Teamcenter Strategic Update and What’s New

Bill Lewis, Director Product Marketing, Teamcenter
Jiri Walek, Product Management, Polarion

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Realize innovation.
The Teamcenter Vision

Deliver world class applications

On the PLM platform of choice

For internal and external partners
Since Last Year

Teamcenter Releases
The Role of Siemens PLM Software:
Key Investment Themes for Teamcenter aligned with Vision

Engaged Users
Usability with Active Workspace
Reach more stakeholders with role based, use case driven interaction

Intelligent Models
Systems Driven Product Development
Closed-loop product planning and virtual validation for complex products

Adaptive System
Platform Innovation
Drive quality, deployability, and extensibility to enable a robust partner ecosystem

Realized Products
Integrated Product Definition
Clearly align the virtual with the physical to streamline upstream and downstream processes
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Active Workspace
Extending PLM across the enterprise

Include more people in your PLM process to realize innovation

Personalized – User Experience for the role and task

Proactive – Information actively delivered for decision making

Intuitive – Clear, easy to understand

Everywhere – Information available anytime, anywhere

I am a Service Technician
Manufacturing Engineer
Program Manager

I am a Graphics Designer
Software Engineer
Designer

I am a Systems Engineer

I am a Product Planner

and I need to

integrate my code into the product

develop packaging for my products

document my work

share requirements

show my customer what we sell

define how my product will work

capture and resolve issues

monitor my programs more easily

understand how to perform my operations

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Active Workspace
Some examples of user productivity improvements

Drag and drop to streamline upload/download and relationships

Embed Active Workspace in Office for search, create, selection & clipboard

Use Active Workspace in multiple MCAD tools

Multi-select and comparison view for business objects

Notification center to inform users when background processes and events occur such as subscription events
Active Workspace
Extend PLM across the enterprise

TEAMCENTER

Start
Designs
Documents
BOMs
Process

Extend
Requirements
Service
Manufacturing
Supplier

Transform
Quality
Cost
Sustainability
Systems

Apps

Reporting and Analytics
Schedule execution of tasks and deliverables
Substance Compliance
Issue Management and CAPA
Simulation Data Management
And SO much more (change, workflow, visualization…)
Enable anyone to analyze the information in PLM and other sources to understand the status of inter-related projects and products

- **Admin UI to Define and create** new reports
- **Run and view reports** directly in Active Workspace
- **User Editable reports** to add additional charts, tables, properties, and slices to analyze and investigate the data
- **In-Context reports** directly runs a report on an open object
- **Open objects** directly from reports so users don’t need to re-search for data
- **Configure** chart styles and data to use when drilling down
Substance Compliance
Extend PLM across the enterprise: What's new

- Substance Compliance on Active Workspace
- Support for Conflict Minerals Reporting, Smelter Management
- Enhanced search and reporting capabilities
  - Search and report on components compliant with REACH, RoHS, etc.
- Enhanced automation for supplier material disclosure
  - Notifications to suppliers on declaration expiration
  - System processing based on supplier part status
Supplier Collaboration
Support a complex supply chain and multiple use cases

Highly Integrated
Partners and Systems Integrators

Moderately Integrated
Systems Integrators(contract staff

Medium Interaction
Systems Design

Low Integration/Interaction
Build to spec

Design
Purchasing
OEM Use Cases
Manufacturing
Materials and Compliance
Program Mgmt
Supplier Collaboration
Extend PLM across the enterprise: What's New

Supplier Self Service enhancements
- Give the supplier the ability to create an item and automatically reserve the OEM part number
- Allow supplier to execute saved queries and choose parts, documents, or other data to be received in a data package
- Automatically schedule updates of data to suppliers

Improved usability and security with a single User ID for suppliers who use both Teamcenter and Supplier Collaboration Foundation

Include CATIA v5 data in a Briefcase for use with the Briefcase Browser to support a wider range of CAD requirements
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Teamcenter 5 Year Vision

- Systems Driven Product Development in the Context of Physical Configurations and BOM
- High performance, integrated solutions supporting Customer processes from early product definition through Design, Production and After Sales Support
- Mechatronic System Design balancing Mechanical, Electrical, Software & Manufacturing requirements
- Integrated User Experience

Product Line Engineering
- Product Line Variability
- Product Requirements
- Attribute Management
- Product Architecture

Multi-Domain Traceability and Configuration
- Requirements
- Functions
- Logical
- Part Master / BOM

Software
- Software Modeling
- Software Development
- Build and Deploy

Control
- Control Modeling
- MiL, SiL, HiL
- Calibration

Physical
- 1D Behavior Modeling
- 3D MCAD / CAE Modeling

Verification, Validation, Change
Siemens Investment in Systems Driven Product Development

Acceleration through Strategic Acquisitions

Multi-Domain Traceability and Configuration

Product Line Engineering

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- Product Requirements
- Attribute Management
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Requirements | Functions | Logical | Physical | Part Master / BOM

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Verification, Validation, Change

Polarion Software Management

LMS Mechatronics Simulation

CD-Adapco 3D Simulation

LMS 3D Simulation
The Future PLM will be Software Driven Product Lifecycle

“80% of Product Innovation and Differentiation now Electrical, Electronics and Software. Not Mechanics”

Siegmar Haasis
R&D CIO

Traditional Product Lifecycle

Software Driven Product Lifecycle

Future Product Lifecycle
Press Release

Plano, Texas, November 25, 2015
Siemens to Acquire Polarion, Expanding Support for Growing ALM Market

Siemens expands PLM by integrating ALM with product lifecycles; Further enhances Siemens’ offerings for smart, software driven products; Extends Siemens’ commitment to deliver open architecture solutions; Acquisition continues Siemens support for digitalization in manufacturing

Siemens has entered into an agreement to acquire Polarion, developer of the first browser-based application lifecycle management (ALM) enterprise solution. Software is an integral part of product development across all industries and ALM enables manufacturers to continuously integrate, verify and validate the growing software content they build into their products. Polarion is a leader in the ALM market, leveraging an open architecture, exhibiting state-of-art source code management and supporting the needs of open source development.
What is ALM?

Application lifecycle Management (ALM) is the product lifecycle management (governance, development, and maintenance) of computer programs. 

*Source: Wikipedia*
Polarion started at 2004 with

“Polarion Software is committed to help companies advance the development, governance and maintenance of software via a unified solution for Requirements, Quality, and Application Lifecycle Management.”

“Polarion ALM had a holistic, integrated, ALM solution in-the-box before the market understood its advantages”.

OVUM, Independent Analyst
Challenges Today

Release More Frequently
Increasing Customization Demands
Bigger Complexity
Better Quality
Modern ALM – 3 Core Pillars

The Pillars of Creation, a well-known star-forming region in the Eagle Nebula
Collaboration doesn't mean everyone can access everything all the time.

Polarion enables teams to collaborate on shared assets easily, in a **secured** environment. You decide who can see what, **who** can change **what**, and **when**, via granular permission controls and robust configurable workflow automation.
Cross Domain Traceability

With Polarion you can ensure completeness of the information about every step in a development process.

Every step is just a click away - starting with modified lines of code up to high-level change requests.
Reuse

Statistics says that 60-80% of requirements, code and test are being shared between projects. With Polaris you can **reuse**, **branch** and **merge** your data for effective sequential or parallel project or product line development.

*The biggest benefit for WaveLight is the ease of reuse (of artifacts such as Requirements) across different projects.*

Werner Motzet,  
WaveLight
Unified Repository

“Polarion was fundamental to our success thanks to the real-time access to centralized information at the right level for each collaborator”

“Thanks to Polarion, we can rely on a single platform to collect our data, exchange documents, collaborate, keep traceability, and control our workflow.”

ZUMTOBEL

PHOENIX CONTACT
Unified Repository - Open Architecture

Market today:
3.6 testing tools per customer
Unified Repository - Role Based User Experience

3 Requirements

3.1 General Operations

DP-313 - DrivePilot shall easily engage operations while the vehicle is at rest.

DP-314 - DrivePilot may not be engaged while the vehicle is under manual control.
- provide voice authentication
- ensure handicap access.

DP-315 - DrivePilot shall be easy to operate without extensive training.

DP-316 - Before any user may engage DrivePilot on public roads, the user shall receive a DrivePilot license.

DP-317 - DrivePilot will disengage with audible, visual notifications if the following conditions are met:
- Driver change is not manually selected
- Brakes are not engaged
- Speed is less than 5 mph
- Bonnet is manually engaged
- Turn signal is activated.

DP-332 - DrivePilot is not compatible with any vehicle that has "adequate" parking.

Some models of vehicle are equipped with such capability. Not all models are available at the moment.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toyota</td>
<td>LQ200</td>
</tr>
<tr>
<td>Volkswagen</td>
<td>Tiguan, PassatCC Golf</td>
</tr>
</tbody>
</table>

DP-330 - DrivePilot shall operate with input power of 12 Volts, not to exceed 150W.

"Polarion is easy to use, and you have the ability to track as you go.,” “Polarion provides everything we need!”
Flexibility

Process Neutral Platform – Built-in templates

Incremental Process Adjustments

Embedded SOP Guidance and Documentation

Project / Portfolio

Requirements
The stakeholder needs identified in the Project Charter define what the system will do but not how it will be documented and baselined. The Requirements space provides several enhancements to the requirements process.

OBJECTIVE
Develop a validated set of system requirements.

INPUT
- Project Scope - project goals and objectives
- Applicable statutes, regulations, and standards
- Constraints (required legacy systems)

OUTPUT
- System Requirements
- System Validation and Verification
- System Test Specification

REVIEW
- System Requirements by Status - Baseline
- System Requirements by Category Requirement
- System Requirements Approval Status
- System Requirements Test Coverage

VERIFY and ACCEPT
- Recent System Verification Test Results
- System Verification Test Statistics Report
- Frequent System Verification Test Coverage

Release Planning
Once a user story is reviewed, it should be accepted by the development team. To accept a user story the team needs to:

- Estimate the effort to implement it
- Create a list of tasks required to fully cover the implementation process.

A complement of the acceptance process is release planning. To assign a user story to a release, open the Releases page.

Releases

- Version 0.9 (2014-12-27)
- Version 1.0 (2015-06-30)

The flexibility to define your software development process, the possibility to customize Polarion to your needs is actually unreached in the market of ALM tools."

Guido Majewskia,
T-System International
Only Full ALM Solution Certified for IEC 61508/ISO 26262
Templates for CMMI, FAA, FDA, IEC, ISO, SPICE etc.

"We’re just thrilled about Polarion’s tool qualification for ISO 26262. This saves us a lot of time and money in our own qualification process."

- Maria Eugenia Zuniga, Quantum Technologies
Standalone vs Integrated ALM

75% Mechatronics / 25% Pure SW
### ALM and PLM

#### Teamcenter/Polarion Integration

<table>
<thead>
<tr>
<th>Requirements Management</th>
<th>Change Management</th>
<th>Closed-loop Embedded Systems Delivery</th>
</tr>
</thead>
</table>
| • Access product & software requirements from Teamcenter and Polarion | • Assess the cross-domain impact of changes  
  • Define and monitor hardware and software change processes | • Integrate software data and processes  
  • Track software/software and software/hardware dependencies  
  • Manage software as part of product Bill-of-Material |
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Teamcenter
Integrated Product Definition – What It Is
Teamcenter Product Configurator – Key Value

### Product Variability: Flexible and Intuitive
- Single reusable definition of variability
- Allocate allowed variability from Option Dictionary to each Product
- Intuitive grid / table based interactions

### Configurator Rules: Control and Analysis
- Configurator rules define option compatibility
- Straightforward impact analysis
- Maximum control - rules for specified product models, pre-conditions

### Autonomy of Configurator and Product Data
- Enable separate users and lifecycles for configurator and product data
- Ensure engineering consistency with configurator rules

**Provides Common Feature Language Across Lifecycle Processes**

- Product Planning
- Design
- Process Planning
- Service
- Manufacturing
- Delivery

**Product Configurator**

Manage variability in Product Configurator; ensure consistency when authoring and qualifying product data
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Deployment Center

Goal

- Web based system
- Remotely install, patch, upgrade Teamcenter environments
- Target usage
  - Setup Teamcenter Environments
  - Install Active Workspace
  - Install custom software
  - Install and update RAC client machines
  - Patch and Upgrade Teamcenter environments

Benefits

- Reduced costs of managing Teamcenter environments through easy to use web client
- Reduced cost of deploying custom software through available deployment automation tools
Deployment Center

SOFTWARE REPOSITORIES  ENVIRONMENTS

All environments are easily accessible by clicking on the Environments tile.
### Upgrade Active Workspace without upgrading the platform release

- Reduces downtime for system update and certifying the update
- While the “minimum version” of the platform will not change, some features added into the platform will require an upgrade to get the “full featured” content

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Teamcenter 10.x</th>
<th>Teamcenter 11.x</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Minimum Version</td>
<td>Full Featured</td>
</tr>
<tr>
<td>3.0</td>
<td>Fall 2015</td>
<td>10.1.5</td>
<td>10.1.5</td>
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<td>3.1</td>
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<td>10.1.5</td>
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<td>Spring 2017</td>
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<td>TBD</td>
</tr>
<tr>
<td>TBD</td>
<td>Fall 2017</td>
<td>TBD</td>
<td>TBD</td>
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</table>
Collaboration

Include the right people

Provide the right data

Facilitate the process
Collaboration

Who, When, With What?

The Process

Architecture modeling

Common Bill of Materials

Estimating Cost

Supplier Collaboration

Software

The Process

Architecture modeling

Common Bill of Materials

Estimating Cost

Supplier Collaboration

Software
Untangling the basics

Who?

When?

With what?
THE REAL VALUE

The right people, at the right time, with the right data.
Collaboration

The Process

Architecture modeling

Common Bill of Materials

Estimating Cost

Supplier Collaboration

Software

Collaboration

Estimating Cost

Supplier Collaboration

Software
What does the product need to do?
THE REAL VALUE

Clearly define how to achieve product targets.
Collaboration

The Process  Architecture modeling

Common Bill of Materials

Estimating Cost  Supplier Collaboration  Software
Who’s view is correct?
Product Configurator

Vehicle-Dictionary (Dictionary Variant Options)

- Vehicle-Dictionary
  - Geographic Options
  - Body
    - Front Grille
    - Sunroof
    - Rooftype
  - Steering
    - Steering Wheel
    - Drive Side
  - Powertrain
    - Engine
    - Engine Block Heater
    - Transmission
  - Ride and Handling
    - Suspension
      - Active Damping
      - Computer Active Tech
      - Adaptive Magneride
      - Adaptive Solenoid
      - Semi-active valve ac
    - Special Packages
      - Cold Weather Package
  - Special Packages
  - Cold Weather Package

Passenger Car-Product Family (Variant Options)

- Passenger Car-Product Family
  - Models
  - Summary Models
  - Geographic Options
  - Body
    - Front Grille
    - Rooftype
  - Steering
    - Steering Wheel
    - Drive Side

Passenger Car-Product Family (Availability View)

- Anaconda LX
  - All-Weather Tires
  - Cold Weather Package
    - Drive Side
      - Left Hand Drive
      - Right Hand Drive
    - Engine
      - Engine Block Heater
    - Transmission
      - Engine
      - Manufacturer Warranty Std (Years)
      - Rooftype
      - Snow Tires
      - Sold-to Country
      - Steering Wheel
      - Wheel Type

Ready
THE REAL VALUE

A common bill of materials, variability, for everybody to leverage.
Collaboration

The Process
Architecture modeling
Common Bill of Materials
Estimating Cost
Supplier Collaboration
Software
When is the right time to understand cost?

wait and see
Know ahead
THE REAL VALUE

Understanding cost early, and throughout.
Collaboration

- The Process
- Architecture modeling
- Common Bill of Materials
- Estimating Cost
- Supplier Collaboration
- Software
What about the value chain?
THE REAL VALUE

Collaborate with a clear understanding both internally and externally.
THE REAL VALUE

ALM + PLM = Success.
Join the conversation on Siemens PLM Community

www.siemens.com/plm/community/teamcenter

- Teamcenter Blog
- Teamcenter Knowledge Base
- Teamcenter Users Forum
- Teamcenter Administrators Forum

Read insightful posts from Siemens PLM Software key experts and thought leaders, ask questions, share best practices and connect with Teamcenter users from around the globe!
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