

BEDIFFERENT

ACE 2012 INTERNATIONAL





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Application Lifecycle Management Workshop

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ALM and PLM: BFF?

The design of software to be embedded in “smart” products has become too interdependent with the design of the product for ALM and PLM to remain completely independent of one another. On the other hand, the two domains have each have special needs that don’t easily fit within the context of the other. So for the foreseeable future, ALM and PLM will have to walk hand-in-hand. What are the challenges in making that effective and as we look to the future, where should we focus our efforts?

Workshop Format



▶ **6 slides – background information I've collected**

▶ **Open discussion / brainstorming session on 4 topics:**

- Source Code Vaulting
- IDE Integration
- Requirements Management / Systems Engineering
- Configuration Management

▶ **Introductions**

- ▶ **Application Lifecycle Management**
- ▶ **For Software that is the product or goes into the product**
 - Firmware
 - Application software
 - Embedded
 - **Mechatronics context**

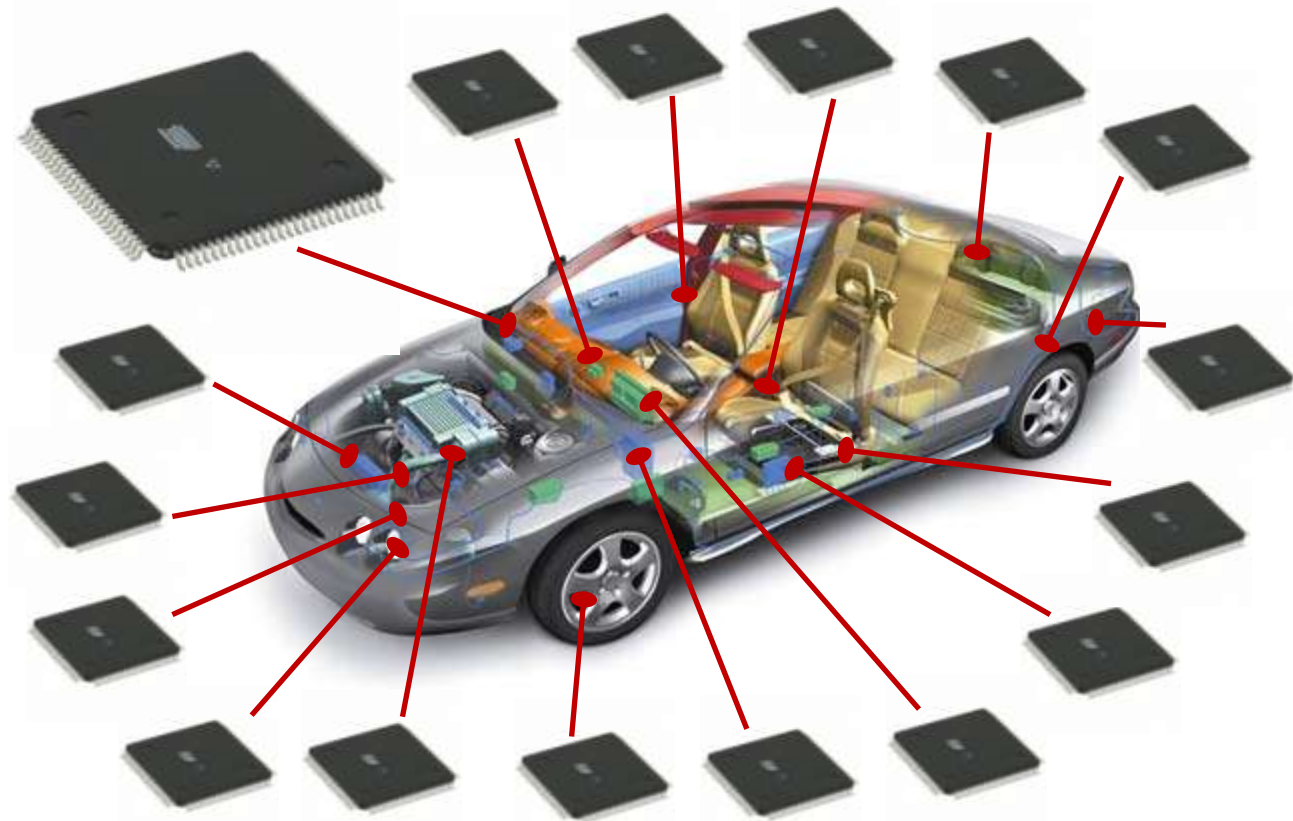
- ▶ **Not the internal IT applications**
 - Although the solution may be the same....

Why is ALM Important...

- ▶ Lockheed F-22 Raptor = 1.7 million lines of code
- ▶ Lockheed F-35 Joint Strike Fighter = 5.7 million lines of code
- ▶ Boeing 787 Dreamliner = 6.5 million lines

- ▶ Today's Luxury Automobile

- ✓ 30-50+ chips
- ✓ >100 million lines of code



sources spectrum.ieee.org/green-tech/advanced-cars/this-car-runs-on-code

ALM

Current Solutions & Approaches



- **Microsoft**
- **IBM-Rational**
- **Rally**
- **Open Source solutions (Git, Subversion, Bugzilla, ...)**

Approaches:

- **Focus is source code vaulting with very few features for ALM process and configuration management**
- **Hard-coded systems for small teams that lack the flexibility to adapt easily to user requirements, lack integration tools, and are not scalable for large, distributed enterprise projects**
- **Suite of point applications, not integrated approaches**
- **Designed for pure software company use cases, not mechatronics**

Workshop Proposal



- ▶ **Assume that ALM inside of PLM is the direction**
 - Single Configuration Management schema, but different behaviors and use cases for Mechanical, Electrical and Software content

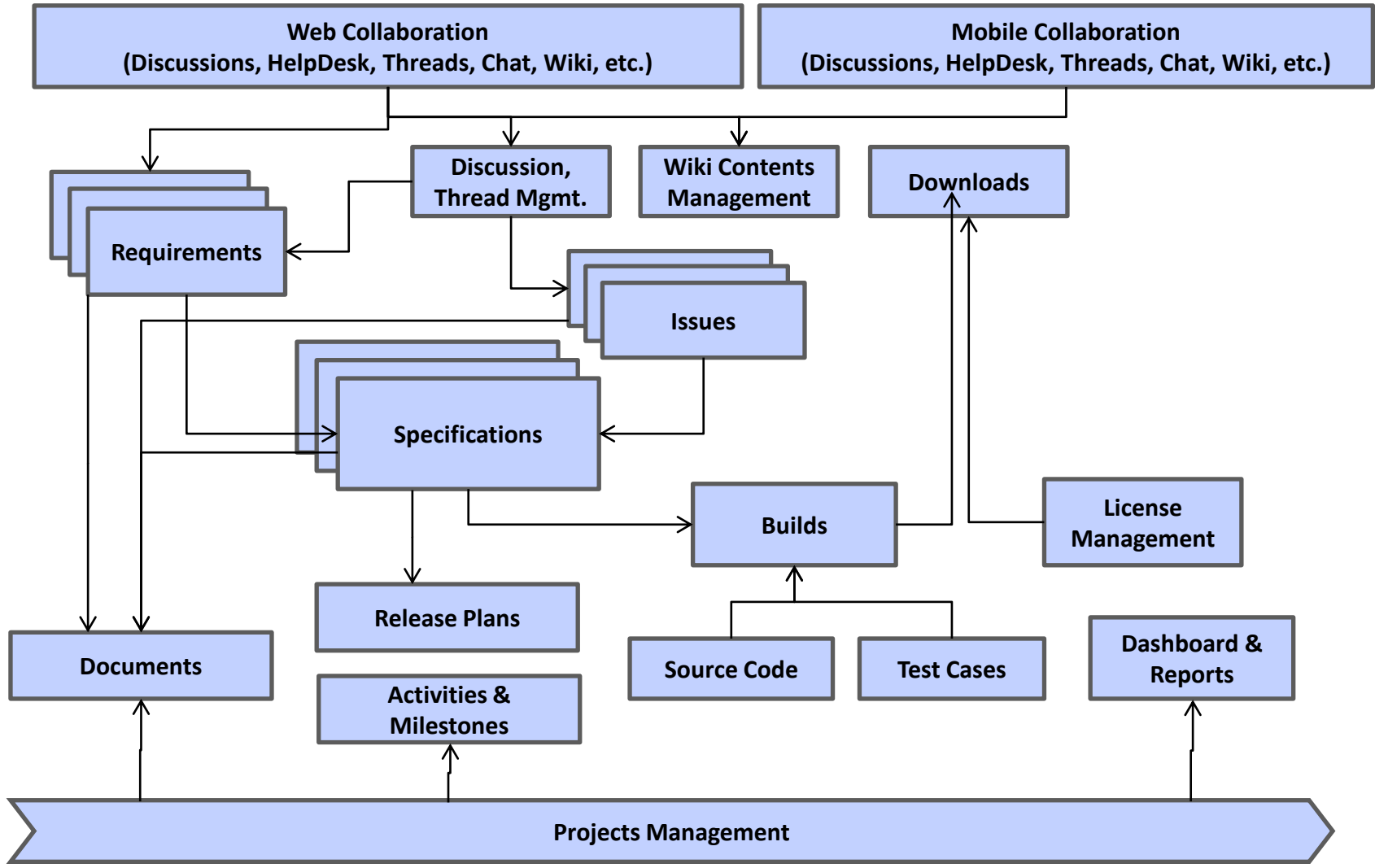
- ▶ **We'll talk about the data model, the process model, and the use cases. AND what do we integrate to or replace.**



- Requirements Management
- Workflow
- Lifecycles
- Configuration Management
- Document and Specification Vaulting
- User and Access Rights Controls
- Project and Task Management
- Issue Tracking
- Collaboration / Social tools
- Use Case Management
- Test Case and Test Results Traceability
- Release Planning
- Source Code Vaulting
- ? what did I miss ?

ALM

Software Development Process Map



Discussion Topic

▶ Source Code Vaulting

■ Integrate

- Subversion
- CVS
- Git
- ...

■ Replace

- Use PLM Vault? Practical? Realistic?

■ Work-in-Process versus Released file vaulting

▶ IDE (development/authoring applications)

- Eclipse
- Visual Studio
- ...

- Integrate or Replace?
- Do we integrate in a similar way as Mechanical CAD ?
- What functions?

► Requirements Management

- Is there a difference in RM data or processes?
 - Software
 - Mechanical
 - Electronic
 - Cable/Harness

- Complete System Modeling - Systems Engineering?

- Model-based engineering and simulation impact?

Discussion Topic

► Configuration Management

- Configuration Identification – does S/W get a part # ?
- Is S/W on the BOM?
- Do we need a vehicle configuration that includes S/W?
- How to handle the differences in Rate of Change?
- How to handle form-fit-function tier-up when software becomes significant to end-user operation, but changes so often?

Summary

▶ Next Steps?

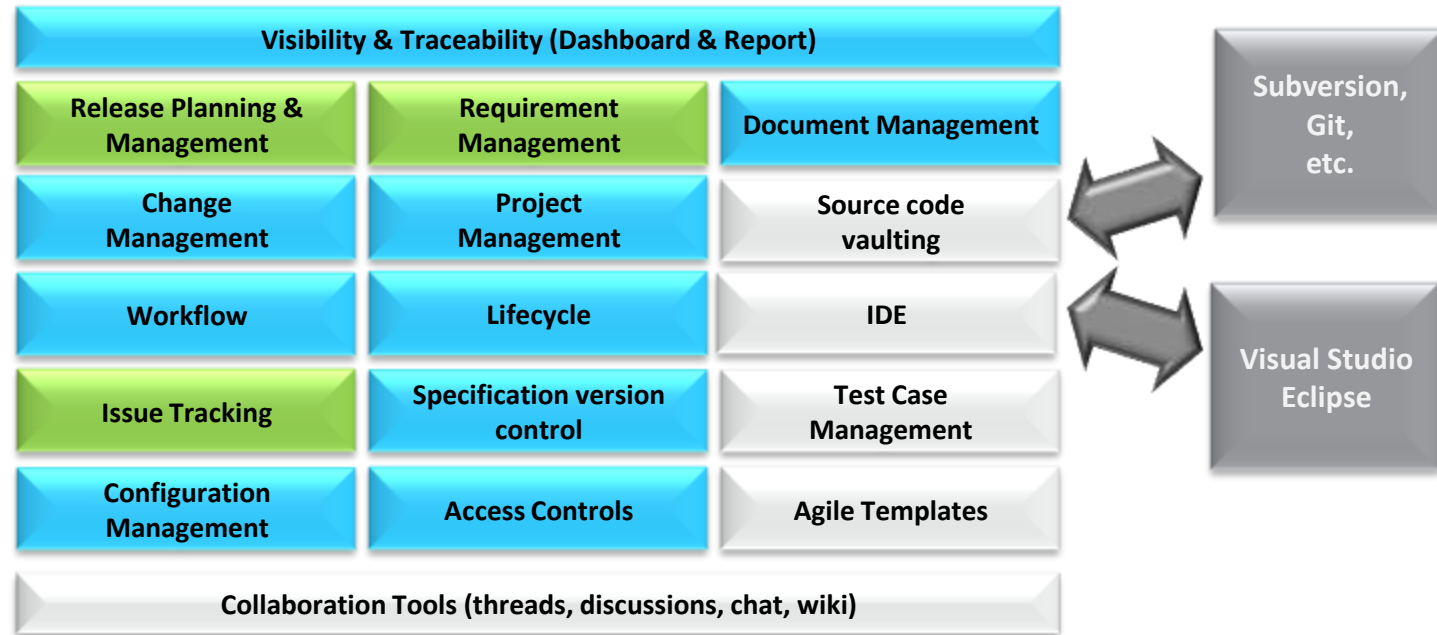
- What's Aras doing? (Next slide)

▶ Do we create an ALM SIG?

Aras ALM Solution Approach



Roadmap



2012 -> Standard (Aras Managed) Modules:

- Requirements Management with Use Case and Test Case Traceability
- Collaboration Tools

2012 -> Community Solutions

- Aras ALM modules: Release Planning, Issue Tracking
- Git or Subversion Integration for source code vaulting
- Workflow and lifecycle templates for Agile methodology
- Visual Studio and/or Eclipse IDE plug-ins