

Pascal-Nicolas Becker

DSpace's entities in practice

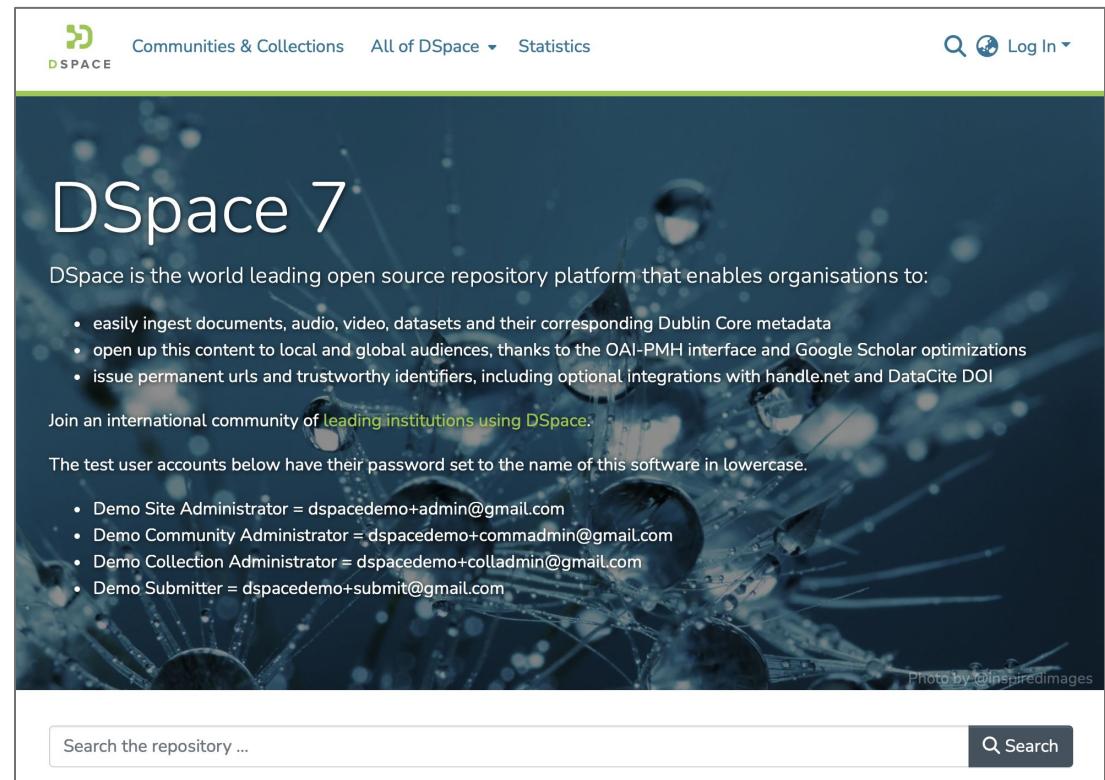
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2024.



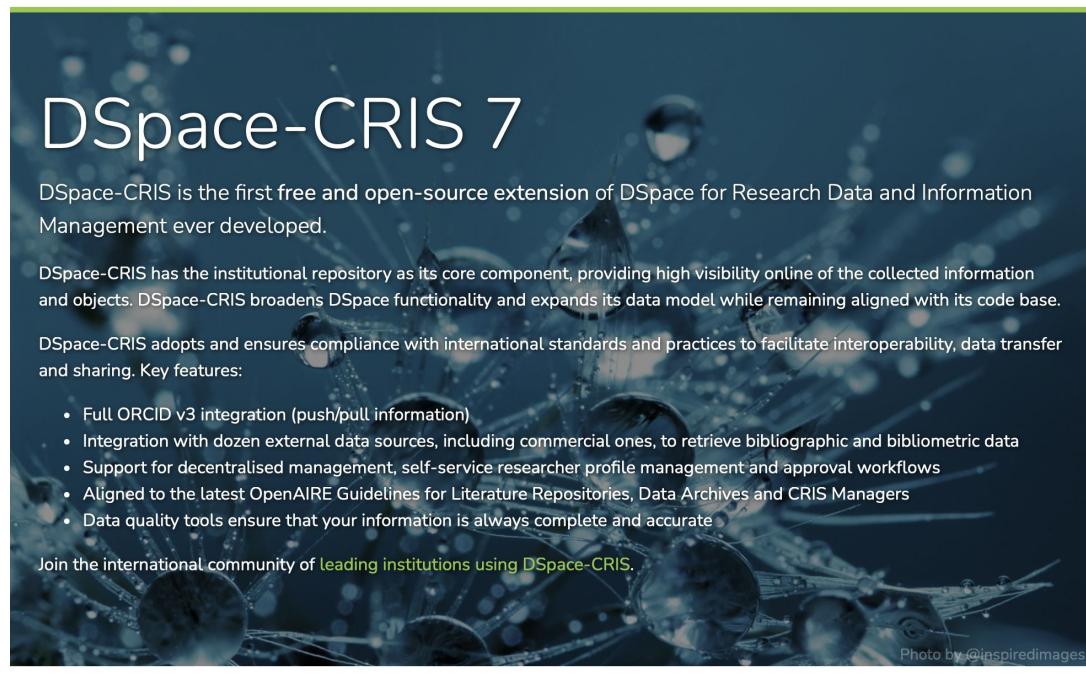
The Library
Code GmbH
DSpace Service Provider

DSpace 7

- In development for more than 5 years
- Released on August 2nd, 2021
- Unifying the UI by replacing JSPUI and XMLUI with one new UI based on Angular
- Introducing feature complete REST API
- Introducing customizable Entities



DSpace-CRIS



Search the repository ...

 Research outputs 98

 Projects 14

 People 29



DSpace's entities in practice

- DSpace-CRIS is an extension of DSpace enhancing the software to serve as a Current Research Information System (CRIS)
 - A CRIS records all research related activities, including projects, organization units and even people who do the actual research
 - DSpace-CRIS has been able to differentiate types of items for many years with 'entities'
 - Which entities DSpace-CRIS should be use, how they relate to each other is configurable in DSpace-CRIS
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DSpace

- Up to version 6 DSpace was structured by a Site object, communities, collections, items, bundles and bitstreams
- Items were the major object being described by metadata and having bundles and bitstreams assigned to it, that were or represented the actual contents
- Item was more or less used as a synonym for documents or media stored in the repository
- Inspired by DSpace-CRIS a DSpace Working Group was set into place to discuss if and how entities could be brought to DSpace 7

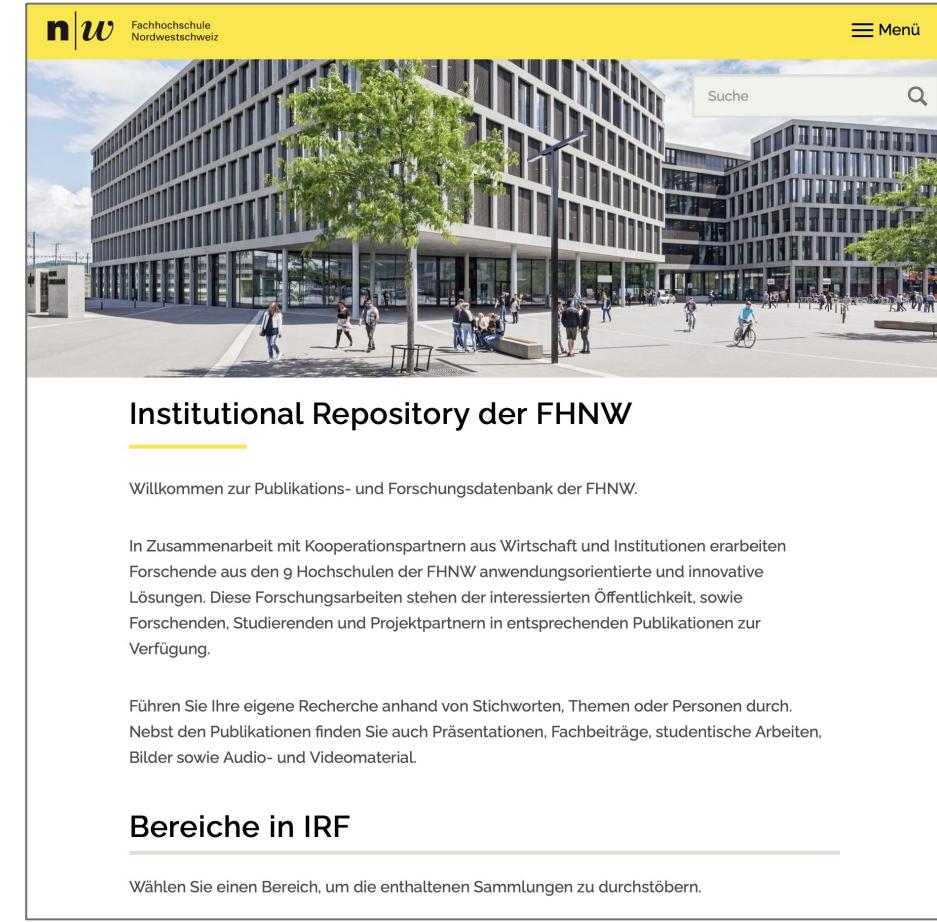
DSpace 7 Entities

- „Optional, new Configurable Entities feature. DSpace now supports ,entities‘, which are DSpace Items of a specific ‚type‘ which may have relationships to other entities.“ DSpace 7.0 Release Notes
- An instance of an entity in DSpace 7 is “just” an item with a metadata field “dspace.entity.type”, for example “Publication”, “Person”, “Project”, “Journal”, ...
- In addition, “relations” were introduced, to connect instances of entities
- Relations in DSpace 7 are typed, for example “isPersonOfProject”, “isPublicationOfAuthor”
- A relation has a “leftType” and a “rightType” defining the type of entities that it connects, as well as a “lefwardType” and a “rightwardType” defining the type of the relationship from the left entity to the right and vice versa
- “Virtual metadata” allows display of metadata of a related entity on the item view of another entity (showing the journal name on an article’s item view)

Case study: Institutional Repository FHNW (IRF)

- IRF is an institutional repository of Fachhochschule Nordwestschweiz (FHNW)
- The Library Code migrated it in 2023 from DSpace 6 to DSpace 7
- It contained
 - 3,000+ unique people backed by external data
 - 40,000+ authority-controlled metadata values
 - 24,000+ items (publications, student's work and projects)
- Students' works and projects had a custom metadata field storing their special type

[]_{type} custom metadata field storing their special
DSpace's entities in practice



DSpace 6 to 7 migration

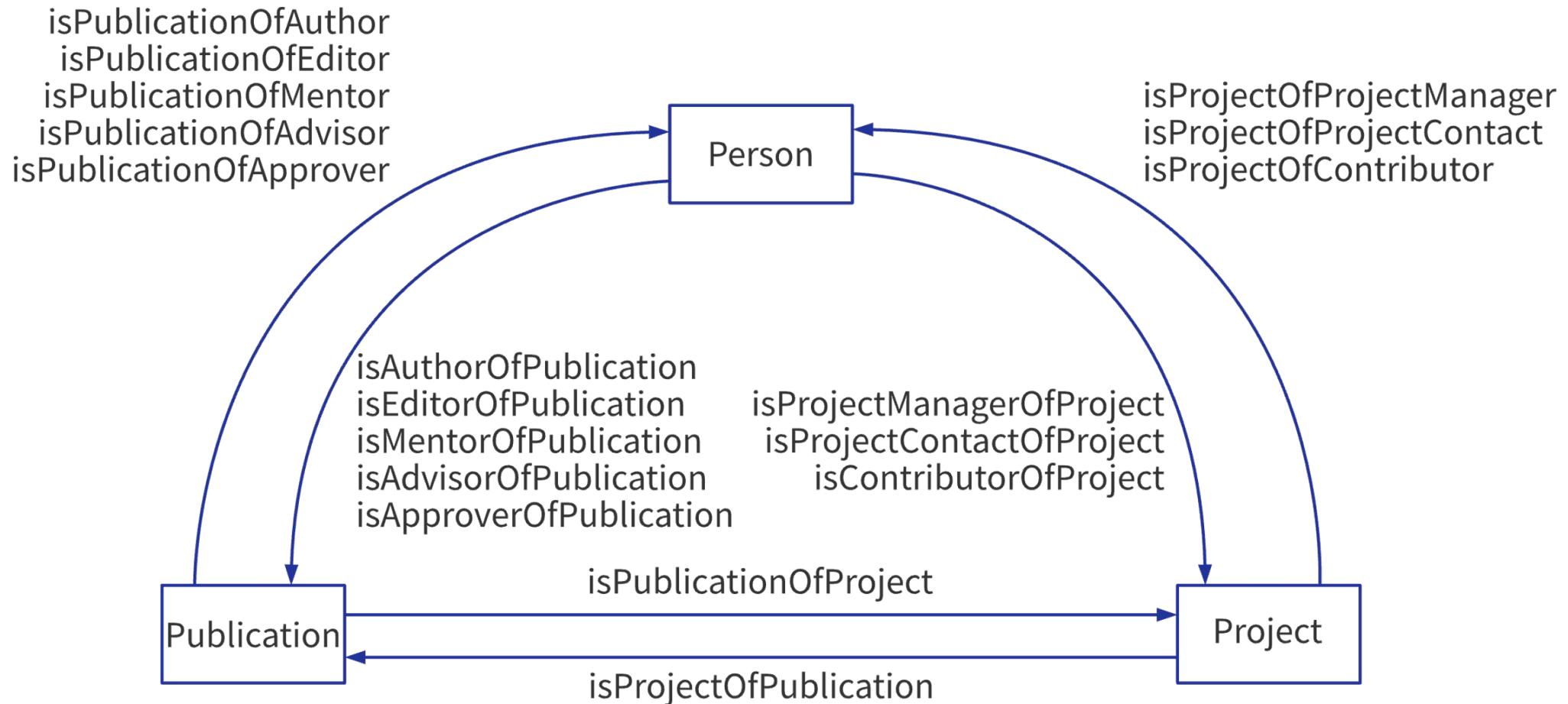
- IRF has a long history with different service providers and different repository managers of multiple years
- Many customizations, some with forgotten undocumented specifications
- DSpace 7 required reimplementations of anything concerning the new UI
- Decision: starting with a clean code base, reimplementing needed features, getting rid of unused or unclear functions
- Getting rid of DSpace 6 Authorities, as External Data Providers and Entities fits the use case of IRF much better
- In certain ways IRF in DSpace 6 was ahead of its time, using ideas comparable to DSpace 7's entities

Using entities for IRF

- We analyzed the existing data and identified the need for three entity types:
 - Person
 - Project
 - Publication
- Publication's have a document type (dc.type) within their entity
 - Article in scientific journal
 - Article in magazine or newspaper
 - Monograph
 - Anthology
 - Student work
 - ...
- As relationships are typed, we came up with
 - Five relationship types between Person and Publication (author, editor, mentor, ...)
 - Three relationship types between person and Project
 - One relationship type between Publication and Project
- Each entity needs at least one specific collection that only stores those entities
- Each collection can just store one kind of entity



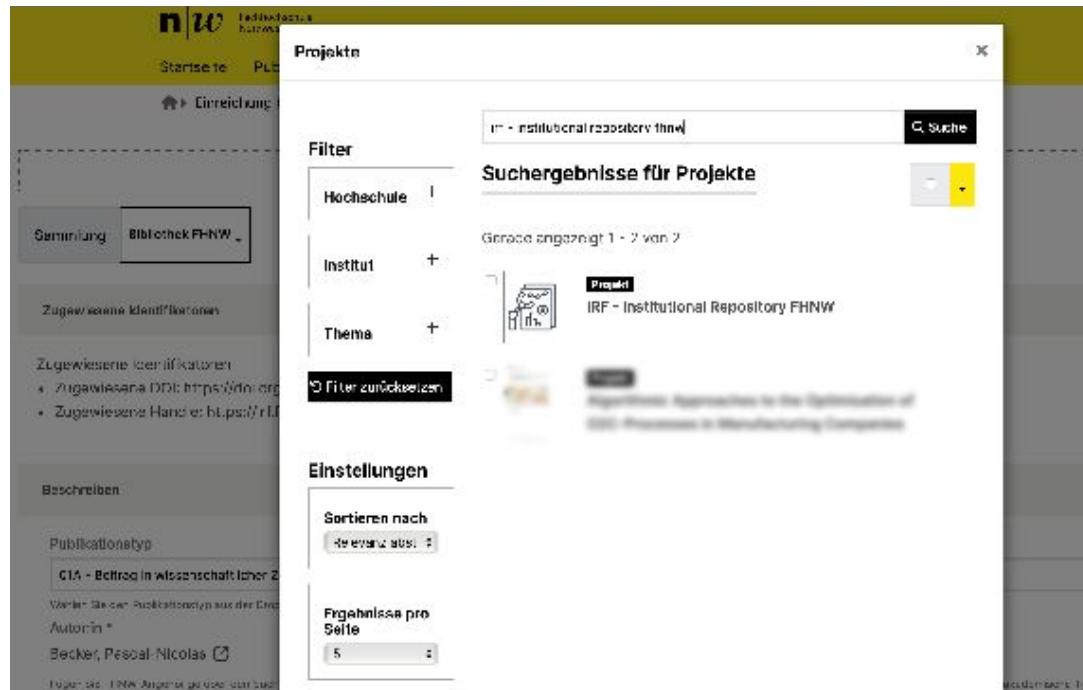
Using entities for IRF



Benefits of entities for IRF

- We abandoned Authority for IRF completely
 - No content is stored in SOLR anymore
 - Projects, Publications, Persons are stored as items in the database
- We highlighted the entities by linking them in the navigation bar
- Authors can easily create relationships between entities in submission, as DSpace offers a lookup service to define relationships
- Default search filters can be applied to search masks in submission, so that results are limited to the specific entity
- Search offers filters by “Item Type” (entity)
- As persons are items, IRF offers simple person profiles, showing all public works of a person

Creating relations between entities in submission



- DSpace contains mechanisms to create relationships between entities, if those relationship types have been defined
- Filters can be defined to limit search to specific entities

Submission Forms

The screenshot shows a DSpace submission interface for 'FHNW Allgemein Projekte'. At the top, there's a yellow header bar with the n|w logo, the text 'Fachhochschule Nordwestschweiz', and navigation links for 'Startseite', 'Publikationen', 'Projekte', 'Studentische Arbeiten', and 'IRF entdecken'. Below the header is a search bar with a magnifying glass icon and a user profile icon. A dashed box highlights a file upload area with the placeholder 'Dateien herüberziehen, um sie dem Item hinzuzufügen, oder stöbern'. Underneath, there are two tabs: 'Sammlung' and 'FHNW Allgemein Projekte', with the latter being active. The main form area is titled 'Beschreiben' and contains fields for 'Institut *' (with a dropdown menu), 'Projekttitel *' (with a text input field containing 'Projekttitel'), and 'Projekttyp *' (with a dropdown menu). To the right of these fields is a 'Status *' dropdown menu. A note below the project title says: 'Geben Sie Titel mit Untertitel an, falls vorhanden. Trennen Sie Titel und Untertitel mit einem Punkt.' A small note at the bottom of the form says: 'Status des Projekts. Der Status wird automatisch angepasst, sobald das'.

- Different Entities need different metadata fields to describe them
- DSpace lets you configure specific submission forms for each entity



Show Links between related entities on Item Views

The diagram illustrates the interconnected nature of DSpace entities through item views. A central item view page displays three related entities: 'Projektmanager:in' (Selena Savic), 'Beteiligte' (Yann Patrick Martins), and another 'Projektmanager:in' (Selena Savic). Lines connect the main item view to each of these detailed entity pages, demonstrating how users can explore the relationships between different types of entities within a single research output.

Publikationen

Publikation
Articulating nomadic identities of radio signals
(Revistes científiques de la Universitat de Barcelona, 25.02.2022) Savic, Selena [In: Matter: Journal of New Materialist Research]
This article presents a new materialist approach to artificial neural networks, based on experimental research in categorization of data on radio signals. Picking up on Rossi Braidotti's nomadic theory and a number of new materialist perspectives on informatics, the article presents identification of radio signals as a pro...
▼ mehr...
01A - Beitrag in wissenschaftlicher Zeitschrift

Publikation
Modulating matters of computation, modelling and hyper-separations
(Electronic Workshops in Computing (eWiC), 09/2021) Savic, Selena; Miyazaki, Shintaro; Christensen, Michelle; Corradi, Florian; Sandergaard, We engage in a conversation with critical ecofeminism, which proposed to transform the colonialism-racism-capitalism-patriarchalism induced environmental crisis by non-essentialist countering of oppressions and hyper-separations produced by human/nature dualism. We modulate the critical ecofeminist approach by...
▼ mehr...
01B - Beitrag Konferenzschrift

Publikation
Architectonic Studies of Radio Signals: Reorganizing Archives of Data/Natures In Their Own Terms
(18.08.2020) Savic, Selena
As we slowly accustom to thinking about planetary issues through the notion of 'assemblage' rather than that of the 'system', we get better at acknowledging complex entanglements between living and inert, between social and technical. This paper presents a critical reflection on the use of machine learning tech...
▼ mehr...
06 - Präsentation

Projektmanager:in
Savic, Selena ↗

Beteiligte
Martins, Yann Patrick ↗

Projektmanager:in
Savic, Selena ↗



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Using Entities for searches

- You can filter search results for entity types
- We hide one entity type here on purpose

The screenshot shows the search interface of the n|w Fachhochschule Nordwestschweiz website. The top navigation bar includes links for Startseite, Publikationen, Projekte, Studentische Arbeiten, and IRF entdecken. The main search bar has a placeholder 'Suchtext' and a 'suche' button. On the left, a 'Filter' sidebar lists categories: Hochschule, Institut, Autor:in, Typ, Thema, Datum, Enthält Dateien, and Item-Typ. The 'Item-Typ' section is expanded, showing two options: 'Publikation' (25.9K) and 'Projekt' (2.1K). Below this is a 'Item-Typ suchen' input field and a 'Filter zurücksetzen' button. The main area displays search results under 'Suchergebnisse', showing 1 - 10 of 28040 results. The results are categorized as 'Publikation' and include titles like 'Thuner Imaginativskala für Kinder (TIS-K): Ein Instrument zur Messung der Imaginativen Fähigkeit (2. Teil)' and 'Lernfähigkeit der Subjekte, Widerstand und solidarisches Handeln. Zu Leben und Werk des Erziehungswissenschaftlers Gottfried Mergner'. There are also sections for 'Vorlesbarkeit nicht verfügbar' and 'Vorlesbarkeit verfügbar'.



Simple Person Profiles

The screenshot shows a person profile page for 'Savic, Selena' on a digital repository. The top navigation bar includes links for Startseite, Publikationen, Projekte, Studentische Arbeiten, IRF entdecken, and Anmelden. The main content area displays the user's name, a placeholder profile picture, and basic contact information: Nachname (Savic), Vorname (Selena), and Name (Savic, Selena). A 'Komplettanzeige' button is present. Below this, tabs for 'Werke' and 'Betreute Arbeiten' are shown, with 'Werke' being active. On the left, a sidebar titled 'Filter' lists categories like Hochschule, Institut, Autor:in, Typ, Thema, Datum, Enthält Dateien, and Item-Typ, each with a '+' sign. The main right section shows search results for 'Gesamter Bestand' with a search input field and a 'Suche' button. The results are titled 'Suchergebnisse' and show two publications by Selena Savic:

- Publication:** Making Arguments with Data: Resisting Appropriation and Assumption of Access / Reason In Machine Learning Training Processes
(Weizenbaum Institute for the Networked Society, 30.10.2023) Savic, Selena; Marchis, This article presents an approach to practicing ethics when working with large datasets and designing data representations. Inspired by feminist critique of technoscience and recent pro...
[View]
- Publication:** Techno-optimism and optimization in media architecture practice and theory
(Routledge, 10.04.2023) Savic, Selena [in: Digital Creativity] Media architecture community systematically explores the potentials of computation and digital media to intervene in form-finding, fabrication of buildings and urban data collection processes...
[View]



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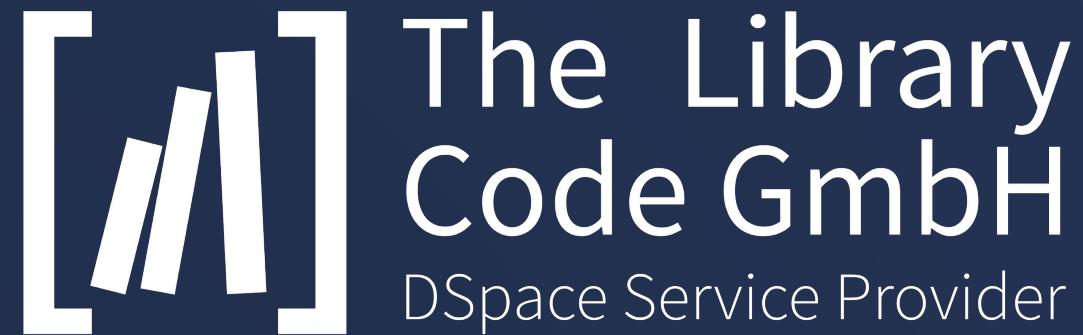
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Conclusion

- If each entry in a vocabulary can be stored and displayed in the repository as an object on its own, you can replace authority with entities
- Entities are items with an additional type
- The entity type is stored as metadata field and can be used as such, for example for search filters
- Entities allows us to store different „kinds“ of items in a repository
- You have to think about
 - specific submissions forms
 - Relationship types between entities
 - Entities‘ item views
- Entities are a great new feature for DSpace
- ~~Entities helps to better model and serve different kinds of contents in our repositories~~





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