ALM and the road to production
Matthias Korpak, Senior IT-Consultant
Agenda

01 Introduction to BHC

02 Field of interest: PLM & ALM

03 Let’s talk about Deployment
Who we are

Our business

BHC
- Management, business and IT consulting for auto-motive, mechanical and plant engineering

We are a part of PROSTEP
- Böblingen, GER

Headquarter
- Böblingen, GER

CEO
- Philipp Hasenäcker
- Member of Management Board of PROSTEP

Team
- More than 50 Experts
- More than 17 years experience

Partnership
- Established PLM/ALM partner of Mercedes-Benz AG
- Service Partner for PTC codebeamer

Expertise in
- PLM and ALM for mechatronic and software
- consistent design for processes and methods (IT neutral)
- Operational support of your (agile) IT tool development process

Customers
- CARIAD
- Mercedes-Benz
- EvoBus
- AMG

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FIELD OF INTEREST: PLM & ALM
Field of interest: PLM & ALM

Would you rather...

**DECOUPLE?**

Decoupling:
- Agile workflow
- More flexibility
- More speed
... for the software development.

*But:* *Leads to silo mentality*

**INTEGRATE?**

Integration:
- More consistency
- Well-known processes

*But:* *Like handcuffs to at least one side*
Field of interest: PLM & ALM

... do both!

Integrate domains by a common V-model based systems layer

"Traditional" Development

... but decouple on domain level

Requirements

System Design

Detail Design

System Integration & Testing

Software

E/E

Mechanics
LET'S TALK ABOUT DEPLOYMENT
Let’s talk about Deployment

Application Lifecycle Management overview

Application Lifecycle Management

1. Plan
   - Management
   - Legal

2. Develop
   - Engineering

3. Test
   - Engineering

4. Deploy
   - Production
   - Engineering

5. Maintain / Retire
   - After-Sales
   - Sales & Marketing
   - Engineering

Commitment by the whole company.

Strategic decisions
Legal requirements
-Innovations
-Sales opportunities

ALM & PLM Systems
Engineering
IT-Tools

Software will keep us busy!
Let’s talk about Deployment

What’s the difference?

Application Lifecycle Management

1. Plan
2. Develop
3. Test
4. Deploy
5. Maintain / Retire

Testbenches, simulations, test-vehicles
Production vehicles

The difference:

▪ (Already on-going) high volume output
▪ Clearly defined production processes
▪ High aversion of delays/deviations of any kind
▪ Product completeness
▪ Local circumstances

Is my software affected by this?

Software Developer
Let’s talk about Deployment

Deployment strategies

GitHub

EBOM

What if we ask the question: “Do you know where your software is?”

It’s complicated

Software Developer

Plant Logistics

How does the (right) software find its way into the car?
Let’s talk about Deployment

Deployment strategies – Benefits and Drawbacks

<table>
<thead>
<tr>
<th>Off-Site</th>
<th>On-Site</th>
<th>In-Line</th>
<th>Post-Production</th>
<th>Sales</th>
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</thead>
<tbody>
<tr>
<td>▪ Outsourced assembly</td>
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<td>▪ Outsourced liability</td>
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<td>▪ Flexibility</td>
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Is this relevant to me?

Software Developer

- Physical delivery process
- Purchasing of HW/SW mix
- Coordination
- Workspace and storage
- Coordination
- Car storage
- Market restrictions
- Infrastructure / architecture

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### Let’s talk about Deployment

**Deployment strategies – What can go wrong?**

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<tr>
<td>Example:</td>
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<tr>
<td>▪ Attempt to streamline ALM and PLM</td>
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<td>▪ Opportunity to reduce paperwork</td>
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<td>▪ Problem: Supplier contracts and the mode of delivery was already negotiated.</td>
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<td>Example:</td>
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<td>▪ Production ramp-up</td>
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<td>▪ Plan to update a defined number of ECUs</td>
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<td>▪ Problem: Software changes faster than expected.</td>
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<td>Number of ECUs in need of update exceed planned storage and workspace.</td>
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<td>Example:</td>
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<td>▪ ECUs to be flashed in-line for mass production.</td>
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<td>▪ Problem: One ECU with slower memory for cost reduction.</td>
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<td>Flashing times are too long for assembly line.</td>
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<td>▪ Expansion of post-production updates.</td>
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<td>▪ Problem: Due to responsibilities, production refuses to build up and hand over cars without full customer approved software.</td>
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<td>▪ ECU final update outside of factory.</td>
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<td>▪ Save time and space in plant.</td>
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<td>▪ Problem: One ECU not capable of diagnostics while in use.</td>
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<td>Updates cause shut down of functionality in field.</td>
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Let’s talk about Deployment

**Conclusion**

- Successful deployment doesn’t happen by chance but by good planning.
- Software deployment doesn’t end with compiling code.
- Software deployment doesn’t start at the vehicle interface.

**What we can do: Methods and tools**

- Systems Engineering helps us to get the data we need.
- Application Lifecycle Management means the whole lifecycle.
- Consequent SE and ALM will lead to better requirements and from there to better production/deployment.

**What we can do: Organization**

- Involve experts from production in your vision of a software driven product!
- Explain to purchasing early the needs of next generation software development!
Thank you for your attention!

ご清聴ありがとうございました。
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