

# **DDF-MXD**

## **Danish Research Database**

### **Metadata Exchange Format for Documents**

**Version 1.2.2**

9 May 2011

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## 0.1 Preface to version 1.0.0

Version 1 of the exchange format for documents was developed as an initiative of the DEFF E-publishing Programme Area.

The primary motivation was to contribute to the organisation and dissemination of Danish research by establishing an infrastructure, where DDF, the Danish Research Database, automatically may harvest local research databases and institutional repositories and build a national database and search engine in an efficient and quality assured fashion.

The format may well prove useful in a number of other use-cases related to research publications and documentation.

The work started in August 2004 and has entailed analysis of the current formats of DDF and the emerging institutional repositories of Danish universities as well as the ongoing university initiative to standardise the categorisation of research documents in order to produce better research output statistics.

The standards for XML and XML-schema used as basis for this document and schema are:  
- XML 1.0 : Third Edition - <http://www.w3.org/TR/2004/REC-xml-20040204/>  
- XML Schema : Second Edition (Part 1 & 2) - <http://www.w3.org/TR/xmlschema-1/> and <http://www.w3.org/TR/xmlschema-2/>

The current document metadata of the Danish Research Database will be converted to the exchange format shortly.

Similar formats for the exchange of metadata for projects, organisations and persons will follow.

Version 1.0.0,  
8 November, 2005

Mogens Sandfær, editor

## 0.2 Preface to version 1.1.0

A new release (v.1.1.0) of the MXD-documentation was decided upon the first experience and usage of the initial corresponding schema. Some fields had been interpreted too restrictive in the schema and thus needed relaxations to comply better with real data. Additionally an extra document type as well as a couple of new supplier names and person roles have been added to the format. We refer further to the changelog from the schema for details in the changes.

Please note that there has been an equivalent new release of the schema and the corresponding stylesheet for sorting elements - more information available on this in section 2.

Version 1.1.0  
18 May, 2006

Liv Fugl, editor

### 0.3 Preface to version 1.2.0

Version 1.2.0 of the MXD-documentation has been released to comply with the demands of the DASTI (Danish Agency for Science, Technology and Innovation) Bibliographic Research Indicator model. Thus elements for unique identification of authors, publishing channels and national research areas have been added in addition to a required create date for each document and type definitions for ISSN and ISBN. Furthermore MXDs document types have been modified to handle the new requirements.

In addition to the demands of DASTI the publication element in the MXD-schema has been expanded with a digital object container that handles the increasing number of full-text documents in managed institutional repositories. Moreover, a few elements and minor changes to the publication container and updates to the enumerated lists have been added. In particular an access attribute to the URI element has been added, to make it easier to promote Open Access in the Danish National Research Database. Changes are explained in detail in the changelog from the schema.

The version number definition has been changed, such that adding backward-compatible changes (like new non-mandatory elements) does not require a new namespace definition in the document.

The version numbering of this format follows a 3-digit numbering scheme, where digit:

1. Represents a major version - an increment would require a thorough study of the new version and subsequent changes of style sheets and other programs. Changes in major version always imply both a new release of the schema, AND a change in the namespace declaration. The new version of the schema will therefore NOT validate older documents.
2. Represents a revision, which modifies some definitions of the previous version in a way that is not backward compatible with older version. An increment of the revision number would most likely require the update of XSLT style sheets for presentation or similar purposes.

Changes in revision always imply both a new release of the schema, AND a change in the namespace declaration. The new version of the schema will therefore NOT validate older documents.

3. Represents a minor revision, which either only contains changes in wording or clarifications, OR expands the vocabulary of certain elements, OR which adds new non-mandatory data elements in a way which still validates older documents with the same version and revision.

An increment in minor revision number may require updates of XSLT style sheets and similar in order to reflect newly-added elements.

Version 1.2.0  
19 June, 2008

Mikael K. Elbæk, editor

#### **0.4 Preface to version 1.2.1**

Version 1.2.1 of the MXD-documentation has been released to comply with the additional demands of the DASTI (Danish Agency for Science, Technology and Innovation) Bibliographic Research Indicator model. Following the first release (1.2.0) complying with the Bibliographic Research Indicator model there has been identified a need to add the DASTI publisher number in the publication elements report and in\_report.

Moreover the dataprovider READ - Arkitekt- og designskolerne has been added in the documentation of exporting institutions @rec\_source.

Version 1.2.1  
22 December 2009

Mikael K. Elbæk, editor

#### **0.5 Preface to version 1.2.2**

Version 1.2.2 of the MXD-documentation has been released to enable compliancy with the OpenAIRE Guidelines 1.1 ([www.openaire.eu](http://www.openaire.eu)). The OpenAIRE Guidelines explicitly requires the declaration of an EC grant agreement number, if the access is embargoed and date stamp indicating the end of the embargo period.

In addition small changes have been adopted to accommodate the requests received from DDF-MXD stakeholders since the last version (1.2.1). The changes includes: the addition of a new state of publication – unpublished related to unpublished material i.e. grey literature. A new <series> field in <report> and <in\_report> to accommodate the need to express series titles in the two publication forms. And finally the inclusion of <vol> and <issue> in\_report series.

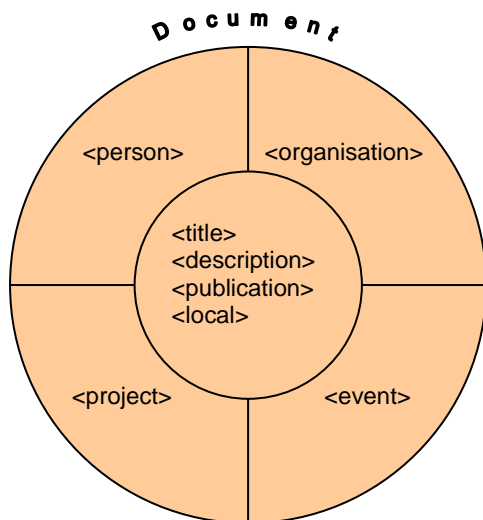
## 1. Introduction

DDF MXD, the Danish Research Database Metadata Exchange Format for Documents, is intended for the exchange of document metadata between institutional research databases (Institutional Repositories etc.) and the national index and search engine for research information, the Danish Research Database (Den Danske Forskningsdatabase - DDF).

DDF MXD has a simple yet flexible design, intended to cater equally well for the simplest minimum-level metadata as for more detailed and sophisticated cataloguing practises.

DDF MXD may be transported using OAI PMH, the Open Archives Initiative Protocol for Metadata Harvesting, and mapped to OAI DC, the simple Dublin Core format used as default in OAI PMH.

DDF MXD is organised in 8 elements, which may be broken down using sub-elements. The diagram below illustrates the data model and the 8 main elements:



The 4 elements in the centre describe the document itself

- **title**
- **description**
- **publication** information
- **local** information

The surrounding 4 elements, which may be repeated, represent entities related to the document:

- **person**
- **organisation**
- **project**
- **event**

### Title

Contains the document title and optional translated title.

### Description

Contains a variety of descriptive data types that deal with the content of the document, such as notes, abstracts, subject classifications and keywords etc.

### Publication

Contains all the information about how the document was published in the widest sense of the word, including electronic availability via personal homepages, institutional repositories and similar web sites.

### Local

Contains additional local information, which may be formatted according to local preferences.

### Person

Contains information about any person related to the creation of the document - like authors, editors, composers, publishers, illustrators etc.

**Organisation**

Contains information about any organisation related to the document, whether it be as the affiliation of an author, as a corporative author or in any other capacity of importance for the document.

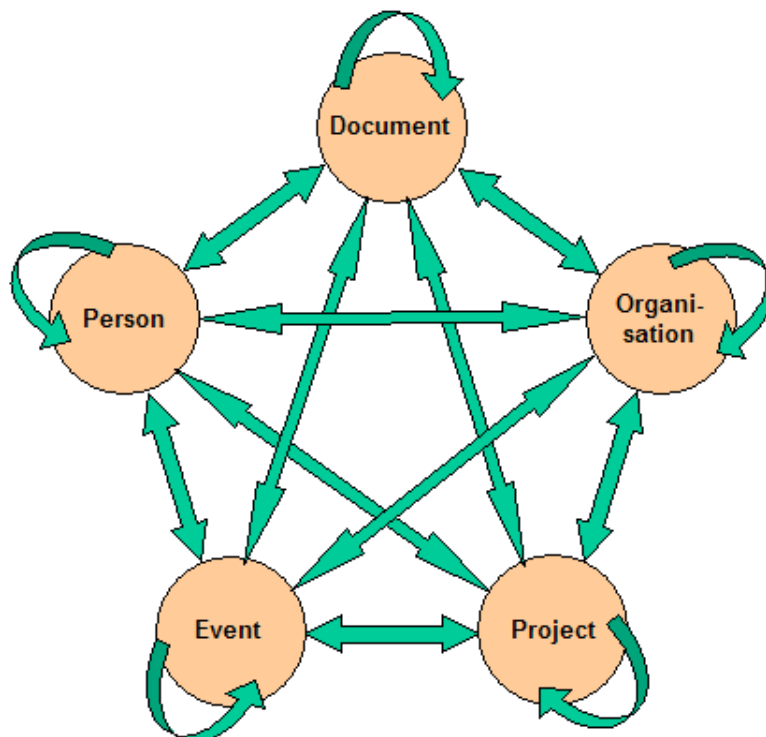
**Project**

Contains information about any project related to the document.

**Event**

Contains information about any event (conference, seminar, workshop, meeting, course, etc.) related to the document.

The Exchange Format for Documents is fully compatible with the general data model for the Danish Research Database, illustrated by the diagram below.



As DDF-MXD only serves to describe documents (one of the five DDF information objects above) it has a simple architecture with a few elements describing the document itself and four elements describing the relations to the four other information objects of the model.

Other DDF exchange formats with similar architectures are planned for projects, persons, organisations, etc.

## 2. Overview of format

The table below is only intended to provide a quick overview.

- For full details please consult to section 3.
- The numbers at the right hand side of the page refer to the notes in section 4.
- Examples illustrating the use of the format may be found in section 5.

### General specifications

- UTF-8 is mandatory character encoding for all data
- Whenever an element contains sub-elements, all data must be placed in these sub-elements, rather than in the element itself.
- The latest corresponding XML schema for validation of MXD v.1.2.0 can be found at <http://mx.forskningsdatabasen.dk/mxd/1.2>  
Please note the sequence of elements in the schema must be obeyed - A stylesheet for sorting can be found at the same address.
- The namespace for the schema is set to <http://mx.forskningsdatabasen.dk/mxd/1.2>

### Explanation of codes used in the first two columns of the list below

§	<b>Mandatory</b> - in all cases. Records without this element or attribute will be rejected.
(§)	<b>Mandatory</b> - when its parent element is used. In such cases, records without this element or attribute will be rejected
[§]	<b>Mandatory</b> - when its parent element is used and another specified condition is met. In such cases, records without this element or attribute will be rejected
!	<b>Required</b> - whenever it applies and data is available. These elements or attributes are required to establish a fully functional DDF record, which may be successfully searched, displayed and used for statistics. They cannot, however, be made mandatory, as they do not apply in all cases (e.g. not all publications have a personal author, but if such exists it must be recorded).
+	<b>Recommended</b> - whenever it applies and data is available. These elements or attributes are recommended, as they substantially enhance the functionality and usability of the record.
?	<b>Optional</b> - these elements or attributes are entirely optional. They primarily serve the needs of data suppliers that want to preserve the finer details of their local data – for example to use the DDF data as a backup copy or similar.
®	<b>Repeatable</b> - the element may be repeated

## Table of elements and attributes

<b>Root element:</b>			
<b>&lt;ddf_doc&gt;</b>	§		
<b>@format_version</b>	§	Exchange format version used - "1.2.2" for current version	
<b>@doc_type</b>	§	Type of document	1)
<b>@doc_lang</b>	§	Language of document	2)
<b>@doc_year</b>	§	Annual report year of the document (may differ from publication year)	3)
<b>@doc_review</b>	§	Document review process type like "peer-review", "no review"	4)
<b>@doc_level</b>	§	Indicating purpose/audience like "scientific", "educational", "popular"	5)
<b>@rec_source</b>	§	Code of exporting database/institution	6)
<b>@rec_id</b>	§	Data supplier's local record ID - must be unique for supplier	
<b>@rec_created</b>	§	Date when the record was first created in the local database, in yyyy-mm-dd	
<b>@rec_upd</b>	§	Last update date in format yyyy-mm-dd	
<b>@rec_status</b>	§	Whether the record is to be considered as "new", "updated" or "deleted"	7)
<b>Sub-elements:</b>			
<b>&lt;title&gt;</b>	§	Title of the work in focus	
<b>&lt;original&gt;</b>	§	The title in the original language	
<b>@xml:lang</b>	?	Language of title	2)
<b>&lt;main&gt;</b>	§	Main title	
<b>&lt;sub&gt;</b>	! ®	Sub title	
<b>&lt;part&gt;</b>	+	Part designation of a multipart work ("Vol. 1", "Bind 1" etc)	
<b>&lt;other&gt;</b>	?	Any other title information	
<b>&lt;translated&gt;</b>	? ®	The title translated to another language	
<b>@xml:lang</b>	(§)	Language of title	2)
<b>&lt;main&gt;</b>	(§)	Main title	
<b>&lt;sub&gt;</b>	? ®	Sub title	
<b>&lt;part&gt;</b>	?	Part designation of a multipart work ("Vol. 1", "Bind 1" etc)	
<b>&lt;other&gt;</b>	?	Any other title information	
<b>&lt;description&gt;</b>	!		
<b>&lt;abstract&gt;</b>	! ®	Summary of content	
<b>@xml:lang</b>	?	Language of abstract	2)
<b>&lt;note&gt;</b>	? ®	Any descriptive note	
<b>@xml:lang</b>	?	Language of note	2)
<b>&lt;thesis&gt;</b>	!	Special thesis note	
<b>&lt;institution&gt;</b>	!	Name of the academic institution awarding the degree	
<b>&lt;advisor&gt;</b>	+	Name of the academic advisor/supervisor	
<b>&lt;aw_date&gt;</b>	+	Date of awarded degree in format yyyy-mm-dd	
<b>&lt;other&gt;</b>	?	Any other information	
<b>&lt;subject&gt;</b>	!	Subject description	
<b>&lt;keyword&gt;</b>	! ®		
<b>@key_type</b>	(§)	Vocabulary/theasurus used, like "EUDISED", "INSPEC" or "free"	8)
<b>@xml:lang</b>	?	Language of keyword	2)
<b>&lt;class&gt;</b>	! ®		
<b>@class_type</b>	(§)	Classification system used, like "DDC", "UDC", "DEF", "DK5"	9)
<b>@xml:lang</b>	?	Language of classification	2)
<b>&lt;research_area&gt;</b>	!	Special national research area, used by DASTI	
<b>@area_code</b>	(§)	One of four national research areas.	31)
<b>@xml:lang</b>	?	Language of research area	2)
<b>&lt;person&gt;</b>	! ®	Person related to the document (in the same sequence as in document)	
<b>@pers_role</b>	(§)	Role of the person in relation to the document (see note)	10)
<b>@aff_no</b>	(§)	Reference no. of the affiliation within the record (links person to organisation)	11)
<b>&lt;name&gt;</b>	(§)		
<b>&lt;first&gt;</b>	(§)	First name (personal name) or initials	
<b>&lt;last&gt;</b>	(§)	Last name (family name)	
<b>&lt;id&gt;</b>	? ®	Identification number or code	
<b>@id_type</b>	(§)	Type of ID, registered with DDF - like Danish CPR no.	12)
<b>@id_source</b>	+	Source of the person-ID, i.e. aau, cbs etc. only for use with the Danish DNFD	6)
<b>&lt;title&gt;</b>	?	Title	
<b>&lt;birthdate&gt;</b>	?	In format yyyy-mm-dd	
<b>&lt;country&gt;</b>	?	Country of citizenship using ISO country codes	13)
<b>&lt;address&gt;</b>	?	Postal address	
<b>&lt;email&gt;</b>	?	Email address	
<b>&lt;uri&gt;</b>	?	URI (URL) link to web page	



<b>&lt;organisation&gt;</b>	§ ®	Organisation related to the document, information formatted as below	
<b>@org_role</b>	§	Role of the organisation in relation to the document (see note)	14)
<b>@aff_no</b>	§	Reference no. of the affiliation within the record (links person to organisation)	11)
<b>&lt;name&gt;</b>	§ ®	Name - only repeatable in case of language variants	
<b>@xml:lang</b>	[\$]	Language of organisation name (mandatory if name is repeated)	2)
<b>&lt;level1&gt;</b>	§	Name of highest organisational level (example: university)	
<b>&lt;level2&gt;</b>	!	Name of second organisational level (example: faculty)	
<b>&lt;level3&gt;</b>	!	Name of third organisational level (example: institute, department)	
<b>&lt;level4&gt;</b>	!	Name of fourth organisational level (example: section, center, division)	
<b>&lt;acronym&gt;</b>	!	Acronym	
<b>&lt;id&gt;</b>	? ®	Identification number or code	
<b>@id_type</b>	(\$)	Type of ID, registered with DDF - like Danish CVR no.	12)
<b>&lt;country&gt;</b>	+	Country of legal residence using ISO country codes	13)
<b>&lt;uri&gt;</b>	?	URI (URL) link to web page	
<b>&lt;project&gt;</b>	! ®	Project related to the document, information formatted as below	
<b>@proj_role</b>	(\$)	Role of the project in relation to the document (see note)	15)
<b>&lt;title&gt;</b>	§ ®	Title - only repeatable in case of language variants	
<b>@xml:lang</b>	[\$]	Language of project title (mandatory if title is repeated)	2)
<b>&lt;main&gt;</b>	(\$)	Main title	
<b>&lt;sub&gt;</b>	!	Sub title	
<b>&lt;acronym&gt;</b>	!	Acronym	
<b>&lt;id&gt;</b>	? ®	Identification number or code	
<b>@id_type</b>	(\$)	Type of ID, registered with DDF - like local project number	12)
<b>&lt;uri&gt;</b>	?	URI (URL) link to web page	
<b>&lt;event&gt;</b>	! ®	Event (like conference) related to the document	
<b>@event_role</b>	(\$)	Role of the event in relation to the document (see note)	16)
<b>@dasti_conference_no</b>	!	DASTI conference number from the DASTI conference database	26)
<b>&lt;title&gt;</b>	§ ®	Title - only repeatable in case of language variants	
<b>@xml:lang</b>	[\$]	Language of the event title (mandatory if title is repeated)	2)
<b>&lt;full&gt;</b>	(\$)	Full title, like "European Conference on Digital Libraries"	
<b>&lt;acronym&gt;</b>	!	Acronym title, like "ECDL"	
<b>&lt;number&gt;</b>	!	Number in series of recurrent events, like "8"	
<b>&lt;dates&gt;</b>	!		
<b>&lt;start&gt;</b>	(\$)	First day of the event in format yyyy-mm-dd, or yyyy-mm, or yyyy	19)
<b>&lt;end&gt;</b>	(\$)	Last day of the event in format yyyy-mm-dd, or yyyy-mm, or yyyy	19)
<b>&lt;place&gt;</b>	!	Place (city, country) of the event/conference	
<b>&lt;uri&gt;</b>	?	URI (URL) link to web page	
<b>&lt;local_field&gt;</b>	? ®	Locally defined field with optional subfield	
<b>@tag_type</b>	(\$)	Defining if/how field should be indexed and displayed	17)
<b>@xml:lang</b>	?	Language of field	2)
<b>&lt;code&gt;</b>	(\$)	Field code (tag) using a-z (upper or lower case) and 0-9 only	
<b>&lt;data&gt;</b>	(\$)	Field data	
<b>&lt;subfield&gt;</b>	? ®	Sub tag	
<b>&lt;code&gt;</b>	(\$)	Subfield code (tag) using a-z (upper or lower case) and 0-9 only	
<b>&lt;data&gt;</b>	(\$)	Subfield data	



## DDF-MXD - Danish Research Database - Metadata Exchange Format for Documents

<b>&lt;publication&gt;</b>	\$	Use one (minimum) or more of the cases below	
<b>&lt;in_journal&gt;</b>	!	Use for articles, papers published in a journal (incl. proceedings issues)	
<b>@pub_status</b>	(\$)	Status of publication, like "submitted", "accepted", "published"	18)
<b>&lt;title&gt;</b>	(\$)	Journal title	
<b>&lt;title_alternative&gt;</b>	! ®	Alternative journal title, i.e. former title, title from other data sources and languages	
<b>&lt;issn&gt;</b>	! ®	ISSN no. without dashes	23)
<b>@type</b>	!	Defining electronic or print ISSN	
<b>&lt;year&gt;</b>	!	Year of publication in format yyyy	
<b>&lt;vol&gt;</b>	!	Volume no.	
<b>&lt;issue&gt;</b>	!	Issue no.	
<b>&lt;pages&gt;</b>	!	In the format Firstpage-Lastpage (when Paper ID, the number of pages)	22)
<b>&lt;paperid&gt;</b>	!	Paper ID	
<b>&lt;doi&gt;</b>	!	DOI no.	
<b>&lt;journal_no&gt;</b>	!	DASTI journal number from the DASTI journal database	28)
<b>&lt;uri&gt;</b>	+	URI (URL) link to article on journal web site	
<b>@access</b>	+	Use to state the accessibility of the linked article, i.e. "Open Access"	27)
<b>&lt;in_book&gt;</b>	!	Use for chapters, papers published as a part of a book (incl. proceedings)	
<b>@pub_status</b>	(\$)	Status of publication, like "submitted", "accepted", "published"	18)
<b>&lt;title&gt;</b>	(\$)	Book title	
<b>&lt;sub_title&gt;</b>	+	Book sub title	
<b>&lt;part&gt;</b>	!	Part designation of a multipart work ("Vol. 1", "Bind 4: Middelalderen" etc)	
<b>&lt;edition&gt;</b>	!	Book edition, like "2. rev. udg."	
<b>&lt;editor&gt;</b>	!	Name of the editor of the book	
<b>&lt;isbn&gt;</b>	! ®	ISBN no. without dashes	24)
<b>@type</b>	!	Defining electronic or print ISBN	29)
<b>&lt;issn&gt;</b>	! ®	ISSN no. without dashes	23)
<b>@type</b>	!	Defining electronic or print ISSN	29)
<b>&lt;place&gt;</b>	!	Place of publication	
<b>&lt;publisher&gt;</b>	!	Name of publisher	
<b>&lt;year&gt;</b>	!	Year of publication in format yyyy	
<b>&lt;doi&gt;</b>	!	DOI no.	
<b>&lt;pages&gt;</b>	!	In the format Firstpage-Lastpage	22)
<b>&lt;series&gt;</b>	! ®	Book series	
<b>&lt;publisher_no&gt;</b>	!	DASTI publisher number from the DASTI publisher database	28)
<b>&lt;uri&gt;</b>	+	URI (URL) link to web site of book	
<b>@access</b>	+	Use to state the accessibility of the linked article, i.e. "Open Access"	27)
<b>&lt;in_report&gt;</b>	!	Use for chapters, papers etc published as a part of a report	
<b>@pub_status</b>	+	Status of publication, like "submitted", "accepted", "published"	18)
<b>&lt;title&gt;</b>	(\$)	Report title	
<b>&lt;sub_title&gt;</b>	+	Report sub title	
<b>&lt;part&gt;</b>	!	Part designation of a multipart work ("Vol. 1", "Bind 4: Middelalderen" etc)	
<b>&lt;editor&gt;</b>	!	Name of the editor of the report	
<b>&lt;isbn&gt;</b>	! ®	ISBN no. without dashes	24)
<b>@type</b>	!	Defining electronic or print ISBN	
<b>&lt;series&gt;</b>	! ®	Report series title	
<b>&lt;rep_no&gt;</b>	! ®	Report number	
<b>&lt;place&gt;</b>	!	Place of publication	
<b>&lt;publisher&gt;</b>	!	Name of publisher	
<b>&lt;year&gt;</b>	!	Year of publication in format yyyy	
<b>&lt;vol&gt;</b>	!	Volume no.	
<b>&lt;issue&gt;</b>	!	Issue no.	
<b>&lt;pages&gt;</b>	!	In the format Firstpage-Lastpage	22)
<b>&lt;paperid&gt;</b>	!	Paper ID	
<b>&lt;doi&gt;</b>	!	DOI no.	
<b>&lt;publisher_no&gt;</b>	!	DASTI publisher number from the DASTI publisher database	28)
<b>&lt;uri&gt;</b>	+	URI (URL) link to web site of report	
<b>@access</b>	+	Use to state the accessibility of the linked article, i.e. "Open Access"	27)
<b>&lt;book&gt;</b>	!	Use when the document is an entire book	
<b>@pub_status</b>	(\$)	Status of publication, like "submitted", "accepted", "published"	18)
<b>&lt;edition&gt;</b>	!	Book edition, like "2. rev. udg."	
<b>&lt;isbn&gt;</b>	! ®	ISBN no. without dashes	24)
<b>@type</b>	!	Defining electronic or print ISBN	
<b>&lt;place&gt;</b>	!	Place of publication	
<b>&lt;publisher&gt;</b>	!	Name of publisher	
<b>&lt;year&gt;</b>	!	Year of publication in format yyyy	
<b>&lt;pages&gt;</b>	!	Total no. of pages	
<b>&lt;series&gt;</b>	! ®	Book series	
<b>&lt;publisher_no&gt;</b>	!	DASTI publisher number from the DASTI publisher database	28)
<b>&lt;uri&gt;</b>	+	URI (URL) link to web site of book	
<b>@access</b>	+	Use to state the accessibility of the linked article, i.e. "Open Access"	27)

DDF-MXD - Danish Research Database - Metadata Exchange Format for Documents

<b>&lt;report&gt;</b>	!	Use when the document is an entire report	
<b>@pub_status</b>	+	Status of publication, like "submitted", "accepted", "published"	18)
<b>&lt;isbn&gt;</b>	! ®	ISBN no. without dashes	24)
<b>@type</b>	!	Defining electronic or print ISBN	
<b>&lt;series&gt;</b>	! ®	Report series title	
<b>&lt;rep_no&gt;</b>	! ®	Report number	
<b>&lt;place&gt;</b>	!	Place of publication	
<b>&lt;publisher&gt;</b>	!	Name of publisher	
<b>&lt;year&gt;</b>	!	Year of publication in format yyyy	
<b>&lt;pages&gt;</b>	!	Total no. of pages	
<b>&lt;publisher_no&gt;</b>	!	DASTI publisher number from the DASTI publisher database	28)
<b>&lt;uri&gt;</b>	+	URI (URL) link to web site of report	
<b>@access</b>	+	Use to state the accessibility of the linked article, i.e. "Open Access"	27)
<b>&lt;patent&gt;</b>	!	Use when the document is a patent (application)	
<b>@pub_status</b>	(§)	Status of publication, like "submitted", "accepted", "published"	18)
<b>&lt;country&gt;</b>	!	Country of patent issue using ISO country codes	13)
<b>&lt;ipc&gt;</b>	!	International Patent Classification	20)
<b>&lt;number&gt;</b>	!	Patent no.	
<b>&lt;date&gt;</b>	!	Date of status above in format yyyy-mm-dd	
<b>&lt;uri&gt;</b>	+	URI (URL) link to web site of patent	
<b>@access</b>	+	Use to state the accessibility of the linked article, i.e. "Open Access"	
<b>&lt;inetpub&gt;</b>	! ®	Use when epublished on the net (web page, preprint server)	
<b>&lt;text&gt;</b>	(§)	Text describing the file and service: "PDF on personal home page"	
<b>&lt;uri&gt;</b>	(§)	The URI (URL)	
<b>@access</b>	+	Use to state the accessibility of the linked article, i.e. "Open Access"	27)
<b>&lt;digital_object&gt;</b>	! ®	Digital object - typically a full text	
<b>@id</b>	(§)	Unique id for the parent record	
<b>@role</b>	!	What is the role of the object in relation to the record ie. Postprint	30)
<b>@access</b>	(§)	Use for stating the access rights for the object ie. "Open Access"	27)
<b>&lt;description&gt;</b>	!	Description of the specific digital object	
<b>&lt;embargo_end&gt;</b>	(§)	Embargo end date in the format yyyy-mm-dd	
<b>&lt;file&gt;</b>	(§)	System generated description of the digital_object	
<b>@lang</b>	!	Language of the file	2)
<b>@size</b>	(§)	The size of the file	
<b>@mime_type</b>	!	Mime type for the file must comply with the IANA specifications	25)
<b>@timestamp</b>	(§)	Timestamp given when the file was change or uploaded	26)
<b>@filename</b>	(§)	Name of the file when uploaded	
<b>&lt;description&gt;</b>	!	Description of the specific version	
<b>&lt;uri&gt;</b>	!	URI (URL) to the digital object ie. in the local repository	
<b>&lt;other&gt;</b>	+	Use for any other form of publication if none of the above apply	

### 3. Annotated list of elements and attributes

This section contains a complete listing of the elements and attributes of the format.

- The numbers at the right hand side of the page refer to the notes in section 4.
- Examples illustrating the use of the format may be found in section 5.
- A more condensed overview table is provided in section 2.

#### General specifications

- UTF-8 is mandatory character encoding for all data
- Whenever an element contains sub-elements, all data must be placed in these sub-elements, rather than in the element itself.
- The latest corresponding XML schema for validation of MXD v.1.2.0 can be found at <http://mx.forskningsdatabasen.dk/mxd/1.2.0>  
Please note the sequence of elements in the schema must be obeyed - A stylesheet for sorting can be found at the same address.
- The namespace for the schema is set to <http://mx.forskningsdatabasen.dk/mxd/1.2>

#### Explanation of codes used in the first two columns of the list below

- § **Mandatory** - in all cases.  
Records without this element or attribute will be rejected.
- (§) **Mandatory** - when its parent element is used.  
In such cases, records without this element or attribute will be rejected
- [§] **Mandatory** - when its parent element is used and another specified condition is met  
In such cases, records without this element or attribute will be rejected
- ! **Required** - whenever it applies and data is available.  
These elements or attributes are required to establish a fully functional DDF record, which may be successfully searched, displayed and used for statistics. They cannot, however, be made mandatory, as they do not apply in all cases (e.g. not all publications have a personal author, but if such exists it must be recorded).
- + **Recommended** - whenever it applies and data is available.  
These elements or attributes are recommended, as they substantially enhance the functionality and usability of the record.
- ? **Optional** - these elements or attributes are entirely optional. They primarily serve the needs of data suppliers that want to preserve the finer details of their local data – for example to use the DDF data as a backup copy or similar.
- ® **Repeatable** - the element may be repeated

## Root element

[Notes](#)

§	<p><b>ddf_doc</b></p> <p>Root element of one document record. Other DDF record types similarly have type-specific root elements, <code>ddf_pro</code> for projects, <code>ddf_org</code> for organisations, <code>ddf_per</code> for persons, etc. The element is organised in 8 sub-elements, described on the following pages:</p> <ul style="list-style-type: none"> <li><code>ddf_doc/title</code></li> <li><code>ddf_doc/description</code></li> <li><code>ddf_doc/person</code></li> <li><code>ddf_doc/organisation</code></li> <li><code>ddf_doc/project</code></li> <li><code>ddf_doc/event</code></li> <li><code>ddf_doc/local</code></li> <li><code>ddf_doc/publication</code></li> </ul> <p>and the mandatory attributes described below:</p> <hr/>	
§	<p><b>ddf_doc/@format_version</b></p> <p>The particular version of the exchange format used, for the current version check the cover. As subsequent versions have now been issued, this aids the schema validation and other applications parsing the XML.</p>	
§	<p><b>ddf_doc/@doc_type</b></p> <p>Code for type of document (like "dja" for "journal article") according to the DDF list of types and their codes (see note). Code is used for various retrieval and sorting purposes, see Annex 1.</p>	1)
§	<p><b>ddf_doc/@doc_lang</b></p> <p>Code for language of the document itself. Codes must follow the W3C rules for <code>xml:lang</code>, which means complying with IETF RFC 1766 and ISO 639.</p>	2)
§	<p><b>ddf_doc/@doc_year</b></p> <p>Annual report year of the document (may differ from publication year) in the format yyyy. This is used for various sorting and searching purposes as well as for data management.</p>	3)
§	<p><b>ddf_doc/@doc_review</b></p> <p>Code indicating the type of review the document has been subject to like "peer-review" or "no review". See note for DDF list of review types and their codes. Code is used for various retrieval and sorting purposes, see Annex 1.</p>	4)
§	<p><b>ddf_doc/@doc_level</b></p> <p>Code indicating literary scope or level of the document, like "scientific", "educational", "popular". See note for DDF list of levels and their codes. Code is used for various retrieval and sorting purposes, see Annex 1.</p>	5)
§	<p><b>ddf_doc/@rec_source</b></p> <p>Code of exporting database/institution. Each organisation/database acting as a source and exporting records to DDF is registered with a unique code. See note for DDF list of source database codes.</p>	6)
§	<p><b>ddf_doc/@rec_id</b></p> <p>The data supplier's local/original ID of the record – must be unique per data supplier. In case supplier is exporting from more than one local database, which may use the same IDs, these must be prefixed (with database name or similar) to become unique within the supplier's data.</p>	
§	<p><b>ddf_doc/@rec_created</b></p> <p>Date when the record was first created in the local database in the format yyyy-mm-dd</p>	
§	<p><b>ddf_doc/@rec_upd</b></p> <p>Last update date of the exporting database in the format yyyy-mm-dd</p>	
§	<p><b>ddf_doc/@rec_status</b></p> <p>Code indicating whether the record is to be considered as "new", "updated" or "deleted". Since data is gathered via OAI harvesting "new" records must be set as "updated". See note for DDF list of record status codes.</p>	7)

**Title element**

\$		<b>ddf_doc/title</b>	
		Title of the work in focus. Other titles such as conference titles and titles of host publications (journals, books) are recorded in other elements, ddf_doc/event and ddf_doc/publication respectively. The element is organised in the following 2 sub-elements: title/original (mandatory) title/translated (optional and repeatable)	
<hr/>			
\$		<b>ddf_doc/title/original</b>	
		The title in the original language – use sub-elements below	
?		<b>ddf_doc/title/original/@xml:lang</b>	
		Language of title	2)
\$		<b>ddf_doc/title/original/main</b>	
		Main title	
+	®	<b>ddf_doc/title/original/sub</b>	
		Sub title	
+		<b>ddf_doc/title/original/part</b>	
		Part designation of a multipart work ("Vol. 1", "Bind 1" etc)	
?		<b>ddf_doc/title/original/other</b>	
		Any other title information	
<hr/>			
?	®	<b>ddf_doc/title/translated</b>	
		The title translated to another language – use sub-elements below	
(\$)		<b>ddf_doc/title/translated/@xml:lang</b>	
		Language of title	2)
(\$)		<b>ddf_doc/title/translated/main</b>	
		Main title	
?	®	<b>ddf_doc/title/translated/sub</b>	
		Sub title	
?		<b>ddf_doc/title/translated/part</b>	
		Part designation of a multipart work ("Vol. 1", "Bind 1" etc)	
?		<b>ddf_doc/title/translated/other</b>	
		Any other title information	

## Description element

!		<b>ddf_doc/description</b>	
		The description element is the common container for a variety of descriptive data types that deal with the content of the document, such as notes, abstracts, subject classifications and keywords etc. The description element is not mandatory but should be used whenever such data is available.	
		The element is organised in the following sub-elements:	
		description/abstract (summary of the content),	
		description/thesis (special structured note for academic thesis),	
		description/note (other descriptive notes),	
		description/subject/keyword (free or controlled keywords),	
		description/subject/class (classification system codes).	
		description/research_area (special national Danish research areas).	
<hr/>			
!	Ⓢ	<b>ddf_doc/description/abstract</b>	
		Summary of content	
?		<b>ddf_doc/description/abstract/@xml:lang</b>	
		Language of abstract	2)
<hr/>			
?	Ⓢ	<b>ddf_doc/description/note</b>	
		Any descriptive note	
?		<b>ddf_doc/description/note/@xml:lang</b>	
		Language of note	2)
<hr/>			
!		<b>ddf_doc/description/thesis</b>	
		Special thesis note – use sub-elements below. The attribute <code>ddf_doc/@doc_type</code> is used to differentiate between different types/levels of thesis	1)
!		<b>ddf_doc/description/thesis/institution</b>	
		Name of the academic institution awarding the degree	
+		<b>ddf_doc/description/thesis/advisor</b>	
		Name of the academic advisor/supervisor	
+		<b>ddf_doc/description/thesis/aw_date</b>	
		Date of awarded degree in format yyyy-mm-dd	
?		<b>ddf_doc/description/thesis/other</b>	
		Any other information	
<hr/>			
!		<b>ddf_doc/description/subject</b>	
		Subject description – use sub-elements below.	
!	Ⓢ	<b>ddf_doc/description/subject/keyword</b>	
		Keywords – whether free or controlled.	
(\$)		<b>ddf_doc/description/subject/keyword/@key_type</b>	
		Vocabulary/theasurus used, like "EUDISED", "INSPEC" or "free"	8)
?		<b>ddf_doc/description/subject/keyword/@xml:lang</b>	
		Language of keyword	2)
!	Ⓢ	<b>ddf_doc/description/subject/class</b>	
		Classification codes according to the system declared in the attribute below.	
(\$)		<b>ddf_doc/description/subject/class/@class_type</b>	
		Classification system used, like "DDC", "UDC", "DEF", "DK5"	9)
?		<b>ddf_doc/description/subject/class/@xml:lang</b>	
		Language of classification	2)
<hr/>			



!	<b>ddf_doc/description/research_area</b>	Special national research area used by the Danish Agency for Science, Technology and Innovation.	
(\$)	<b>ddf_doc/description/research_area/@area_code</b>	Code for one of the four national research areas, ie.: Science/technology, Social science, Humanities and Medical science.	31)
!	<b>ddf_doc/description/research_area/@xml:lang</b>	Language of the research area	

## Person element

!	®	<b>ddf_doc/person</b>	
		This repeatable element is used to record information about any person related to the creation of the document (like authors, editors, composers, publishers, illustrators etc.). Each person and the corresponding role are recorded in a separate instance of the element and the sequence should follow that of the document title page. The correct attribution of persons to documents is essential for any statistical purposes.	
		The element is organised in the following sub-elements of which most are optional:	
		<ul style="list-style-type: none"> <li>person/name (split in first and last name),</li> <li>person/id (various forms of identification numbers - optional),</li> <li>person/title (personal title - optional),</li> <li>person/birthdate (optional),</li> <li>person/country (of citizenship - recommended),</li> <li>person/address (postal - optional),</li> <li>person/email (optional),</li> <li>person/uri (link to web page - optional)</li> </ul>	
(\$)		<b>ddf_doc/person/@pers_role</b>	
		Role of the person in relation to the document (see note for authorised values)	10)
(\$)		<b>ddf_doc/person/@aff_no</b>	
		Internal reference no. of the organisation (ddf_doc/organisation/@aff_no) to which the person was affiliated while creating/contributing to this document.	11)
(\$)		<b>ddf_doc/person/name</b>	
		Personal name – use sub-elements below	
(\$)		<b>ddf_doc/person/name/first</b>	
		First name (personal name) or initials	
(\$)		<b>ddf_doc/person/name/last</b>	
		Last name (family name)	
?	®	<b>ddf_doc/person/id</b>	
		Identification number or code	
(\$)		<b>ddf_doc/person/@id_type</b>	
		Type of ID, registered with DDF - like Danish CPR no.	12)
!		<b>ddf_doc/person/@id_source</b>	
		Source of the NFDB Person-ID, i.e. aau, cbs etc. A combination of local id and prefix will create a unique id for each author.	6)
?		<b>ddf_doc/person/title</b>	
		Personal title related to academic degree and/or job function.	
?		<b>ddf_doc/person/birthdate</b>	
		In format yyyy-mm-dd	

?	<b>ddf_doc/person/country</b>	Country of citizenship using ISO country codes	13)
?	<b>ddf_doc/person/address</b>	Postal address	
?	<b>ddf_doc/person/email</b>	Email address	
?	<b>ddf_doc/person/uri</b>	URI (URL) link to web page	

## Organisation element

\$	®	<b>ddf_doc/organisation</b>	
		This repeatable element is used to record information about any organisation related to the document, whether it be as the affiliation of an author, as a corporative author or in any other capacity of importance for the document. Each organisation and the corresponding role is recorded in a separate instance of the element. The correct attribution of organisations to documents is essential for any statistical purposes. The element is organised in the following sub-elements: organisation/name (split in up to 4 hierarchical levels and acronym), organisation/id (optional), organisation/country (recommended), organisation/uri (link to web page - optional)	
\$		<b>ddf_doc/organisation/@org_role</b>	14)
		Role of the organisation in relation to the document (see note for authorised values)	
\$		<b>ddf_doc/organisation/@aff_no</b>	11)
		Internal reference no. of the organisation. Is used to link persons with the right affiliation.	
\$	®	<b>ddf_doc/organisation/name</b>	
		Name - only repeatable in case of language variants - use sub-elements below	
[S]		<b>ddf_doc/organisation/name/@xml:lang</b>	2)
		Language of organisation name (mandatory if name is repeated)	
\$		<b>ddf_doc/organisation/name/level1</b>	
		Name of highest organisational level (example: university) In cases where the name cannot be split in several hierarchical levels, this sub-element contains the entire name.	
!		<b>ddf_doc/organisation/name/level2</b>	
		Name of second organisational level (example: faculty)	
!		<b>ddf_doc/organisation/name/level3</b>	
		Name of third organisational level (example: institute, department)	
!		<b>ddf_doc/organisation/name/level4</b>	
		Name of fourth organisational level (example: section, division, group)	
!		<b>ddf_doc/organisation/name/acronym</b>	
		Acronym. Whenever possible, the acronym should reflect the same organisational hierarchy as the levels of the full name, for example UNIV.FACU.INST.GRP	
?	®	<b>ddf_doc/organisation/id</b>	
		Identification number or code	
(\$)		<b>ddf_doc/organisation/id/@id_type</b>	12)
		Type of ID, registered with DDF - like Danish CVR no.	
+		<b>ddf_doc/organisation/country</b>	

Country of legal residence using ISO country codes 13)

---

? **ddf\_doc/organisation/uri**  
URI (URL) link to web page

## Project element

! ® **ddf\_doc/project**  
This repeatable element is used to record information about any project related to the document. Each project and the corresponding role are recorded in a separate instance of the element. The attribution of projects to documents will allow users to jump easily between projects and their documents.  
The element is organised in the following sub-elements:  
    project/title (split in main and sub and acronym),  
    project/id (optional)  
    project/uri (link to web page - optional)

---

(\$) **ddf\_doc/project/@proj\_role**  
Role of the project in relation to the document (see note for authorised values) 15)

---

(\$) ® **ddf\_doc/project/title**  
Title - only repeatable in case of language variants – use sub-elements below

[\$] **ddf\_doc/project/title/@xml:lang**  
Language of project title (mandatory if title is repeated) 2)

(\$) **ddf\_doc/project/title/main**  
Main title

! **ddf\_doc/project/title/sub**  
Sub title

! **ddf\_doc/project/title/acronym**  
Acronym

---

? ® **ddf\_doc/project/id**  
Identification number or code

(\$) **ddf\_doc/project/id/@id\_type**  
Type of ID, registered with DDF - like local project number 12)

---

? **ddf\_doc/project/uri**  
URI (URL) link to web page

## Event element

!	®	<b>ddf_doc/event</b>	
		This repeatable element is used to record information about any event (conference, seminar, workshop, meeting, course, etc.) related to the document. Each event and its corresponding role are recorded in a separate instance of the element. The element is organised in the following sub-elements: event/title (split in full, acronym and number), event/dates (split in start and end), event/place (split in start and end), event/uri (link to web page - optional)	
<hr/>			
(S)		<b>ddf_doc/event/@event_role</b>	
		Role of the event in relation to the document (see note for authorised values)	16)
!		<b>ddf_doc/event/@dasti_conference_no</b>	
		DASTI conference number from the DASTI conference database	26)
<hr/>			
(S)	®	<b>ddf_doc/event/title</b>	
		Title - only repeatable in case of language variants – use sub-elements below	
[S]		<b>ddf_doc/event/title/@xml:lang</b>	
		Language of the event title (mandatory if title is repeated)	2)
(S)		<b>ddf_doc/event/title/full</b>	
		Full event title, like "European Conference on Digital Libraries"	
!		<b>ddf_doc/event/title/acronym</b>	
		Acronym event title, like "ECDL"	
!		<b>ddf_doc/event/title/number</b>	
		Number in series of recurrent events, like "8"	
<hr/>			
!		<b>ddf_doc/event/dates</b>	
		Start and end dates of event – use sub-elements below:	
(S)		<b>ddf_doc/event/dates/start</b>	
		First day of the event in format yyyy-mm-dd, or yyyy-mm, or yyyy	19)
(S)		<b>ddf_doc/event/dates/end</b>	
		Last day of the event in format yyyy-mm-dd, or yyyy-mm, or yyyy	19)
<hr/>			
!		<b>ddf_doc/event/place</b>	
		Place (city, country) of the event/conference	
<hr/>			
?		<b>ddf_doc/event/uri</b>	
		URI (URL) link to web page	

**Local field element**

?	Ⓜ	<b>ddf_doc/local_field</b>	<p>This repeatable and optional element is used to handle additional information using a locally defined two-level field structure, where a local field may have one or more parallel subfields. The <code>local_field/@tag_type</code> attribute is used to pass instructions on how to index and display the field and its subfields in the receiving system.</p> <p>The element is organised in the following sub-elements:</p> <ul style="list-style-type: none"> <li><code>local_field/code</code> (field code),</li> <li><code>local_field/data</code> (field data),</li> <li><code>local_field/subfield</code> (subfield likewise split in code and data)</li> </ul>	
<hr/>				
(\$)		<b>ddf_doc/local_field/@tag_type</b>	Defining if/how field and should be indexed and displayed, see note	17)
?		<b>ddf_doc/local_field/@xml:lang</b>	Language of field	2)
<hr/>				
(\$)		<b>ddf_doc/local_field/code</b>	Field code (tag) using a-z and 0-9 only	
<hr/>				
(\$)		<b>ddf_doc/local_field/data</b>	Field data	
<hr/>				
?	Ⓜ	<b>ddf_doc/local_field/subfield</b>	Repeatable subfield likewise split in code and data	
(\$)		<b>ddf_doc/local_field/subfield/code</b>	Subfield code (tag) using a-z and 0-9 only	
(\$)		<b>ddf_doc/local_field/subfield/data</b>	Subfield data	

**Publication element**

- § **ddf\_doc/publication**
- The mandatory publication element carries all the information about how the document was published in the widest sense of the word, including electronic availability via personal homepages, institutional repositories and similar web sites.
- The publication element is structured in 9 publication cases, each with its own repertoire of sub-elements:
- In a journal (as an article or similar)
  - In a book (as a chapter or similar)
  - In a report (as a chapter or similar)
  - As a book (the book as a whole)
  - As a report (the report as a whole)
  - As a patent (or patent application)
  - As an Internet publication (institutional repository, preprint archive, home page etc.)
  - As a Digital object (in a managed institutional repository, preprint archive etc.)
  - Any other form of publication
- These cases correspond to the sub-elements: *in\_journal*, *in\_book*, *in\_report*, *book*, *report*, *patent*, *digital\_object*, *inetpub* and *other*.
- At least one of these cases must be applied, but often two or more cases may be applied concurrently. For example, a journal article may be published "In a journal" and at the same be available at the author's institutional repository "As an Internet publication" or "Digital object".

**Publication case - In a journal**

- ! **ddf\_doc/publication/in\_journal**  
Use for articles, papers, etc. published in a journal (or submitted to a journal for publication)  
All data is placed in the sub-elements: *title*, *title\_alternative*, *issn*, *year*, *vol*, *issue*, *pages*, *paperid*, *doi*, *journal\_no*, *uri*.
- (§) **ddf\_doc/publication/in\_journal/@pub\_status** 18)  
Status of publication, like "submitted", "accepted", "published" – see note.  
Is mandatory for in-journal publications because the time from "submitted" to "published" is often long and may cross year boundaries.
- (§) **ddf\_doc/publication/in\_journal/title**  
Journal title
- ! **ddf\_doc/publication/in\_journal/title\_alternative**  
Alternative title of the journal, i.e. former title, title in other languages, title from different data sources.
- ! ® **ddf\_doc/publication/in\_journal/issn** 23)  
Journal ISSN no. without dashes
- ! ® **ddf\_doc/publication/in\_journal/issn/@type** 29)  
Defining type of ISSN, i.e. electronic or primary etc.
- ! **ddf\_doc/publication/in\_journal/year**  
Year of publication in format yyyy
- ! **ddf\_doc/publication/in\_journal/vol**  
Volume number
- ! **ddf\_doc/publication/in\_journal/issue**  
Issue number
- ! **ddf\_doc/publication/in\_journal/pages** 22)  
In the format Firstpage-Lastpage (or in case of Paper ID, the number of pages)
- ! **ddf\_doc/publication/in\_journal/paperid**  
Paper ID, an alternative to page numbers, typically used by e-journals
- ! **ddf\_doc/publication/in\_journal/doi**  
Digital Object Identifier



Unique publisher number from the DASTI journal database, only publications with this unique id will be counted for by the DASTI Bibliometric Research Indicator. This is only applicable for universities and research institutions included in the Bibliometric Research Indicator.

- + **ddf\_doc/publication/in\_book/uri**  
URI (URL) link to web site of book
- + **ddf\_doc/publication/in\_book/uri/@access** 27)  
Use to state the accessibility of the linked web site of the book, i.e. "Open Access"

#### Publication case - In a report

- ! **ddf\_doc/publication/in\_report**  
Use for chapters, papers, etc. published as a part of a report.  
All data is placed in the sub-elements: title, sub\_title, part, editor, isbn, rep\_no, place, publisher, year, pages, uri.
- + **ddf\_doc/publication/in\_report/@pub\_status** 18)  
Status of publication, like "submitted", "accepted", "published"
- (\$) **ddf\_doc/publication/in\_report/title**  
Report title
- + **ddf\_doc/publication/in\_report/sub\_title**  
Sub title of the host publication/report
- + **ddf\_doc/publication/in\_book/part**  
Par designation of a multipart work ("Vol. 1", "Bind 4: Middelalderen" etc.)
- ! **ddf\_doc/publication/in\_report/editor**  
Name of the (first) editor of the report as a whole
- ! ® **ddf\_doc/publication/in\_report/isbn** 24)  
ISBN no. without dashes
- ! ® **ddf\_doc/publication/in\_report/isbn/@type** 29)  
Defining type of ISBN, i.e. electronic or primary etc.
- ! ® **ddf\_doc/publication/in\_report/series**  
Report series title
- ! **ddf\_doc/publication/in\_report/rep\_no**  
Report number
- ! **ddf\_doc/publication/in\_report/place**  
Place of publication
- ! **ddf\_doc/publication/in\_report/publisher**  
Name of publisher
- ! **ddf\_doc/publication/in\_report/year**  
Year of publication in format yyyy
- ! **ddf\_doc/publication/in\_report/vol**  
Volume number
- ! **ddf\_doc/publication/in\_report/issue**  
Issue number
- ! **ddf\_doc/publication/in\_report/pages** 22)  
In the format Firstpage-Lastpage
- ! **ddf\_doc/publication/in\_report/publisher\_no** 28)  
Unique publisher number from the DASTI journal database, only publications with this unique id will be counted for by the DASTI Bibliometric Research Indicator. This is only applicable for universities and research institutions included in the Bibliometric Research Indicator.





	Report series title	
!	<b>ddf_doc/publication/report/rep_no</b> Report series and number	
!	<b>ddf_doc/publication/report/place</b> Place of publication	
!	<b>ddf_doc/publication/report/publisher</b> Name of publisher	
!	<b>ddf_doc/publication/report/year</b> Year of publication in format yyyy	
!	<b>ddf_doc/publication/report/pages</b> Total no. of pages	
!	<b>ddf_doc/publication/report/publisher_no</b> Unique publisher number from the DASTI journal database, only publications with this unique id will be counted for by the DASTI Bibliometric Research Indicator. This is only applicable for universities and research institutions included in the Bibliometric Research Indicator.	28)
+	<b>ddf_doc/publication/report/uri</b> URI (URL) link to web site of report	
+	<b>ddf_doc/publication/report/uri/@access</b> Use to state the accessibility of the linked web site of the record, i.e. "Open Access"	27)

**Publication case – As a patent**

!	<b>ddf_doc/publication/patent</b> Use when the document is a patent (or a patent application) All data is placed in the sub-elements: <i>country, ipc, number, date, uri.</i>	
(\$)	<b>ddf_doc/publication/patent/@pub_status</b> Status of publication, like "submitted", "accepted", "published" Is mandatory for patent publications because the time from "submitted" to "published" is often long and may cross year boundaries.	18)
!	<b>ddf_doc/publication/patent/country</b> Country of patent issue using ISO country codes	13)
!	<b>ddf_doc/publication/patent/ipc</b> International Patent Classification	20)
!	<b>ddf_doc/publication/patent/number</b> Patent no.	
!	<b>ddf_doc/publication/patent/date</b> Date of status above in format yyyy-mm-dd	
+	<b>ddf_doc/publication/patent/uri</b> URI (URL) link to web site of patent	
+	<b>ddf_doc/publication/patent/uri/@access</b> Use to state the accessibility of linked web site of the patent, i.e. "Open Access"	27)

**Publication case – As an Internet publication**

!	® <b>ddf_doc/publication/inetpub</b> Use when published electronically on the net (institutional repository, author's homepage, preprint server, etc.) If the document is also published in a journal, book or report, the corresponding publication cases should be used in addition. All data is placed in the sub-elements: <i>text</i> and <i>uri</i> .	
(\$)	<b>ddf_doc/publication/inetpub/text</b>	





## 4. Notes

The notes in this section are referred to in section 2 and 3. They primarily consist of authoritative lists of codes and corresponding display values, which define the controlled vocabularies of a number of key attributes.

In many cases, these vocabularies may be extended by the DDF secretariat, acting as the DDF-MXD maintenance agency. DDF data suppliers needing such extensions should contact the DDF secretariat.

### 1) Type of document - codes and display text (for @doc\_type)

Code	Danish text	English text	Comment
dja	Tidsskrift-artikel	Journal article	Full article
djl	Tidsskrift-brev til redaktøren	Letter to the editor	Journal letters, letters to editor
djc	Tidsskrift-kommentar	Journal comment	Comments to the journal
djr	Tidsskrifts-review artikel	Journal review article	Review in journal
djb	Tidsskrifts-anmeldelse	Journal book review	Book review
dna	Avis-artikel	Newspaper article	
db	Bog	Book	An entire book
dba	Bog-kapitel	Book chapter	A chapter or article in a book
dbp	Bog forord, leksikonartikel	Book preface, encycl. entry	Entry in encyclopedia, preface to book
dr	Rapport	Report	
dra	Rapport-kapitel	Report chapter	
dcp	Konference-paper	Conference paper	Full paper
dca	Konference-abstract	Conference abstract	Abstract only
dco	Konference-plakat	Conference poster	
dct	Konference-foredrag	Conference talk	Slides, video, audio of talk
dw	Arbejdsrapport, (pr)eprint	Working paper, (pr)eprint	Informal print or Internet publication
dln	Undervisning-noter	Lecture notes	
dl	Undervisning-forelæsning	Lecture	Slides, video, audio of lecture
dp	Patent	Patent	
dtd	Afhandling-Doktor	Thesis Doctoral	
dtp	Afhandling-Ph.D.	Thesis PhD	
dtm	Afhandling-Kandidat	Thesis Master	
dts	Studenterrapport	Student report	
dso	Software	Software	
dd	Datasæt	Data set	
drt	Radio/TV-udsendelse	Radio/TV broadcast	Public broadcast
dx	Udstillingskatalog	Exhibition catalogue	
do	Andet	Other	

See note 21) for valid combinations of @doc\_type, @doc\_review and @doc\_level and comments on the use of these attributes for statistical purposes.

### 2) Language codes (for @doc\_lang and @xml:lang)

Codes must comply with the W3C rules for xml:lang, namely IETF RFC 3066 and ISO 639.

See <http://www.ietf.org/rfc/rfc3066.txt>  
and <http://www.w3.org/WAI/ER/IG/ert/iso639.htm>  
and <http://www.loc.gov/standards/iso639-2/>

In practice this provides for the use of 2-letter (ISO 639-1) as well as 3-letter codes (ISO 639-2). As the 3-letter codes are the most common in the bibliographical context, some illustrative examples (including mappings) are listed below. Please note the extra available codes “mul” and “und” for multiple languages and undetermined language respectively in ISO 639-2.

► As an example:

<b>639-2</b>	<b>Danish text</b>	<b>English text</b>	<b>(639-1 equiv.)</b>
dan	Dansk	Danish	da

### 3) Annual report year of document (for @doc\_year)

A 4-digit year indicating which annual report year ("indberetningsår") the document belongs to. In most cases this will be the same as the publication year, but (formal) publishing sometimes is not completed before the following calendar year or even later – a process outside the control of the author and the institution and a process which sometimes is repeated for the same document. The annual report year, on the other hand, documents when the institution considered the document to be completed and ready for listing in the annual report – a process under the control of the institution and which cannot be repeated for the same document. Thus the annual report year may be used for statistical purposes.

### 4) Indicator for document review process (quality control) (for @doc\_review)

Code	Danish text	English text	Comment
pr	Peer review	Peer review	
or	Andet review	Other review	Editorial, institutional review etc.
nr	Intet review	No review	
und	Ubestemt	Undetermined	The nature of the review process (if any) could not be determined

See note 21) for valid combinations of @doc\_type, @doc\_review and @doc\_level and comments on the use of these attributes for statistical purposes.

### 5) Indicator for literary scope/level of document (for @doc\_level)

Code	Danish text	English text	Comment
sci	Videnskabelig	Scientific	
edu	Undervisningsrettet	Educational	
pop	Populærvidenskabelig	Popular	
adm	Administrativ	Administrative	Progress reports, Annual reports, etc
und	Ubestemt	Undetermined	The literary scope/level could not be determined

See note 21) for valid combinations of @doc\_type, @doc\_review and @doc\_level and comments on the use of these attributes for statistical purposes.

### 6) Codes for exporting database/institution (for @rec\_source)

Codes in alphabetical order:

Code	Danish text
aaa	Arkitektskolen i Aarhus
aardas	Århus Dag- og Aftenseminarium
aas	Aalborg Sygehus
afg	Dansk Institut for Klinisk Epidemiologi
agri	Danmarks JordbrugsForskning
ai	Arbejds miljø Information
akf	Amternes og kommunernes forskningsinstitut
ami	Det nationale forskningscenter for Arbejds miljø
amr	Arbejds miljø rådets Service Center
ark	READ - Arkitekt- og designskolerne
au	Aarhus Universitet
aau	Aalborg Universitet

bio	Det Bioteknologiske Forsknings- og Udviklingsprogram
bioteknik	Teknologisk Institut. Bioteknik
can	Kræftens Bekæmpelse
cemtv	Center for Evaluering af Medicinsk Teknologivurering
cfb	Center for Børnelitteratur
cuf	Dansk Center for Internationale Studier og Menneskerettigheder
dbi	Danmarks Biblioteksskole
dds	Danmarks Designskole
dfs	Dansk Folkemindesamling
dlh	Danmarks Lærerhøjskole
dmf	Dansk Matematisk Forening
dmu	Danmarks Miljøundersøgelser
dpi	Danmarks Pædagogiske Institut
dpu	Danmarks Pædagogiske Universitet
dss	Dansk Institut for Sundheds- og Sygeplejeforskning
dtf	Danmarks Transport Forskning
dtu	Danmarks Tekniske Universitet
ens	Energistyrelsen
fak	Forsvarsakademiet
far	Danmarks Farmaceutiske Universitet
for	Forskningsstyrelsen
fou	Forsknings- og udviklingscentret for Hjælpemidler og Rehabilitering
fri	Forskningscenter Risø
fsl	Forskningscenter for Skov og Landskab
ftu	FTU-programmet
geus	Danmarks og Grønlands Geologiske Undersøgelse
hha	Handelshøjskolen i Århus
cbs	Copenhagen Business School
hhs	Handelshøjskole Syd
hvhosp	Hvidovre Hospital
ifg	Institut for grænseregionsforskning
ifo	Institut for Forskning i Idræt og Folkelig Oplysning
itu	IT-universitetet i København
jpsem	Jydsk Pædagogseminarium
ka	Kunstakademiets Arkitektskole
kab	Danmarks Kunstbibliotek
kas	Københavns Amts Sygehusvæsen
kib	Kunstindustrimuseets Bibliotek
ku	Københavns Universitet
kvl	Københavns Universitet Det Biovidenskabelige Fakultet
mup	Det Materialeteknologiske Udviklingsprogram
nlb	Danmarks Natur- og Lægevidenskabelige Bibliotek
ruc	Roskilde Universitet
sbi	By og Byg. Statens Byggeforskningsinstitut
sdu	Syddansk Universitet
seb	Sekretariat for Børnekultur netværk
shu	Statens Husdyrbrugsforsøg
sji	Statens Jordbrugs- og Fiskeriøkonomiske Institut
sp	Statens Planteavlsforsøg
ssl	Statens Skadedyrslaboratorium
suc	Sydjysk Universitetscenter
svs	Statens Veterinære Serumlab. og Statens Veterinære. Inst. for Virusforskning
►	Further codes may be registered with DDF

**7) Record status codes (for @rec\_status)**

Code	Danish text	English text	Comment
n	Ny post	New record	
c	Rettet post	Corrected/updated record	
d	Slettet post	Deleted record	

Note: Since data is gathered via OAI harvesting, 'new' (n) records should be set as 'updated' (c).

**8) Keyword vocabulary/thesaurus (for @key\_type)**

Code	Danish text	English text	Comment
fre	Fri/ukontrolleret	Free/uncontrolled	
ini	INIS	INIS	
eud	EUDISED	EUDISED	
ins	INSPEC	INSPEC	
loc	Lokal	Local	

► Further codes may be registered with DDF

**9) Classification system (for @class\_type)**

Code	Danish text	English text	Comment
ddc	Dewey	Dewey	
udc	UDK	UDC	
dk5	DK5	DK5	
def	DEF	DEF	
loc	Lokal	Local	

► Further codes may be registered with DDF

**10) Person roles in relation to document (for @pers\_role)**

Code	Danish text	English text	Comment
pau	Forfatter	Author	
pa1	Primær forfatter	Primary author	Optional – if needed to differentiate
pa2	Sekundær forfatter	Secondary author	Optional – if needed to differentiate
ped	Redaktør	Editor	
ppu	Udgiver	Publisher	
ptr	Oversætter	Translator	
pil	Illustrator	Illustrator	
inv	Opfinder	Inventor	
sup	Vejleder	Supervisor	

► Further codes may be registered with DDF

**11) Affiliation reference key (for @aff\_no)**

The reference key is a simple number "0"- "999" which uniquely identifies organisations within the document record. The reference key is used to associate a person unambiguously with the organisation to which s/he is affiliated. The reference key is not intended to carry any meaning outside the context of the document record.

**12) Identification system codes (for @id\_type)**

Code	Danish text	English text	Comment
cpr	CPR nr.	CPR no.	Danish national person identification
cvr	CVR nr.	CVR no.	Danish national enterprise identification
ddf_rec	DDF post ID	DDF record ID	Danish Research Database record ID
loc_rec	Lokal post-ID	Local record ID	Local (data supplier) record ID*



## DDF-MXD - Danish Research Database - Metadata Exchange Format for Documents

loc_per	Lokal person-ID	Local person ID	Local (data supplier) person ID*
loc_pro	Lokal project-ID	Local project ID	Local (data supplier) project ID*
loc_org	Lokal organisations-ID	Local organisation ID	Local (data supplier) organisation ID*
fi_nfdb	FI national forsker database	FI national researcher DB	For use with the Danish researcher DB
ec_ga_fp7	EU FP7 Bevillingsaftale nr.	EC FP7 Grant Agreement No.	For use with the Danish researcher DB

► Further codes may be registered with DDF

\* The local IDs are defined by the data supplying organisations se note 6).

A local ID prefixed with the code of the data-supplying organisation becomes nationally unique.

### 13) Countries - codes and names

Code	Danish text	English text	Comment
au	Australien	Australia	
at	Østrig	Austria	
ca	Canada	Canada	
ch	Schweiz	Switzerland	
cn	Kina	China	
de	Tyskland	Germany	
dk	Danmark	Denmark	
es	Spanien	Spain	
fi	Finland	Finland	
fr	Frankrig	France	
gb	Storbritannien	Great Britain	
gr	Grækenland	Greece	
hu	Ungarn	Hungary	
ie	Irland	Ireland	
in	Indien	India	
is	Island	Iceland	
it	Italien	Italia	
jp	Japan	Japan	
nl	Nederlandene	Netherlands	
no	Norge	Norway	
rs	Serbien	Serbia	
ru	Rusland	Russia	
pl	Polen	Poland	
pt	Portugal	Portugal	
se	Sverige	Sweden	
th	Thailand	Thailand	
us	USA	USA	
za	Sydafrika	South Africa	
...			

► Further country codes may be added according to ISO 3166  
See <http://www.iso.org/iso/en/prods-services/iso3166ma/index.html>

### 14) Organisation roles in relation to document (for @org\_role)

Code	Danish text	English text	Comment
oau	Korporativ forfatter	Corporate author	
oaf	Institutionstilknytning	Affiliation	
opu	Udgiver	Publisher	

► Further codes may be registered with DDF

### 15) Project roles in relation to document (for @proj\_role)

Code	Danish text	English text	Comment
pd	Leverance fra	Deliverable of	
pr	Relateret til	Related to	

► Further codes may be registered with DDF

#### 16) Event roles in relation to document (for @event\_role)

Code	Danish text	English text	Comment
ep	Præsenteret ved	Presented at	
er	Relateret til	Related to	

► Further codes may be registered with DDF

#### 17) Local field types (for @tag\_type)

Code	Field treatment in DDF
1	Field is neither indexed nor displayed in search module
2	Field may be displayed in search module
3	Field may be indexed in search module
4	Field may be indexed and displayed in search module

#### 18) Status of publication (for @pub\_status)

Code	Danish text	English text	Comment
s	Indsendt	Submitted	
a	Accepteret	Accepted	
i	I trykken	In press	
p	Publiceret	Published	
u	Upubliceret	Unpublished	e.g. grey literature

#### 19) Date format for events

The start and end dates of events may be recorded as a year (yyyy e.g. "2004"), as a month (yyyy-mm e.g. "2004-11") or as a day (yyyy-mm-dd e.g. "2004-11-03")

#### 20) International Patent Classification

The Strasbourg Agreement (of 1971) concerning the International Patent Classification provides for a common classification for patents for invention including published patent applications, utility models and utility certificates. The International Patent Classification (IPC) is a hierarchical system in which the whole area of technology is divided into a range of sections, classes, subclasses and groups.

See <http://www.wipo.int/classifications/ipc/en/>

#### 21) Valid combinations of values of the 3 attributes @doc\_type, @doc\_review and @doc\_level

@doc_type		@doc_review				@doc_level				
English display text	code	pr	or	nr	und	sci	edu	pop	adm	und
Journal article	dja	pr	or	nr	und	sci	edu	pop		und
Journal letter (to the editor)	djl	pr	or	nr	und	sci	edu	pop		und
Journal comment	djc	pr	or	nr	und	sci	edu	pop		und
Journal review article	djr	pr	or	nr	und	sci	edu	pop		und
Journal book review	djb	pr	or	nr	und	sci	edu	pop		und
Newspaper article	dna		or	nr	und			pop		Und
Book	db	pr	or	nr	und	sci	edu	pop		und
Book chapter	dba	pr	or	nr	und	sci	edu	pop		und
Book preface, encyclopedia article	dbp	pr	or	nr	und	sci	edu	pop		und
Report	dr	pr	or	nr	und	sci	edu		adm	und
Report chapter	dra	pr	or	nr	und	sci	edu		adm	und

Conference paper	dcp	pr	or	nr	und	sci	edu	und
Conference abstract	dca	pr	or	nr	und	sci	edu	und
Conference poster	dco	pr	or	nr	und	sci	edu	und
Conference talk/presentation	dct	pr	or	nr	und	sci	edu	und
Working paper, (pr)eprint, ...	dw		or	nr	und	sci	edu	pop adm und
Lecture notes	dln			nr	und		edu	und
Lecture	dl			nr	und		edu	und
Patent	dp			nr	und	sci		und
Thesis Doctoral	dtd			nr	und	sci		und
Thesis Ph.D.	dtp			nr	und	sci		und
Thesis Master	dtm			nr	und		edu	und
Student report	dts			nr	und		edu	und
Software	dso			nr	und	sci	edu	adm und
Data set	dd			nr	und	sci	edu	adm und
Radio/TV broadcast	drt			nr	und		edu	pop und
Other	do	pr	or	nr	und	sci	edu	pop adm und

The table above specifies for each @doc\_type value the allowed values of @doc\_review and @doc\_level. For example: "dna" (newspaper article) may be combined with either "or" or "nr" and with "pop".

One may retrieve documents (and statistical figures) using these three attributes in combination. In a number of cases a fourth attribute, @doc\_lang, may be added in order to distinguish between documents in national languages (Danish etc.) and documents in an international language (generally English).

#### 22) Valid page numbering for Firstpage-Lastpage

Format Firstpage-Lastpage must be a range in format of "optional letter+1-6 digits - optional letter+1-6 digits" E.g. S17-S24 and 354-376 are both valid while SS45, S.86, SS97-SS103 are non valid ranges.

#### 23) Valid ISSN format

Format for ISSN is without dashes and should follow: 7 digits plus one digit or x - e.g. 0173083x or 00280453

#### 24) Valid ISBN format

Format for ISBN is without dashes and should follow: '9 digits plus digit or x' OR '12 digits plus digit or x' e.g. 0201694972 ; 040669694x ; 0236496273554 ; 026496273556x

#### 25) Mime\_types (for @mime\_types)

Mime\_types must comply with the definitions specified by IANA (Internet Assigned Numbers Authority). See <http://www.iana.org/assignments/media-types/>

#### 26) Timestamp

Timestamp must comply with ISO 8601, i.e. YYYY-MM-DDThh:mm:ssTZD  
See <http://www.w3.org/TR/NOTE-datetime>

#### 27) Access definitions (for @access)

Code	Danish text	English text	Comment
oa	Open access	Open access	For use free and open access to resource.
ca	Campus adgang	Campus access	For use with campus only access.
ea	Foreløbig lukket adgang	Embargoed access	For use with publications under an embargo.

na	Ingen offentlig adgang	No public access	For use with non-public and owner only access.
----	------------------------	------------------	--

- Embargo periods in regards to Open Access must be managed by the data provider, i.e. the access status must be changed locally when the embargo period is ended.

<b>28)</b>	<b>dasti_conference_no, journal_no and publisher_no (unique IDs from DASTI databases)</b>
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Unique IDs used to identify Conference, Journal or Publisher titles in the DASTI (Danish Agency for Science, Technology and Innovation/Forsknings- og Innovationsstyrelsen) Bibliometric Research Indicator database.

<b>29)</b>	<b>ISSN/ISBN type definition (for @type)</b>
------------	--

Code	Danish text	English text	Comment
pri	ISSN/ISBN	ISSN/ISBN	For use with primary ISSN/ISBN
ele	E-ISSN/E-ISBN	E-ISSN/E-ISBN	For use with ISSN/ISBN for electronic resources.
alt	ISSN/ISBN	ISSN/ISBN	For use with alternative ISSN/ISBN
und	ISSN/ISBN	ISSN/ISBN	For use with undefined ISSN/ISBN

<b>30)</b>	<b>Digital object definition (for @role)</b>
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Code	Danish text	English text	Comment
pre	Preprint	Preprint	Draft before refereeing and publication
pos	Postprint	Postprint	The refereed, accepted final draft
pub	Forlagsversion	Publisher version	Version as published by publisher
rev	Revideret version	Revised version	Any revisions after the published version

<b>31)</b>	<b>National research area (for @role)</b>
------------	---

Code	Danish text	English text	Comment
sci	Teknik/naturvidenskab	Science/technology	
soc	Samfundsvidenskab	Social science	
hum	Humaniora	Humanities	
med	Sundhedsvidenskab	Medical science	

## 5. Examples

**Example 1: Book with two editors, one of which is affiliated with a DDF data supplier.**

### Full XML document

```
<ddf_doc xmlns="http://mx.forskningsdatabasen.dk/ns/mxd/1.2" format_version="1.3.0" doc_type="db"
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rec_created="1996-10-01" rec_upd="1996-10-11" rec_status="c">
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  <description>
    <abstract xml:lang="eng">
      The book addresses the crucial intersection of Human-Computer Interaction (HCI) and software engineering. It examines quality from the perspectives of both HCI and Software Engineering, and then systematically develops and illustrates a framework for reasoning about the interaction between quality concerns from HCI and Software Engineering on the one hand, and critical aspects of software development such as the choice of software architecture and the deployment of software tools. The book presents a framework for future research and development, both in academia and industry, into specialised software architectures, methods and tools for high quality interactive systems. Likely developments over the next few years depend mostly on the development of better formal approaches to the definition of practical and relevant software properties, better ways of describing and comparing software architectures, and more rigorous and reflective approaches to requirements definition for software tools. The book develops key concepts for guiding the application of these developments to the production of high quality interactive software.
    </abstract>
    <note xml:lang="eng">Written by IFIP Working Group 2.7</note>
    <subject>
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      <keyword key_type="fre" xml:lang="eng">Software engineering</keyword>
      <keyword key_type="fre" xml:lang="eng">Documentation, theory</keyword>
      <class class_type="ddc">005.1</class>
      <class class_type="udc">681.3.02</class>
    </subject>
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  </description>
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    <id id_type="loc_per" id_source="dtu">v661</id>
    <email>cg@imm.dtu.dk</email>
  </person>
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    </name>
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  </organisation>
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      <level2>Technical Committee 2: Software Theory and Practice</level2>
      <level3>Working Group 2.7: User Interface Engineering</level3>
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  </organisation>
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  </name>
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    <year>1996</year>
    <pages>248</pages>
    <uri>http://www.amazon.com/exec/obidos/ASIN/0412724707/104-9175344-3964725</uri>
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**Example 2: Conference paper published in proceedings in book form****Full XML document**

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      Computer visualizations of planned built environment and infrastructures are increasingly used as a basis for democratic decisions when the impact of the projects is of wide-ranging interests and influence. It is of great importance for the democratic process that all aspects of the material in a project can be trusted as a basis for discussion and decisions among politicians and citizens. This paper describes the objective aspects of the quality of data in the information basis for 3D visualizations and it calculates the precision that can be achieved by the known methods of 3D-CAD visualization. Furthermore, the paper suggests a model that can secure sufficient quality in future visualization work processes by accumulating documentation for both the factual basic data and information that carry the aim and meaning of the message and make this information accessible through the visualization.
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  <person pers_role="pau" aff_no="001">
    <name><first>Uffe</first><last>Lentz</last></name>
    <title>Professor, arkitekt</title>
    <email>uffe.lentz@aarch.dk</email>
    <uri>http://aarch.dk/arkitektskolen_aarhus/personale/persondata/uffe-lentz/</uri>
  </person>
  <person pers_role="pau" aff_no="001">
    <name><first>Andreas</first><last>Lykke-Olsen</last></name>
    <title>Ph.d.-studerende, arkitekt</title>
    <email>andreas.lykke-olesen@aarch.dk</email>
    <uri>http://aarch.dk/arkitektskolen_aarhus/personale/persondata/andreas-lykke-olesen/</uri>
  </person>
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      <level2>Institut for Design</level2>
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        <acronym>eCAADe</acronym>
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      </title>
      <dates><start>2004-09-15</start><end>2004-09-18</end></dates>
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<isbn>0954118324</isbn>
<publisher>CumInCAD Cumulative index of Computer Aided Architectural Design</publisher>
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<pages>380-386</pages>
<uri>http://cumincad.scix.net/cgi-bin/works/Show?2004\_380</uri>
</in_book>
</publication>
</ddf_doc>
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**Example 3: Journal article with one author****Full XML document**

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  <title> <original xml:lang="eng"><main>Recent applications of microemulsion electrokinetic
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  <description>
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      Microemulsions are used in a similar way as micellar solutions are used for separations in
capillary electrophoresis. Within the last six years, a number of papers have appeared in the
literature in which the separation characteristics of microemulsion electrokinetic
chromatography (MEEKC) have been investigated. One of the major fields of application for
MEEKC has been the lipophilicity of chemical substances but the technique has also been
applied for the analysis of substances within the fields of natural products, pharmaceuticals,
vitamins, peptides, proteins, and nucleic acid bases as well as nucleosides. An overview of the
applications is given together with the microemulsions used for each application.
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  <person pers_role="pau" aff_no="001">
    <name><first>Steen Honore</first><last>Hansen</last></name>
    <email>shh@dfuni.dk</email>
    <uri>http://www.dfh.dk/index.php?id=1338</uri>
  </person>
  <organisation org_role="oaf" aff_no="001">
    <name xml:lang="eng">
      <level1>The Danish University of Pharmaceutical Sciences</level1>
      <level2>Department of Analytical Chemistry</level2>
      <acronym>DFU</acronym>
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      <uri>http://www3.interscience.wiley.com/cgi-bin/abstract/106568866</uri>
    </in_journal>
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03T14:42:58" file="post-print_article.pdf >
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