

Towards a better representation of research objects in interdisciplinary research

Alexander Struck, Anna Arbuzova, Anne Hattwich & Martin Wagner

Affiliation: Cluster of Excellence “Matters of Activity” at Humboldt-Universität zu Berlin, Germany

The Cluster of Excellence “Matters of Activity. Image Space Material” (MoA) is funded by the German Research Foundation (DFG) under Germany's Excellence Strategy from 2019 to 2025 (<https://www.matters-of-activity.de/en/>). Our research organization spans 40 disciplines investigating active material from several angles in interdisciplinary project setups. These include the natural sciences, humanities, medicine, design disciplines, informatics, and external industry partners. It's easy to see that architects have other output needs than surgeons, art historians, or computer scientists. A robot arm for surgery requires different metadata than an exhibition about bio-inspired materials or 3D models of wooden structures. It is also important to cover research software output next to research data publications. Embracing more diverse research output aligns with the current development of research results recognition, see for example Katerbow et al (2018), Jay et al (2021), European Commission (2021), and DORA resources (<https://sfdora.org/resource-library/>). We are aware of active development (at CERIF and [KDSF](#)) regarding the inclusion of extended metadata to reflect the diversity of today's research output. In our contribution, we present MoA CRIS, an improved setup tailored towards interdisciplinary projects with an extended metadata schema. We are looking forward to comparing our system and metadata schema with new developments.

We first reviewed existing CRISystems at three different research organizations and received insights into their disciplinary needs. We were introduced to FACTScience, PURE, and Converis and learned about their features and limitations. One takeaway was their rather static templating systems (to create new research objects), which did not consider much else than papers, books, patents, and presentations as research outcomes. Another important insight was that commercially hosted systems often equal a vendor lock-in.

In our scoring system, we required that the license would allow modification of the software to our needs and that it includes hosting a second instance for testing and possible fail-over. For us, local hosting requires few resources but eases compliance with several regulations, e.g. GDPR.

We also evaluated other frameworks and systems, e.g. VIVO and DSpace. Experiments with an earlier version of VIVO in 2019 revealed great flexibility in defining a variety of properties and connections. While VIVO is a comprehensive tool for displaying researchers and their collaborative work, for us it proved a bit too complex as a user-facing CRIS.

Four out of five vendors replied to our tender. One offer scored better due to flexibility and at least four-fold lesser costs. This system was based on the information system UniversiS, which we expanded into CRIS together with their development team.

At MoA, several stakeholders were involved in defining and evaluating the CRIS. This included research evaluation, academic management, IT, and selected researchers from all career stages. Through this joint effort by the stakeholders and the software provider, it was possible to go into production within a year.

Highly regarded features were the flexibility of the system to reflect our interdisciplinary setup and the outreach options to engage with broader society. We spent significant effort in reflecting all possible research objects from all disciplines, especially design and architectural work. In our ongoing CRIS evaluation, surprising feedback was recurring requests to better reflect the roles everyone played in their collaborative work. Our setup allows easy adjustment of metadata.

Since our initial evaluation, other solutions based on VIVO and DSpace have been further developed. For example, [Berlin University Alliance](#) currently develops a CRIS based on VIVO to visualize research collaboration and societal outreach. We happily agreed to contribute our experience to their system with configuration details and data (within GDPR regulation).

Many of our researchers are affiliated with other research organizations. This presents a challenge as we need to motivate those to split up their research results between different organizations. Here, ease of use was an important requirement and our system has been designed to import data via common formats, for example, RIS and BibTeX. Our next milestone is automated ORCID-based import of research output. Another requirement was metadata import via PIDs, like DOI. Metadata export to ORCID is also on our agenda to allow seamless transfer between CRISystems.

As a research organization, we are also tasked with knowledge transfer and public engagement. In this context, we also implemented display features for Open Access content, Open Source code and we suggest research-friendly licenses as defaults. The metadata on our research objects can be easily reused within our website (using an API). This enhances our societal outreach.

European Commission. Directorate General for Research and Innovation. (2021). Towards a reform of the research assessment system: scoping report. Publications Office.

<https://doi.org/10.2777/707440>

Jay, C., Haines, R., & Katz, D. S. (2021). Software Must be Recognised as an Important Output of Scholarly Research. In *International Journal of Digital Curation* (Vol. 16, Issue 1, p. 6). Edinburgh University Library. <https://doi.org/10.2218/ijdc.v16i1.745>

Edinburgh University Library. <https://doi.org/10.2218/ijdc.v16i1.745>

Katerbow, M., & Feulner, G. (2018). Recommendations On The Development, Use And Provision Of Research Software. Zenodo. <https://doi.org/10.5281/ZENODO.1172988>