HELIPORT

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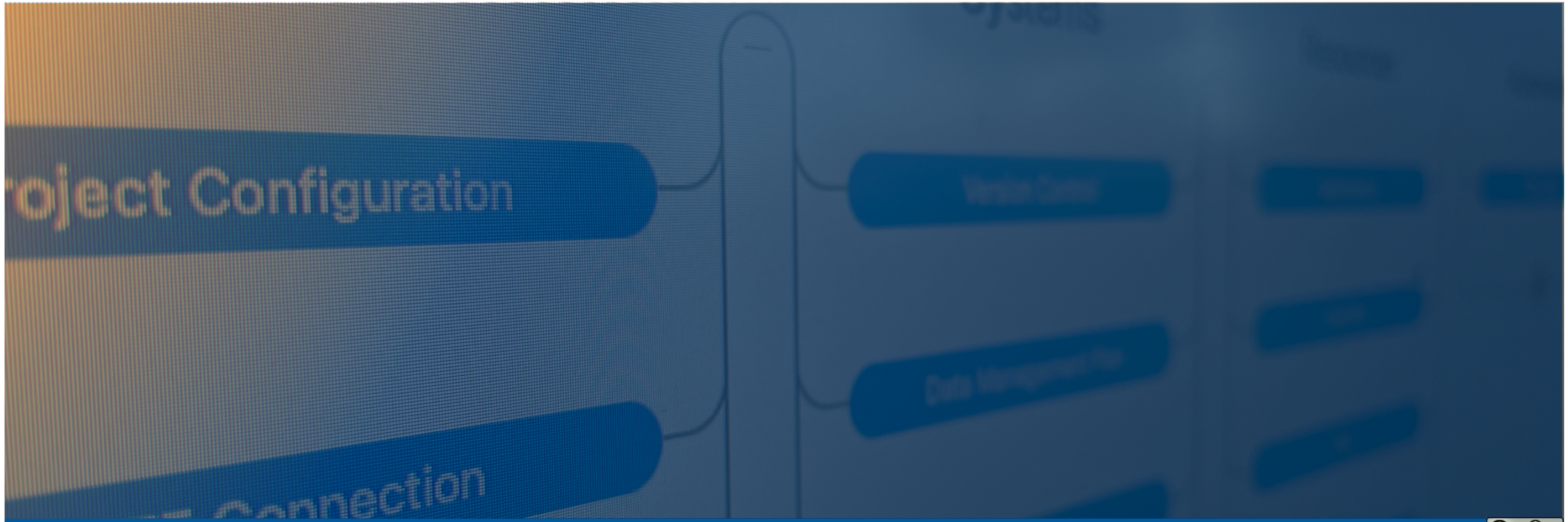
HI JENA Helmholtz Institute Jena
HZDR HELMHOLTZ ZENTRUM DRESDEN ROSSENDORF



The Integrated Research Data Lifecycle of the HELIPORT Project

HMC Conference 2022 // October 5, 2022

Oliver Knodel, Martin Voigt, Robert Ufer, David Pape, Mani Lokamani, Jeffrey Kelling, Stefan E. Müller, Thomas Gruber, Guido Juckeland, Alexander Kessler, Chien-Li Lee , Joachim Hein, Bernd Schuller // contact: o.knodel@hzdr.de

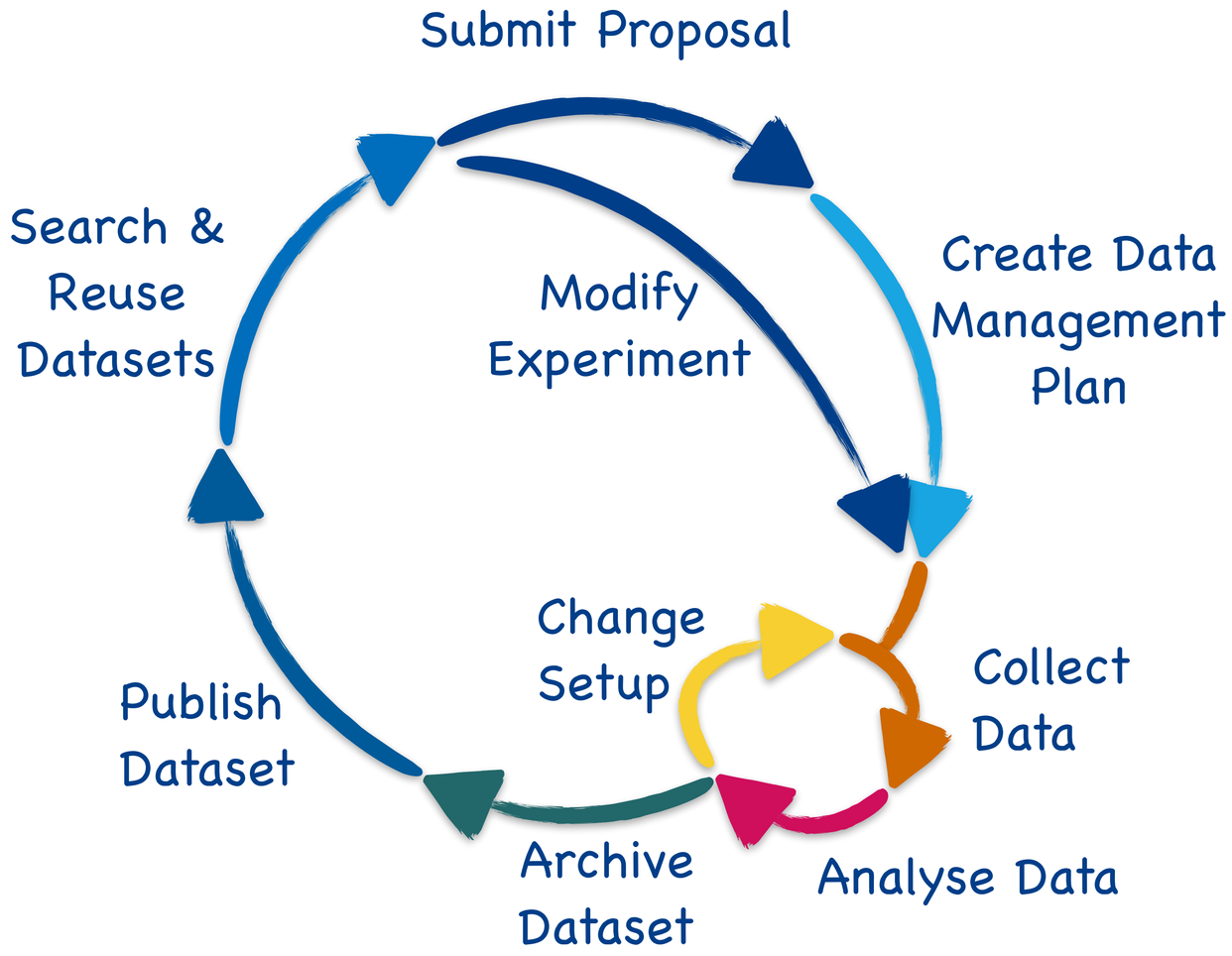
DRESDEN concept

Our Challenge: An End-to-End Digital Data Lifecycle

— We support many steps of our different research experiment (matter, energy and health) with tools:
  - electronic lab books,
  - interactive analysis,
  - publication of datasets,
  - scientific workflow management,
  - Handle generation and management.

— A uniform and smooth access to and between all services and systems in our ecosystem is necessary.

— The documentation of all these linked resources is essential to create a comprehensible and FAIR data lifecycle.



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The Motivation to Develop HELIPORT

— HELIPORT was originally intended to provide only the **proposal's metadata**, to allow the assignment of resources.

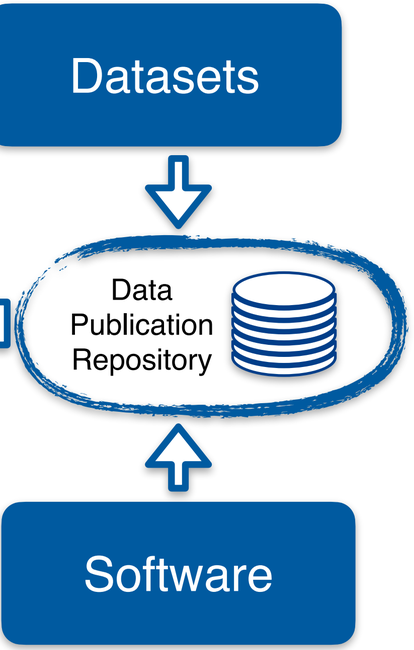
— Over time, we realised that HELIPORT can also answer our scientists' most important questions, such as:

What are the necessary steps towards a full comprehensible and FAIR research experiment ensuring data provenance?

How we can reduce computations and save energy?

How can we **automate recurring processes** and keep track of status and data products?

Which datasets or software can be **published** (and how)?



How can we bring **new team members** or external scientists into our project lifecycle and associated services/tools?

Where are data, software and how can I gain **access** to both of them?

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HELIPORT

HELmholtz Sc**I**entific
Project W**OR**kflow Pla**T**form

> The HELIPORT project aims at developing a platform which accommodates the **complete life cycle** of a scientific project and links all corresponding programs, systems and workflows to create a more **FAIR** and comprehensible project description.

Project Members:

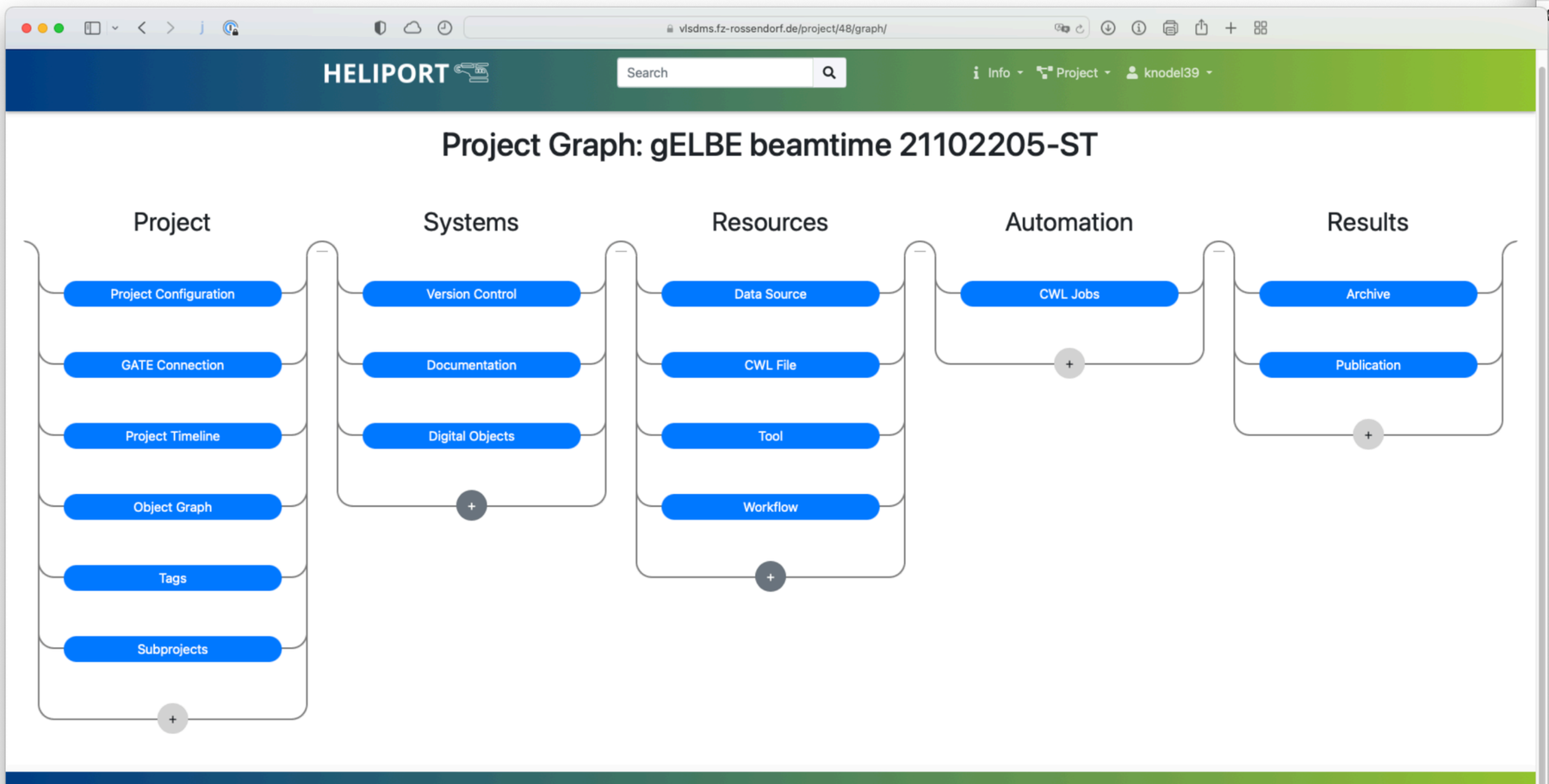
HZDR HELMHOLTZ ZENTRUM DRESDEN ROSSENDORF

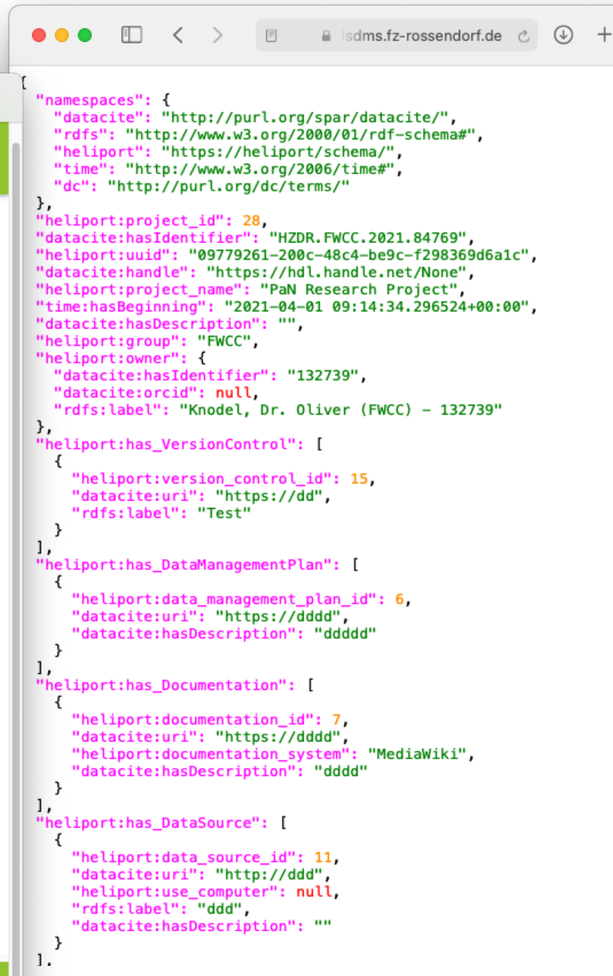
HI JENA Helmholtz Institute Jena

JÜLICH FORSCHUNGSZENTRUM

Funded by:

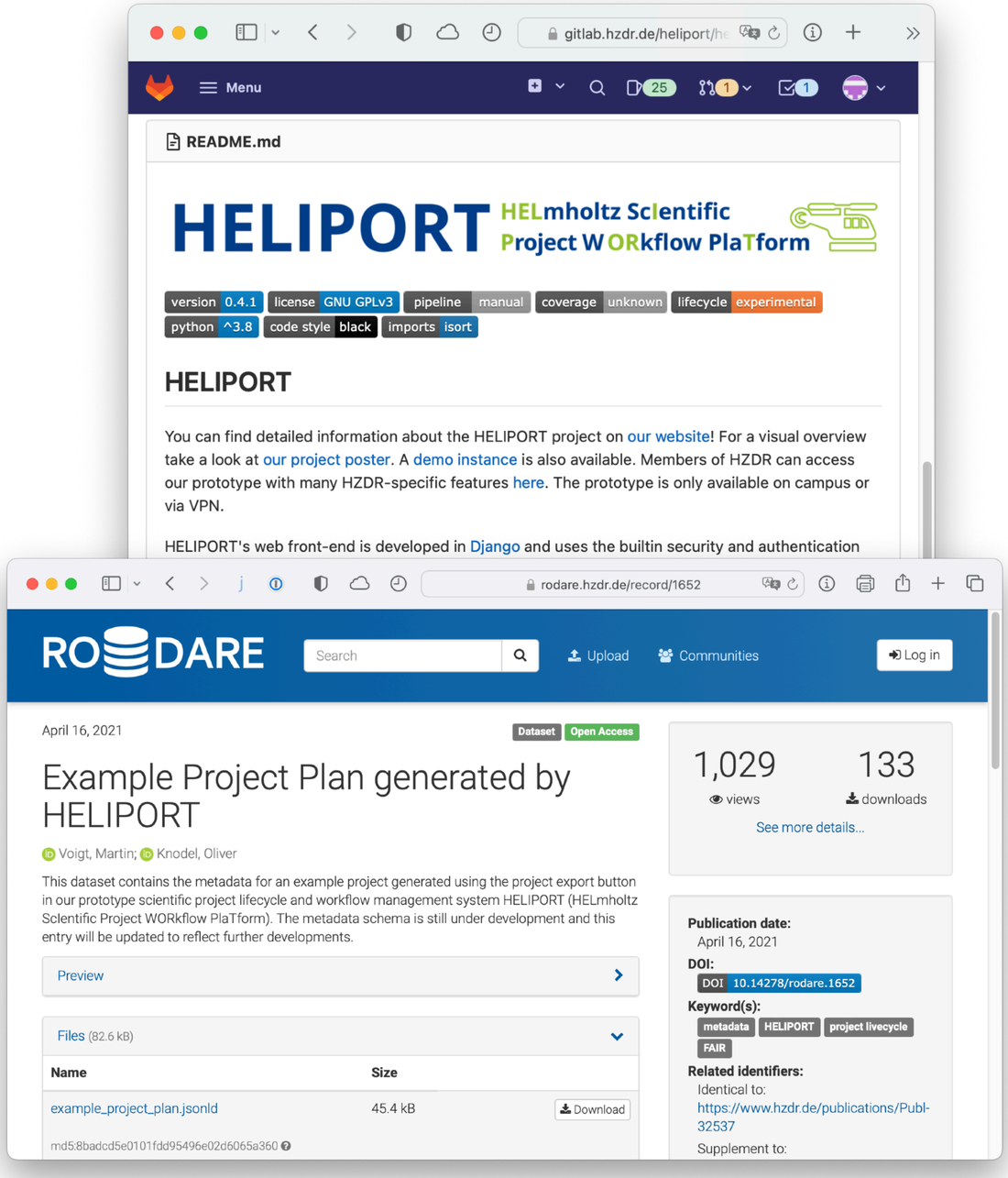
HMC HELMHOLTZ METADATA COLLABORATION





The First Year…

- Discussions on the modular HELIPORT architecture and first prototype (D3) also available on gitlab.hzdr.de and: DOI 10.14278/rodare.947 ✓
- Project-level metadata schema as a first draft based on DataCite (D1): DOI 10.14278/rodare.1652 ✓
- The experiment-specific metadata is not directly part of the HELIPORT metadata:
  - For the laser experiments we started discussions within the community (Mattermost Team, Laserlab Europe talks, …).
  - We started the integrate/linkage of external metadata catalogues in HELIPORT (e.g. ICAT, SciCat, …).
- A first concept for mapping CWL to the UNICORE language has been completed (D2). ✓



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The Project Meeting at HI Jena in 2022

events.hifis.net/event/461/

HELIPORT project meeting

IN PERSON

Jun 22, 2022, 12:00 PM → Jun 23, 2022, 1:00 PM Europe/Berlin

Helmholtz Institut Jena

Alexander Kessler (Helmholtz Institut Jena) , Oliver Knodel (Helmholtz-Zentrum Dresden-Rossendorf (HZDR))

Description

HELIPORT HELmholtz Scientific Project WORkflow PlaTform

HELIPORT (Helmholtz Scientific Project WORkflow PlaTform) is a project funded by the Helmholtz Metadata Collaboration, and runs from July 2021 until June 2023. HELIPORT aims to make the entire life cycle of a scientific project findable, accessible, interoperable and reusable according to the FAIR principles, mentioned below. In particular, our data management solution deals with the areas from the generation of the data to the publication of primary research data, the workflows carried out and the actual research results. For this purpose, a concept was developed which shows the various essential components and their connections. Descriptions of the individual components can be found in our HZDR Data Management Strategy.

This event is intended as an internal project meeting located at Helmholtz Institute Jena and open for all members of our HELIPORT project from HZDR, HIJ and FZJ.

Registration

You are registered for this event. 10 Check details

Participants

Alexander Kessler, Bernd Schuller, David Pape, Jeffrey Kelling, Joachim Hein, Malte Christoph Kaluza, Mani Lokamani, Martin Voigt, Oliver Knodel, Stefan Mueller

Contact heliport@hzdr.de

Wednesday, June 22

12:00 PM → 12:15 PM **Welcome, Introduction to HELIPORT and Roadmap** 15m

Speaker: Oliver Knodel (Helmholtz-Zentrum Dresden-Rossendorf (HZDR))

Heliport_Meeting_J...

12:15 PM → 1:00 PM **Features and latest extensions** 45m Minutes

1. **Infrastructure Report:** Updates on code, CI, packaging, and other infrastructure-related topics. (David Pape)
2. **Latest Developments and Features:** Showcase of major updates since the last HELIPORT release on Rodare. (Martin Voigt)
3. **User Discussion:** Discussion on use cases, features, usability, and more.

Speakers: David Pape (HZDR), Martin Voigt (HZDR)

1:15 PM → 2:15 PM **HELIPORT@Jena Status and Metadata DB Discussion** 1h Minutes

Speaker: Alexander Kessler (Helmholtz Institut Jena)

2:30 PM → 4:30 PM **Interactive Session I: Deployment** 2h

Speaker: David Pape (HZDR)

5:00 PM → 6:00 PM **POLARIS Tour** 1h

Speaker: Alexander Kessler

6:00 PM → 6:20 PM **Summary Day 1** 20m

Speaker: Oliver Knodel (Helmholtz-Zentrum Dresden-Rossendorf (HZDR))

HELIPORT

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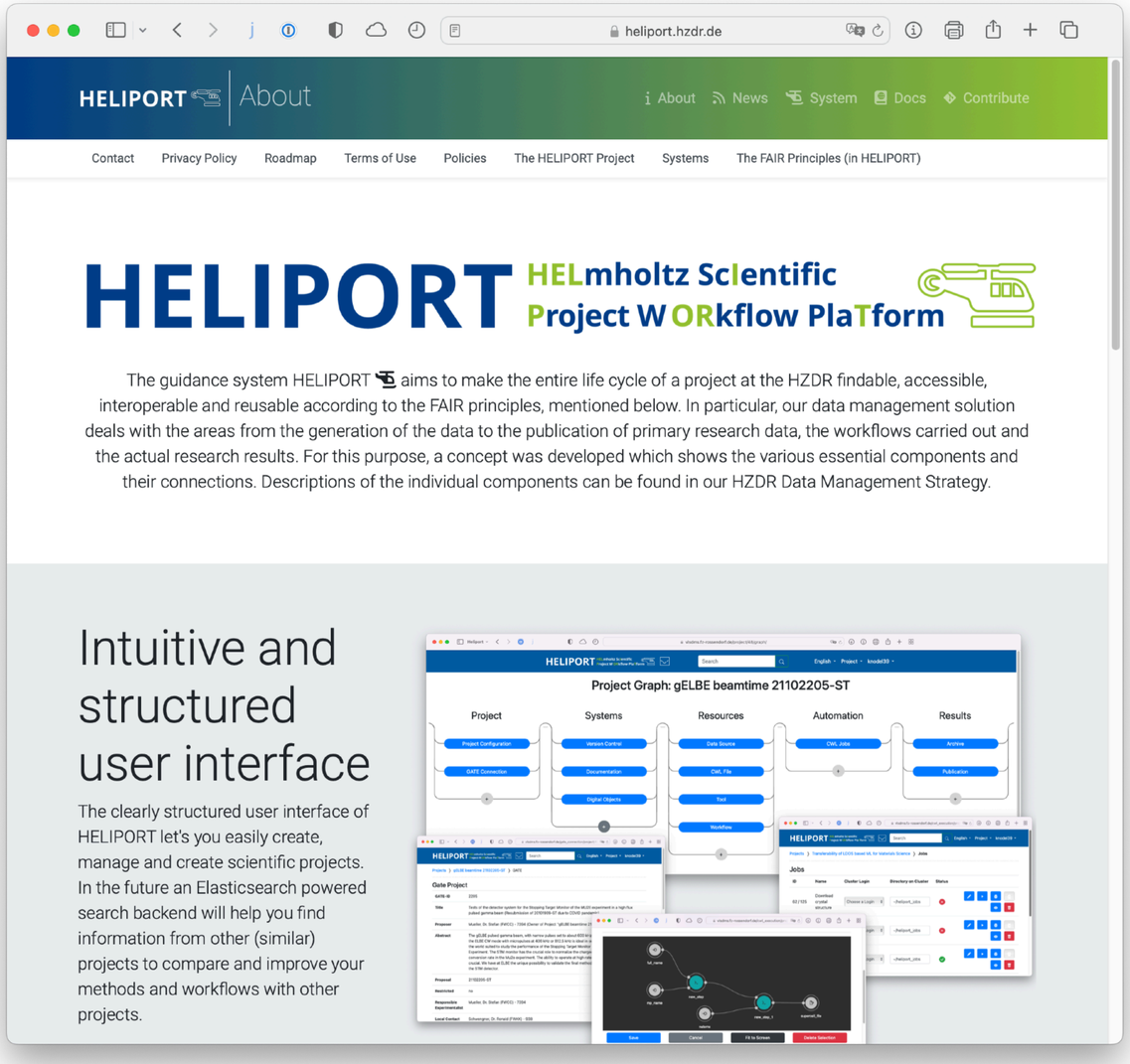
Important (but unplanned) Milestone: heliport.hzdr.de

- We received an increasing number of questions regarding heliport.
- To address the demands we created the website **heliport.hzdr.de** with:
  - Overall information on HELIPORT,
  - Documentation,
  - Ressources (Poster, Presentation, Paper)
  - News section and
  - Our two HELIPORT systems:

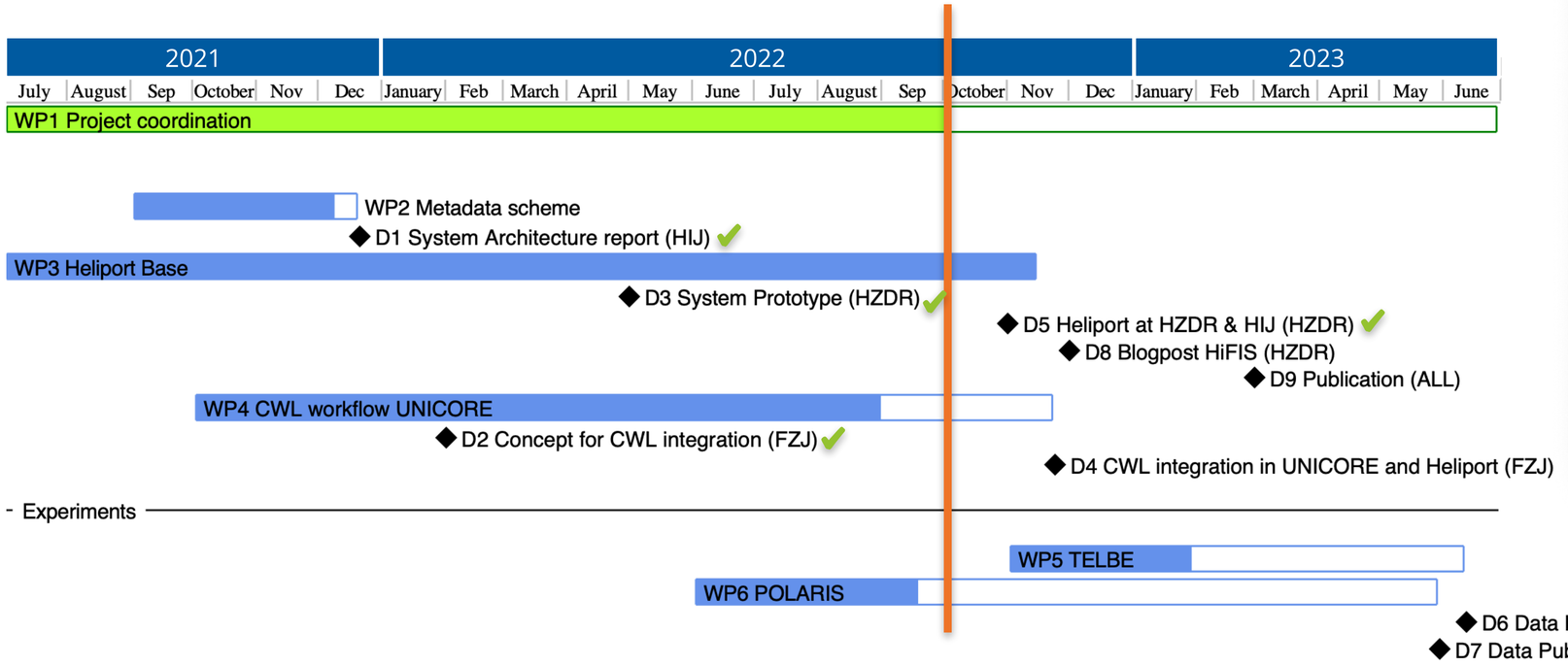
Demo Version

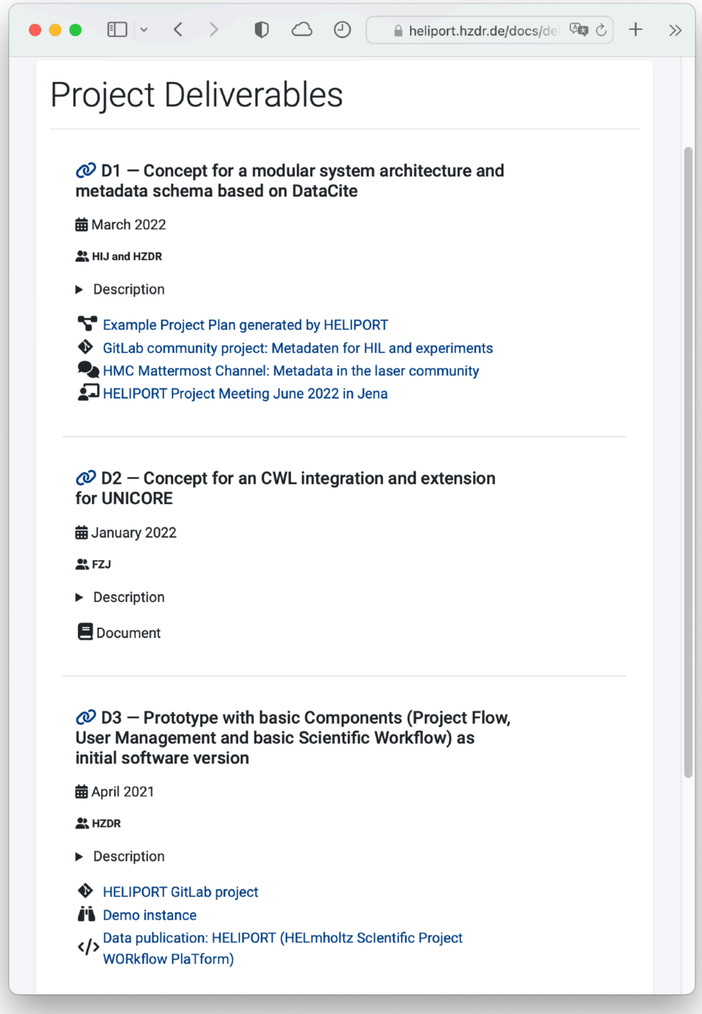
HZDR Version (Internal)



Overview of our Deliverables and Results

- Our first three deliverables are completed and the results are available on our website.
- We speak with different Helmholtz members, universities and European partners about HELIPORT and build a HELIPORT community.
- Overview of work packages and milestones:





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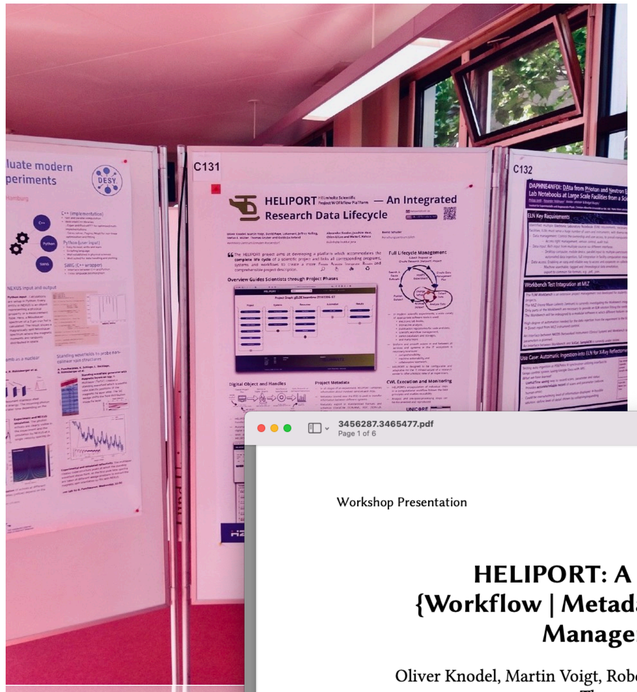
Our HELIPORT Outreach



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Workshop Presentation

DOI 10.1145/3456287.3465477

HELIPORT: A Portable Platform for FAIR {Workflow | Metadata | Scientific Project Lifecycle} Management and Everything

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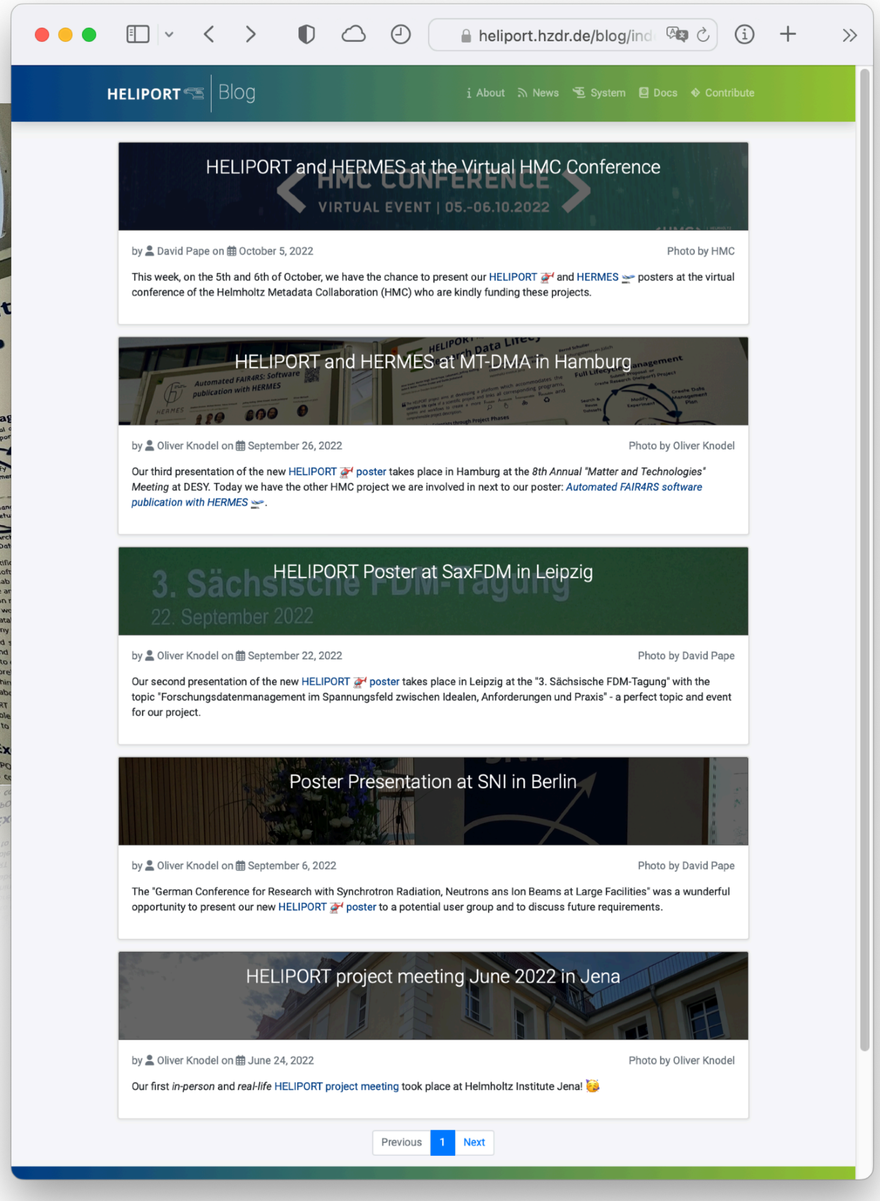
ABSTRACT

Modern scientific collaborations and projects (MSCPs) employ various processing stages, starting with the proposal submission, continuing with data acquisition and concluding with final publications. The realization of such MSCPs poses a huge challenge due to (1) the complexity and diversity of the tools, (2) the heterogeneity of various involved computing and experimental platforms, (3) flexibility of analysis targets towards data acquisition and (4) data throughput. Another challenge for MSCPs is to provide additional metadata according to the FAIR principles for all processing stages for internal and external use. Consequently, the demand for a system, that assists the scientist in all project stages and archives all processes on the basis of metadata standards like DataCite to make really everything transparent, understandable and citable, has risen

Workshop on Practical Reproducible Evaluation of Computer Systems (P-RECS '21), June 21, 2021, Virtual Event, Sweden. ACM, New York, NY, USA, 6 pages. https://doi.org/10.1145/3456287.3465477

1 INTRODUCTION

An essential objective of modern cutting-edge research should be to enable accessibility of the acquired research data and its re-usability across different research fields and their respective communities. The current generation of scientists is therefore faced with the challenging task of transferring experimental investigations into a data oriented research flow with strong focus on documenting every step closely following the FAIR [41] principles. The FAIR principles are well-established as standards in the field of research data management. The three pillars F (Findable), A (Accessible) and



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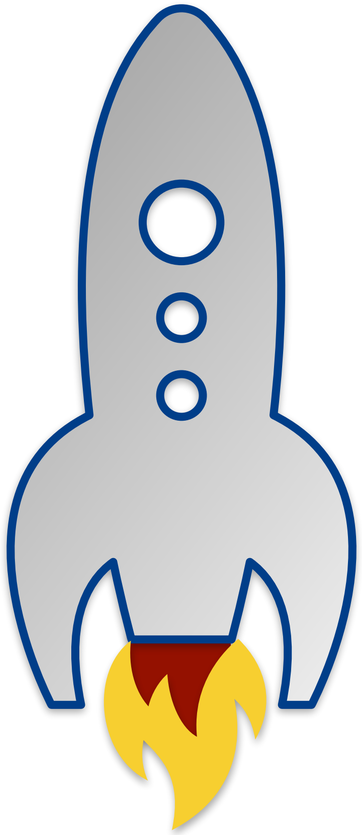
Conclusions and Outlook

The fist year:

- In the first year we created a useable HELIPORT prototype at HZDR and HIJ.
- We developed first plugins and established our HELIPORT website with various resources and a HELIPORT demo system.
- The metadata discussion on laser metadata in the laser community successfully started.
- The HZDR cluster is accessible using UNICORE.
- ➧ We found different interested stakeholders, gave presentations (posters, talks) and walked the first steps towards a HELIPORT community.

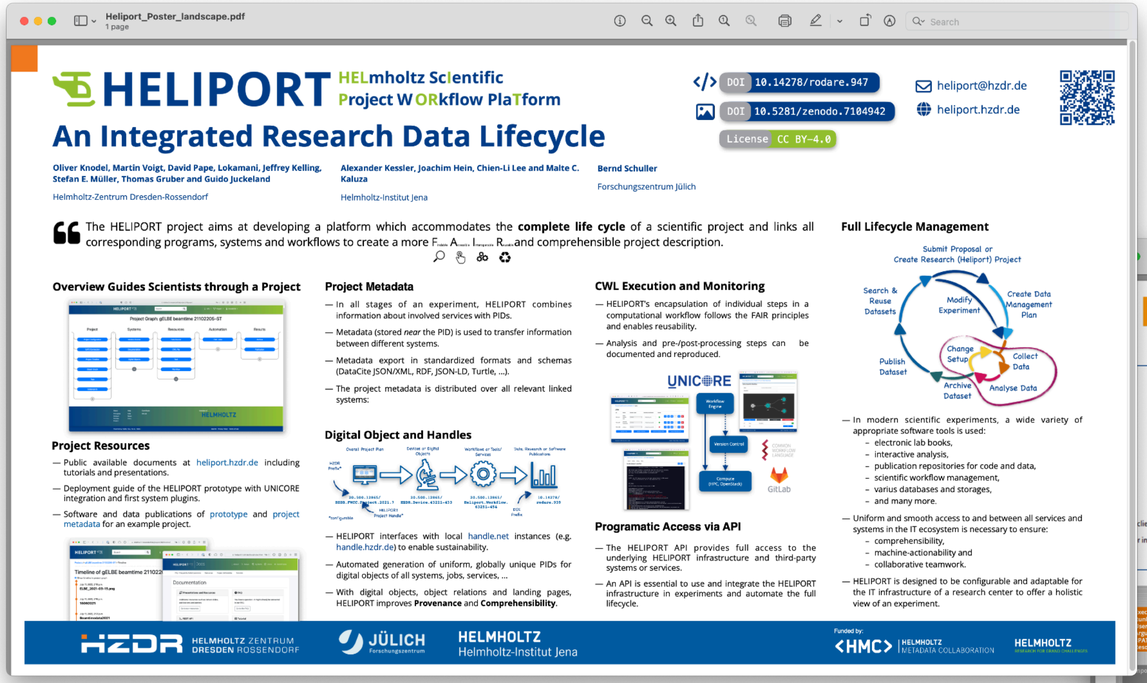


The next year:

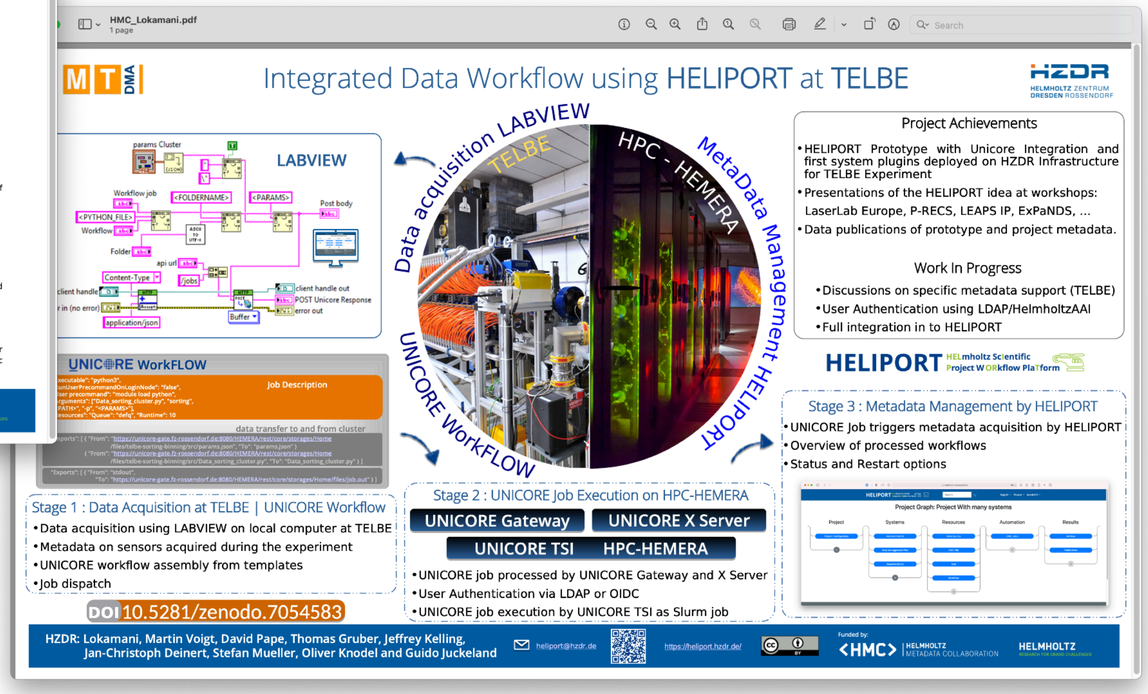
- We move forward and bring further interested stakeholders into our project.
- The CWL integration for UNICORE gives us an additional workflow language for our projects TELBE and POLARIS.
- Conversion to or implementation of our experiments with HELIPORT:
  - TELBE at HZDR
  - POLARIS at HIJ

HELIPORT and HELIPORT@TEIBE Poster in Postersession I & II

Poster | Postersession | Postersession I



Poster | Postersession | Postersession II



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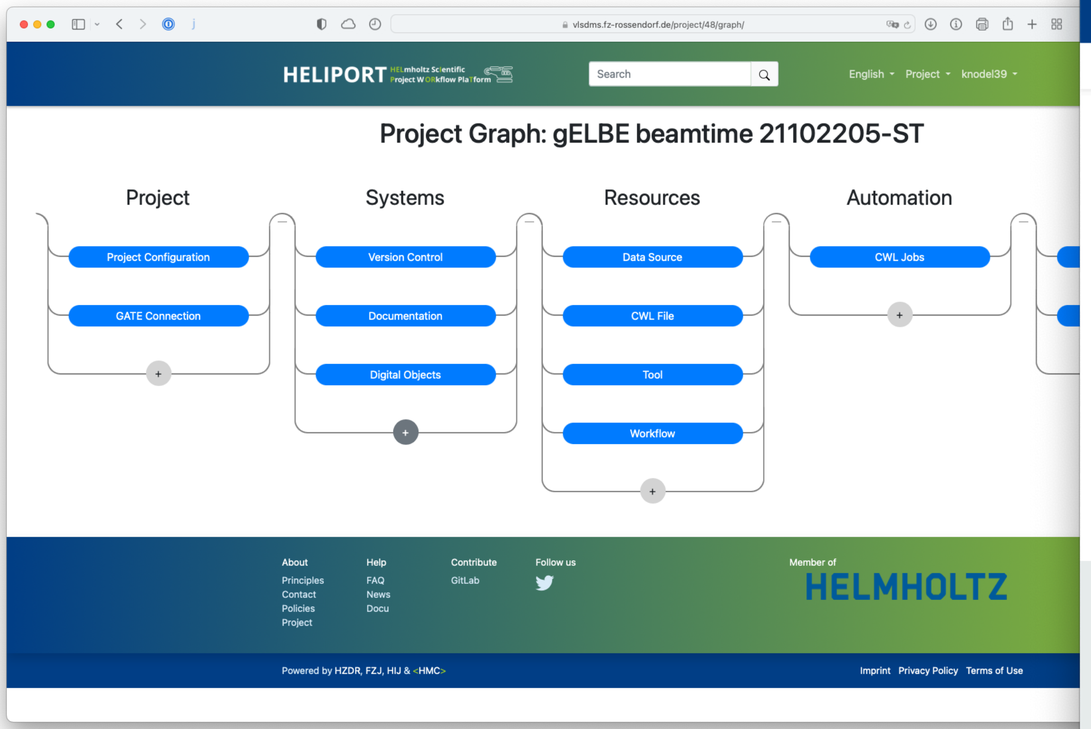
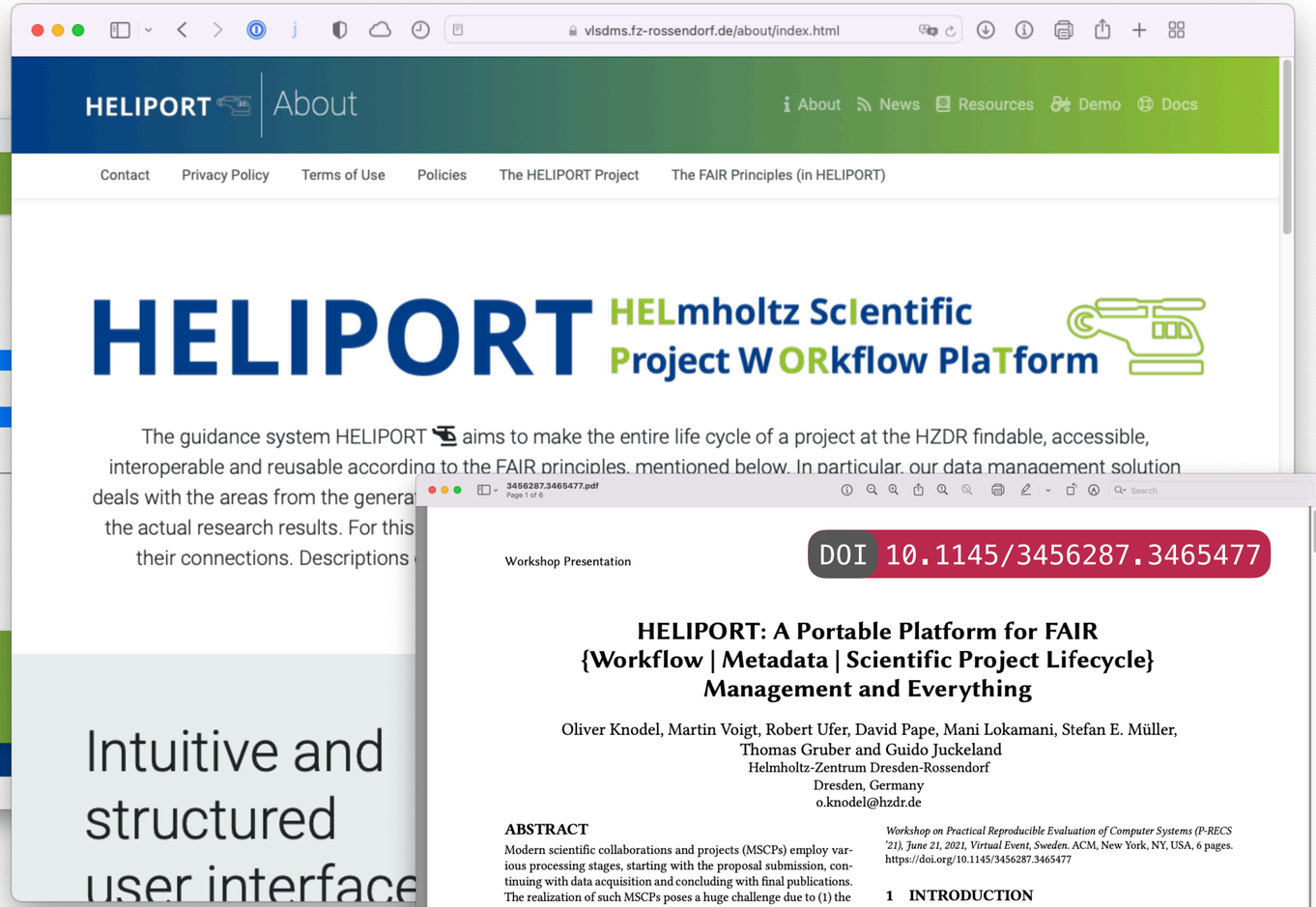
Resources

Website: heliport.hzdr.de



Demo: heliport.hzdr.de/app



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