FAKULTÄT FÜR !NFORMATIK
Faculty of Informatics

Master's Thesis

Designing an Architecture for Machine-actionable Research Data Management Planning in an Institutional Context

Master programme:
Software Engineering & Internet Computing

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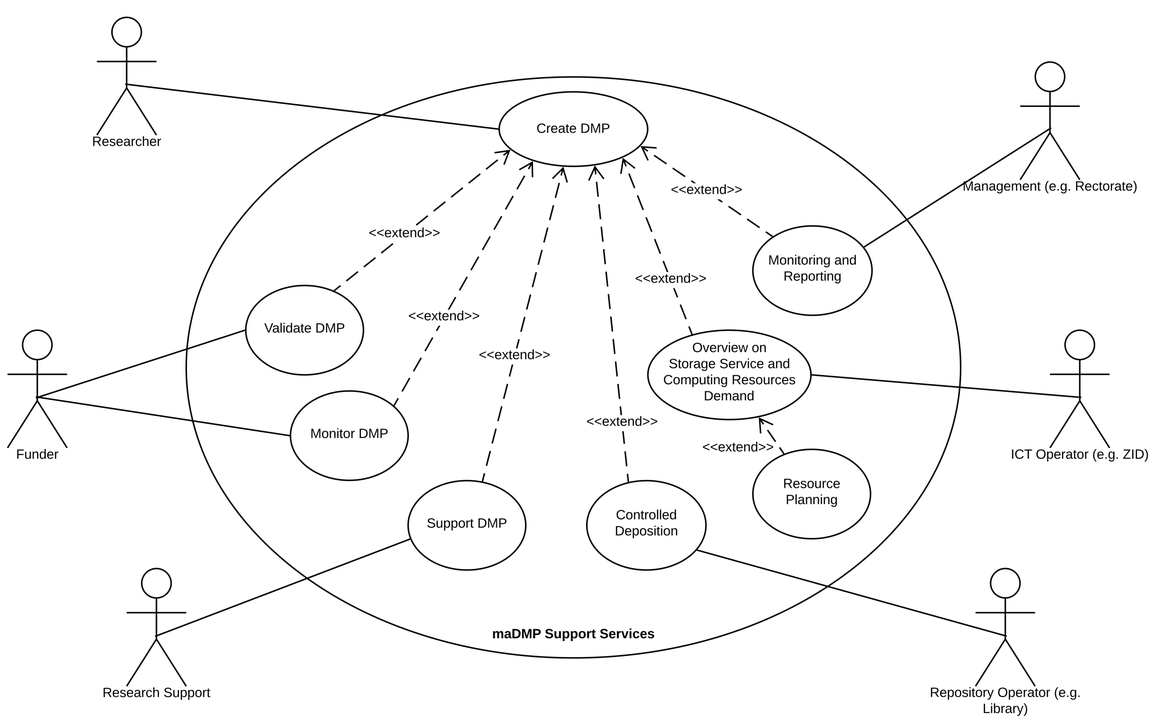
Motivation

Data Management Plans (DMPs) have become a useful tool to raise awareness of good data management practices among researchers. However, DMPs in their current representation are static documents written in free-form text. In recent years, the research community has recognized this shortcoming and proposed to deploy DMPs in a machine-actionable format to facilitate the flow of information between research systems and the automation of workflows.

Aim

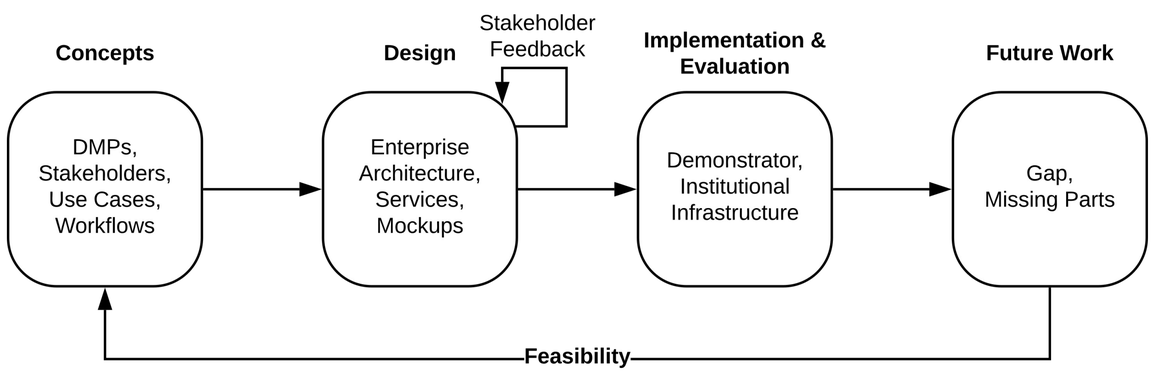
This work aims on describing how machine-actionable data management planning could be realized in the context of a research institution or university and hence provides a holistic view on the data management infrastructure and its stakeholders. The following research questions shall be addressed:

- **RQ1:** What is the architecture supporting machine-actionable data management planning at a research institution?
- **RQ2:** Which tasks of data management planning can be supported with system integration and automation?
- **RQ3:** To which extent can we integrate RDM services offered at the institution with data management planning?



Use cases of a system supporting machine-actionable DMPs and their stakeholders

Method



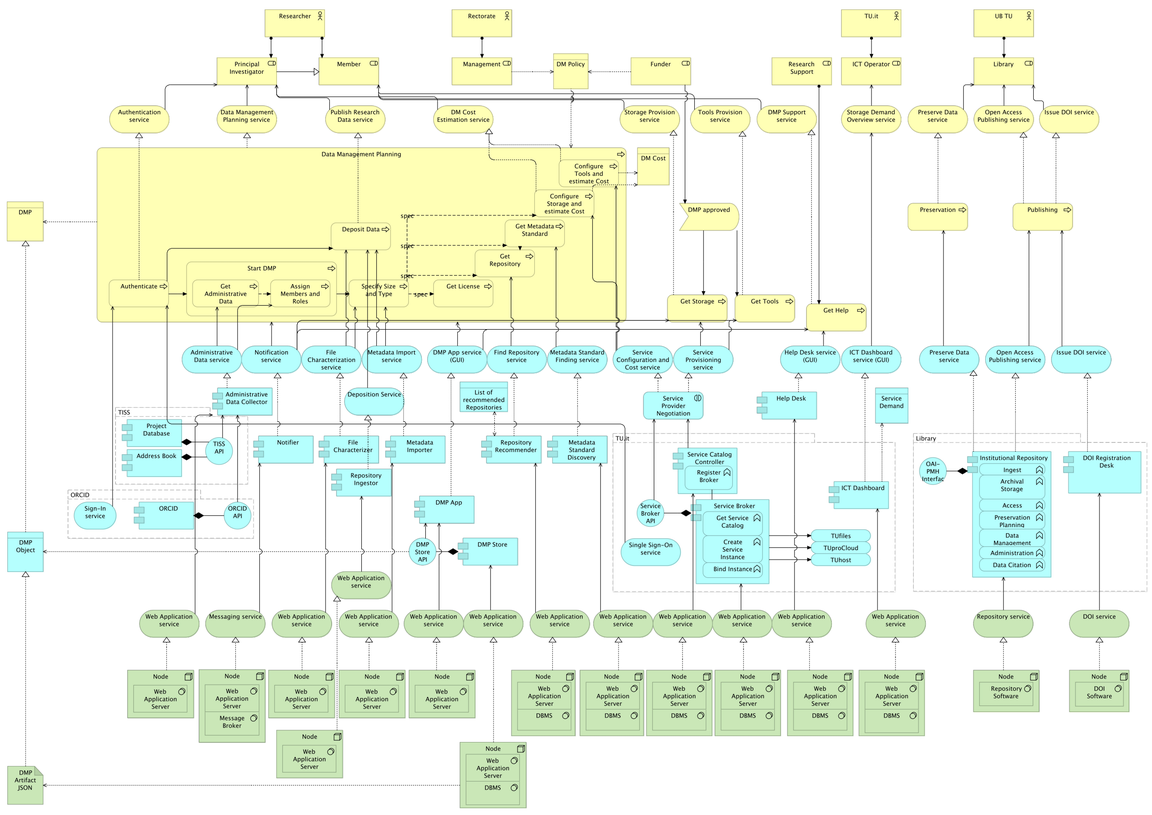
I. Concepts
- Study machine-actionable DMP use cases collected by the research community
  - Literature
  - RDA DMP Common Standard user stories
- Develop workflows based on use cases using BPMN

II. Design
- Describe system design implementing the workflows using Enterprise Architecture (EA) modeling and ArchiMate modeling language
- Develop graphical mockups for all stakeholders using Balsamiq
  - Collect feedback from stakeholders at TU Wien and external (research support, researchers, funder)
  - Refine mockups based on feedback

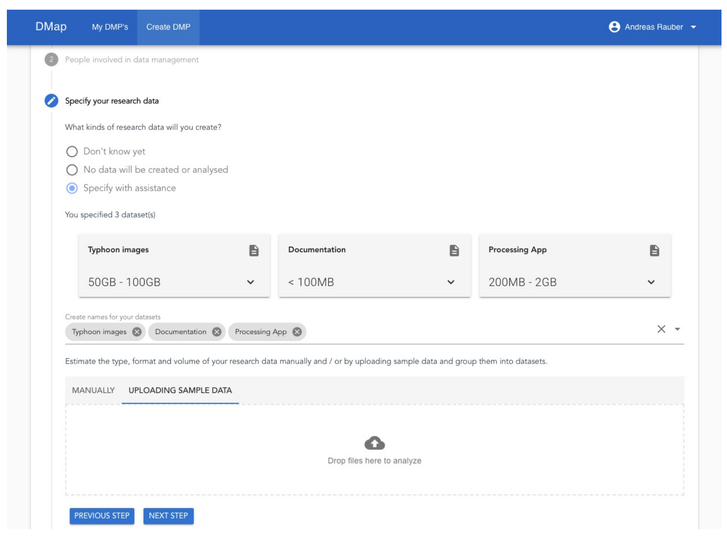
III. Implementation & Evaluation
- Develop a demonstration tool implementing some use cases
  - using the institutional infrastructure of TU Wien
  - supporting the machine-actionable DMP data model developed by RDA DMP Common Standard WG
- Analytical Evaluation
  - Degree of automation and simplification compared to standard, manually performed process of writing a DMP
  - Check coverage of DMP topics by comparing it against DMP templates of FWF (Science Europe Core Requirements for DMPs) and EC H2020

IV. Future Work
Identify and discuss shortcomings, limitations, gaps and outline future work to overcome them

Selected Artifacts



Enterprise Architecture: Layered view



Demonstration tool DMap

DMap selected features:
- Connects to TUW CRIS
  - Project DB
  - Researcher DB
- Data specification aided by FITS
- Integrates EUDAT License Selector
- Integrates re3data repository search
- Exports RDA DMP Common Standard

Available on GitHub
https://github.com/oblassers/dmap

References

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