

Supporting the Research Software Development Community at DLR

HiRSE Seminar, 10.06.2022, Online

Tobias Schlauch <Tobias.Schlauch@DLR.de>

Institute for Software Technology

German Aerospace Center (DLR)

<http://www.dlr.de/sc>



Knowledge for Tomorrow



Research Software Development at DLR

- **Some background**

- More than 9000 employees, ~20% of DLR employees involved in software development
- Variety of fields, maturity, and technologies:
<https://doi.org/10.1145/3387940.3392244>

- **Brief history of DLR`s Software Engineering Initiative**

- Activities started in 2005 as part of DLR`s quality assurance program
- Since 2017 focus moved more and more on research software development aspects
- Work is driven by the DLR institute for Software Technology and funded by DLR IT



Software Engineering Initiative for DLR

Software Engineering Initiative for DLR

Policy
Development

Guidelines
and
Tools

Training
and
Consulting

Community
Building
and Experience
Exchange



Software Engineering Initiative for DLR (cont.)

DLR SE Guidelines

<https://rse.dlr.de/>

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>		
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>		
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>		



Git

Issue Tracker

Continuous
Integration

Collaboration

...

DLR GitLab Instance

Community Building and Experience Exchange

- **Goals**

- Improve collaboration across domains and hierarchies
- Enable the establishment of DLR-wide and local communities

- **Challenges**

- Distributed across different institutes, domains and locations
- High fluctuation of personnel
- Culture of “working on your own”

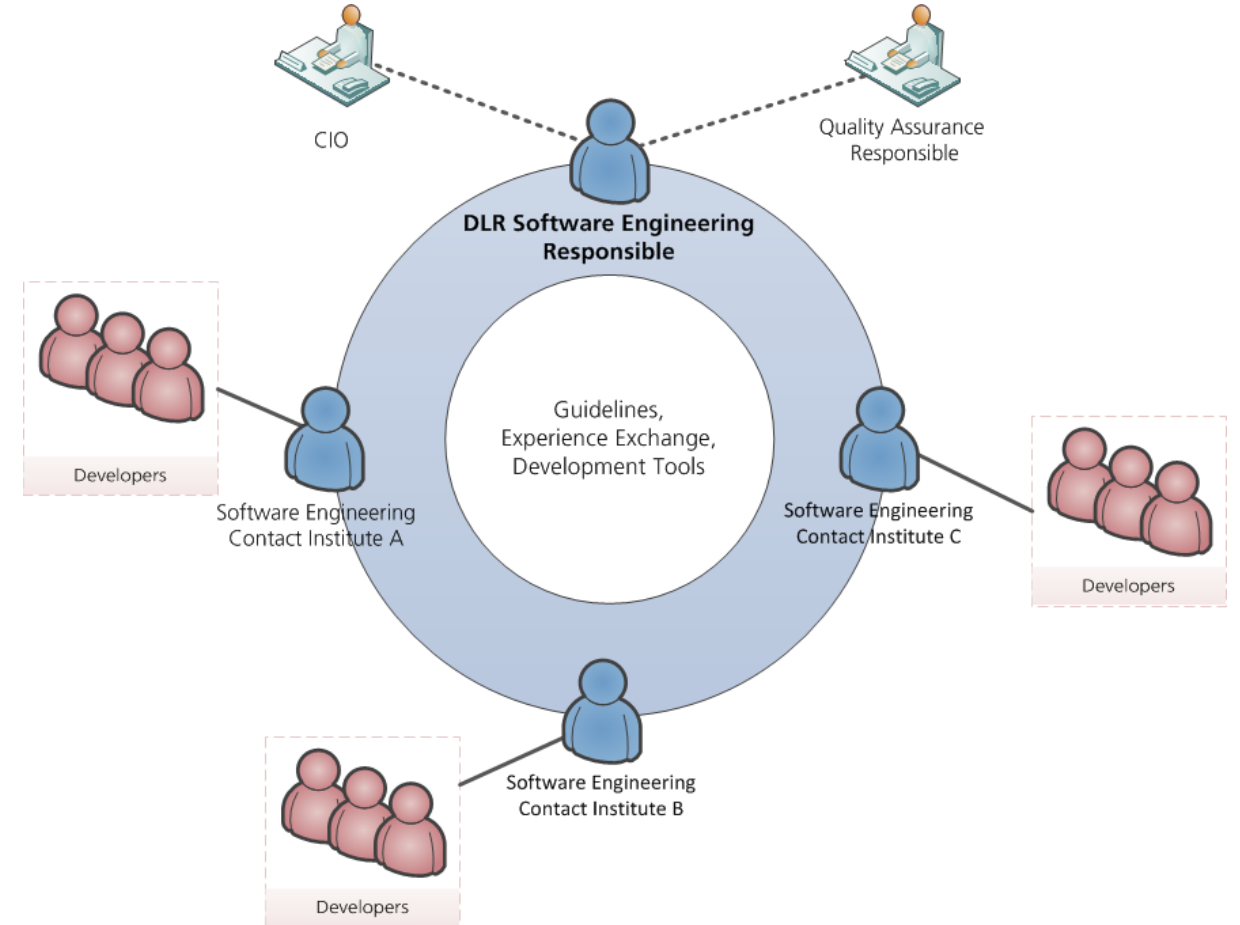
- **Current Approach**

- Establish an official DLR-wide collaboration network
- Establish low-threshold opportunities for knowledge and experience exchange



DLR Software Engineering Network

- Consists of the **Software Engineering Contacts** and further interested persons of each institute
- Software Engineering Network and related roles are officially established via DLR`s quality policy
- **Role of the Software Engineering Network**
 - Exchange experiences and needs across the different institutes
 - Discuss and work on central topics related to software engineering
 - Joint decision making



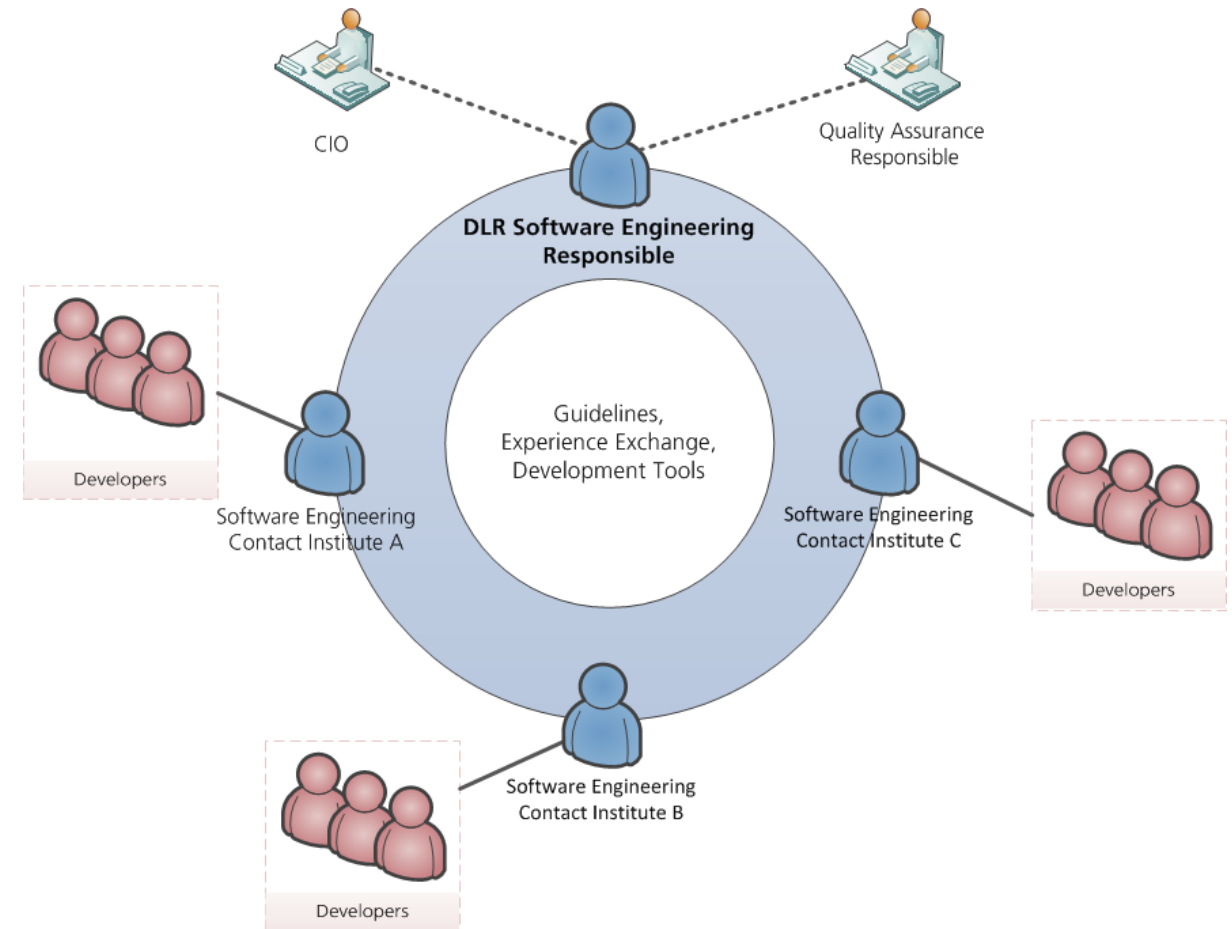
DLR Software Engineering Network

• Role of the Software Engineering Contact

- Coordinate institute-wide software engineering strategy and their practical implementation
- Organize the institute-specific knowledge exchange

• How do we collaborate?

- Yearly joint meeting, if possible in person
- Small working groups work on current topics asynchronously
- Information exchange via a shared Wiki space, GitLab group, persistent chat, and mailing list



Software Engineering Knowledge Exchange Workshops

- **Idea:** Organize a yearly software engineering event to actively involve DLR researchers and to foster exchange!
- **Concept:**
 - Intensive 1.5 day workshop with focus on a main topic
 - Active involvement of the participants through interactive formats such as posters sessions, software architecture speed dating, group work, etc.
 - Social event
 - Talk program consisting of DLR-internal contributions
 - Invited external speakers
 - Results are shared via the **DLR SoftwareEngineering.Wiki**

WissensAustauschWorkshop

Software Engineering VIII

16. - 17. September 2021, Virtuell



Knowledge Exchange Workshops (cont.)

Overall:

- 461 participants
- 58 participants per workshop in average

#	Topic	# Participants	Date	Location
1	Kick-Off	57	November 2014	Braunschweig
2	Tools and Processes	56	April 2015	Köln
3	Open and Inner Source	53	April 2016	Oberpfaffenhofen
4	Software Architecture	52	April 2017	Berlin
5	Embedded Systems	47	May 2018	Bremen
6	Software Engineering for Data Science	55	May 2019	Jena
7	Software Development Process and Software Architecture	70	September 2020	Online
8	Software Development in distributed Teams	71	September 2021	Online
9	Inner Source and Legacy Code	??	September 2022	Berlin?



DLR SoftwareEngineering.Wiki

- **Idea:** Provide a central place to exchange software engineering content and find contacts at DLR!
- **Concept:**
 - Actively moderated
 - Everyone can read, contribute, and comment on content
 - Pre-structured Wiki space
 - Blog for announcing news
 - Established in April 2013, > 500 Wiki pages, > 250 blog posts

Software Engineering

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?** [The guidelines section](#) provides an overview about general recommendations. 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](#).

Get Involved!



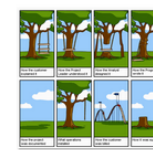
Get Involved!

Ask a Question



Ask a Question

Topics



Learn about specific SE Topics!

Literature



Find out about useful SE readings!

Tools



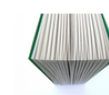
Learn about specific SE Tools!

Best Practices



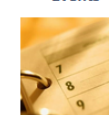
Programming recommendations, how-tos and more!

Software Engineering Guidelines



Learn how to organize your software development!

Events



Find out about upcoming workshops, presentations, or trainings!

Suche in diesem Bereich



Blog Posts

Free and Open Source Software Conference (FrOSCon) - Call for Papers / Call for Projects created by [User] 09. May 2022 Software Engineering

Studienteilnehmerinnen gesucht! created by [User] 22. April 2022 Software Engineering

DLR GitLab - Update from 14.5 => 14.6 created by Schlauch, Tobias 14. January 2022 Software Engineering

Latest Questions

WSL2 / Windows Subsystem for Linux 2 DNS issues question software-engineering

Sicherheitskritische Software question software-engineering

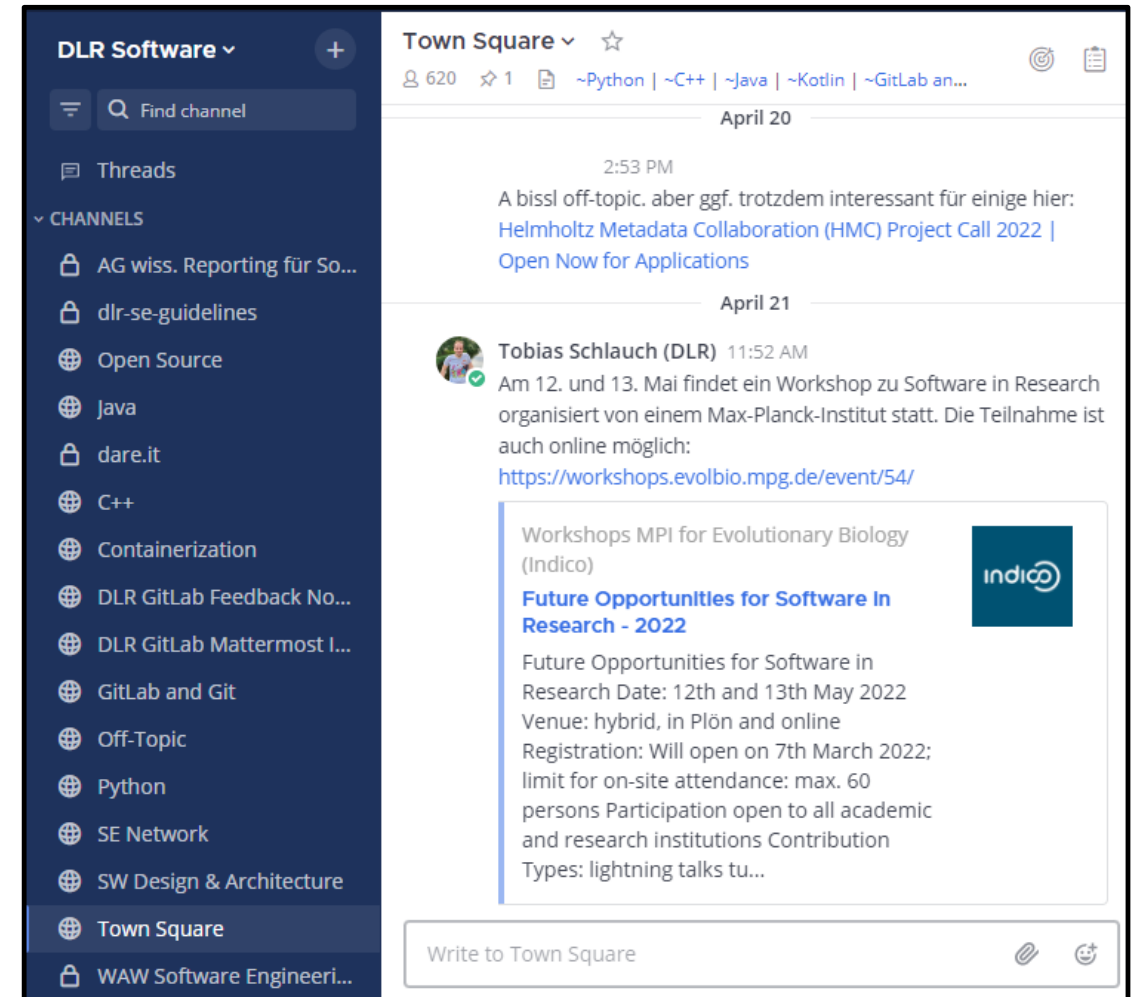
Remindertool question software-engineering

Latest Changes

Schlauch, Tobias DLR-GitLab commented about 3 hours ago

DLR Software Mattermost Team

- **Idea:** Make it easier to discuss software engineering related topics and ask questions!
- **Concept:**
 - Establish the DLR Software Team using the Mattermost service provided by [HIFIS](#)
 - Actively moderated
 - Everyone can join into channels and create public/private channels for their own purposes
 - Topic channels link back to Wiki topic pages
 - Established in early 2021, > 600 participants, 25 public channels, > 8000 messages



Summary

- **Combined top-down and bottom-up approach** with regard to community building and experience exchange from the overall DLR point of view
- **Software Engineering Network:**
 - Joint working and decisions making across the different DLR institutes
 - Software Engineering Contacts organize institute-internal collaboration
- **Low-threshold opportunities for knowledge and experience exchange:**
 - Software Engineering Knowledge Exchange Workshops
 - DLR SoftwareEngineering.Wiki
 - DLR Software Mattermost Team
- **Future Idea:** Better utilization of the DLR GitLab instance by establishing a culture of “Inner Source” to foster internal collaboration on concrete software projects



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Thank you!

What are your Questions?

Tobias.Schlauch@dlr.de

www.DLR.de/sc | [@TobiasSchlauch](https://twitter.com/TobiasSchlauch)