



ALM STRATEGY AND ROADMAP

Roque Martin, GM ALM Segment

Ryan Lloyd, VP Strategy and Business Development

June 7th 2016

liveworx.com | #LIVEWORX



ALM STRATEGY AND ROADMAP

- Introduction
- Agile Engineering Transformation
- Lifecycle Traceability
- Consumability

IOT'S IMPACT ON PRODUCT DEVELOPMENT



Product design has increasingly become much more complex and requires an **agile**, multi-disciplined approach.

The challenge is to harness the information and its **relationships** to make better business decisions, and identify the impact of changes.

Today's systems demands an integrated, **collaborative** approach within engineering, as well as with our customers, suppliers, and users.

Julie DeMeester, Engineering Fellow Raytheon Integrated Defense Systems



Raytheon



Agile Engineering Transformation



Lifecycle Traceability



Consumability

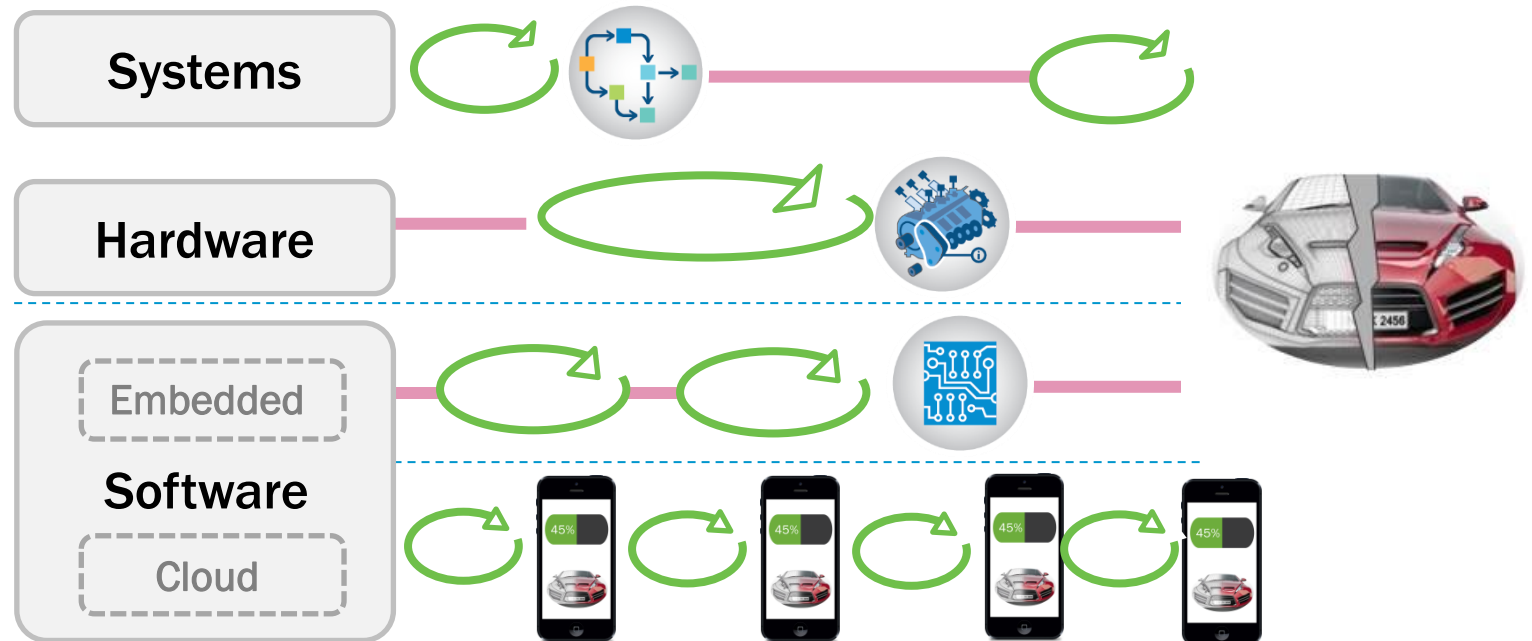
ALM STRATEGY AND ROADMAP

- Introduction
- Agile Engineering Transformation
- Lifecycle Traceability
- Consumability

- Teams work in siloed, rigid waterfall sequence
- Feedback cycles are measured in years
- Disciplines work at different pace
- Safety and regulatory compliance are the norm
- Customers input isn't captured

Slow delivery of the wrong products

MANUFACTURERS
FACE UNIQUE
CHALLENGES...



AGILITY IS THE BASIS FOR COMPETITIVE ADVANTAGE

30%

Higher profits

2X

Faster time-to-delivery

50%

More likely to complete strategic initiatives

Agile firms grow revenue **37%** faster. Agile firms generate **30%** higher profits. ▶ *MIT Sloan*

Highly agile organizations are **50%** more likely to successfully complete their strategic initiatives. ▶ *Project Mgt Institute*

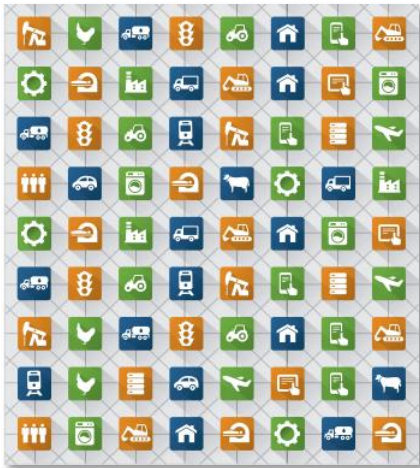
Companies that use agile can expect **10-20%** lower costs, **2X** faster time to delivery, lower defect rates and higher rates of customer satisfaction. ▶ *Boston Consulting Group*

AGILITY COMES TO PRODUCT ENGINEERING

- **Business Accelerators**

- Smart, connected products are transforming how companies create and capture value
- Far more intense coordination among functions is now required
- Customer relationships are continuous and open-ended

Michael Porter, Jim Heppelmann, Harvard Business Review, November 2014 & October 2015



- **Engineering Accelerators**

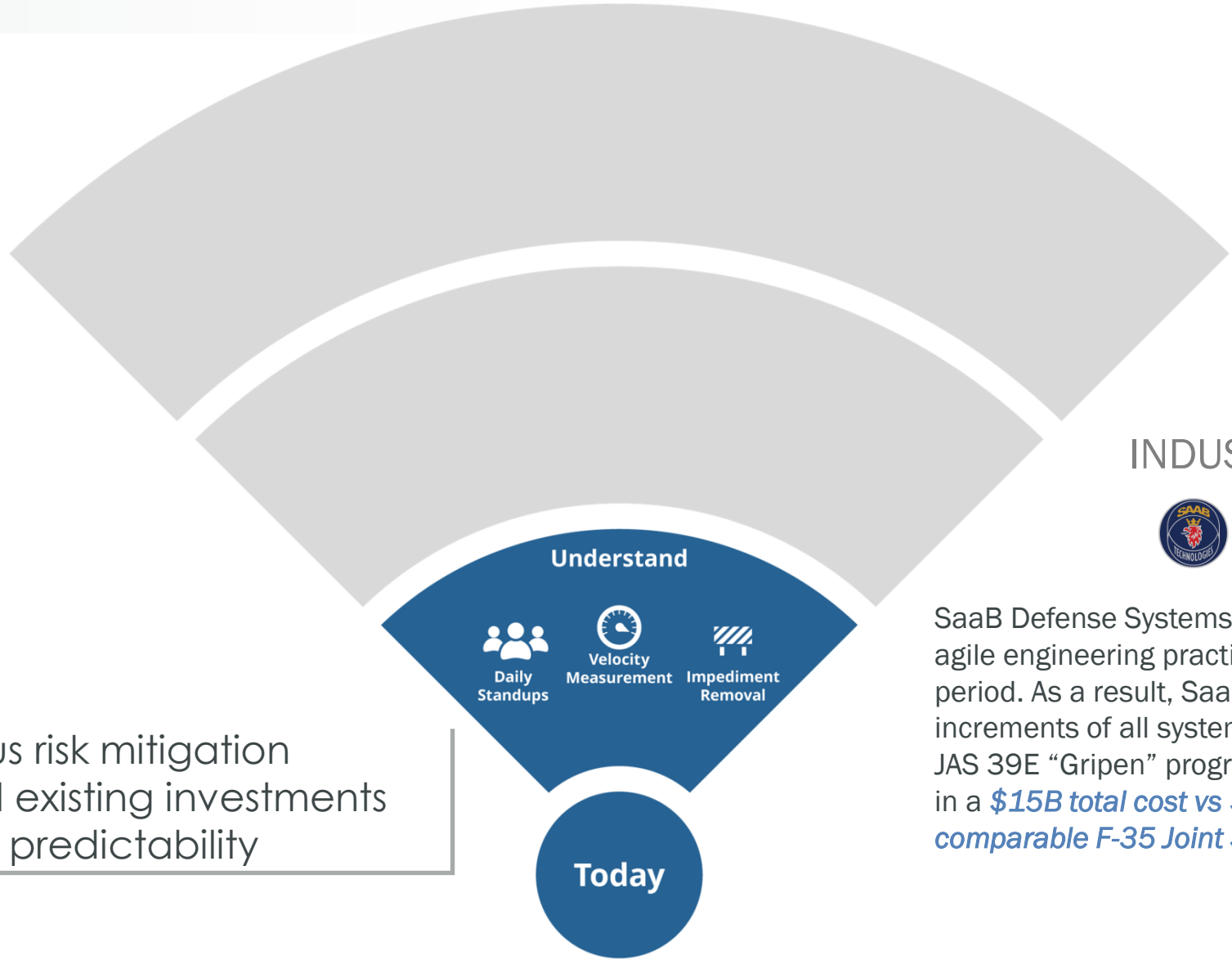
- Ubiquitous connectivity
- Digital product representations
- Augmented Reality + 3D printing
- Advanced analytics and machine learning

Decorative geometric shapes in the background: a large pink triangle pointing down-left, a blue triangle pointing up-right, a yellow triangle pointing down-right, and a green triangle pointing up-right.

AGILE ENGINEERING TRANSFORMATION

Improve your time-to-market, and mitigate risk unifying your engineering disciplines and increasing their adaptability

ACHIEVE MORE PREDICTABLE PRODUCT DELIVERY FROM IMPROVED VISIBILITY AND BETTER ENLIGHTENED DECISIONS



INDUSTRY EXAMPLE



SaaB Defense Systems transformed to adopt agile engineering practices over a 6 years period. As a result, Saab was able to deliver increments of all systems *every 6 months* for its JAS 39E “Gripen” program, ultimately resulting in a *\$15B total cost vs \$143B for the comparable F-35 Joint Strike Fighter Program.*⁶

Results:

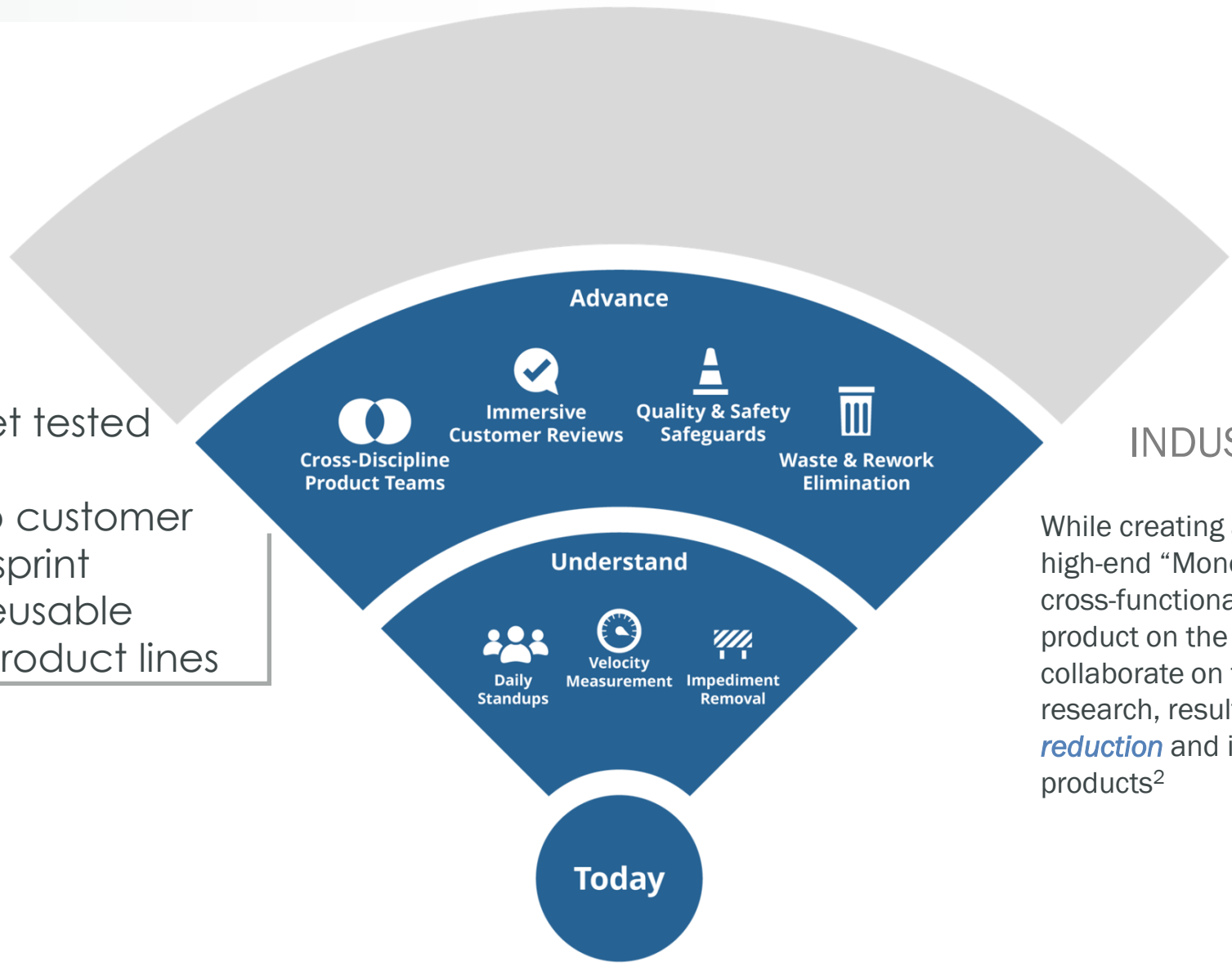
- Continuous risk mitigation
- Optimized existing investments
- Increased predictability

CREATE BETTER, MORE TIMELY PRODUCTS THROUGH IMPROVED COORDINATION AMONG YOUR ENGINEERING TEAMS AND FREQUENT INCORPORATION OF CUSTOMER FEEDBACK



Results:

- Correct, market tested products
- Adaptability to customer input at each sprint
- Savings from reusable assets across product lines

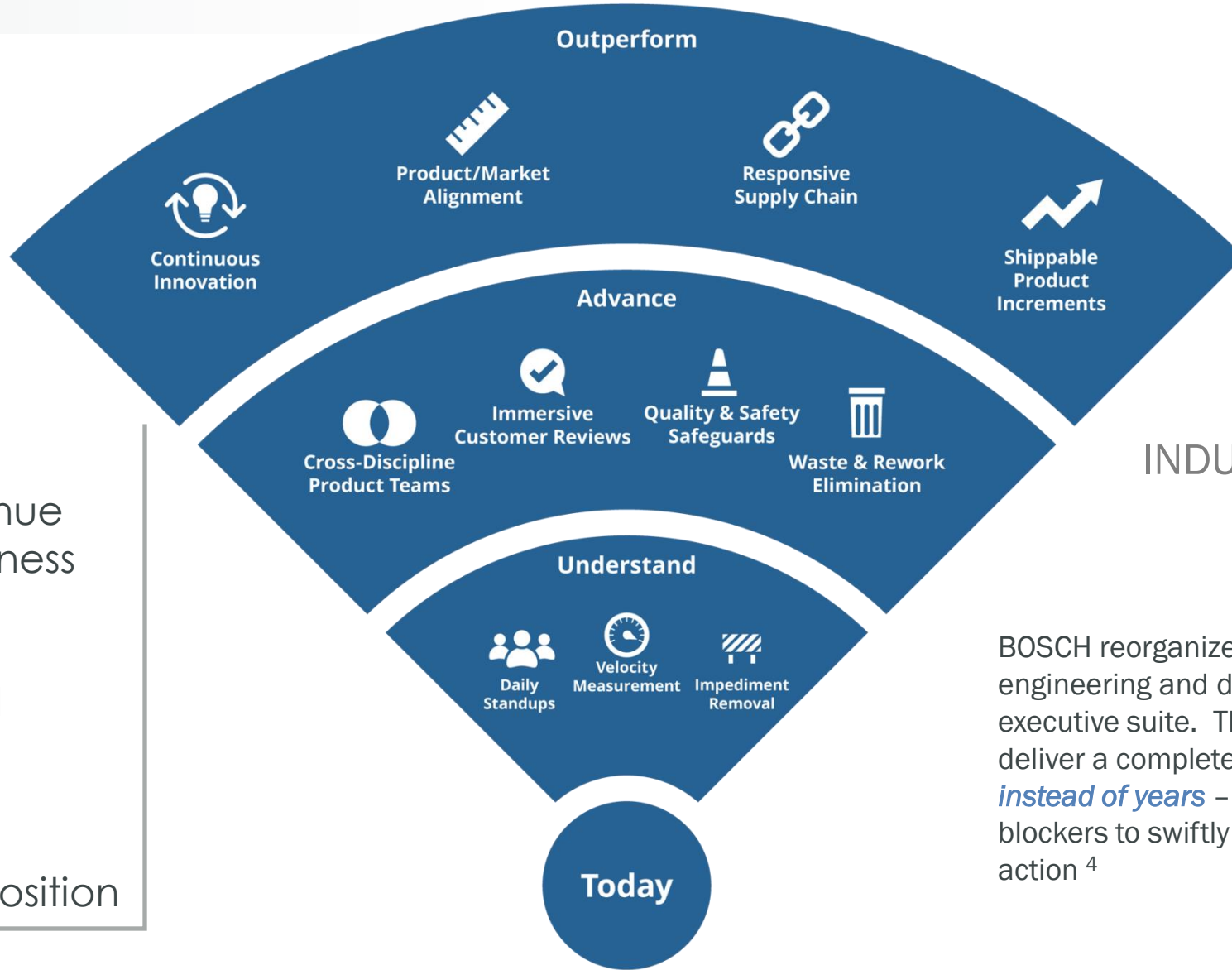


INDUSTRY EXAMPLE

While creating a new refrigerator for their high-end “Monogram” line, GE established a cross-functional team to both build the product on the factory floor as well as collaborate on the behind-the-scenes market research, resulting in a **50% program cost reduction** and in **2x sales** for comparable products²



CONTINUOUSLY INNOVATE TO BETTER ANTICIPATE MARKET CHANGES BY ALIGNING THE ORGANIZATION AND STAKEHOLDERS



Results:





- Increase revenue from new business opportunities
- Realize peak organizational efficiency
- Sustain a continuously competitive position

INDUSTRY EXAMPLE



BOSCH reorganized to be agile from engineering and design all the way up to the executive suite. This allows the company to deliver a complete prototype *within months instead of years* – and enables organizational blockers to swiftly gain executive visibility and action ⁴

Breakthrough Product Engineering

-  **UNIFY**
the cross-discipline team
-  **ORGANIZE**
for product variants
-  **SAFEGUARD**
quality and safety
-  **CONNECT**
to real-world insight

JUNE LAUNCH AT LIVEWORX



PRODUCT ENABLERS



Available Today

- PTC AgileWorx
 - Backlog Mgmt, Sprint Planning, Taskboard, Burndown, Traceability
- PTC Navigate (Integrity, Windchill)

Available in Future

- Immersive Product Review
- PTC AgileWorx Team Rooms
- PTC AgileWorx Scaling Scrum

The AgileWorx Backlog interface shows a list of tasks with columns for Summary, Size, Type, Status, Team, and Tags. The Sprint Burndown Chart displays a line graph showing the remaining work over a 30-day sprint cycle, with a label indicating 'SP-1 3 days remaining'.

#	Summary	Size	Type	Status	Team	Tags
1	New Item added here Change algorithm to determin team size algorithm to determin...	23	Story	In Progress	EnTeam	
2	Change algorithm to determin team size algorithm to determin team size algorithm to...	12	Story	Defined	TheRoyals	Mobile, Low End
3	Write automated tests algorithm to determin team size algorithm to...	34	Task	Draft	MastersOfNone	Mobile, Asia Pacific
4	Change algorithm to determin team size algorithm to determin team size algorithm to...	11	Task	In Progress	EnTeam	Low end
5	Change algorithm to determin team size algorithm to determin team size	5	Task	Defined	TheRoyals	Asia Pacific
6	Write automated tests	17	Docum...	Draft	WTF	
7	Change algorithm to determin team size algorithm to determin team	29	Docum...	In Progress	TheRoyals	Mobile, Low End
8	Change algorithm to determin team size algorithm to determin team size algorithm to det...	24	Story	Defined	MastersOfNone	Mobile, Asia Pacific
9	Write automated tests to determin team size algorithm to determin team algorithm to	9	Story	Draft	EnTeam	Low end
10	Change algorithm to determin team size algorithm to determin	12	Story	In Progress	TheRoyals	
11	Write automated tests	17	Story	Draft	WTF	Low end
12	Change algorithm to determin team size algorithm to determin team	29	Story	In Progress	TheRoyals	Asia Pacific
13	Change algorithm to determin team size algorithm to determin team size algorithm to det...	24	Defect	Defined	MastersOfNone	
14	Write automated tests	9	Defect	Draft	EnTeam	
15	Change algorithm to determin team size algorithm to determin	12	Defect	In Progress	TheRoyals	

The PTC Navigate interface shows a 3D model of a nose structure with various toolbars and panels. The Thing Browser interface shows a mobile view of the 'Nose Structure' with details like Name, Version (A3), Status (Released), Author (Francois), and Supplier (Aerolia).

ALM STRATEGY AND ROADMAP

- Introduction
- Agile Engineering Transformation
- Lifecycle Traceability
- Consumability



Marketing
- Sales



Management



Engineering



Quality



MFG



Service
- Support

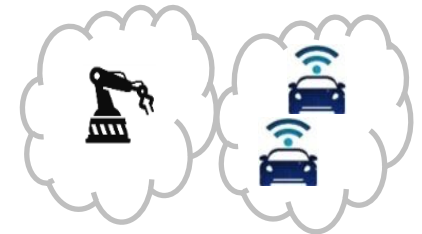
TRACEABILITY

WHO MAKES THE CALL.
WHAT'S AT STAKE.
WHAT DATA THEY NEED.

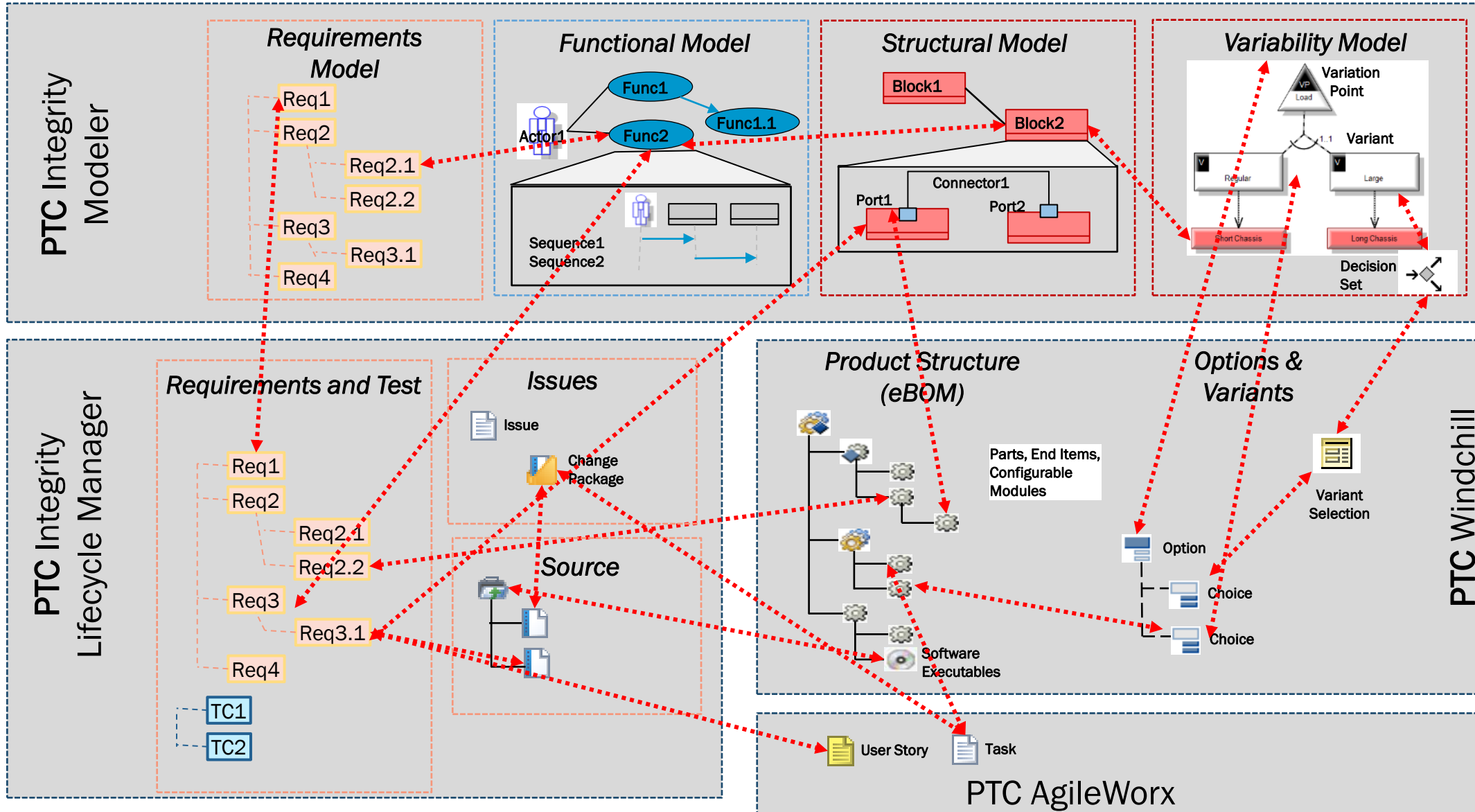
Safety | Quality | Compliance | Innovation | Time-to-Market

Reliability | Performance | Accuracy | Serviceability

Customer Satisfaction | Functionality | Market Suitability



ENABLING LIFECYCLE TRACEABILITY



ALM STRATEGY AND ROADMAP

- Introduction
- Agile Engineering Transformation
- Lifecycle Traceability
- Consumability

Easy to Buy

Quick to Deploy

Interoperable

Easy to Support / Maintain

User Adoption and Use Experience

CONSUMABILITY



EASIER TO BUY



FLEXIBLE AND SCALABLE

PTC Subscription puts an end to the risk of wasted software licenses by giving you the flexibility to buy only what you need, when you need it. You can easily add more capacity and remix capabilities as you grow or change your business—with no disruption.



LOWER UPFRONT COSTS

PTC Subscription provides lower upfront costs for the software and support you need. This can help shorten your company's decision time to purchase and enables you to use operating budget rather than capital budget to fund it. And by paying for only the immediate benefits you seek you will achieve a faster ROI on your projects.



PREDICTABLE BUDGETING

PTC Subscription gives you the control to match your cost to usage as your business needs change over time. Predict exactly what you will pay now and in the future with consistent, transparent payment schedules and software and support bundled together in one subscription.

QUICK TO DEPLOY



CLOUD DEPLOYMENT

In addition to PTC Subscription, you can also outsource hardware, administration, maintenance, and support with cloud deployment. PTC will manage the critical applications in the cloud, freeing you up to focus on what matters most—your business. You will benefit from software deployment flexibility, faster implementation, lower IT costs, and seamless maintenance. (Cloud deployment is not available for all PTC software. Ask a PTC representative for more information.)



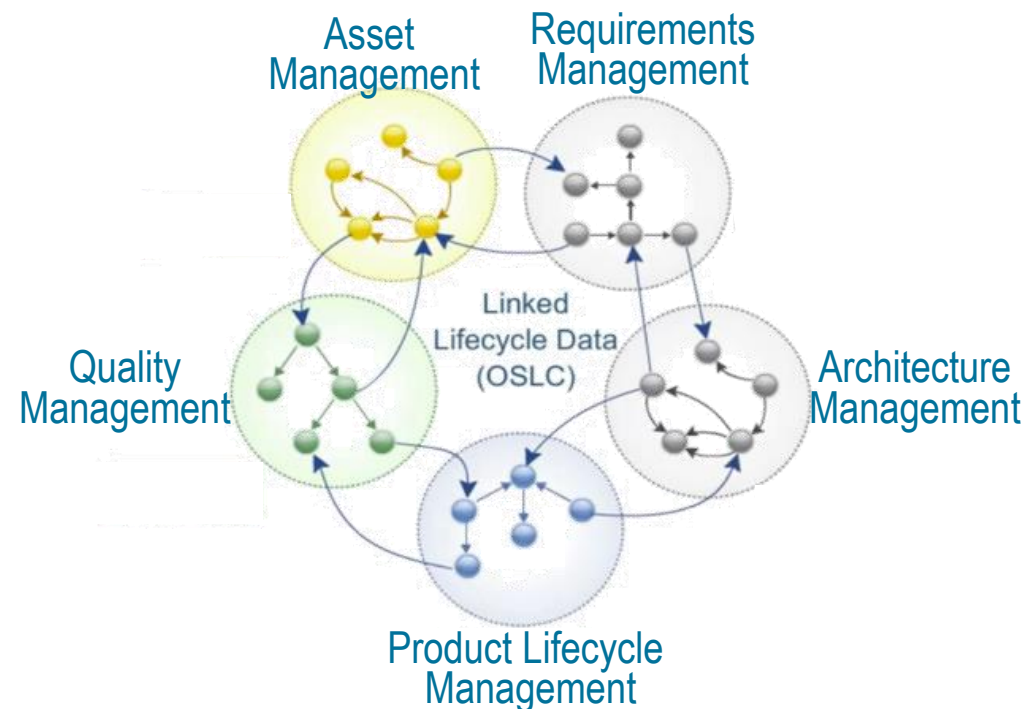
STANDARD SOLUTION CONFIGURATIONS

Delivering configurations of PTC products that are pre-configured for specific industry needs and functional domains. PTC makes configurations available to achieve faster deployment and to lower the customization effort for specific solution use cases.

INTEROPERABLE – OPEN STANDARDS AND ROBUST ARCHITECTURE

PTC will utilize OSLC as a foundational layer to satisfy key customer use cases

- Standards-based
- RESTful Web Services architecture
- PTC co-chairs OSLC Core group – ensuring our customers’ needs are represented
- Designed for maintainability
- Open / extensible



EASY TO SUPPORT AND MAINTAIN



- The new Performance Advisor for PTC Integrity Lifecycle Manager leverages the ThingWorx platform to give unprecedented visibility into Integrity Lifecycle Manager hardware and software environment
 - An easy-to-use online dashboard
 - Personalized Dashboards for viewing, reporting and trend analysis
 - Accessible through PTC eSupport Portal
 - Provides insight into important performance and usage metrics
 - Monitoring and reporting of the health of Integrity Lifecycle Manager environment
 - Comprehensive visibility into software versions
 - Proactively provide approved solutions to identified issues

Performance Advisor for PTC Integrity Lifecycle Manager

Dashboard

Server List mks1.mks.com:9001 (WD) Selected server data updated on Thu Apr 28 14:21:00 EDT 2016

ALL SERVERS STATUS

No Alerts: 1, Pending Alerts: 2, Pending Critical Alerts: 0

SERVER INFORMATION

Hostname: mks1.mks.com, Port: 9001, Server Version: 10.8, OS: Windows Server 2008, DB Type: Oracle, DB Version: 11.2.0.3.0

SERVER ALERTS

ALERT	TIMESTAMP	EVENT	KCSLINK	ACKNOWLEDGE?
▲	2016-04-26 15:10:47	High Item Load Time	View	<input type="checkbox"/>
▲	2016-04-26 15:10:47	Low Item Edit Time	View	<input type="checkbox"/>
▲	2016-04-29 00:07:36	Slow DB Response	View	<input type="checkbox"/>
▲	2016-04-27 18:50:26	Slow DB Response	View	<input type="checkbox"/>

[Acknowledge](#)

SERVER HOTFIXES

INSTALLED	ID	DESCRIPTION	SERVER	CLIENT	LINK
	HF-S140000001-001	Deleting entire sandbox directory w	False	True	View
	HF-S140000001-007	Certain variant shared subproject co	True	True	View
	HF-S140000001-009	Trigger fix bundle	True	False	View
	HF-S140000001-015	Checkpoint as of date for older date	True	False	View
	HF-S140000001-016	Group cache and ACL optimizations	True	True	View

SCALABILITY METRICS

METRIC	VALUE
Item Field Edits	63555256
Relationships	45995114
Item Edits	43577316
Audit Entries	1146638
Items	979851

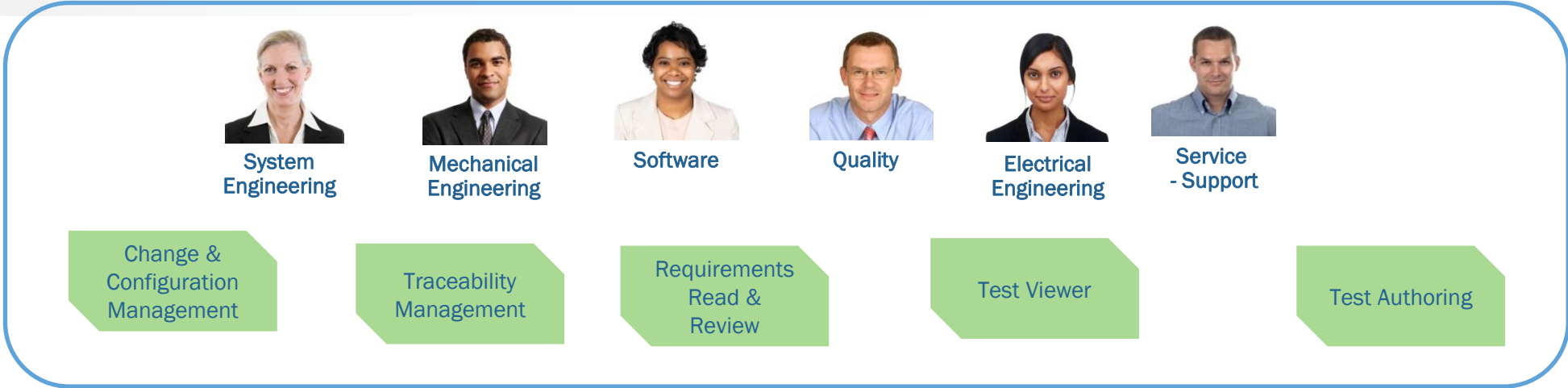
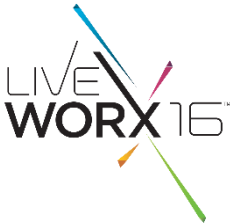
PERFORMANCE METRICS

METRIC	Avg Time (Ms)	PTC Avg (Ms)
Item Create Time	2389932.00	1207116.00
Item Edit Time	1363573.00	1363573.00
Item View Time	67580.00	53775.75
Database Response Time	0.55	0.97

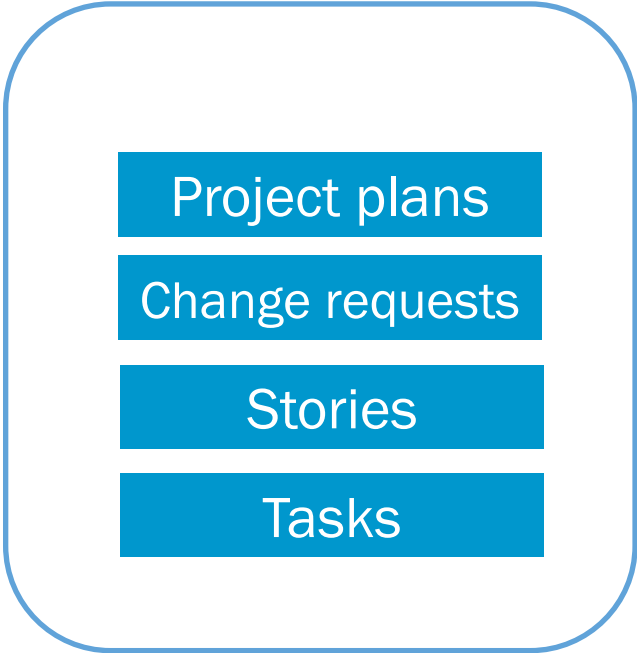
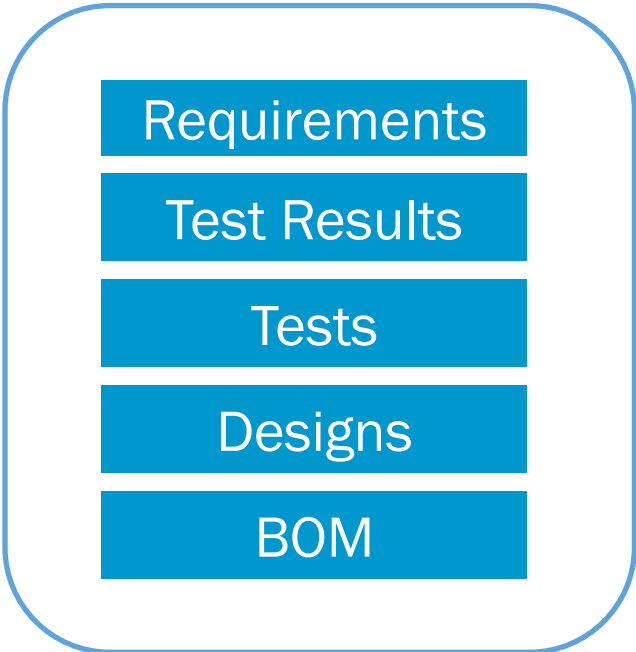
Performance Advisor is supported for Integrity Lifecycle Manager v9.7 and above
A HotFix is pre-requisite when using Performance Advisor for versions prior to 10.9

PTC Integrity Lifecycle Manager
Smart & Connected

USER ADOPTION & USER EXPERIENCE: WORKFLOW, DATA, PEOPLE



Data



Activities & Workflow

TASK BASED APPLICATIONS – INCREASING USER ADOPTION



- **Requirements Management**
 - + – Requirements Read Only
 - + – Requirements Author
- **Test Management**
 - + – Test Viewer
 - + – Test Authoring
 - + – Test Execution and Results Capture
- **Agile Development**
 - + – Sprint Planning
 - + – Backlog Management
 - + – Story and Task Authoring
 - + – Taskboard and Burndowns
- **Trace Management**
 - + – Trace Management (create and update traces, set/clear suspecting)
 - + – Change and Configuration Management
 - + – Software Issue Management
- **Model-based Systems & Software Engineering**
 - + – Model Viewer (read only, model access, including diagrams)
 - + – Model Feedback (visual, human model reviews giving feedback into the model)
 - + – Model Review (management dashboard and automated, detail review of model completeness & correctness)

- + Available Now
- + Available Soon
- + Future

Capabilities

- **View document App**
 - Properties
 - Content
- **View Drawing**
- **View Part Properties**
- **View Component Part List**
- **View Part Structure**
- **View/Download design files**
- **View & measure in 3-D**
- **View Requirements**

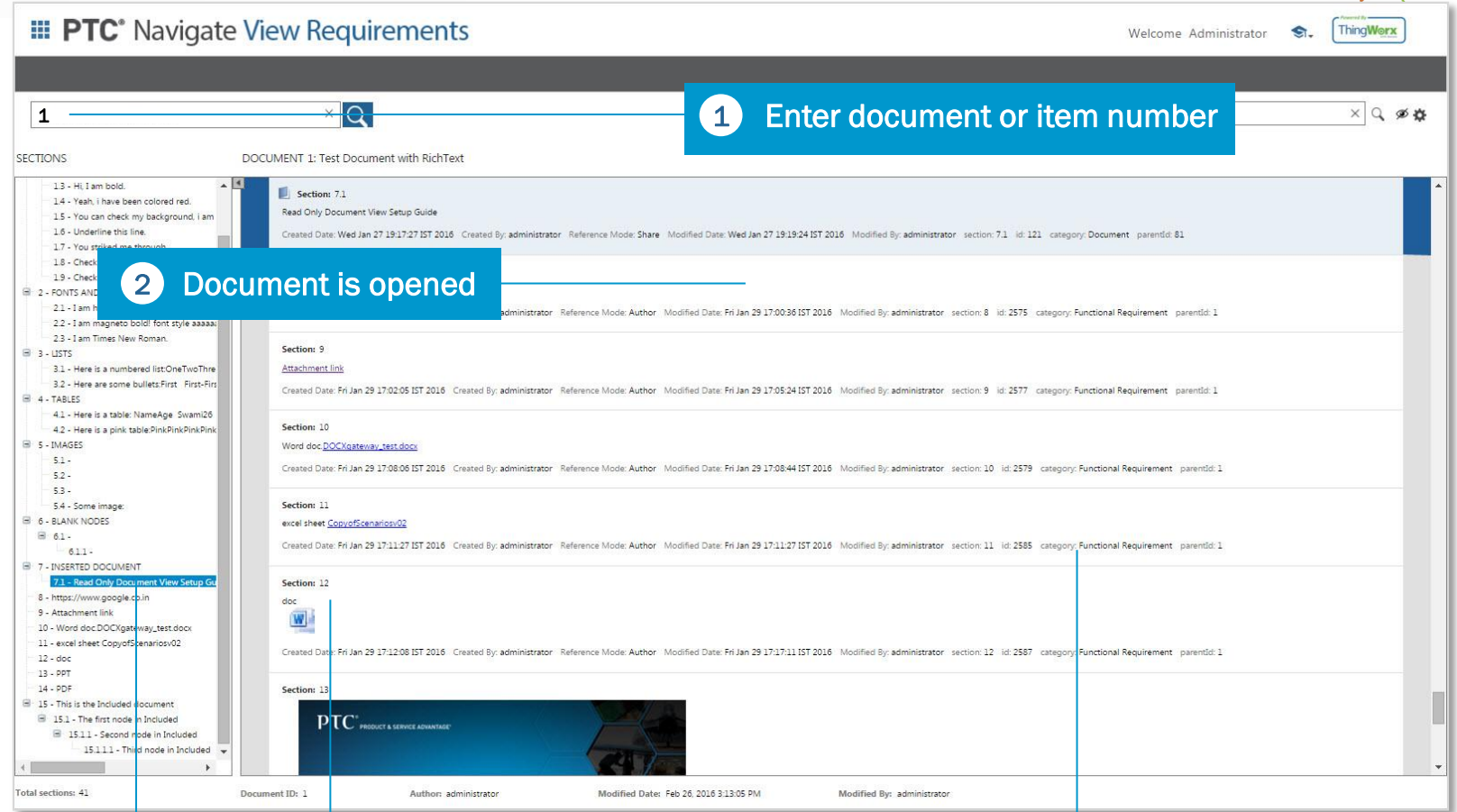
The screenshot shows the PTC® Navigate application interface. At the top, it says "PTC® Navigate" and "Welcome Administrator". Below this is a row of six app icons: "View Design Files", "View Drawing", "View & Measure in 3D", "View Part Properties", "View Parts List", and "View Part Structure". Below this row are three more app icons: "View Document" and "View Requirements".

Annotations with lines pointing to the icons:

- "Apps for part info" points to the "View Part Properties", "View Parts List", and "View Part Structure" icons.
- "Apps for document info" points to the "View Design Files" and "View Drawing" icons.
- "Apps for requirement info" points to the "View Requirements" icon.

Benefits

- ✓ View all Integrity LM requirement or structured documents
- ✓ Displays all captured rich text information
 - Fonts, tables, bullets, colors, subscript, superscript, etc.
 - Embedded images and attachments
- ✓ Easily search and filter text
- ✓ Quickly open other inserted documents



Document structure with Row highlighted

Inserted documents and objects accessible

Rich text information and properties displayed

SUMMARY

- Product Development has become increasingly complex, involving multiple disciplines
- Competitive pressure and the IoT demands greater agility and creates more continuous, open-ended relationships with customers
- PTC's ALM Strategy enables;
 - Agile Engineering Transformation to deliver faster and to respond to change
 - Lifecycle Traceability to ensure safety and quality of complex products
 - Consumability to enable more rapid adoption and acceptance of enabling technology at a lower cost of ownership

The image features several colorful geometric shapes, primarily triangles and lines, scattered across the background. A large, multi-colored triangular shape is prominent on the right side, composed of various shades of blue, green, yellow, orange, and purple. Several thin, colored lines (blue, pink, green, orange) radiate from the center of the text area. The text 'LIVE WORX 16™' is the central focus, with 'LIVE' in a thin, outlined font and 'WORX 16™' in a bold, solid black font.

LIVE
WORX 16™

TAKE A FRESH LOOK AT THINGS

liveworx.com