Digitale TU Graz

Researcher-led FAIR services at TU Graz

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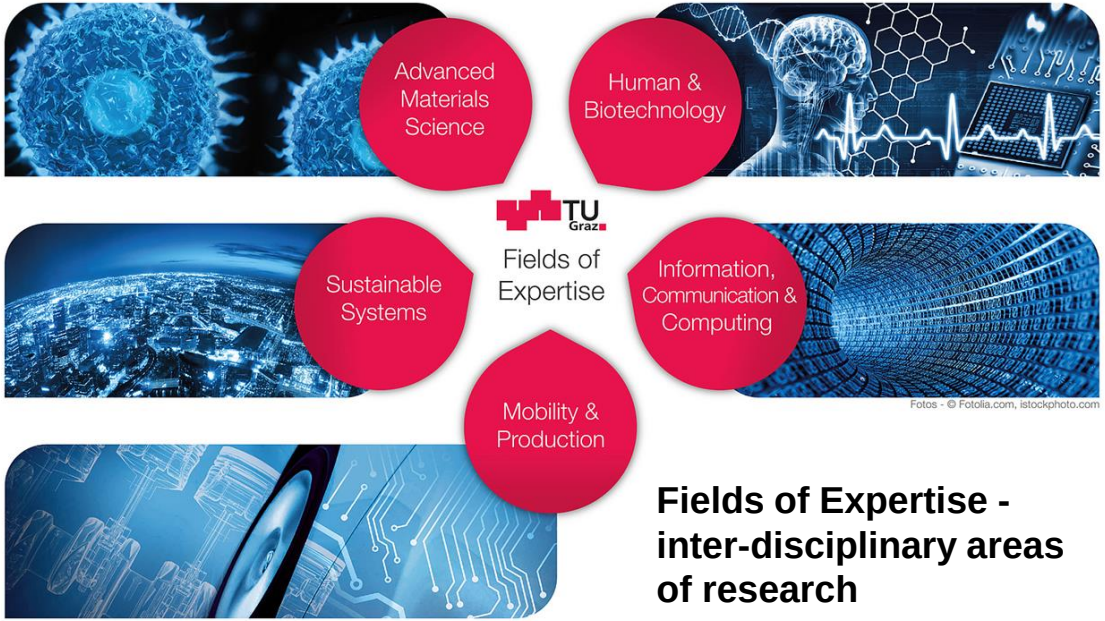
Focus on FAIR – FAIR Data and the European Open Science Cloud
Graz, 07.11.2019

GRAZ UNIVERSITY OF TECHNOLOGY

- Mid size university
- Since 1811
- One of 3 austrian tech unis
- 17 500 students
- 3000 employees
- 7 faculties
- about 100 institutes
- 3 campus locations in Graz

SCIENCE
PASSION
TECHNOLOGY

GRAZ UNIVERSITY OF TECHNOLOGY



Fields of Expertise - inter-disciplinary areas of research

DIGITAL TU GRAZ - STRATEGIC GOAL

- First project of its kind in Austria
- The proactive shaping of the digital transformation is a binding decision of Graz University of Technology
- With its digitization policy, Graz University of Technology is creating a strategic framework for dealing with digitization and its diversity of change

Maintaining and increasing the competitiveness of our researchers

in an environment constantly increasing administrative and regulatory requirements.

IDENTIFIED FIELDS OF OPPORTUNITY

FIELD OF OPPORTUNITY RESEARCH

- FAIR data through RDM
- Boost of impact and reputation
- Re-usability of data
- International visibility
- Disciplinary and cross-disciplinary
- State-of-the-art tools & services

Highly attractive working environment for researchers

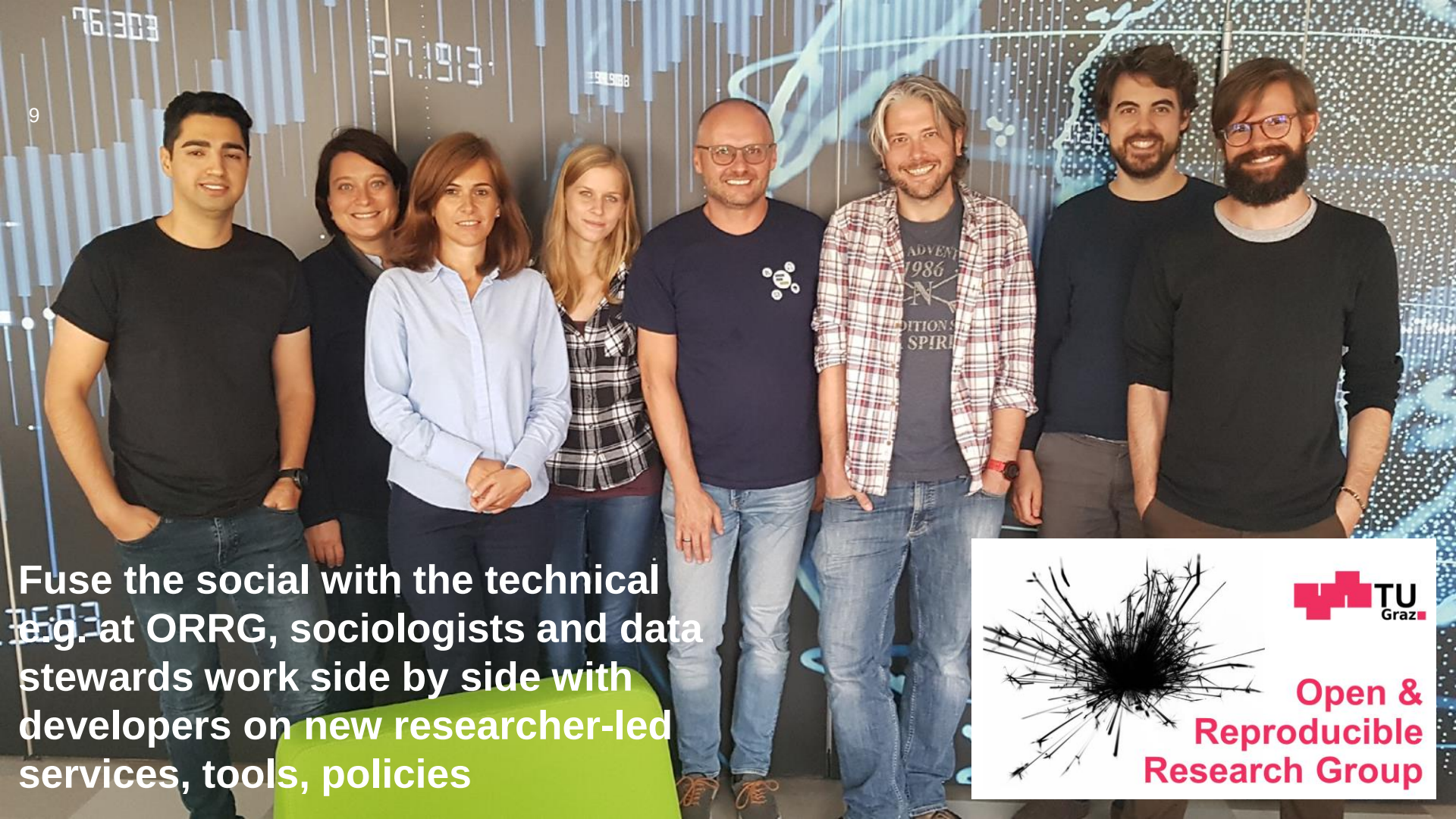
PROBLEM STATEMENT

Outcomes of the conception phase (2017-18)

- How do I store and curate data?
- Who takes care of my data in future?
- How do I comply with funder mandates?
- How to collaborate efficiently?
- Where can I get training and support for RDM?
- What about a centralized data repository @TUG?

APPROACH

- RDM needs researcher-led services
- As general as possible as discipline-specific as needed
- Avoid one general solution fits all
- Open participation and co-creation processes
- Develop social and technical solutions in parallel



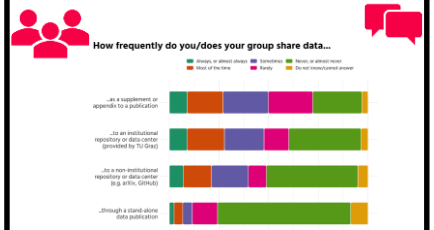
Fuse the social with the technical
e.g. at ORRG, sociologists and data stewards work side by side with developers on new researcher-led services, tools, policies

TU Graz

Open & Reproducible Research Group

FIELD OF OPPORTUNITY RESEARCH

KEY STRATEGIC ACTIVITIES



RDM Faculty Survey and Interviews

Framework RDM Policy

Faculty-specific implementation strategies

RDM Policy Development

CYVERSE

Discipline-specific solutions

CyVerse Austria

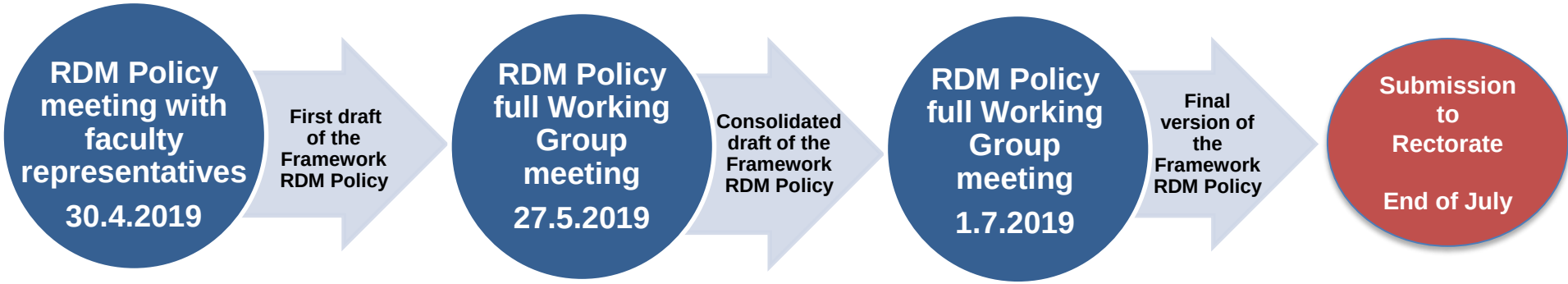
CERN INVENIO

Invenio RDM Repository

TU GRAZ RDM POLICY DEVELOPMENT

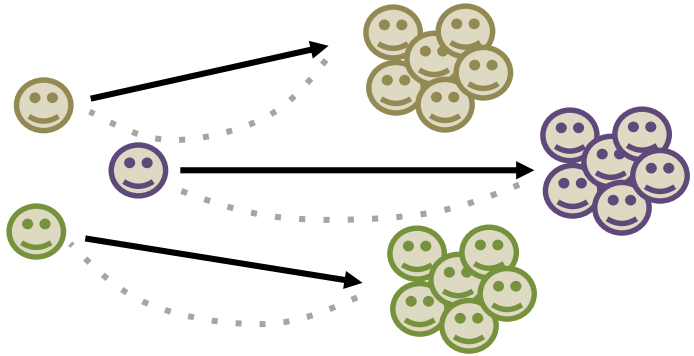
- RDM core WG: representatives from Faculties, the Rectorate, F&T Haus, our Legal Department, the Library and ZID

FAIR Data ≠ Open Data



WORKING GROUP – FACULTY REPRESENTATIVES

- Played the amplifier-role
- Discussed the RDM policy development within faculties
- Identified biggest barriers to the successful implementation of the policy



RDM POLICY SECTIONS

Framework RDM Policy

Roles, responsibilities, rights

Roles and responsibilities at the university level (ZID, Library, F&T Haus, **Faculties**)
Rights and responsibilities of the university (Rights ownership, Intellectual property rights (IPR), UG 2002)

Faculty-specific implementation strategies

Roles, responsibilities, rights

Faculty specific roles and responsibilities (e.g., PI, PhD supervisor, student, individual researcher)

Further requirements for data management planning

Specific rights of each Faculty (IPR - further defined based on addit guidelines and agreements (e.g., grant or consortium agreements))

Framework RDM Policy includes the role of faculties and minimal general requirements, making faculty specific implementation strategies interoperable

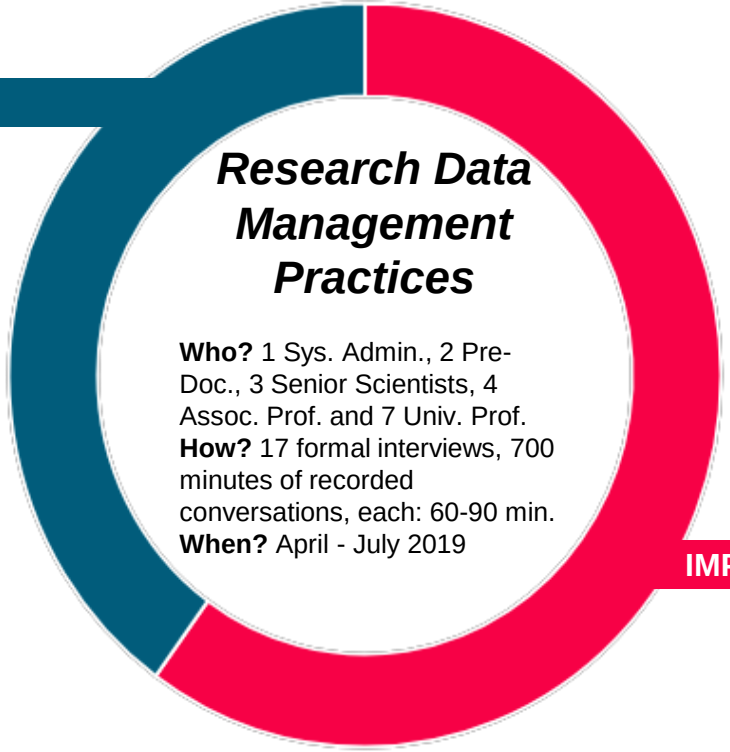
TU GRAZ RDM INTERVIEWS

TU GRAZ INTERVIEWS

Aims

Analyse RDM practice without assuming anything about the concrete forms of scientific practice on the part of researchers

Understand and locate research data in the context of research



Results

Draw recommendations to facilitate the development of RDM tools and services

IMPLEMENTATION - CF RESEARCH

RDM INTERVIEWS RESULTS

- Lots of **variation between faculties, institutes and research groups** with respect to
  - Data Intensity (amount and complexity of data)
  - Data Handling (resources put into data handling)
  - Reproducibility (research style: what is the aim of the field)

- Variation in the **extent to which data are archived** and how
- Effort that needs to be invested into gathering/processing the data is key
- Data amounts are huge so researchers need support

RDM INTERVIEWS RESULTS

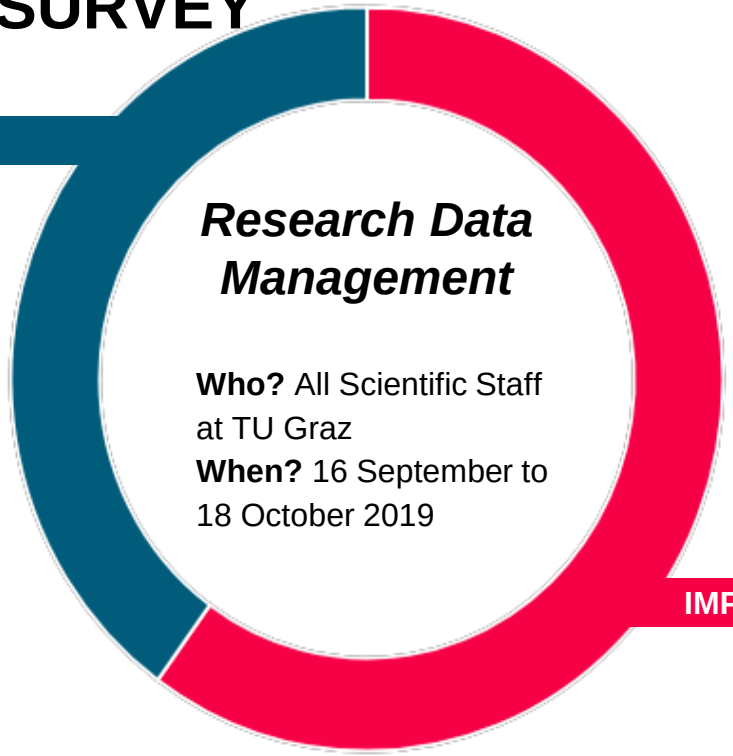
"*[We definitely need] the raw data, and of course it's, the analysis takes a lot of time, many working hours and you never know if you're gonna need it again, but it would be awful if you wanted to look something up for a publication but could only find the raw data, because then you'd have to start everything from scratch. A month's work for one analysis can be expected, which is why we want to archive [those data]." (Interview 1)*

RDM INTERVIEWS RESULTS

“The issues are fairly mundane, but they can have serious consequences here. [The data pipeline] needs to be automated, because nobody can deal with these data amounts any more, you need to be able to rely [on technology]. It can sour the mood if you spend one and a half months on an analysis and then [try to figure out] whether there was something there.” (Interview 11)

TU GRAZ RDM SURVEY

TU GRAZ SURVEY



Attitudes/Opinions
Advantages/disadvantages of Data sharing, Data ownership (who owns the data?), competition in academia, Intellectual Property

Account for RDM perspectives and needs of TUG researchers

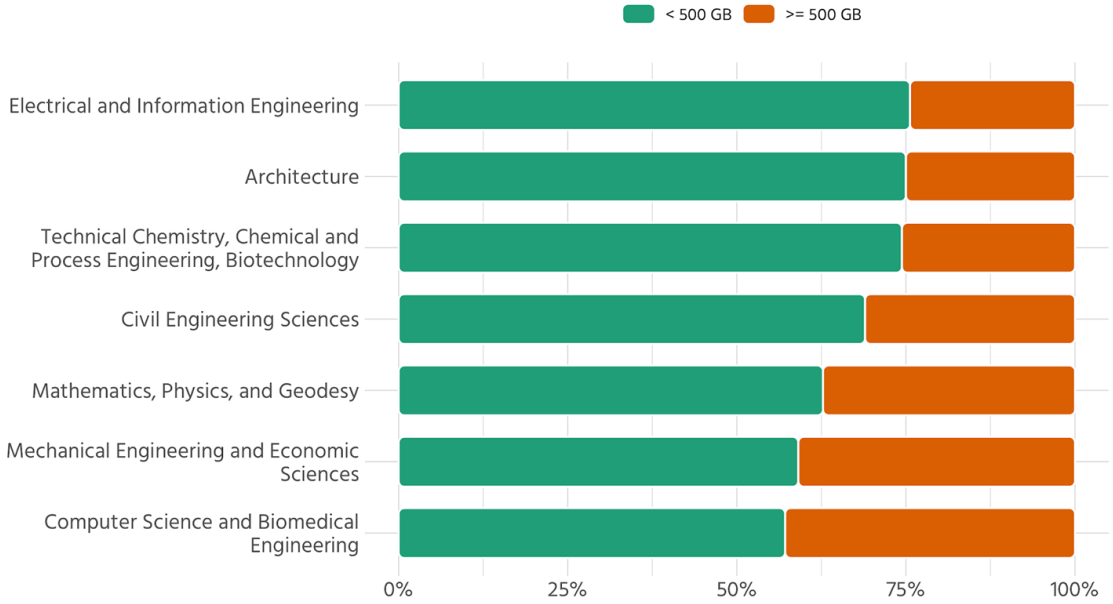
FACTS
Amount, type(s) and format(s) of data, tools and repositories in use, workflows (as far as possible within a survey)

IMPLEMENTATION - CF RESEARCH

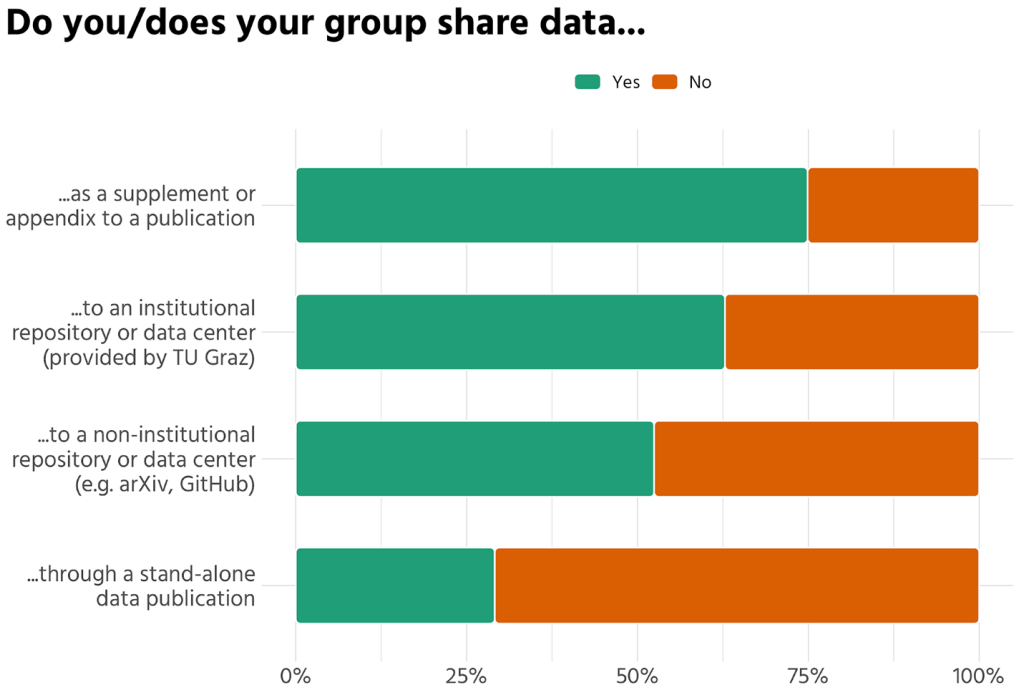
Deliver a framework to enable excellent research
Introduce and implement RDM-Infrastructures @ TUG

RDM SURVEY RESULTS

How much data do you handle in the course of your research, on average, per year?



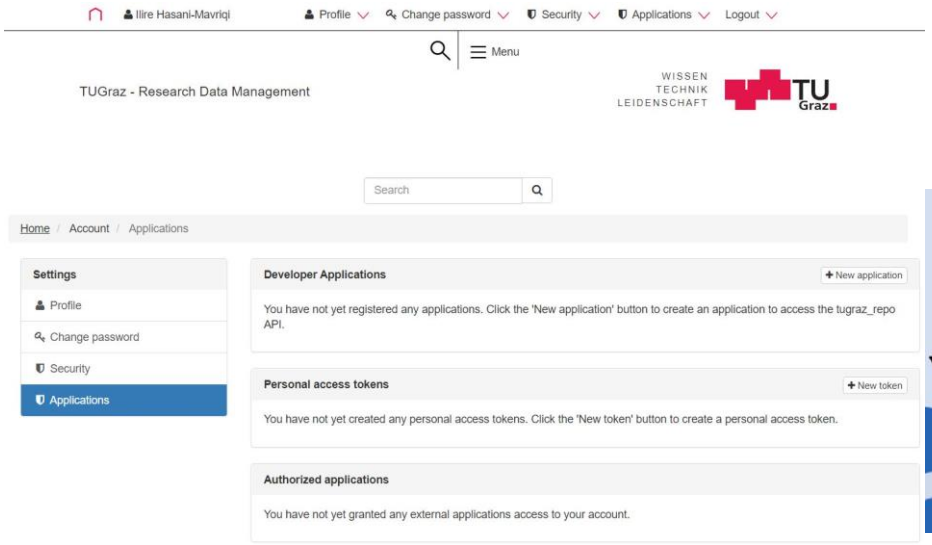
RDM SURVEY RESULTS

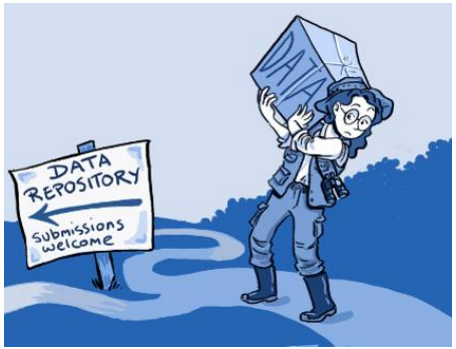


TU GRAZ NEXT GENERATION REPOSITORIES

InvenioRDM - research data and publication repository developed as part of a CERN project with TU Graz in the core team

First one in Austria - happy to contribute and collaborate with other universities





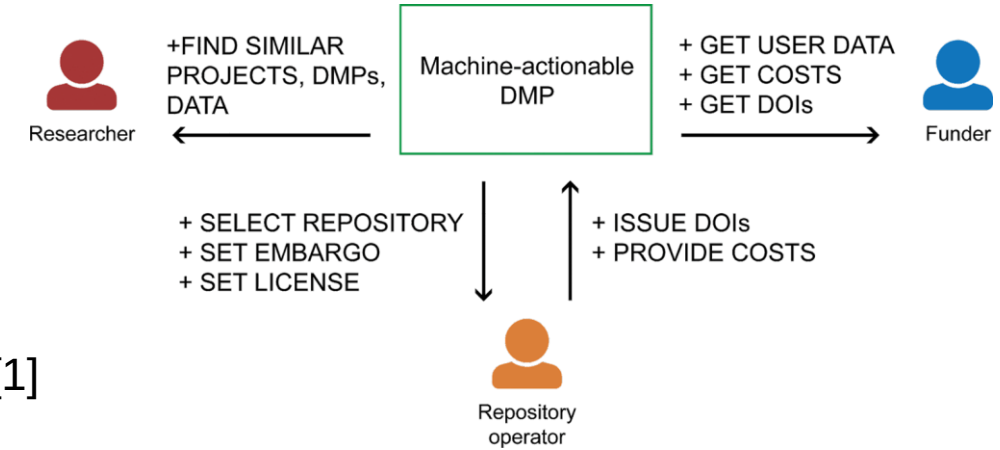
MACHINE-ACTIONABLE DATA MANAGEMENT PLANS (maDMPs)

DMPs must create benefits for researchers

- Less work
- Automation of tasks
- Reuse of information

Adopt the maDMPs common model [1] for the needs of TUG researchers

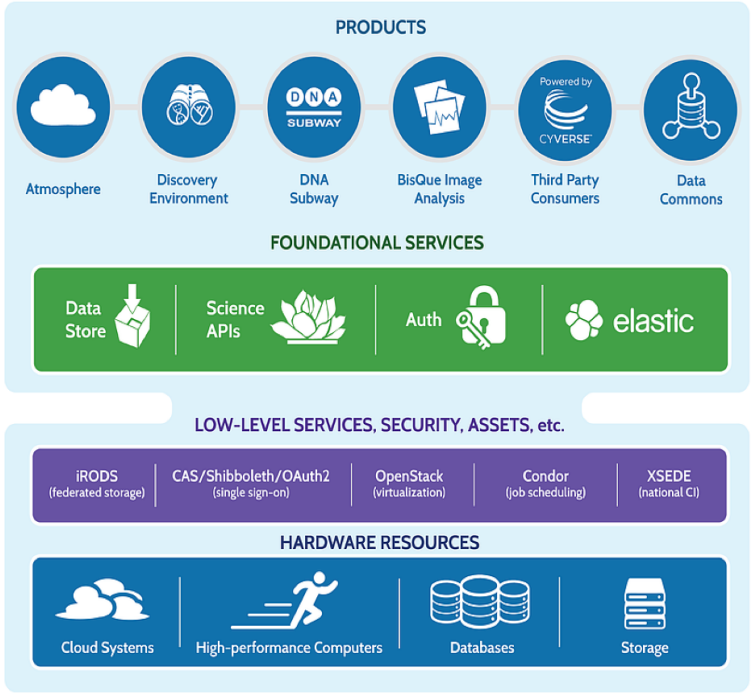
Integrate with university specific services



Source: Miksa T, Simms S, Mietchen D, Jones S (2019) Ten principles for machine-actionable data management plans. PLoS Comput Biol 15(3): e1006750. https://doi.org/10.1371/journal.pcbi.1006750

[1] https://github.com/RDA-DMP-Common/RDA-DMP-Common-Standard

RDM IN LIFE-SCIENCES – CyVerse AUSTRIA



CYVERSE®

BioTechMed GRAZ

Deployment of Cyverse infrastructure by end of 2019

Included components : User Portal, Discovery Environment and Data Store (iRODs)

RDM IN LIFE-SCIENCES – CyVerse AUSTRIA

Use Cases

- Galaxy integration in CyVerse
- Microbiome Study

Train-the-Trainer approach

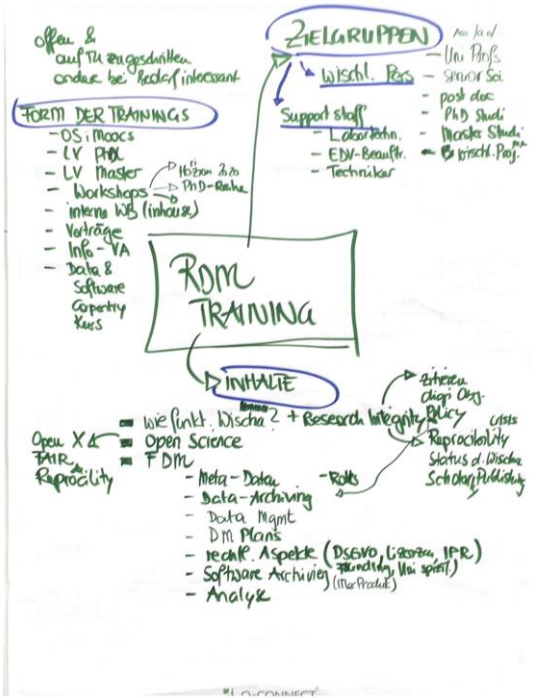
Policy development

BioTechMed GRAZ

CYVERSE

UPCOMING PRIORITIES

- Develop training courses (online and offline)
  - including Open Science Mooc for institutions
- Integration of InvenioRDM with other university tools and services
- Implementation of maDMPs
- Further development of CyVerse for other disciplines (use-cases)



Many thanks!

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