



# Accelerate Innovation with Subscription-Based PTC ALM Solutions

Adopt a holistic software and systems engineering approach that unifies teams and disciplines.

## Executive overview

### Product Transformation Starts with Software and Systems Engineering

The world is changing.

Smart, connected products are the future of manufacturing. Yet building these products requires greater collaboration and more complex orchestration across teams and disciplines. It also requires capabilities that give your teams every advantage to deliver higher quality, more competitive products that win in the marketplace.

A new family of subscription based PTC ALM solutions is designed to make it easier than ever to equip teams with the targeted capabilities they need to succeed. Designed to work synergistically, these complementary solutions deliver greater value for practitioners, managers, and the extended product development community.



## Collaborate as never before

With PTC ALM solutions, everyone benefits from transparent access to critical software and systems engineering intelligence.

- Software development teams rely on PTC Global Software Development to manage the flow of activities and assets across the software engineering lifecycle.
- Cross-functional hardware, software and systems engineering teams rely on PTC AgileWorx as their central hub for high-performance product engineering.
- Cross-functional engineering teams use PTC Model-Based Systems Engineering to specify and design products and product lines using standards-based models.
- Product owners, architects, and analysts use PTC Requirements and Validation to capture, manage, validate and share product and product line requirements with the extended engineering community.



Successful IoT initiatives demand mature software and systems engineering practices. The newest PTC Integrity family product releases deliver important benefits and can provide a clearer pathway to better approaches for this challenging, interconnected world.”

– Melinda Ballou, ALM and Executive Strategies Analyst, IDC



## Achieve breakthrough product engineering

### PTC AGILEWORX

Products have changed. They are smarter and connected. Relationships between customers and suppliers are more continuous and open ended. The global economy has changed as well, and disruptors are around every corner. How well you adapt – how quickly you are able to respond – will determine your ability to win. Agility is the optimized response to change.

#### Designed for Product Engineering Teams

Today, Agile practices are used by 91% of software teams.<sup>1</sup> That’s because Agile teams realize productivity improvements of 10X or more – with lower defect rates and higher rates of customer satisfaction.<sup>2</sup>

Yet many organizations face challenges in adapting proven Agile principles to the complexities of physical product development. Unlike software teams, product teams require close coordination of specialized hardware, software and systems engineering teams. Attention to safety, quality and compliance is paramount. And unlike software, physical products and variants must be managed over years and decades.

PTC AgileWorx is the first Agile solution designed for product engineering teams. As a cloud-based solution, AgileWorx provides a central hub where product teams can share ideas, prioritize activities, and manage product development progress. Unlike other solutions, AgileWorx is focused on products. It links to the CAD, PLM and ALM systems of record you rely on. PTC AgileWorx lets you focus on building great products – without sacrificing product safety or quality.

With PTC AgileWorx you can:

- Unify cross-discipline teams by providing whole team transparency and easy access to systems of record
- Safeguard quality and safety by aligning with the quality and compliance frameworks you already rely on
- Organize for product variants by sharing and reusing product components and user stories across teams, reflecting the way you naturally work
- Connect to real-time insight by integrating product feedback into your engineering lifecycle



## Gain visibility, control, and flexibility over the software lifecycle

### PTC GLOBAL SOFTWARE DEVELOPMENT

As software development teams struggle to keep pace with the explosive demand for software intensive products, they face daunting challenges to deliver higher quality, more innovative software in less time. Add the complexities of globally distributed teams, regulatory and compliance reporting requirements and a high velocity of change, and you'll see why a unified software lifecycle management solution is key to your success.

#### Flexible and Complete

PTC Global Software Development helps teams deliver higher quality, more innovative software with less risk. It provides comprehensive support for software requirements and validation; process and workflow; change, configuration and release management; and reporting, risk and compliance management. The solution excels at balancing rigor with flexibility, and can be used to automate any development process or methodology to meet team and organizational needs.

#### Audit-Ready

With PTC Global Software Development every item type has its own enforceable workflow that describes how it moves from state to state—complete with definable rules e-signature and full audit trails. Organizations with the most stringent audit requirements – including manufacturers of safety-critical products such as pacemakers and automotive safety systems—rely on PTC Global Software Development for comprehensive, automated and tamper-resistant audit reporting.

With PTC Global Software Development you can:

- Manage the flow of people, process and artifacts throughout the software lifecycle
- Replace multiple repositories of software requirements and user stories, change requests, defects, test data, code, builds and releases with one unified solution
- Gain visibility and control, with insight based on actual work activities, not estimates
- Enhance innovation by collaborating more effectively across the extended software team
- Safeguard strategic software assets with comprehensive change and release management
- Achieve compliance with CMMI, Automotive SPICE or functional safety frameworks like IEC 61508 or ISO 26262
- Automate your Agile, traditional or hybrid process



Our healthcare markets really demand compliance and traceability. We did a proper assessment and Integrity just came out as the best...With PTC Integrity Lifecycle Manager we gain a competitive edge because we can respond faster to requests of our customers.”

– Project Manager, R&D Tools and Data Management, Barco NV



## Capture, manage and validate product requirements

### PTC REQUIREMENTS AND VALIDATION

Mature requirements and validation practices are an integral part of the product development process and vital to mitigating risk in the development of complex and engineered products. Yet many organizations struggle to keep up with the volume and velocity of changes required. The explosive growth of product variants and the need to comply with multiple, overlapping regulatory requirements only adds to the pressure—and cost—of effective product stewardship.

#### Gain Insight and Oversight

The PTC Requirements and Validation solution empowers teams to capture, manage, validate and verify product and product-line requirements throughout the product lifecycle. End-to-end traceability reduces risk, while comprehensive change and audit management safeguards strategic assets and streamlines regulatory reporting. Rich data synchronization supports flexible collaboration across teams and vendors, including complex supply chains.

#### Whole Team Collaboration

With PTC Requirements and Validation you can:

- Safeguard strategic assets with a complete audit trail of every change as requirements evolve, branch, or change
- Speed time to market by reusing groups of requirements and pursuing parallel product development scenarios
- Integrate with PLM software to understand the impact of changing requirements to the product BoM
- Improve product quality by managing test sessions and verifying results against requirements
- Promote safe, whole team collaboration through comprehensive change management, with advanced versioning and baselining
- Reduce the cost of compliance with industry and standard regulations.
- Exchange large amounts of rich requirements information across tools and among partners, vendors, and customers
- Easily determine the impact of proposed changes

## Easily design, specify and validate complex systems

### PTC MODEL-BASED SYSTEMS ENGINEERING

Today's smarter, more complex products and systems are inherently more difficult to specify, design and evaluate. Without a common visual design approach, organizations struggle to create and improve complex products, product families and variants across large, distributed multidisciplinary teams. And without a systematic approach to re-use, teams find it hard to control costs and stay on schedule.

The PTC Model-Based Systems Engineering solution transforms how teams capture and communicate design ideas for next-generation products through standards-based modeling of system components, products and product lines, and systems of systems. The result is early, rapid concurrent exploration of options, improved cross-discipline collaboration, high rates of re-use, and accelerated time-to-market.

#### Whole Systems Thinking

Studies show that, when compared to typical systems engineering endeavors, the addition of model-based systems engineering alone delivers a 55% reduction in total development cost. The **productivity, savings, quality, compliance and time-to-market benefits** multiply with a collaborative, standards-based platform for systems engineering, systems of systems design and product line engineering.

The PTC Model-Based Systems Engineering solution empowers teams to:

- Get up and running quickly with best practices that reflect PTC's vast experience on actual projects
- Design components, products and product lines using industry-standard SysML in a scalable, multi-user environment
- Validate complex behavior early in the design lifecycle
- Simulate systems of systems design ideas with drag-and-play ease
- Simplify management of multiple products, platforms, product lines and variants
- Intuitively specify, publish and reuse systems, hardware and software assets
- Adopt a modular, architected design approach with high rates of reuse



The PTC Model-Based Systems Engineering solution allows us to unify all of our engineering teams through a common, model-based systems engineering approach, enabling us to deliver higherquality engineering services with best value for our customer in time and cost."

– Head of Synergistic Methods, AVL

## Manage complexity and improve software quality

### PTC SOFTWARE MODELING

The PTC Software Modeling solution enables embedded and other software developers to work in the intuitive and standards-based UML design language, and automatically generate software code in today's popular programming languages. The solution provides bi-directional synchronization of models and code, applying updates in either direction whenever needed to keep model and code in perfect alignment. The resulting integration of design and development allows designers, developers and testers to collaborate regardless of their location. Standards-based transformation patterns are used to automate enforcement with coding standards. This solution accelerates software delivery time, eliminates manual coding errors and ensures fidelity of requirements, models and code.

With PTC Software Modeling you can:

- Design your own process by accessing rich best practices content based on PTC's vast experience on real projects
- Design software before you build using the industry-standard UML language, in a scalable, multi-user environment
- Automatically keep models and code in synch for improved software quality
- Validate complex behavior earlier in the software lifecycle
- Exercise systems of systems design ideas with drag and play simulation
- Manage software embedded in products, platforms, product lines and variants
- Specify, publish and reuse your organizations' software assets



With PTC Integrity Modeler, we dramatically improved the quality of work while reducing time taken to keep our artifacts consistent throughout the design lifecycle.”

– Software Researcher, Softcomputing Lab, CIRA (Centro Italiano Ricerche Aerospaziali)



## Pay for what you need, when you need it

### PTC SUBSCRIPTION-BASED SOLUTIONS

PTC ALM Solutions are offered in a subscription model that makes it possible for you to equip your team with a flexible and scalable environment that can meet your evolving needs.. You can periodically adjust, add and subtract subscriptions to more easily align your team with the capabilities they need.

By offering lower upfront costs compared to traditional licensing, the subscription model allows you to more easily equip your teams with the best engineering tools available.

### Simplify Selection, Collaboration and Administration

With PTC ALM solutions you:

- Simplify selection, with comprehensive packages of capabilities aligned to team needs
- Streamline collaboration, with licenses designed to maximize team access to real-time information
- Simplify administration by eliminating the burden of managing licenses not tied to customer value

Smart connected products are delivering unprecedented opportunities. Your product development team needs every advantage to survive and thrive in the transformational years that lie ahead.

PTC ALM solutions are designed to help you seize this opportunity with purpose-built subscription based solutions to help you drive product advantage.



PTC brought extensive knowledge from their wealth of experience in the automotive industry to the engagement. They were able to achieve all 15 success criteria in less than 2 months.”

– Director of Engineering, Yazaki

**For more in-depth information** about PTC ALM Solutions, visit: [PTC.com/application-lifecycle-management](https://www.ptc.com/application-lifecycle-management)

<sup>1</sup> TechBeacon, *Survey: Is agile the new norm?*, May 2015

<sup>2</sup> Jeff Sutherland, *Scrum: The Art of Doing Twice the Work in Half the Time*, 2014

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J7197-ALMSolutions-EN-0516