**OR2020 Presentation Submission**

**15th International Open Repositories Conference, June 1st-4th in Stellenbosch, South Africa**

# DSpace 7 - Configurable Entities

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## Abstract

## DSpace 7 has been extended with the possibility of “Configurable Entities” in response to a growing need for describing more types of objects and relations between objects as well as compound objects. Examples include: authors, projects, datasets, grants, monographs, lecture series, … .

## The new Configurable Entities feature and new concepts in DSpace 7 will be presented such as relations between items, virtual metadata, … .

## Defining an entity model through configuration is made possible without using Java classes for the specific entities. To achieve this, the concept starts from the current DSpace Item object and extends it, allowing institutions to keep using DSpace with standard items. The entities in a custom entity model are items that can be typed, and relations between items of different types can be created. Several entity models can be defined and can exist alongside one another in one repository.

## Finally, this talk will briefly touch on the next steps for future versions of DSpace.

## This presentation is an update to the presentation “DSpace 7 - The Power of Configurable Entities” presented at OR2019 as the work has now been finalized and the features announced at OR2019 have now been implemented and can be demonstrated.

## Keywords

DSpace, DSpace 7, Entity modeling, Configurable Entity Model, Compound Objects.

## Audience

Everyone: Repository managers, Data producers, Librarians, Developers, etc.

## Proposal (no longer than 3 pages)

* *Tell us what you will cover in the presentation. Why will your topic be of interest to the intended audience? Include figures and images if they will help reviewers evaluate the proposal content.*
* *All proposals should be in English and approximately 2-3 pages in length - excessively long submissions place undue burden on the reviewers.*

In response to a growing need for describing more types of objects and relations between objects in alignment with the COAR Next Generation Repositories recommendations [1] and compliance with OpenAIRE v4 guidelines [2], a working group was established. The working group discussed requirements, and different proposals for implementation to be evaluated by the DSpace Steering Committee for the final selection of implementation strategy.

The DSpace Steering Committee recommended adopting a flexible and configurable entity model which allows existing DSpace institutions to choose whether to enable new (out-of-the-box) entities in their system [3]. The solution will initially concentrate on entity models required to meet OpenAIRE v4 guidelines, while also allowing institutions to create/design additional entity models to meet other use cases. The solution should be built incrementally over several releases.

The result should be a system that supports a configurable entity model, as this will allow for DSpace to be adapted/extended for additional use cases. However, to stay true to the goals described in the DSpace 2015-18 Strategic Plan [4], DSpace should avoid becoming too specific to a single repository use case. Instead, a goal of Configurable Object Models should be to allow third-party extensions or add-ons to extend the DSpace object model for specific use cases. Configurable Object Models should allow for such extensions to be more easily installed/maintained in out-of-the-box DSpace.

For the reasons stated above, the DSpace Steering Committee recommended the new entity model be an extension of the current Item model. The creation of this new model has been coordinated by the DSpace Steering Committee, and be developed in collaboration with the global DSpace community. By doing so, the configurable entities will be a transparent and inclusively developed model ensuring that DSpace can face the new challenges and address the needs and requirements of its global community.

The presentation will cover the main principles of the functional direction of the Configurable Entities feature in DSpace 7 and its impact on the existing DSpace features.

The “Configurable Entities” has been subjected to specific entity model use cases during discussion and development, and the implementation of these use cases in a live DSpace 7 instance will be used in this presentation to introduce the different features of the Configurable entities.

The first use case is a **hierarchical entity model** that represents a **Journal - Volume - Issue - Article** structure and it will be illustrated how this entity model has been created in DSpace 7. Some of the specific challenges in a hierarchical entity model and solutions for these challenges will be presented.

In a hierarchical entity model it is desired to be able to populate the metadata of an entity with the metadata of other entities higher up in the hierarchy, and to ensure that the metadata is available independent of the manner used to retrieve the metadata. (OAI, SWORD, REST, …). The presentation will show how metadata can virtually be mapped from one item to another item in this hierarchy. Since this is virtual metadata, the metadata is not duplicated, but only displayed.

It will also be shown how, through configuration, the item page of a specific object (item) type can be customized, for example integrating a search component into the Journal item page to allow searching through all articles that are related to that journal.



The second use case that will be used to illustrate the power of these Configurable Object models is **graph entity model** that represents part of the CRIS object model, namely the Publication, Project, Person and Organizational Unit object types and their relations.

Some of the challenges with this model that were addressed in the implementation will be discussed, including Ordering of relations to support ordering author names when some of the authors are plain text metadata and others are Person Objects, as well as author name variants, importing authors from external sources, … .



Outside of these use cases we will also address how the “Configurable Object Models” feature is integrated into other functionality: searching for specific item types, batch import for typed items and their relations, submission forms and workflows per entity type, … .

Finally, open challenges and next steps for future releases will be discussed, including functionality that is aware of the entity model, for example delete operations that operate differently for hierarchical entity models as compared to graph models, permissions on relations, …

## Conclusion

Attendees will leave with a deeper understanding of the new “Configurable Entities” capabilities of DSpace 7, especially the improvements to providing access to different types of materials and the relations that exist between the different types of materials, providing a richer user experience.

## References

1. <http://ngr.coar-repositories.org/>
2. <https://guidelines.openaire.eu/en/latest/>
3. <https://duraspace.org/statement-from-dspace-steering-group-on-the-dspace-7-data-model/>
4. [https://wiki.duraspace.org/display/DSPACE/DSpace+2015-18+Strategic+Plan](https://wiki.duraspace.org/display/DSPACE/DSpace%2B2015-18%2BStrategic%2BPlan)