pSTAIX – A Process-Aware Architecture to Support Research Processes

Marius Politze, Bernd Decker, Thomas Eifert
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Outline

- Motivation

- Problem Statement

- Modelling

- Case Study

RDM at RWTH Aachen University

- Since 2016: Project group with members from the
  - University Library
  - Department Research and Career
  - IT Center

- Goal:
  Establishing a structured and sustainable Research Data Management at RWTH Aachen University

- Measures:
  - support structures for researchers
  - training in RDM topics
  - improving the technical infrastructure

Domain Model for Research Data
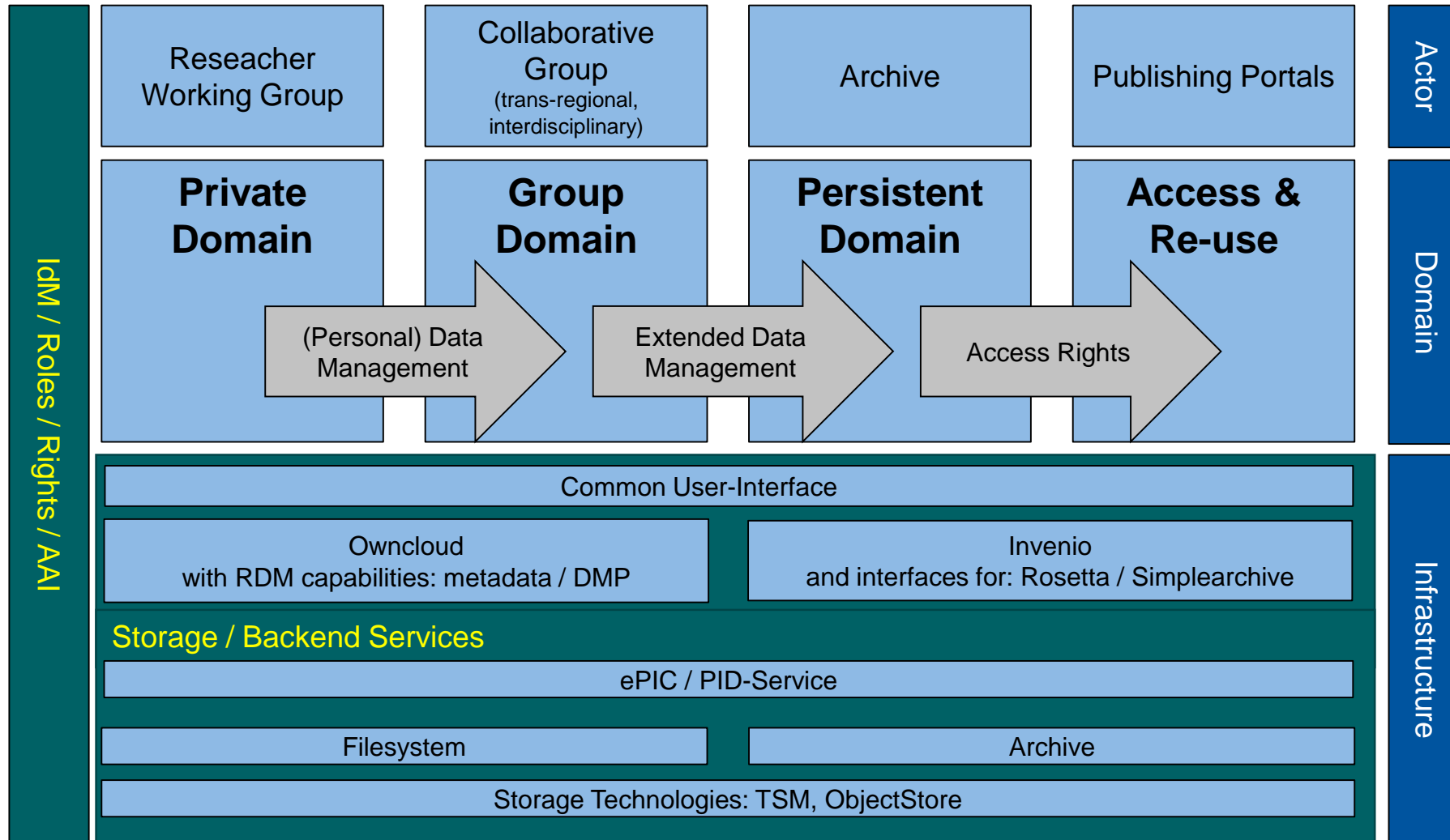
Problem Statement

- Existing research processes span multiple systems

- Integrated into local IT infrastructure of researchers

- Very heterogeneous (IT) system landscape
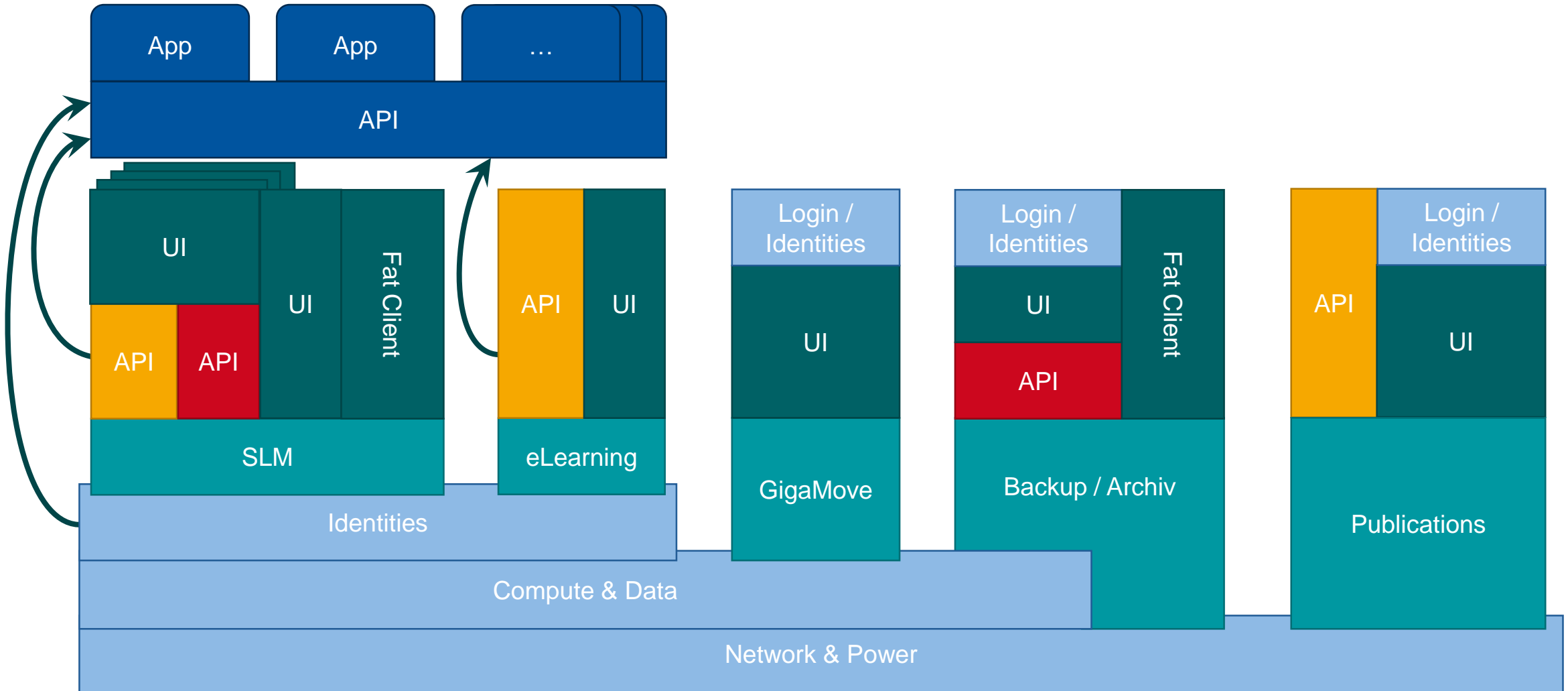
- Legacy systems often not intended for integration

Steel silos storing sunflower seed along the west side of the small West Texas town of Ralls, Texas.
By Wikipedia User leaflet. https://commons.wikimedia.org/wiki/File:Ralls_Texas_Grain_Silos_2010.jpg
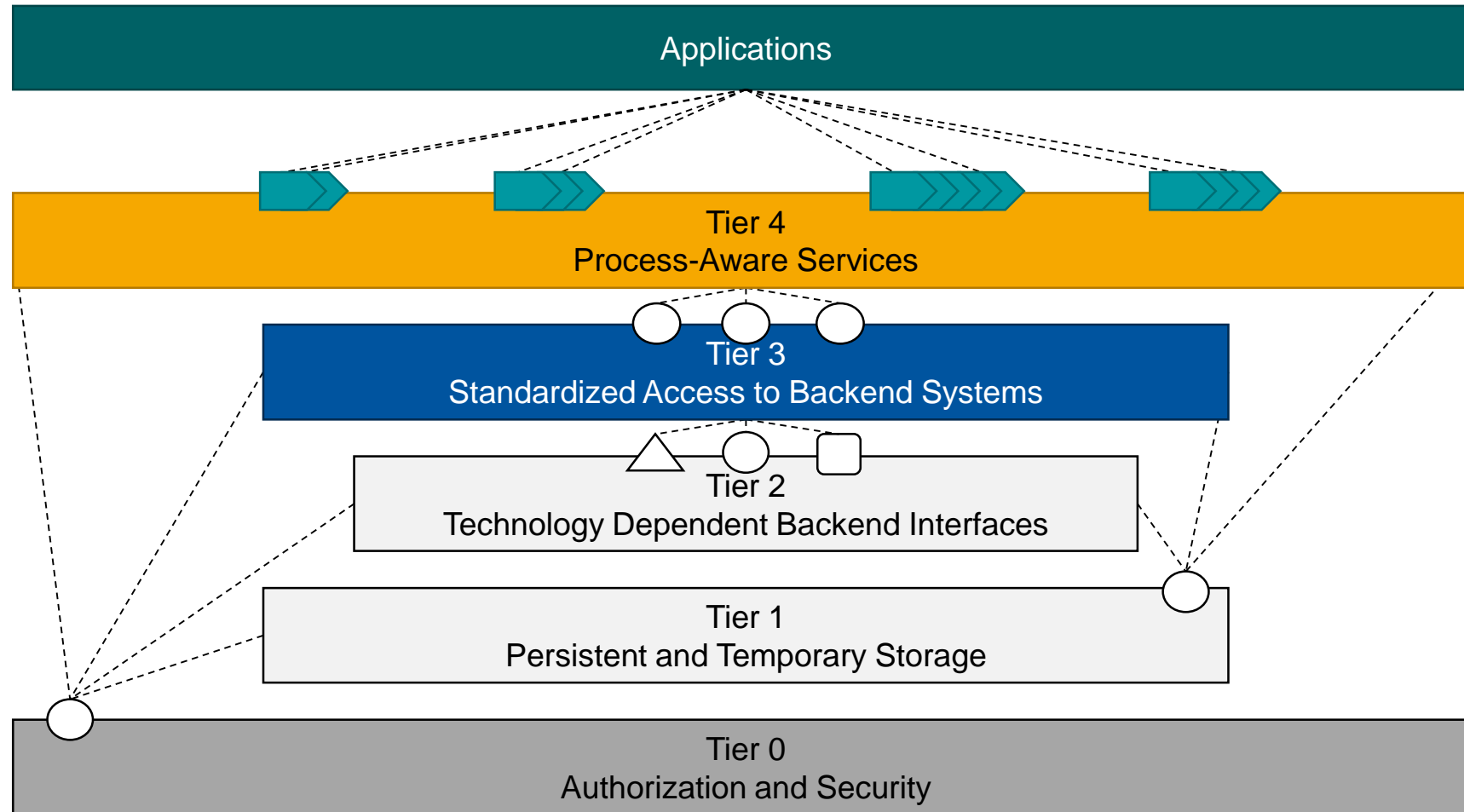
Distributed Services at RWTH Aachen (pre 2014)
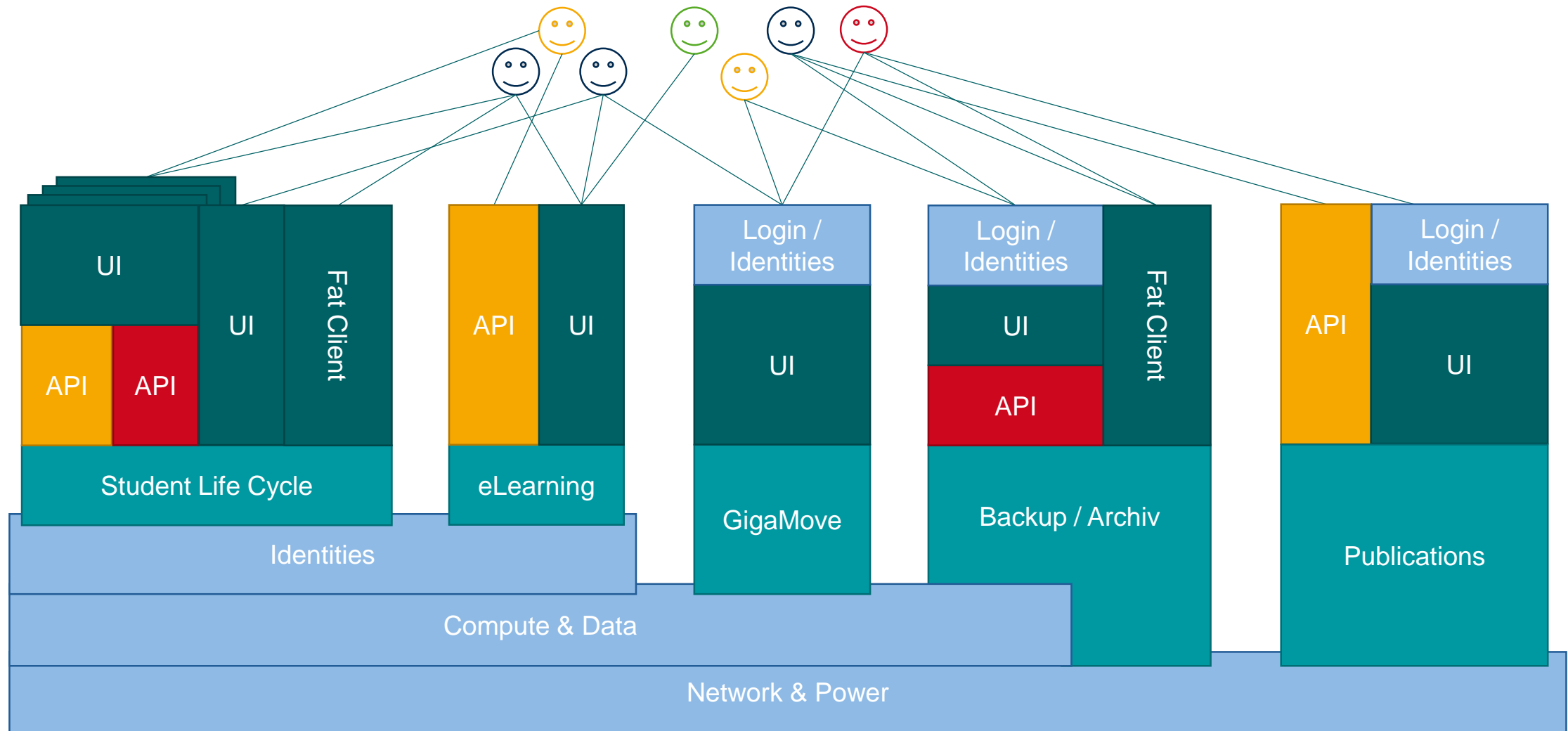
Consolidation in one API (since 2014)

Conceptual Model

Tier 0: Authorization and Security

Enable access to users and their identities

- Centralized Identity Management
  - Different Models: pre provisioning vs. on demand distribution

- User Identity and current Session
  - covey sessions and user information
  - between systems and steps of the process

- Protect and govern personal data
  - Enforce data minimalism
  - Protect personal data
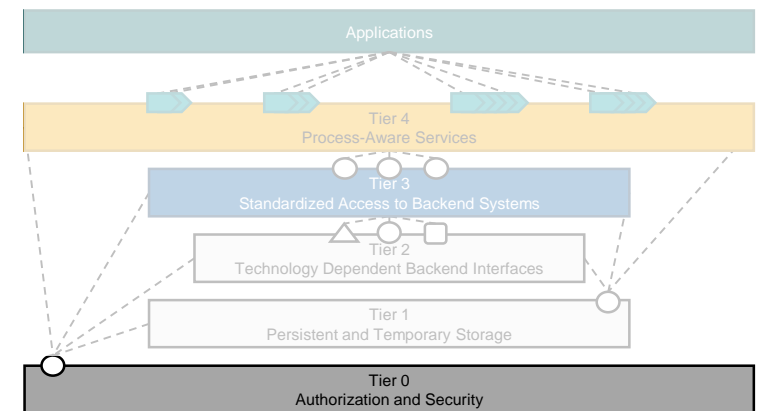
Tier 1: Persistent and Temporary Storage

Enable storage of processual data

- Store small amounts of data
  - Settings
  - Cache

- Reduce impact on "non-interactive" systems

- Allow different levels of storage
  - Per process (user shared)
  - Per user (process shared)
  - Per process and user (private)
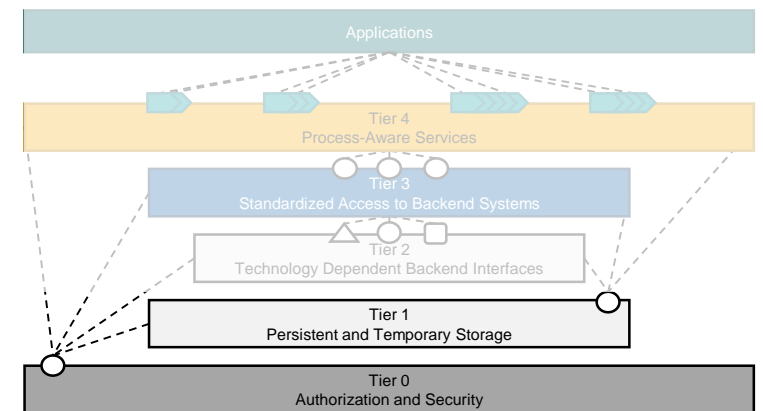
Tier 2. Technology Dependent Backend Interfaces

Enable access to technologies

- Specific for backend systems
  - Legacy systems require in depth technical knowledge
  - Modern systems often provide interfaces

- Process Independent
  - Allow re-use of backend systems
  - May allow administrative access

- Change processes base on systems
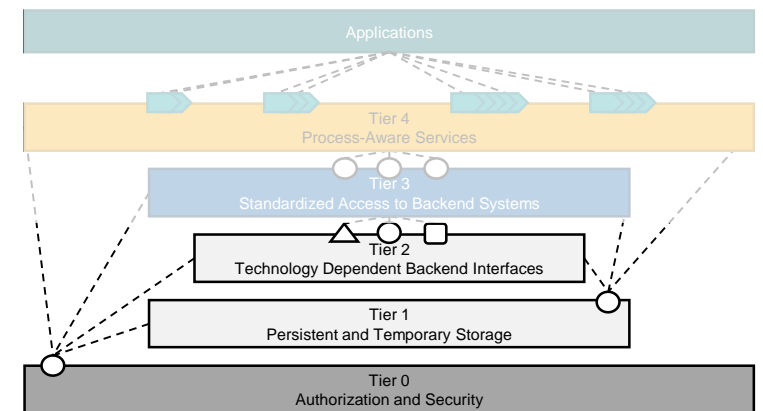
Tier 3: Standardized Access to Backend Systems

Standardize access to technologies

- Expose standardized protocols

- Enforce access in users context

- Common semantics for process entities

- Change processes orient towards software
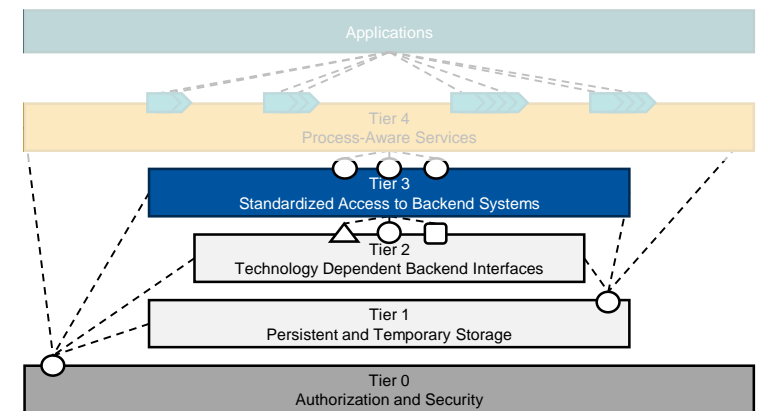
Tier 4: Process-Aware Services

Standardize access to processes

- Integrate interfaces from systems to processes
  - Bundle mandatory steps
  - Across backend Systems

- Retain consistent semantics across processes

- Available to (external) users
  - Individualization
  - Integration
  - Automatization
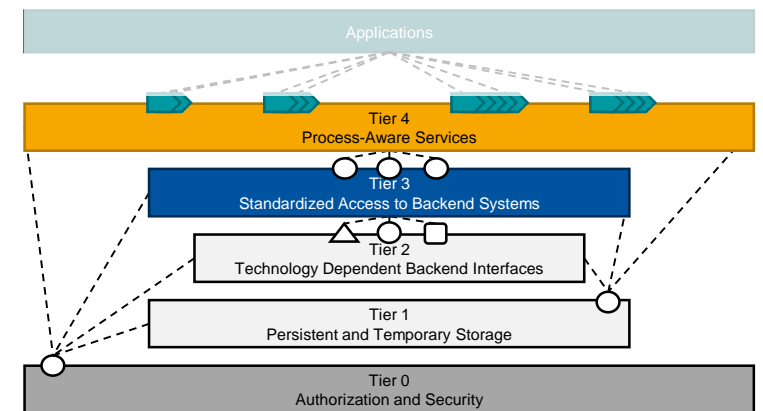
End User Applications

Enabling access for end users

- Use tier 4 to deliver value services

- Allow agile software lifecycles independent from Infrastructure

- Allow individual and automated clients

Konzept: Softwarelayer

IdM / Roles / Rights / AAI

Common User Interface

Common Process Layer

- Researcher Working Group — **Private Domain**
- Collaborative Group — **Group Domain**
- Archive — **Persistent Domain**
- Publishing Portals — **Access & Re-use**

Base Applications

- Owncloud with RDM Capabilities
- Invenio
- Data Management Plans
- Metadata Tool
- simpleArchive

Infrastructure

- Virtualized Compute
- Object Store
- TSM
- Rosetta

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Architecture

Applications | Process-Aware Services | Standardized Access to Backend Systems | Technology Dependent Interfaces, Persistent and Temporary Storage

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Conclusion of Case Study

- simpleArchive is available to selected researchers at RWTH Aachen since Q2 2016
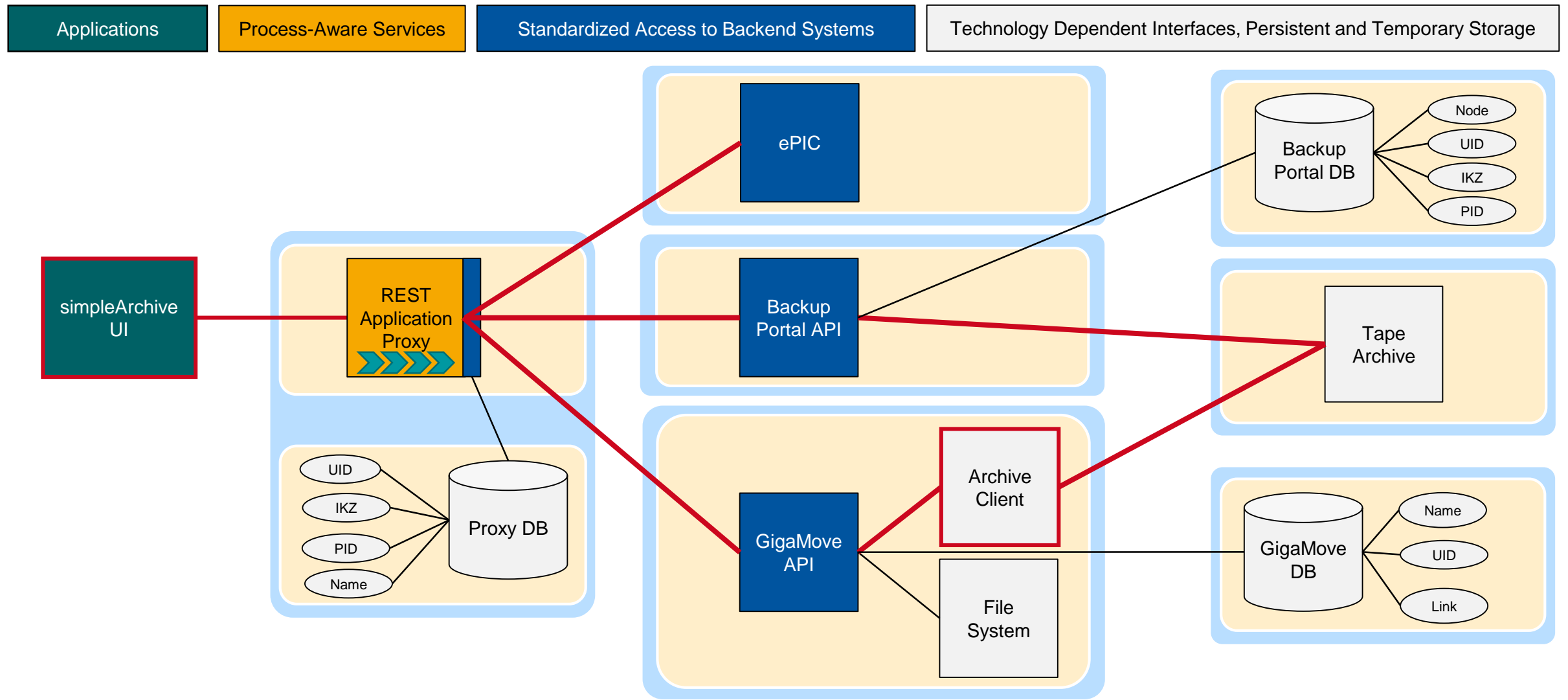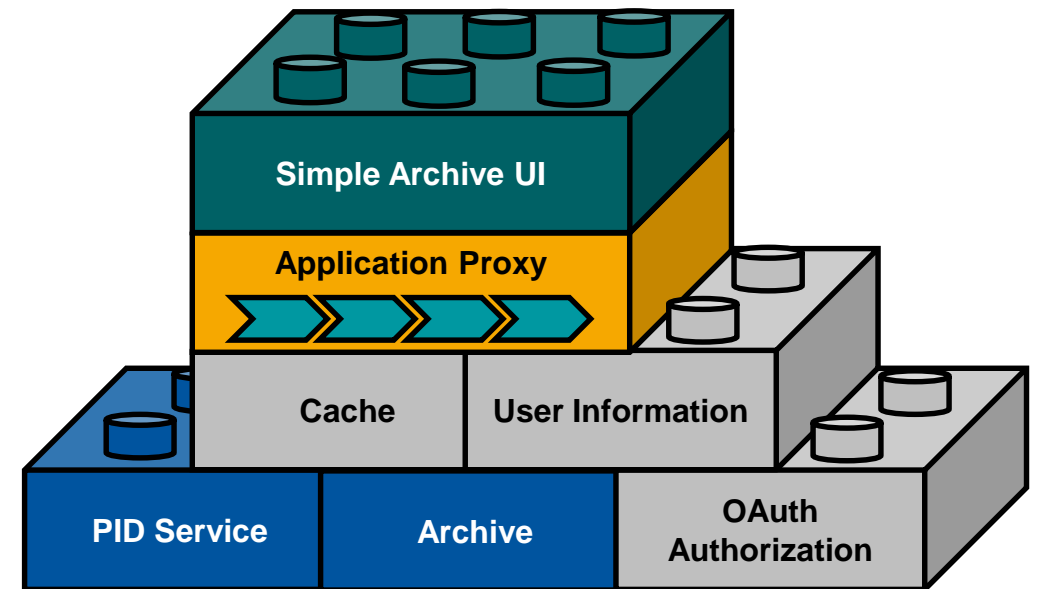
- Implementation reuses existing systems and APIs
  - gigaMove
  - Backup-Portal
  - OAuth2 Service
  - REST Application Proxy

- Even a simple process need policies
  - How long is the data actually stored?
  - Who can restore the data?
  - Can archives be transferred?
  - Can archives be deleted?

Conclusion

- Lessons Learned
  - Need to break open existing silos
  - Do not be afraid of users
  - Bottom up approach from technical perspective

- Upcoming Questions
  - How to shape future IT services and service providers?
  - How to transfer technical infrastructures to business value?

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Conclusion

https://www.itagileshop.de/inspirieren/scrum-bierdeckel/

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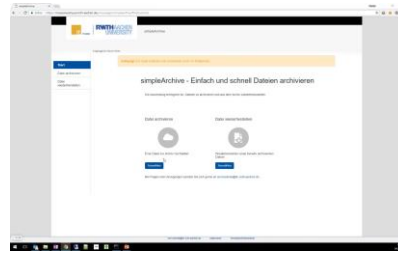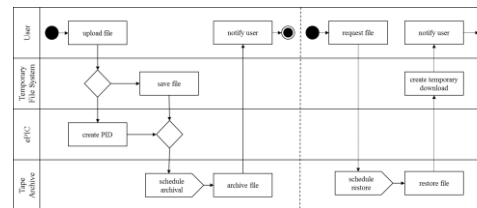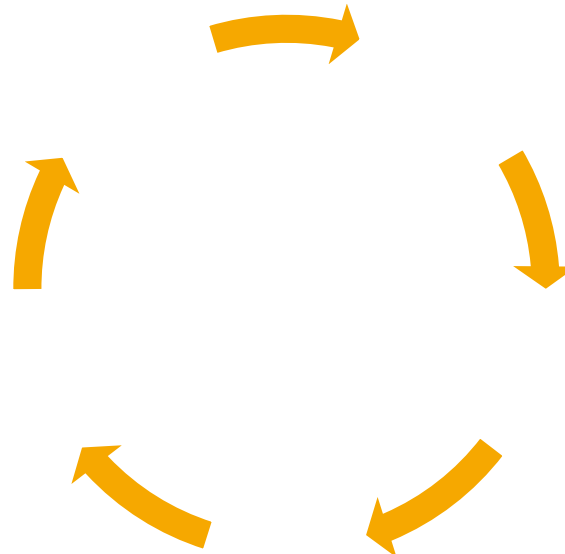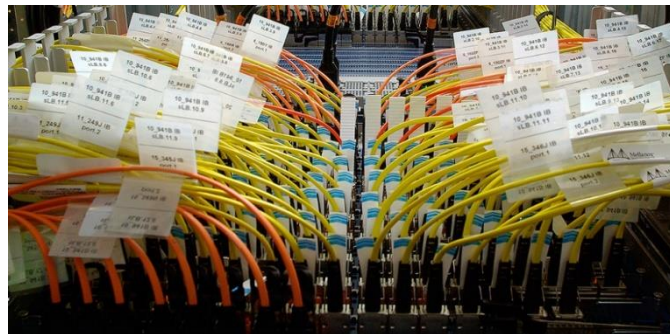
Thank you for your attention

Vielen Dank für Ihre Aufmerksamkeit

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