

The Software Engineering Community at DLR

How we got where we are

Carina Haupt, Tobias Schlauch

German Aerospace Center (DLR)
Department Intelligent and Distributed Systems
Berlin / Braunschweig / Cologne

Workshop on Sustainable Software for
Science: Practice and Experiences 5.1



Knowledge for Tomorrow



German Aerospace Center (DLR)

Numbers

- More than 8000 employees
- ~20% of DLR employees involved in software development
→ DLR is one of the biggest „software houses“ in Germany

Characteristics

- Variety of
 - Fields
 - Maturity
 - Software technologies
 - Team sizes
- “Developers” often do not have any training in software development



German Aerospace Center (DLR)

Numbers

- More than 8000 employees
 - ~20% of DLR employees involved in software development
- DLR is one of the biggest „software houses“ in Germany

Characteristics

- Variety of
 - Fields
 - Maturity
 - Software technologies
 - Team sizes
- “Developers” often do not have any training in software development

Goal: Improve sustainability and quality of software products



German Aerospace Center (DLR)

Numbers

- More than 8000 employees
 - ~20% of DLR employees involved in software development
- DLR is one of the biggest „software houses“ in Germany

Characteristics

- Variety of
 - Fields
 - Maturity
 - Software technologies
 - Team sizes
- “Developers” often do not have any training in software development

Goal: Improve sustainability and quality of software products

How to teach them software engineering?



Software Engineering Initiative of DLR

Software Engineering Initiative of DLR

Guidelines

Trainings

Knowledge
Provision

Collaboration

Experience
Exchange



Software Engineering Guidelines

Guidelines support developers to self-assess their software concerning good development practices.

- Joint development with focus on **good practices, tools, and essential documentation**
- **Three maturity level** available as **checklists in different formats** to ease practical usage

Checklists for different maturity levels

Change Management		
Recommendation	Comment	Status
EÄM.2: The most important information describing how to contribute to development are stored in a central location. <i>(from application class 1)</i>	Build steps are missing	todo
EÄM.5: Known bugs, important unresolved tasks and ideas are at least noted in bullet point form and stored centrally. <i>(from application class 1)</i>		ok
EÄM.7: A repository is set up in a version control system. The repository is adequately structured and ideally contains all artifacts for building a usable software version and for testing it. <i>(from application class 1)</i>		ok
EÄM.8: Every change of the repository ideally serves a specific purpose, contains an understandable description and leaves the software in a consistent, working state. <i>(from application class 1)</i>		ok

Reasoning and further advice

The repository is the central entry point for development. All main artifacts are stored in a safe way and are available at a single location. Each change is comprehensible and can be traced back to the originator. In addition, the version control system ensures the consistency of all changes.

The repository directory structure should be aligned with established conventions. References are usually the version control system, the build tool ([see the Automation and Dependency Management section](#)) or the community of the used programming language or framework. Two examples:

Trainings

Regular trainings are offered to provide hands-on experience in applying the guidelines and the DLR development tools.

Concept

- Intensive two-day course
- Small groups with up to 15 participants
- Hands-on experience on the basis of a complete example project using DLR provided tools
- Trainings are offered on a yearly basis at different DLR locations across Germany

Additional trainings are offered on request for specific topics such as unit testing, open source, and others.



Knowledge Provision and Collaboration SoftwareEngineering.Wiki

Internal Wiki space to share software engineering knowledge and experiences.

Concept

- Open to contributions of all DLR employees
- Moderation by a small central group

Main content categories

- News
- Information about topics like architecture, testing, etc.
- Official programming guides
- Experiences concerning development tools
- Questions & answers



Software Engineering

Created by Pliewischkies, Andre, last modified by Schlauch, Tobias on 10. February 2017

i Welcome to the *SoftwareEngineering.Wiki*!

The *SoftwareEngineering.Wiki* is the place to create, share and discuss software engineering content with colleagues on a working-level! We aim for an open and constructive exchange of ideas. Therefore, feel free to share your knowledge and encourage others to do so as well!

- **Before you start:** Please visit the Get Involved! section and subscribe to our Blog!
- **Any Software Engineering related question?** You can ask it directly in the Ask a Question section!
- **You require more information how you can approach the topic software development in general?** This document [provides an overview about general recommendations \(German only, chapter 4\)](#). In addition, your Software Engineering Contact [is able to support you!](#)

This Wiki space is moderated by Simulation and Software Technology [in addition](#), this work is supported and funded by DLR's central IT department [in addition](#).

Get Involved!

Get Involved!

Ask a Question

Ask a Question

Topics

Learn about specific SE Topics!

Literature

Find out about useful SE readings!

Tools

Learn about specific SE Tools!

Best Practices

Programming recommendations, how-tos and more!

Software Project Manual

Learn how to organize your software project!

Events

Find out about upcoming workshops, presentations, or trainings!

Blog Posts

- [Aus DLR Open Blog: Folge-WAW DLR Open II - Thema und Termin steht - Anmelden!](#) created by Haupt, Carina 06. April 2017 Software Engineering
- [SUMO als Projekt bei der Eclipse Foundation](#) created by Hilbrich, Robert 05. April 2017 Software Engineering
- [Interesting Summary of Google's Software Engineering Practices](#) created by Schlauch, Tobias 09. March 2017 Software Engineering

Latest Questions

- [Experience with Django framework](#) [question](#) [software-engineering](#) [django](#)
- [I want to upstream a \(small\) patch, what form of signoff do I need from whom?](#) [question](#) [software-engineering](#) [open-source](#)
- [Perl Distribution für Windows im DLR](#) [question](#) [software-engineering](#) [perl](#)

Latest Changes

- Schlauch, Tobias**
 - [Organisation EAWSE4](#) updated about 2 hours ago • view change
- Bachmann, Arne**
 - [Vagrant](#) updated yesterday at



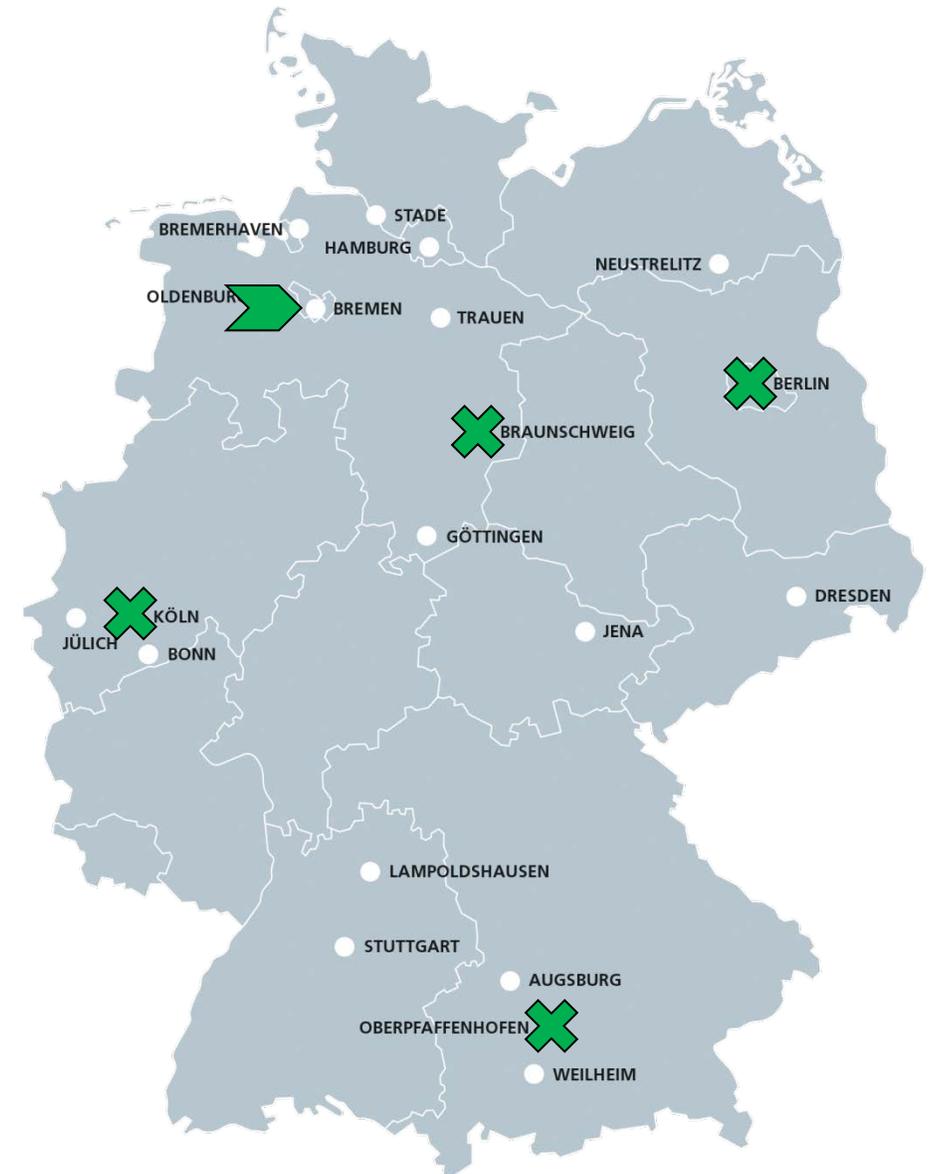
Experience Exchange Workshops

Regular knowledge exchange workshops are held to actively involve DLR scientists and to foster exchange.

Concept

- Intensive 1.5-day workshop to provide *knowledge, experience exchange and networking opportunities*
- Dedicated main topic supported by keynotes of invited experts
- Active involvement of the participants through group work, experience reports, technical presentations, and lightning talks
- Results are shared via the *SoftwareEngineering.Wiki*

Since 2014, four knowledge exchange workshops have been organized at different locations across Germany. About 50 scientists participated in every workshop.



Summary and Outlook

First steps have been taken to build a self-reliant software engineering community at DLR.

Key success factors

- Establishment of a vital software engineering core community
- Joint development of practical software development guidelines
- Raising management awareness and achieving management support
- Wholesome support of domain scientist and DLR institutes

Next steps

- Strengthen community (exchange, “inner source”)
- Provide further, community-driven solutions to ease implementation of guidelines



Questions?

If you have any more questions, just let us know.

More Information can be found in our paper.

Or just ask us here, or via mail:

carina.haupt@dlr.de

tobias.schlauch@dlr.de

