source: [2022 State of Manufacturing Report](#)

Supply Chain Disruptions

Unforeseen events like the COVID-19 pandemic and natural disasters have created more part shortages, logistics issues, and other supply chain disruptions. To gain greater visibility and respond quickly, teams must collaborate frequently with their supply chain partners and have access to accurate, up-to-date sourcing information.

Companies can expect to experience supply chain disruptions lasting at least a month approximately every 3.7 years.



*Source: [McKinsey Global Institute](#)

TRADITIONAL VS. MODERN APPROACH TO NPD

The Old Way: Siloed Teams, Disconnected Systems, and On-Premises Solutions

Traditionally, NPD has been centered around an in-house team of engineers that work independently to develop, test, and fine-tune the product design. In many instances, quality assurance, procurement, manufacturing, and other downstream players are not formally brought into the loop until the early production phase. This informal process works well if everyone is under the same roof and can readily review the design and exchange ideas. However, as more manufacturing steps are outsourced and teams become dispersed, the system breaks down. Eventually, companies encounter design for manufacturability (DFM) issues which prevent them from meeting their quality and cost targets, or even worse, getting products to market ahead of the competition.

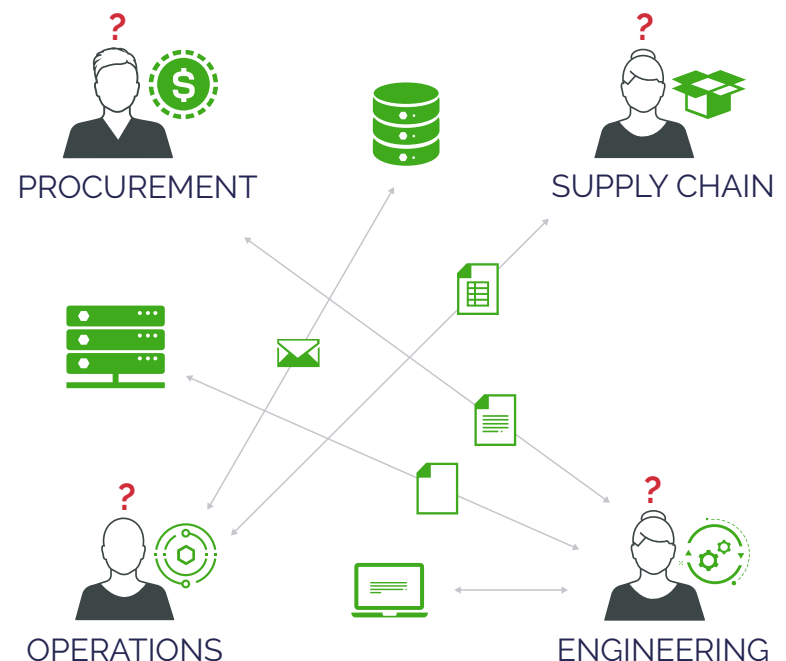
Throughout the NPD process, teams rely on a myriad of tools to manage product and quality information. Engineers typically start with [mechanical CAD \(mCAD\)](#), [electrical design automation \(EDA\)](#), and [product data management \(PDM\)](#) software to create and maintain their design files. Because these systems are intended for engineering workgroups, it is difficult for downstream product teams and external partners to provide input early in the design cycle.

Point software solutions, spreadsheets, and even paper are often used to develop and share critical records such as bills of materials (BOMs), design history files (DHF), and standard operating procedures (SOPs). These records are ultimately saved to local hard drives, one or more shared drives, and/or physical storage sites.

Getting today's distributed product team members to review, revise, approve, and implement changes can be challenging with these siloed, disconnected systems. It is difficult to identify the latest revision when information is stored and maintained in multiple locations. This gives way to engineering change orders with prolonged review cycles and mistakes which result in production errors and delays.

Tracking and maintaining quality documentation and processes is also labor-intensive and unreliable with this siloed approach. Team members must manually link quality information to the product record to keep everything in sync. Otherwise, there is no traceability or visibility into nonconformities that impact the final product. This could lead to the reuse of troublesome parts and subassemblies. In the case of highly regulated companies, it could also create compliance risks.

Lastly, these traditional NPD practices do not enable real-time collaboration across dispersed teams, slowing down the response to design errors, part shortages, and other issues that impact product launch schedules.



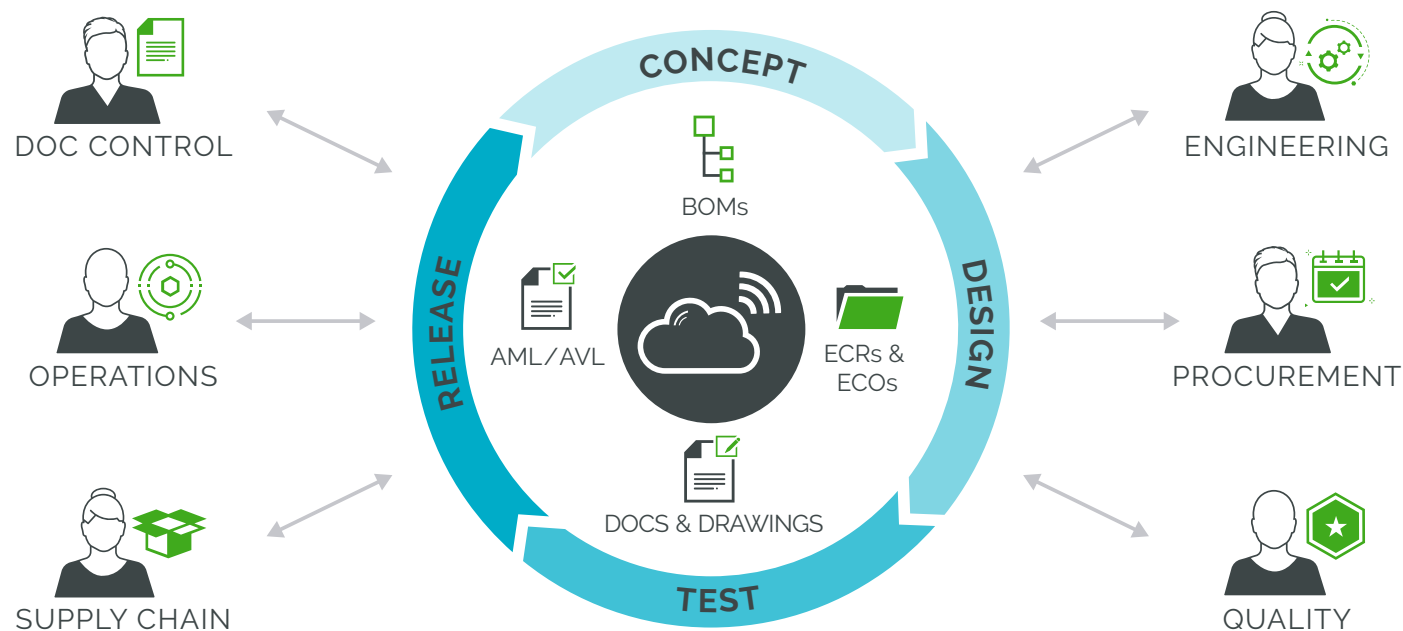
Challenges With On-Premises Enterprise Solutions

While many companies recognize the advantages of adopting a unified enterprise solution to manage NPD, some fall into the trap of investing in an on-premises platform. Oftentimes, businesses overlook hardware, software, firewalls, and other infrastructure required to use and access the system securely. Additionally, they lack the IT resources to implement robust security measures that safeguard sensitive intellectual property (IP).

Companies incur significant expenses from custom coding and upgrades in their effort to tailor the system to meet their unique requirements. As a result, they often get "rev-locked" on older versions of the software which prevents them from fully leveraging the system's enhancements (part of their annual support expense which typically runs up to 25% of the software costs). Remote employees often experience difficulties accessing on-premises systems due to VPN connectivity or firewall issues. Ultimately, companies grapple with exorbitant maintenance costs, frequent downtime, limited functionality, and security vulnerabilities.

These issues decrease productivity, hindering organizations from reaching their product development milestones. Furthermore, IP and compliance risks loom, especially for those companies regulated by export controls and cybersecurity regulations (e.g., ITAR, EAR, CMMC).

The Modern Way: Connecting Product Information, People, and Processes With Cloud-Native Solutions



To successfully coordinate the efforts of a globally dispersed team and accelerate NPD, manufacturers must drive more efficient, agile, and connected processes. By leveraging turnkey cloud-native [product lifecycle management \(PLM\)](#) and [quality management system \(QMS\)](#) solutions, internal teams and external partners can stay connected and better execute engineering changes, DFM reviews, regulatory audits, and other critical product development activities.

Efficient

Cloud-native PLM and QMS solutions aggregate mechanical, electrical, and software designs as well as all the associated product and quality processes into a single source of truth that can be accessed anytime and anywhere by global product teams. This immediate, real-time access allows internal teams and external supply chain partners to efficiently exchange information, resulting in improved component forecasting, shorter lead times, and shorter production cycles. With quality processes linked directly to the product record, teams can also speed the identification and resolution of issues and establish a solid closed-loop CAPA process to minimize compliance risks and enhance the customer experience.

Centralized management of the product BOM and automated change processes provides greater control over product information not realized with legacy practices and ensures that everyone always has access to current and accurate information. Automated revision controls are applied to BOMs, documents, and parts to drive better traceability throughout the entire product development process. In addition, project tasks are electronically tracked and linked to the product record so that teams can stay on course while meeting key deliverables.

Because teams are not burdened with manual, time-consuming processes and are accessing the same information, everyone can stay aligned and focused on getting high-quality products to market faster.



Arena scales with our growing business and affords us the opportunity to effectively meet the market demand for smart, customized energy solutions. We like the holistic approach with Arena, which integrates mechanical, electrical, and software design information in a single system for a centralized view of our product record.

—Andreas Sedlmayr, Co-Founder and CEO,
instagrid



Arena has become our one-stop solution for all things product- and quality-related. We no longer have to access multiple, disconnected systems. With just a few simple clicks, we can do the work that's needed to reach our product development milestones.

—Angette Nordqvist, Sr. Manager Quality Assurance,
SomaLogic

What Is the Difference Between On-Premises, Cloud-Native, and Cloud-Enabled Software Solutions?

On-premises solutions are typically installed and hosted at the customer's site. This single-tenant infrastructure requires IT resources for hardware, networks, and firewall services to ensure the system is optimized, secure, and can scale. Organizations often experience costly and lengthy upgrade projects that span weeks, if not months.

Cloud-native solutions are designed to run and reside in the Cloud from the start. They utilize multi-tenant architecture for maximum scalability. These solutions eliminate the need for software installation on desktops and avoid compatibility issues caused by different operating systems. They run on web browsers and can be accessed anytime and anywhere via a secure login. Since all customers use the same multi-tenant application, they benefit by having updates pushed automatically and seamlessly to their system without fear of breaking their system. Customers get continual access to new capabilities, increasing the value they originally paid for their subscription.

In contrast, many *cloud-enabled* solutions leverage single-tenant (or client-server) architecture and are simply hosted in a data center (Cloud). Many of the same issues that are experienced when hosting these single-tenant solutions at a customer's site still exist when hosted in the Cloud. Each customer's instance must be managed separately, and software providers must manage multiple versions of software across their entire customer base. Maintenance becomes more cumbersome and costly. Every customer must determine whether they can upgrade to the latest version of software based on their customer-specific customizations.

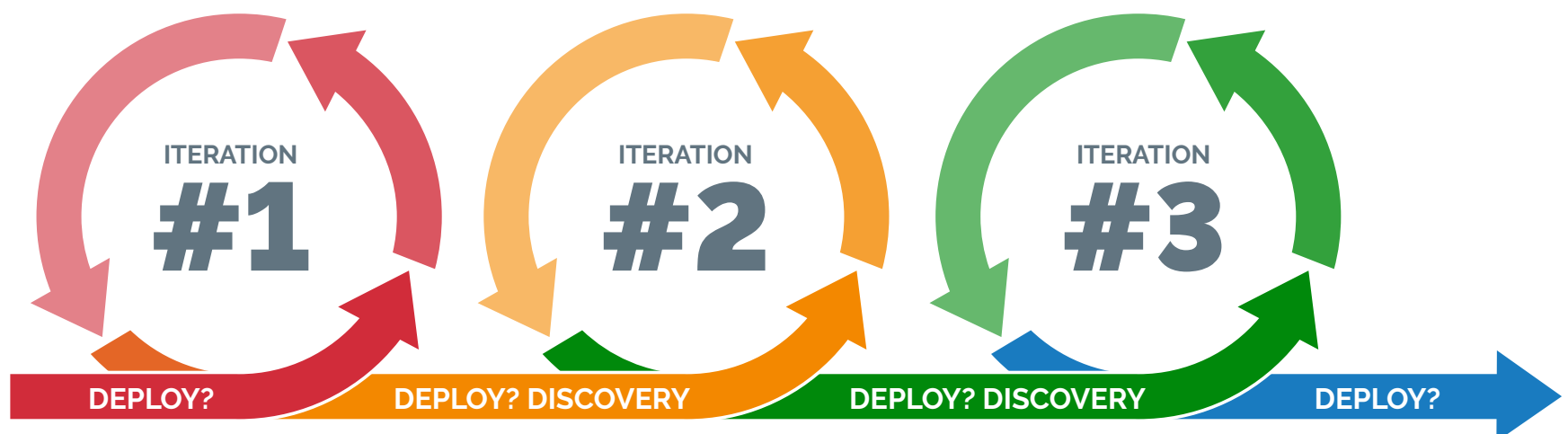


Agile

Companies must iterate quickly and frequently to keep up with ever-changing customer needs and address today's dynamic market conditions. Cloud-native PLM and QMS solutions facilitate this agile methodology by enabling cross-functional teams to collaborate in real time and readily exchange product information.

Through open communication, teams are empowered to experiment with different design ideas and implement changes within rapid iterative cycles. Once analyzed, changes can be quickly adopted or abandoned depending on whether they meet defined requirements and provide value to the customer. This fail-fast approach helps drive continuous improvement and faster innovation.

By exchanging information routinely, impacted teams also gain greater visibility and can respond quickly to part shortages, design errors, and other issues that impede production.



Connected

The availability of cloud-native CAD and PLM solutions enables a new level of frictionless communication for product design teams. By leveraging a seamless connection between these two systems, companies can streamline the flow of information and accelerate the time it takes to go from prototype to production. Design information can be easily disseminated to downstream team members and external partners. In turn, they can conduct early DFM reviews to avoid production errors, enhance product quality, and reduce the cost of goods sold (COGS). Because team members are accessing a single system, they can work concurrently to optimize the final design and release it to production much sooner.



ADDITIONAL RESOURCES

[Global Manufacturers Require Connected New Product Development Processes](#)

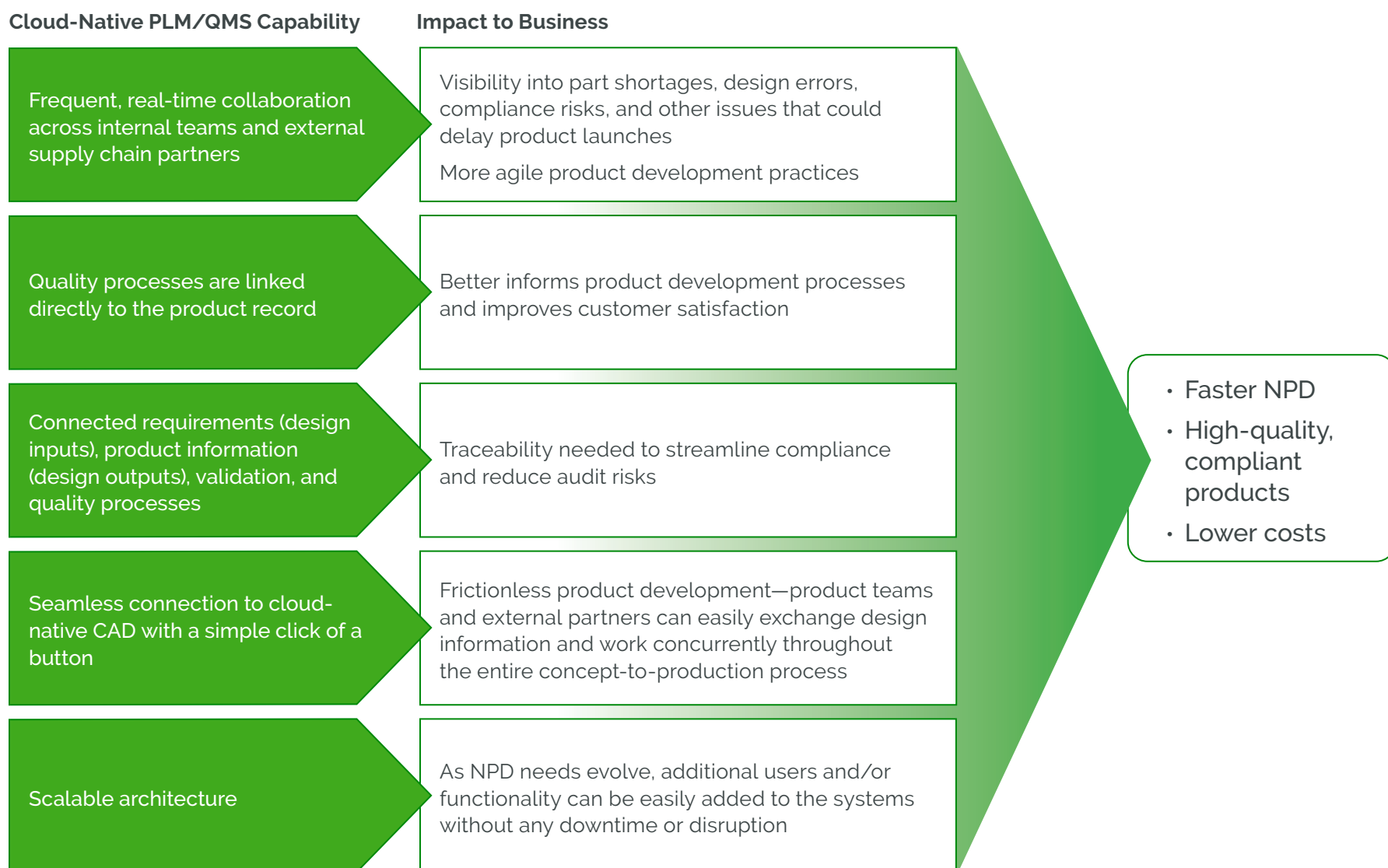
[5 Ways Manufacturers Can Boost Agility](#)

[Rethinking the Supply Chain: Staying Connected in Times of Uncertainty](#)

[4 Ways Connected Cloud PLM and CAD Optimize Design for Manufacturability](#)

“ We want to provide our people with flexibility in terms of how, where, and when they work. The connection between Arena PLM and Onshape’s CAD solution enables our global teams to collaborate on the latest designs anytime and anywhere. By conducting all our product work in a centralized system, we have greater visibility throughout the entire concept-to-production process and can deliver high-quality products on schedule.

—Andrzej Tunkiel, Lead Mechanical Engineer, Easee





A NEW ERA OF PRODUCT INNOVATION

To Keep Pace With Changing Technology and Succeed in Today's Volatile Market, Manufacturers Must Embrace a New, Agile Approach to NPD.

The days of working in silos and assuming you have all the answers up front are no longer feasible if you're looking to deliver highly sophisticated products ahead of the competition.

By bringing together all the product and quality information in a single system, cloud-native solutions like Arena PLM and QMS enable a globally dispersed team of engineers, contract manufacturers, multitiered suppliers, and other key stakeholders to collaborate in real time on the latest designs and iterate quickly to ensure that high-quality, compliant products are produced on time and within budget.

Over 1,400 companies spanning [high-tech electronics](#), [life sciences](#), and [aerospace and defense](#) have moved away from traditional NPD practices and are now embracing a new era of product innovation with Arena.

As the pioneer of cloud-native PLM/QMS software, Arena understands the complexities of NPD and the tremendous time and resources involved in getting new products to market. Our multi-tenant software-as-a-service (SaaS) model enables you to easily deploy, configure, and maintain the system without the burden of additional hardware or IT support. And our systems' multilayered security architecture ensures that your intellectual property is always protected. As your business continues to grow, Arena provides maximum scalability and flexibility to accommodate your evolving needs.

See how Arena drives faster innovation cycles across your supply chain. [Register for a free demo today.](#)

References

1. [The Worst Technology Failures of 2023](#)
2. [A Brief History of Samsung's Troubled Galaxy Note 7 Smartphone](#)
3. [New Product Development and Entrepreneurship Analytics](#)
4. [Perspective: New Product Failure Rates: Influence of Argumentum ad Populum and Self-Interest](#)
5. [2019 Product Manager Survey](#)
6. [Productivity Drivers in Medical Device and Healthcare Software Development](#)

**SEE ARENA
IN ACTION**

[> SCHEDULE A DEMO TODAY](#)



121 Seaport Blvd, Boston, MA 02210 : ptc.com