RSE | 4NFDI

Safeguarding software sustainability in the NFDI

http://www.rse4nfdi.de
Twitter: @rse4nfdi

RSE4NFDI is a cross-cutting consortium. We address all software technology levels across all disciplines.

Situation

Software is critical to modern data-driven research. Research data and research software form an inseparable unit for manipulation and interpretation. Providing a national research data infrastructure without a national research software infrastructure leads to a fragmentation in the software realm. The quality of data is inextricable from the quality and documentation of processes linked to it, and these processes are built on and with software.
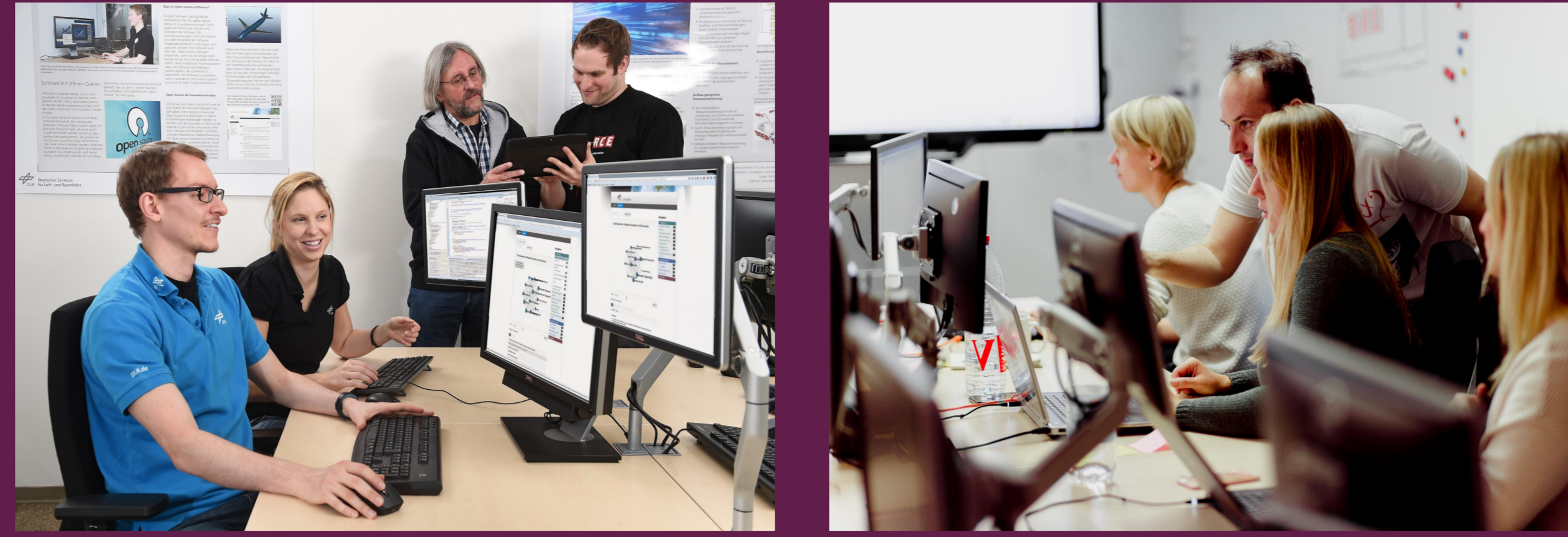
RSE4NFDI

Objectives

- leverages integrating power of software
- increases trustworthiness of results
- enables repeatable, reproducible, reusable, extensible research
- increases rate of discovery and reduces replicated efforts
- frees resources for new research (higher ROI)
- improves readability and usability of data
- avoids fragmentation for an economy of scale
- transfers the FAIR principles to software development in the spirit of Open Science

Activities

- **build communities of practice** by fostering skills and craftsmanship
- **enable collaboration** with a common language for needs and workflows
- **develop policies** for services, organisational frameworks and software sustainability
- maintain an adaptable **application portfolio**
- **Recommend existing & build new e-infrastructures** for software development
- **manage digital processes** to promote innovation
- **create reference architecture** and blueprints
- **increase the valuation of software** within the scholarly value system
- **define the role and tasks of RSEs** and improve recruiting, personnel development & career opportunities
- **saveguard long-time archiving** and **software heritage**

Software is critical to modern data-driven research.

Given the growing relevance of research software, a greater degree of networking between the various stakeholders is necessary, particularly across disciplines.

-- Matthias Katerbow & Georg Feulner in *Recommendations on the development, use and provision of Research Software*, Published by the Research Software Working Group as part of the priority initiative Digital Information of the Alliance of German Science Organisations, doi: 10.5281/zenodo.117298

Do you use research software? — No 8% / Yes 92%
What would happen if you could no longer use research software?
Do you develop your own research software? — No 44% / Yes 56%

-- Simon Hettrick, *Software in research survey*, doi: 10.5281/zenodo.1183562
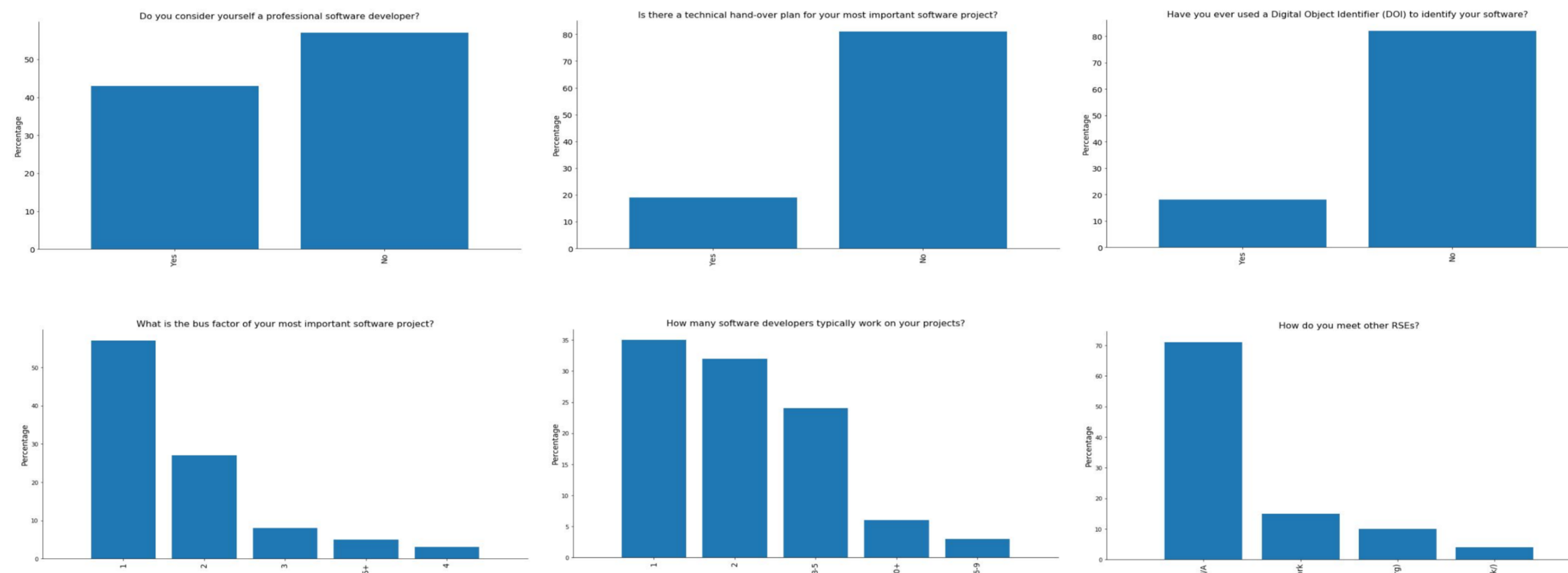
-- Olivier Philippe, Martin Hammitzsch, Stephan Janosch, Anelda van der Walt, Ben van Werkhoven, Simon Hettrick, Daniel S. Katz, Katrin Leinweber, Sandra Gesing, Stephan Druskat, Scott Henwood, softwaresaved/international-survey: Public release for 2017 results doi: 10.5281/zenodo.2574123

What are the THREE most important aspects in your NFDI consortium regarding software?
1. Safeguarded readability and improved usability of research data
2. Trustworthiness of results
3. Repeatable, reproducible and reusable results
4. Extensible research
5. Increased rate of discovery
6. Economies of scale
7. Increased return on investment
8. Interdisciplinary

Is RSE4NFDI an alternative to pursue cross-cutting software aspects in the NFDI?
1. Yes, we don't see any other option.
2. Yes, beside other options - I'll drop a note below about further alternatives.
3. No, other options allow better integration - I'll drop a note about alternatives.
4. No, cross-cutting aspects regarding software are not an issue for our NFDI.

Please tick the statements that apply to your consortium.

Use a sticky note and leave a comment.

Organisations and domains

More than 20 universities and research institutes already support the RSE4NFDI proposal:

- Friedrich-Schiller-University Jena
- Humboldt-University Berlin
- Karlsruhe Institute of Technology
- TU Dresden
- University of Freiburg
- University of Greifswald
- University of Münster
- University of Stuttgart
- University of Trier
- University of Applied Sciences Zwickau
- European Virus Bioinformatics Center Jena
- Fraunhofer FOKUS Berlin
- German Aerospace Center
- Deutsches Krebsforschungszentrum
- Helmholtz Centre Dresden (HZD)
- Helmholtz Centre Potsdam (GFZ)
- Helmholtz Centre Leipzig/Halle (UFZ)
- Information Centre f. Life Science
- Max Planck Institute Jena (MPI-SSH)
- Potsdam Institute for Climate Impact Research (PIK)
- Weizenbaum Institute
- more to come

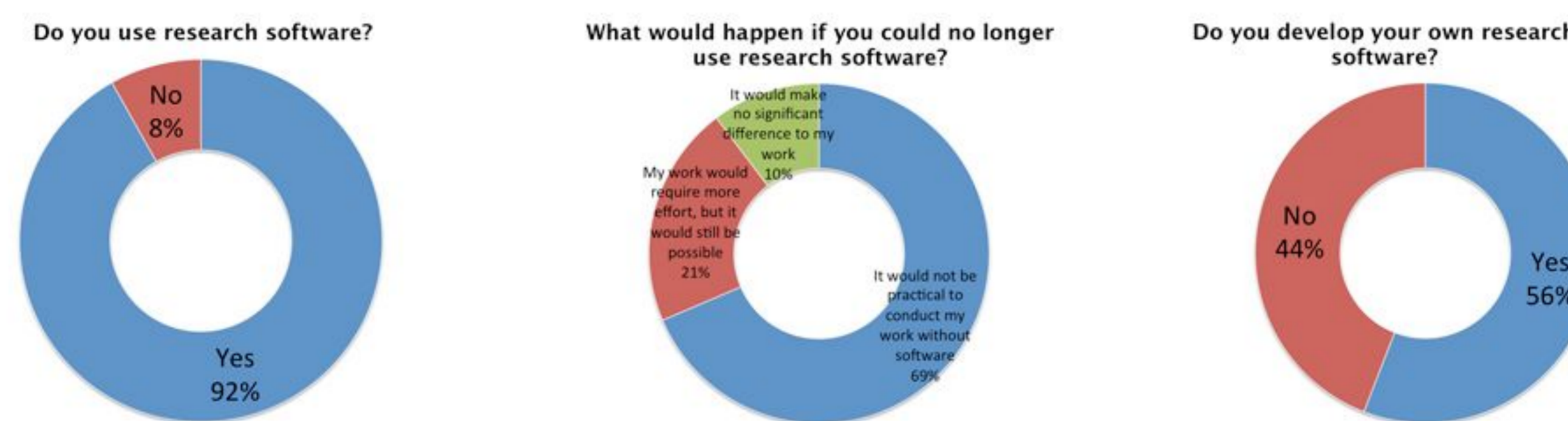Dedicated software experts from the different domains, such as:
- Bioinformatics
- Geoinformatics
- Data Mining & Data Analytics
- High Performance Computing
- Materials Research
- Machine Learning
- Medical Informatics
- Visualization
- Humanities
- ...

RSE, RSEng?

- Research software engineering (RSEng) is the development of software for science
- A Research Software Engineer (RSE) combines **expertise in programming with an intricate understanding of research in other domains.**
- Valuable combination of skills, but **role not well represented in academic system**: contributions are badly recognised, career opportunities low
- Term coined in UK - largest RSE community today
- Professionals of all career stages and job titles self-identify as RSEs and have diverse career paths
- **National chapters** in several countries: researchsoftware.org
- Chapters and local groups welcome all those who contribute to software development in science