

## Describing Collections as Contextual Units for Objects – A Practical Approach

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For more than a decade the Department for Scientific<sup>1</sup> Collections and Science Communication at the interdisciplinary research centre *Hermann von Helmholtz-Zentrum für Kulturtechnik*<sup>2</sup> at Humboldt University of Berlin, under the direction of its co-chair Dr. Cornelia Weber, has been leading in research, documentation and building professional networks in the field of university collections and museums, on a national level and, in the context of the ICOM International Committee for University Museums and Collections<sup>3</sup>, worldwide. Documenting university collections as collections, on a collection level, is an integral part of our work.<sup>4</sup> Collection-level description (clid) helped us to classify collections, plot their academic, disciplinary, personal or institutional interdependencies, to represent their highly dynamic historical transformations (which often enough occurred independently of holding institutions) and, by attaching custodial and contact information, to picture the professional networks which maintain the infrastructure of scientific collecting and its various functions (academic research, teaching, public outreach).

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<sup>1</sup> “Scientific collections” is not an accurate translation of “wissenschaftliche Sammlungen”. The German *wissenschaftlich* refers to the whole field of academic scholarly studies, the unity of science and the humanities combined. For brevity and consistency with previous translations and publications, we will use the term in this broader understanding.

<sup>2</sup> Hermann von Helmholtz-Centre. The term *Kulturtechnik*, in the centre’s understanding, is difficult to translate. Literally “cultural techniques”, it refers to a programm of systematic research of interactions between major scientific and/or cultural changes and technical innovations. Website (German): <http://www.kulturtechnik.hu-berlin.de>

<sup>3</sup> See <http://publicus.culture.hu-berlin.de/umac/>

<sup>4</sup> Though, in the beginning, we weren’t aware of the technical term “collection-level description” and its role in the professional discourse.

University collections and museums are diverse. They manifest in various forms and functions. Some have a long history, some are very young because they are created due to the development of a new speciality or field of study. There are large collections with millions of items (e.g. some zoological collections) and small ones, with less than 100, but possibly unique objects. Some collections are publicly accessible in form of museums, but most of them owe their existence to a specific academic interest and academic function, mainly research and teaching.<sup>5</sup> The relationship of a collection to its legal holding institution (the university) is in many cases a weak one, as the collection was established and is maintained by certain researchers in a certain department within the scope of a specific disciplinary context. Universities as organisational entities, in accordance with the principle of academic freedom, have and had very little influence on collection foundation and policy. When we engaged in documenting university collections, it was therefore obvious to first build a database with collection-level description at its core.<sup>6</sup>

This collection-level approach turned out very fruitful. While information about individual collection items in many cases was and is scarce (not to speak of digitized holdings), it was possible to develop a comprehensive knowledge base about university collections. By connecting collections with classifying properties (collection types, forms and academic subjects), places, organisations, people (who were involved in the foundation or development of collections), historical events (like establishment and termination), we managed to weave an interlinking net which relates the elements of a heterogeneous and dynamic domain without the application of an all too rigid structure. This approach also helped us to build usable and browsable web database interfaces with indices and cross-references. And for the historical documentation we were able to describe lost, terminated, abandoned, split or translocated collections even when all objects were gone, information about them unavailable or when objects and holdings had meanwhile become part of other collections.

In a subsequent project, we moved to the item level and researched and documented the object genre of Material Models in Research and Education across collections and academic disciplines.<sup>7</sup> The resulting item-level descriptions of material models were integrated with the

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<sup>5</sup> Both academic functions imply that conservation is not always the focus: research and teaching may use objects in a way that consumes them, at least partially.

<sup>6</sup> See UMAC Worldwide Database of University Museums & Collections: <http://publicus.culture.hu-berlin.de/collections/> (international database in its original, albeit slightly anachronistic appearance), and University Collections in Germany: <http://www.universitaetssammlungen.de/?setLocale=en>

<sup>7</sup> Material models fulfil various roles in academic contexts: research, teaching, presentation, exposition and representation. See <http://www.universitaetssammlungen.de/modelle?setLocale=en> and Ludwig,

existing collection descriptions. By connecting the model objects with the collections they are part of, significant contextual information could be rendered, especially the why (function, collection policy), when or by whom the items were incorporated into the academic collection.<sup>8</sup> Moreover, the readily available corpus of collection-level documentation helped the research team to solve a particular data-modelling problem: professional model makers serially produced quite a number of material models in academic use, subsequently identical models can be found in various collections. Item-level descriptions of material models were therefore split into an “abstract” or conceptual description of the object (information pertaining to all produced items of one particular model), and into a “holdings description”, which contains information related to the serially manufactured items physically included into a collection. These holdings descriptions are relationally linked to the conceptual item-level model description and to the collection the object is part of.

Over the past years, the role of academic collections in research, teaching and education has seen a continuous increase. Collections are used for university exhibitions, research programmes and especially teaching courses, resisting and partially reversing the prevalent trend of virtualisation. An example: the “Medienarchäologischer Fundus”<sup>9</sup> at the Institute for Musicology and Media Studies at Humboldt University of Berlin teaches students to examine television sets, radios, computers and computing devices for a better understanding of the relationship between physical medium and its cultural effect.<sup>10</sup> There have also been numerous documentation projects, some on the national level, like *Academische Collecties* in Netherlands, or *UMIS: University Museums in Scotland*.<sup>11</sup>

In 2011, the influential German Council of Science and Humanities (*Wissenschaftsrat*)<sup>12</sup> emphasized that physical scientific (academic) collections at universities and research museums are an important research infrastructure and should be developed accordingly.<sup>13</sup> At

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Weber, Zauzig, *Das materielle Modell. Objektgeschichten aus der wissenschaftlichen Praxis*, Paderborn 2014.

<sup>8</sup> See also Wickett et al., *Modeling Cultural Collections for Digital Aggregation and Exchange Environments*, CIRSS Technical Report 201310-1, October 2013; especially the concept of „collection-level attributes that may propagate to the item level or at least inform the item level” (chapter 4.2).

<sup>9</sup> Roughly translated: collection for archaeology of the media

<sup>10</sup> <http://www.medienwissenschaft.hu-berlin.de/medientheorien/fundus>

<sup>11</sup> See <http://www.academischecollecties.nl> and <http://www.revealing.umis.ac.uk>. Collection-level description plays a central role in both projects. *Academische Collecties* uses EAD (Encoded Archival Description).

<sup>12</sup> <http://www.wissenschaftsrat.de/en/home.html>

<sup>13</sup> See Wissenschaftsrat, *Recommendations for Scientific Collections as Research Infrastructures*, 2001, [http://www.wissenschaftsrat.de/download/archiv/10464-11-11\\_engl.pdf](http://www.wissenschaftsrat.de/download/archiv/10464-11-11_engl.pdf)

the same time, it was determined that academic collections at German universities lack funds and do not meet museological standards like proper documentation, maintenance, curating and storage. As a consequence, the Federal Ministry of Education and Research funds since 2012 the “Coordination Centre for Scientific University Collections in Germany”<sup>14</sup>, located at *Helmholtz-Zentrum/Humboldt University of Berlin* and led by Cornelia Weber. The centre’s task is to coordinate activities that develop the collections’ role as a decentralised scientific infrastructure and increase their visibility und usability, and to expand and strengthen the community’s network.

Digitisation and digital web-based documentation play an essential role for increased visibility and academic usability of collections. Thus, the centre has begun to develop a new data platform with a web portal, “Scientific Collections digital”, as its publishing tool.<sup>15</sup> The portal, still in beta, presents interrelated information about collections, objects, involved person and collection activities in research, documentation and exposition. In the future, all data will be accessible via APIs. One central aim of the new platform is to aggregate, connect, and enrich data of numerous local repositories and to provide them further to national and international reference projects like Europeana or German Digital Library. It is therefore for us a given that our work should conform to interoperability standards like LIDO, Dublin Core and CIDOC CRM.

In accordance with the centre’s principal tasks and aim, a data model has been developed, which formally describes and structures the domain of scientific (academic) collections as an infrastructure for research, teaching and education. Franziska Diehr, as a master-thesis at the Institute of Library and Information Science of Humboldt-University of Berlin, designed this Scientific Collection Description Model (SCDM).<sup>16</sup>

SCDM describes a collection as a unity of several single, physically present, material items, which is or was created by one or more persons for a certain reason and is currently used or has the potential to be used in academic research, teaching and/or education. The model represents the dynamics of a scientific collection as an infrastructure by describing the collection itself as a unity, by describing its usage in research, teaching and education and by connecting it with related resources. This perspective on a collection in combination with its related

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<sup>14</sup> <http://wissenschaftliche-sammlungen.de/en/>

<sup>15</sup> <http://portal.wissenschaftliche-sammlungen.de>

<sup>16</sup> Franziska Diehr, *Ontologisch basiertes Datenmodell für die Beschreibung wissenschaftlicher Sammlungen – ein Beitrag zur Identifikation semantischer Zielressourcen und zum Mapping existierender Quellattribute*, master-thesis, Berlin 2013, <http://nbn-resolving.de/urn:nbn:de:kobv:11-100218029>

resources distinguishes SCDM from other collection-level description models like DCCAP.<sup>17</sup> Nevertheless, DCCAP and other standards were used as a basis for SCDM and are therefore compatible. By its re-use of common standards like CIDOC CRM, Dublin Core and especially EDM as base model, SCDM is extendable and reusable; as a descendant of EDM also within the context of Linked Open Data. One reason for the re-use of EDM was its potential for expansion: by defining subclasses, EDM could be differentiated to meet domain specific needs. If applicable, classes and properties were re-used from existing namespaces. Otherwise new concepts were created.

Short explanations, examples and possible relations (properties) of SCDM's main classes:

- Class `scdm:Collection` defines (scientific) collections as a unity of several single, physically present, material items, which is or was created by one or more persons for a certain reason. Single object items might be added or removed from a collection, but it still remains a unity.
- `scdm:CollectionBasedActivity` is performed by an `edm:Agent` or `scdm:Actor` and related to at least one `scdm:collection`. A collection-based activity depends on the existence of a collection, without a collection the activity could not be performed. Collection-based activities demonstrate the usage of a scientific collection as infrastructure for research, teaching and education. Furthermore, those activities often produce results result like a research paper (an instance of `scdm:CollectionDocument`).
- `scdm:CollectionDocument` comprises identifiable immaterial items carrying information about `scdm:Collection`. This could be a single information object like image or audio files or also combined ones like a database.
- `scdm:Actor` defines persons and corporate bodies, who were consciously involved in a `scdm:CollectionBasedActivity` and/or related with at least one `scdm:Collection`. The most important relation between `scdm:Actor` and `scdm:Collection` is `scdm:hasContact(isContactFor)`. It identifies a contact person for a collection such as a curator.
- `scdm:Facilities` defines aids, which enable direct physical interaction with `scdm:Collection` or single items of a collection. Those facilities can be workspaces, laboratories, measurement devices or photo equipment.

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<sup>17</sup> <http://dublincore.org/groups/collections/collection-application-profile/>

### Example 1

```
scdm:CollectionBasedActivity: Apparatus and Machines of Psychiatry (course)
  scdm:used
    scdm:Collection: Medical History Collection
```

### Example 2

```
scdm:CollectionBasedActivity: Material Models in Research and Teaching (research project)
  crm:P14.carried_out_by
    scdm:Actor: Hermann von Helmholtz-Zentrum für Kulturtechnik
```

### Example 3

```
scdm:CollectionDocument: Material Models (database)
  scdm:isResultOf
    scdm:CollectionBasedActivity: Material Models in Research and Teaching
```

### Example 4

```
scdm:Facilities: Core Scanner
  scdm:facilitiesFor
    scdm:Collection: Deep Sea Core Collection
```

SCDM represents a conceptual model for a description of collections and their objects as an infrastructure for academic use. The new German web platform Scientific Collections already reuses its concepts. While intended for domain-specific application, SCDM may serve as an example for collection-level description within the framework of current and developing standards like CIDOC CRM and EDM. Wickett, et al. (2013)<sup>18</sup> enumerate the many reasons for collection-level description in digital aggregation environments<sup>19</sup> and present in a recent article<sup>20</sup> a model for its implementation as part of EDM. Our experience and present projects support further development of these concepts.

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<sup>18</sup> See fn. 8

<sup>19</sup> Representing data providers, providing context for items, management and presentation of search results, assessing relevance and accesbilty, context and navigation, the increasing role of (user generated) reference collections.

<sup>20</sup> Wickett, et al., *Representing Cultural Collections in Digital Aggregation and Exchange Environments*, D-Lib Magazine, May/June 2014, doi:10.1045/may2014-wickett