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Overview of scientific metadata for data publishing, citation, and curation

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22 September 2011

DC-2011

KB, The Hague, Netherlands



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Outline

A study of scientific metadata

Schemes and profiles in the wild

- Geospatial/Environmental Data

- Biology Data

- Social Science and Humanities Data

- Structural Sciences Data

- General Research Data

Comparison of metadata standards and profiles

Is a scientific metadata scheme worth the trouble?



A study of scientific
metadata



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[http://www.ukoln.ac.uk/
projects/sdapss/](http://www.ukoln.ac.uk/projects/sdapss/)



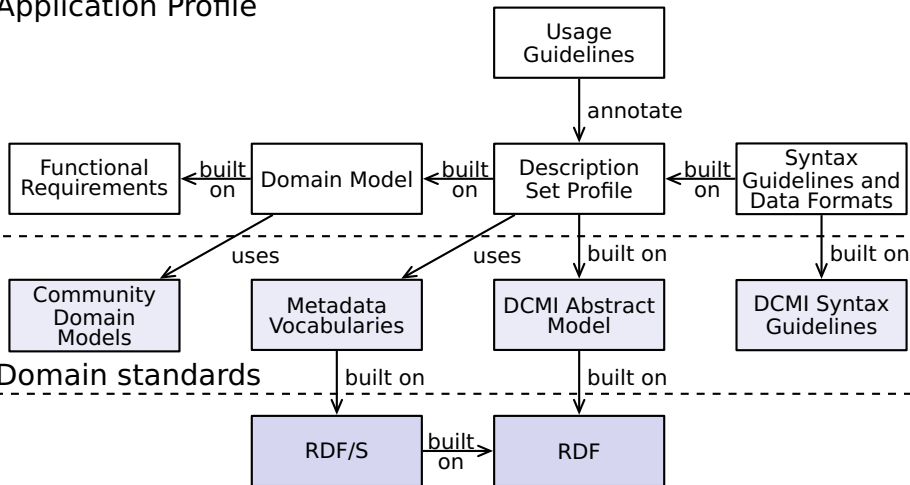
Scientific Data Application Profile Scoping Study Report

Document details

Author:	Alexander Ball, UKOLN, University of Bath
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Document Name:	sdapss.pdf
Notes:	Changes from version 1.0: Typographical corrections made. References added. Conclusions expanded.

Singapore Framework

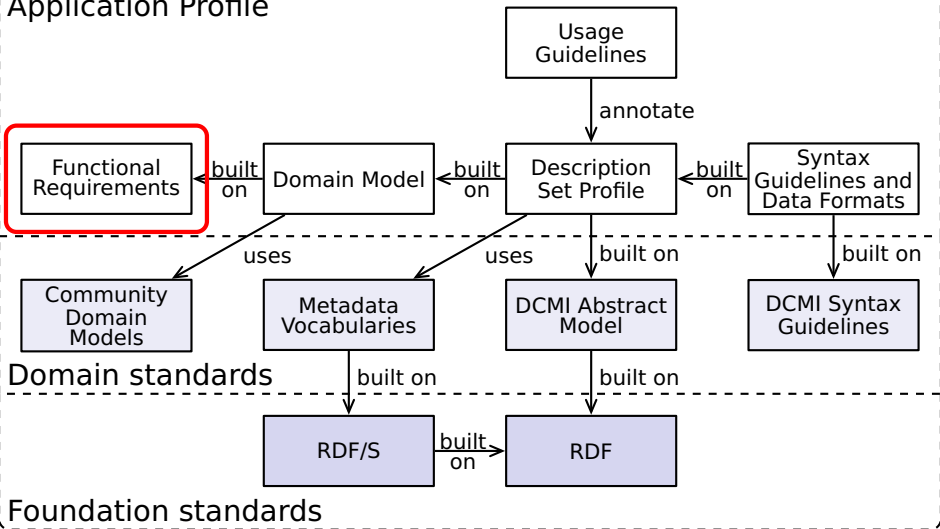
Application Profile



Foundation standards

Singapore Framework

Application Profile



Repository landscape

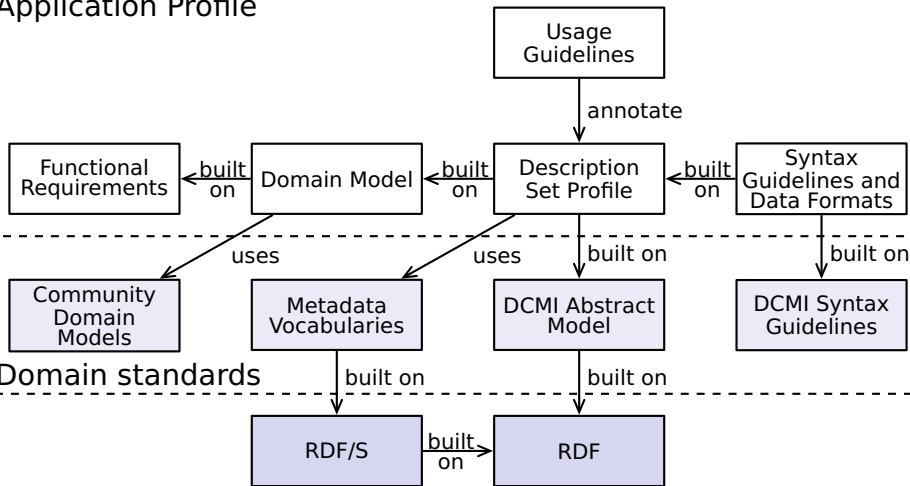


GoGeo eBank UK



Singapore Framework

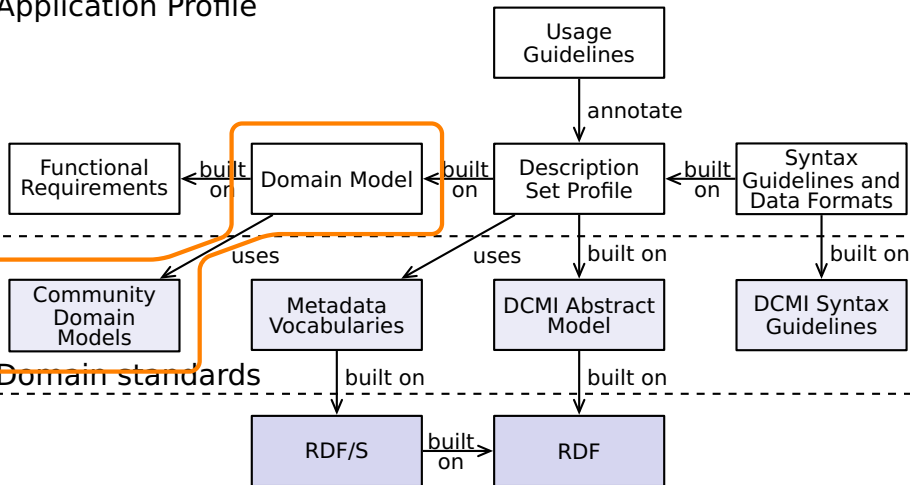
Application Profile



Foundation standards

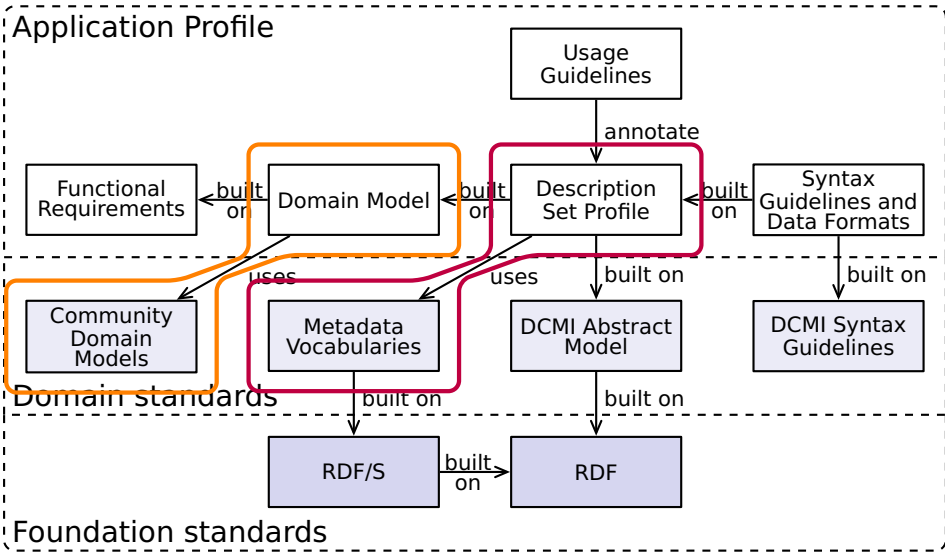
Singapore Framework

Application Profile



Foundation standards

Singapore Framework



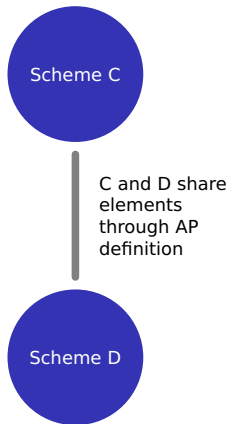
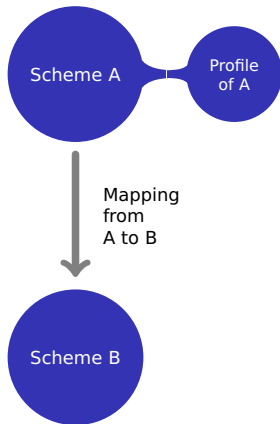
Schemes and profiles in the wild

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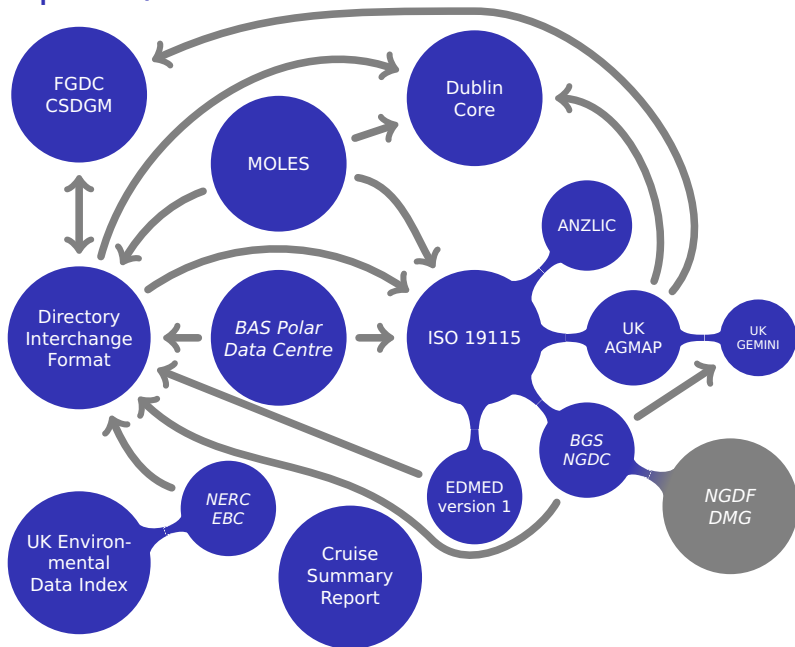


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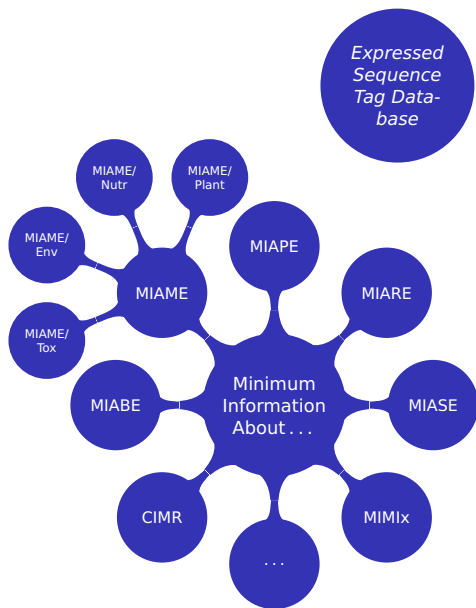
Legend



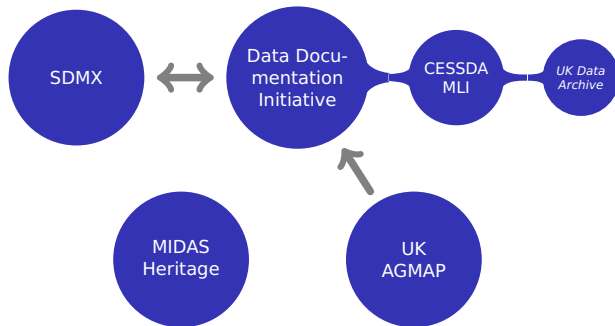
Geospatial/Environmental Data



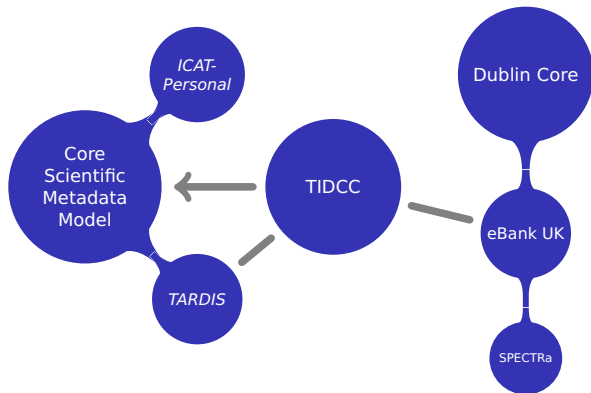
Biology Data



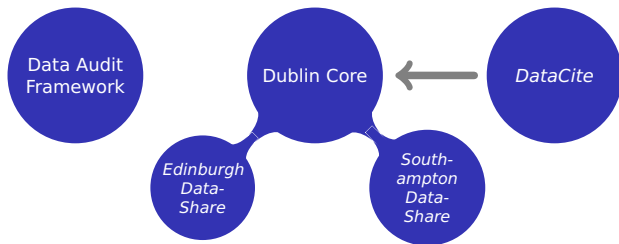
Social Science and Humanities Data



Structural Sciences



General



Legend

- ▶ The following lists show elements that were common to at least 3 of the 15 standards/profiles studied.
- ▶ Elements in red occurred in the most standards/profiles.
- ▶ Elements in black occurred in the fewest standards/profiles.

Identification

- ▶ Dataset Name
- ▶ Dataset Version
- ▶ Dataset Date
- ▶ Dataset Identifier
- ▶ Metadata Scheme Name
- ▶ Metadata Scheme Version
- ▶ Metadata Record Date
- ▶ Metadata Record Identifier

Responsibility

- ▶ Project/Study/Series Name
- ▶ Project/Study/Series Status
- ▶ Rights/Restrictions
- ▶ Agent
- ▶ Agent Contact Details

Archiving

- ▶ Location
- ▶ File Format(s)
- ▶ Storage Medium
- ▶ Size
- ▶ Data Quality Information
- ▶ Data Preview
- ▶ Dataset Language
- ▶ Dataset Status

Spatiotemporal Coverage

- ▶ Spatial Extent
- ▶ Spatial Resolution
- ▶ Temporal Extent
- ▶ Temporal Resolution

Topical Coverage and Derivation

- ▶ Dataset Type
- ▶ Subject/Keywords
- ▶ Abstract/Summary/Description
- ▶ Parameters Used
- ▶ Methodology/Instrumentation
- ▶ Processing Steps
- ▶ Related Datasets
- ▶ Derived Publications

Is a scientific metadata
scheme worth the trouble?

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DataCite Metadata Elements

(based on v2.2, in SDAPSS terms)

Identification

- ▶ Dataset Identifier
- ▶ Dataset Name
- ▶ Dataset Date
- ▶ Dataset Version
- ▶ Metadata Record Date
- ▶ *Metadata Record Version* (not in SDAPSS list)

Responsibility

- ▶ Agent (Creator/
Publisher/Contributor)
- ▶ Rights/Restrictions

Archiving

- ▶ Dataset Language
- ▶ Size
- ▶ File Format(s)

Topical Coverage and Derivation

- ▶ Subject/Keywords
- ▶ Dataset Type
- ▶ Related Datasets
- ▶ Derived Publications
- ▶ Abstract/Summary/
Description

Questions?



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Further information

Contact Alex Ball at
a.ball@ukoln.ac.uk

Scientific Data Application Profile Scoping Study
available from:
<http://www.ukoln.ac.uk/projects/sdapss/>

ISO 19115

Full name ISO 19115:2003. *Geographic information – Metadata.*

Maintained by ISO Technical Committee 211

Usage *Lingua franca* for geospatial data; widely profiled. ISO 19139:2007 provides its XML format, Geographic MetaData XML (GMD).

Further information http://www.iso.org/iso/catalogue_detail.htm?csnumber=26020

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ANZLIC

Full name Australia and New Zealand Land Information Council Metadata Profile

Maintained by ANZLIC – the Spatial Information Council

Usage Profile of ISO 19115 for use in Australia and New Zealand, replacing the *ANZLIC Metadata Guidelines* version 2 (2001)

Further information <http://www.anzlic.org.au/Publications/Metadata+Project/default.aspx>

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BGS NGDC

Maintained by British Geological Survey National Geoscience Data Centre

Usage Application profile for use by the NGDC, based on ISO 19115 with additional elements to support legacy and specialist metadata, including the National Geospatial Data Framework *Discovery Metadata Guidelines*

Further information (NGDC) <http://www.bgs.ac.uk/services/ngdc/home.html>

Further information (NGDF DMG)
<http://www.ngdf.org.uk/Metadata/metguide/metaguide12.pdf>

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UK AGMAP

Full name UK Academic Geospatial Metadata
Application Profile

Maintained by Go-Geo!, EDINA

Usage Profile of ISO 19115 (and superset of UK
GEMINI) for use by the UK higher and further
education sectors

Further information [http:
//www.gogeo.ac.uk/cgi-bin/mdres.cgi](http://www.gogeo.ac.uk/cgi-bin/mdres.cgi)

[Back to Geospatial](#)

[Back to Social Science](#)

UK GEMINI

Full name UK Geo-spatial Metadata Interoperability Initiative Standard

Maintained by Association for Geographic Information

Usage Profile of ISO 19115 for use by the UK Government and national services such as Gigateway

Further information

<http://www.agi.org.uk/uk-gemini/>

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EDMED

Full name European Directory of Marine Environmental Datasets

Maintained by British Oceanographic Data Centre, EU SeaDataNet Project

Usage Metadata scheme used by the EDMED database and national databases; the XML form of version 1 (replacing version 0) is a profile of ISO 19115

Further information https://www.bodc.ac.uk/data/information_and_inventories/edmed/

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CSR

Full name Cruise Summary Report

Maintained by Intergovernmental Oceanographic Commission, Bundesamt für Seeschifffahrt und Hydrographie/Deutsches Ozeanographisches Datenzentrum

Usage Standard form for reporting observations and the samples collected by oceanographic cruises

Further information <http://www.seadatanet.org/Metadata/CSR>

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BAS PDC

Maintained by British Antarctic Survey Polar Data Centre

Usage Application profile for use by the PDC, harmonious with both ISO 19115 and DIF

Further information http://www.antarctica.ac.uk/bas_research/data/

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DIF

Full name Directory Interchange Format

Maintained by Committee on Earth Observation
Satellites International Directory Network
(CEOS IDN)

Usage Native metadata scheme for the Global
Change Master Directory, hosted by NASA

Further information [http://gcmd.nasa.gov/User/
difguide/difman.html](http://gcmd.nasa.gov/User/difguide/difman.html)

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FGDC CSDGM

Full name Content Standard for Digital Geospatial Metadata

Maintained by Federal Geographic Data Committee

Usage Native metadata scheme for the Geospatial One-Stop data portal and the National Spatial Data Infrastructure Clearinghouse.

Further information

<http://www.fgdc.gov/metadata/csdgm/>

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MOLES

Full name Metadata Objects for Linking Environmental Sciences

Maintained by Centre for Environmental Data Archival (CEDA), Science and Technology Facilities Council (STFC)

Usage Native metadata scheme for CEDA and the Natural Environment Research Council's DataGrid

Further information

<http://proj.badc.rl.ac.uk/moles/wiki>

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UKEDI

Full name UK Environmental Data Index

Maintained by Environmental Information Centre,
Centre for Ecology and Hydrology (CEH)

Usage Native metadata scheme for the UKEDI
catalogue

Further information <http://ukedi.ceh.ac.uk/>

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NEBC

Maintained by Natural Environment Research Council
(NERC) Environmental Bioinformatics Centre

Usage Native metadata scheme used across all
data holdings, loosely based on UKEDI
(further, type-specific metadata is also held)

Further information [http://nebc.nerc.ac.uk/data/
standards-and-ontologies/overview](http://nebc.nerc.ac.uk/data/standards-and-ontologies/overview)

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MIBBI

Full name Minimum Information for Biological and Biomedical Investigations

Funded by Natural Environment Research Council, Biotechnology and Biological Sciences Research Council

Purpose To promote and co-ordinate projects working on reporting guidelines (especially 'Minimum Information' schemes), and drive adoption of these guidelines

Further information http://mibbi.org/index.php/MIBBI_portal

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dbEST

Full name Expressed Sequence Tag Database

Maintained by National Center for Biotechnology
Information

Usage Native metadata scheme for EST data in
GenBank

Further information [http://www.ncbi.nlm.nih.gov/
dbEST/how_to_submit.html](http://www.ncbi.nlm.nih.gov/dbEST/how_to_submit.html)

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Dryad

Full name Dryad Metadata Application Profile

Maintained by Dryad Development Team

Usage Native metadata profile for the Dryad repository, mostly drawn from Dublin Core, Darwin Core and BIBO

Further information https://www.datadryad.org/wiki/Metadata_Profile

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DwC

Full name Darwin Core standard

Maintained by Taxonomic Databases Working Group

Usage Biodiversity informatics standard used by the Global Biodiversity Information Facility, the Atlas of Living Australia, the Ornithological Information System, the Ocean Biogeographic Information System, and others

Further information

<http://rs.tdwg.org/dwc/index.htm>

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DDI

Full name Data Documentation Initiative

Maintained by Data Documentation Initiative Alliance

Usage Metadata standard used or profiled by social science data archives across the globe

Further information <http://www.ddialliance.org/>

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CESSDA MLI

Full name Council of European Social Science Data
Archives Minimum Level of Information

Maintained by Council of European Social Science Data
Archives

Usage Common base profile of DDI for use by the
member archives of CESSDA

Further information [http:
//www.cessda.org/sharing/managing/3/](http://www.cessda.org/sharing/managing/3/)

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Maintained by UK Data Archive

Usage Profile of DDI for use by the UKDA, based on the CESSDA MLI.

Further information <http://www.data-archive.ac.uk/create-manage/document/overview>

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SDMX

- Full name** Statistical Data and Metadata Exchange
- Maintained by** Statistical Data and Metadata Exchange Initiative
- Usage** Metadata standard used by the UN, the World Bank, the Organization for Economic Co-operation and Development and others
- Further information** <http://sdmx.org/>

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MIDAS Heritage

Full name Manual and Data Standard for Monument Inventories (MIDAS) Heritage

Maintained by English Heritage, Forum on Information Standards in Heritage

Usage Metadata standard used by UK agencies, record offices, archaeological contractors and academic researchers working with the historic environment

Further information <http://www.english-heritage.org.uk/professional/archives-and-collections/nmr/heritage-data/midas-heritage/>

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Core Scientific Metadata Model

AKA CCLRC Scientific Metadata Model

Maintained by Science and Technology Facilities Council (STFC)

Usage Metadata standard used by STFC's ICAT data catalogue and the Australian Research Enabling Environment (ARCHER) XDMS tool, among others

Further information https://sourceforge.net/userapps/mediawiki/ericayang/index.php?title=I2S2#Core_Scientific_MetaData_model_.28CSMD.29

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ICAT-Personal

Maintained by Science and Technology Facilities Council (STFC)

Usage Extension of the CSMD model to accommodate data processing stages beyond initial collection

Further information <http://sourceforge.net/apps/mediawiki/icatlite/>

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TARDIS

Full name The Australian Repositories for Diffraction Images

Maintained by TARDIS Project partners (Monash University, VeRSI, Australian Synchrotron, and others)

Usage Profile of the CSMD model for Australian crystallographic data

Further information <http://dx.doi.org/10.1107/S0907444908015540>

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eBank UK

Full name eBank UK Metadata Application Profile

Maintained by UKOLN, University of Bath (DCC);
University of Southampton; University of
Manchester

Usage Dublin Core Application Profile suited to
crystallography, later used by the eCrystals
Federation Project

Further information [http://www.ukoln.ac.uk/
projects/ebank-uk/schemas/profile/](http://www.ukoln.ac.uk/projects/ebank-uk/schemas/profile/)

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SPECTRa

Full name Submission, Preservation and Exposure of Chemistry Teaching and Research Data

Maintained by University of Cambridge, Imperial College London

Usage Extension of the eBank profile to organic and computational chemistry

Further information <http://www.lib.cam.ac.uk/spectra/FinalReport.html>

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TIDCC

Full name Towards an International Data Commons for Crystallography

Maintained by The Australian Repositories for Diffraction Images (TARDIS) Project, eCrystals Federation Project, DataMINX Project, Australian Research Council's Molecular and Materials Structure Network (MMSN)

Usage Profile of the CSMD model for Australian crystallographic data

Further information <http://wiki.ecrystals.chem.soton.ac.uk/images/9/9d/ECrystals-WP4-PM-Final.pdf>

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Edinburgh DataShare

Full name DSpace Metadata Schema for Edinburgh DataShare

Maintained by University of Edinburgh

Usage Profile of Dublin Core and administrative DSpace metadata for use in Edinburgh's data repository

Further information http://www.disc-uk.org/docs/Edinburgh_DataShare_DC-schema1.pdf

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Southampton DataShare

Full name DataShare Metadata Schema for ePrints Soton

Maintained by University of Southampton

Usage Profile of Dublin Core and administrative ePrints metadata for use in Southampton's data repository

Further information http://www.disc-uk.org/docs/sPrints_Soton_Metadata.pdf

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DataCite

Full name DataCite Metadata Schema for the
Publication and Citation of Research Data

Maintained by DataCite Metadata Working Group

Usage Scheme for the metadata collected by
DataCite when registering a DOI for a
database

Further information <http://schema.datacite.org/>

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DAF

Full name Data Asset Framework Audit Form 3B: Data asset management (Optional extended element set)

AKA Data Audit Framework

Maintained by HATII, University of Glasgow (DCC)

Usage Suggested set of data to collect about research data assets when assessing their management

Further information

<http://data-audit.eu/documents.html>

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