

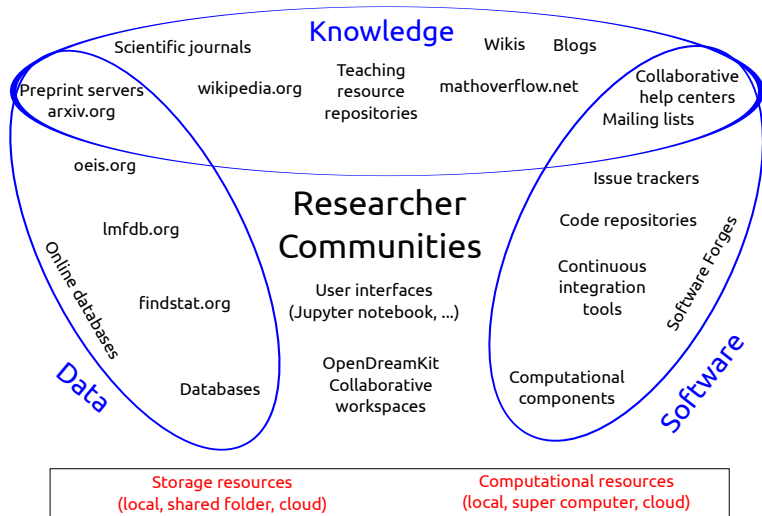
OpenDreamKit Work Package 6

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OpenDreamKit: The Big Picture (from the Proposal)



- ▶ A math VRE where systems share Data (\mathcal{D}), Knowledge (\mathcal{K}), and Software (\mathcal{S}).

WP6 Objectives

- ▶ A VRE needs an infrastructure that supports the creation, management, access, and dissemination of DKS -Structures. ($\mathcal{D} \hat{=}$ Data/ $\mathcal{K} \hat{=}$ Knowledge/ $\mathcal{S} \hat{=}$ Software)
- ▶ **Observation:** All ODK systems (GAP, SAGE, PARI, SINGULAR, OEIS, arXiv.org, . . .) already include data, knowledge, and software modules
- ▶ **Limitation:** low system Interoperability (Not a VRE yet)
- ▶ **Root Cause:** systems share the math, but represent DKS differently.
- ▶ **WP6 Objectives:**
 - 1) design metadata and representation formats for trans-system DKS structures as a basis for a math VRE,
 - 2) implement interfaces to existing systems for interoperability and compatibility with the RE, and
 - 3) implement a joint DKS infrastructure for, searches, documentation, traceability, versioning, provenance, visualisation and native dissemination of OpenDreamKit results (the latter three together with WP4).

WP6: Approach, Coverage

- ▶ **WP6 Goal:** Build a DKS repn. format, implement as a joint DKS -base
 - ▶ **WP6 Approach:** Build on a **modular, foundation-independent, web-scalable DKS -format/base** \leadsto **OKDML/ODKBase**
 - 1) for \mathcal{K} use OMDoc/MMT as a basis (**established interoperability format/base**)
 - 2) for \mathcal{S} extend it by computational foundations (**prototype for Scala exists**)
 - 3) for \mathcal{D} develop scalable \mathcal{KS} -compatible data adaptors. (**theory:**
 $\mathcal{K} \supset \mathcal{D} \wedge \mathcal{S} \supset \mathcal{D}$)
- Based on this make OpenDreamKit system/databases interoperable
- 1) export **existing databases** into **ODKML**,
 - 2) specify **ODK system foundations** in **ODKML**
 - 3) build **OKDML import/export facilities** for ODK systems
 - 4) connect all up via **ODKBase** (**acting as a DKS server and semantic context**)
- ▶ **Coverage:** Start small/deep, extend, iterate (**Mexican hat profile**)

WP6 Participants/Efforts

- ▶ Sites involved in WP6: Data/Knowledge/Software-Bases
 - 1) **JacobsUni** (46 PM; lead) Survey, **ODKML design**, **ODKBase implementation**, **OEIS**, **LMFDB**, **FindStat**, **Python/Sage Foundations**, **Search/query**
 - 2) **UPSud** (37 PM), **ODKbase design**, **CAS Integration**, **Python/Sage Foundations**
 - 3) **USTAN** (10 PM), Survey, **ODKbase design**, **Python/Sage Foundations**, **CAS Integration**
 - 4) **UWarwick** (25 PM) **LMFDB**, **ODKbase design**, **CAS Integration**
 - 5) **UZH** (12 PM) **Survey**, **ODKML design**, **LMFDB**, **FindStat**, **Python/Sage Foundations**
 - 6) **Logilab** (2PM) **ODKbase design**
 - 7) **USlaski** (??? PM) **CAS Integration**, **ODKBase design**
- ▶ Total Effort: 132 PM ($\hat{=}$ 11 person years)