Eprints Special Session

DC-2006, Mexico

Wednesday Oct 4, 14.00 - 16.00

Julie Allinson (UKOLN, University of Bath) and Andy Powell (Eduserv Foundation)

Agenda

- background, rationale and functional requirements
- the model
- the application profile and vocabularies
- dumb-down issues
- community acceptance plan
- discussion

Background, rationale and functional requirements

Julie

Background and rationale

www.ukoln.ac.uk/repositories/digirep/index/Eprints_Application

- JISC-funded
- Scope defined by JISC
- Overall aim
  - to offer a solution to metadata issues identified in Eprints UK project, and by others (e.g. PerX project)
  - to provide a richer metadata profile for the Intute repository search service
- Coordinated by Andy Powell (Eduserv Foundation) and Julie Allinson (UKOLN, Repositories Research Team)
  - Working Group / Feedback Group
  - Wiki for documentation
  - Email list for discussion

  www.jiscmail.ac.uk/lists/EPRINTS-APPLICATION-PROFILE.html

Scope

- Metadata:
  - In scope: DC elements plus any additional elements necessary
  - Out of scope: other metadata formats
- Identifiers:
  - In scope: Identifiers for the eprint and full-text(s); related resources etc
  - Out of scope: Other uses of identifiers
- Controlled vocabularies:
  - In scope: Hospitable to the use of a variety of subject access solutions
  - Out of scope: decisions on terminology solutions
- Complex objects:
  - In scope: Understanding of existing work; prioritising requirements
  - Out of scope: decisions on how to model complex objects
- Additional search entry points
  - In scope: additional properties to fulfil requirements
- Citations and references
  - In scope: Bibliographic citations references citing other works
  - Out of scope: Citation analysis solutions

Issues with simple DC (1)

- what's the problem with using simple DC to describe eprints?
- The ePrints UK project identified technical barriers to successful aggregation of metadata from institutional repositories
  - issues with the quality of metadata
  - the consistency of metadata
  - the handling of complex objects
  - the lack of a common approach to linking to full-text
- The ePrints UK guidelines on 'Using simple Dublin Core to describe eprints' were not widely implemented

Issues with simple DC (2)

- difficult to differentiate 'works/expressions' from 'manifestations/items' – which does dc:identifier identify?
  - in ePrints UK guidelines, dc:identifier used to identify 'work/expression' and dc:relation identifies 'manifestation/item'
  - dc:relation may be used for other resources (e.g. cited works) - ambiguity in the metadata record
  - software applications can't move reliably from the metadata record to the full-text
- other issues:
  - no means of knowing if full-text is freely available online or subject to access restrictions
  - can't distinguish between people and organistations
  - dates are ambiguous
  - subject vocabularies are not identified

Stakeholders

- Intute repository search project (JISC-funded)
- Prospero interim repository project (JISC-funded)
- repository software developers (GNU eprints, DSpace, Fedora)
- repository managers/administrators
- Also:
  - Users of the search service
  - Depositors
  - JISC
  - Other funding bodies
  - Other UK regional and national services
  - DCMI community
  - Global repositories community

Deliverables

- Functional Requirements Specification
- Entity-Relationship Model
- Eprints Application Profile
- Cataloguing/Usage Guidelines
- Plan for Community Acceptance and Take-up

Functional requirements

- Why?
  - to find out what already exists, and
  - what the community wants
  - to engage the community in uptake
- How?
  - existing practice / application profiles / standards
  - scenarios and use cases
  - eprints UK project conclusions
  - working group, feedback group, wider community engagement

Primary use case

- Primary use case
  - to develop an application profile for eprints to be used by the Intute UK repositories search service to aggregate content from repositories
- Scenarios
  - aggregator search service needs consistent metadata
  - user wants to search or browse by a range of elemente, including journal, conference or publication title
  - user wants to be sure they have the latest version
  - repository wants to group together different versions
  - aggregator wants to offer added-value services

Requirements (1)

- Provide a richer set of metadata than is possible with simple DC.
- Facilitate the creation and sharing of consistent metadata.
- Be compatible with library cataloguing approaches.
- Support extensibility of the profile for other types of material.
- Application profile should be sustainable, extensible and robust enough to support future added-value services.
- Implement an unambiguous method of identifying full-text(s).
- Enable identification of metadata-only records.
- Offer a preliminary recommendation for version identification.
- Support navigation between different 'versions'.
- Support identification of the most appropriate or latest Copy of a discovered version.
- Support search of any, or all, elements, particularly of title, author, description, keyword.
- Support browse by any element, as required.
- Support title changes between expressions and the main Eprint (Scholarly Work).
- Facilitate identification of open access materials.

Requirements (2)

- Support subject browse based on knowledge of controlled vocabulary.
- Support filtering of search results and browse tree. For example, by type, publisher, date range, status and version.
- Enable movement from search results and browse tree to available copies.
- Support filtering of available copies by format.
- Enable movement from search results and browse tree to OpenURL link server.
- Support citation analysis between expressions
- Be compatible with dc-citation WG recommendations
- Provide for an authoritative form of Agent names, to include personal names (authors) and corporate names (publishers, funders).
- Enable the author name, as it appears on an eprint, to be captured.
- Enable identification of the research funder and project code
- Enable identification of affiliation of an eprint

Requirements (3)

- Enable identification of the repository or other service making available the copy of an eprint.
- Enable identification of the repository or other service making available the metadata about an eprint.
- Enable the distinction between human-generated and machine-generated metadata to be maintained, particularly of keywords.
- Support disambiguation of publication title.
- Enable identification of copyright holders of different expressions.
- Identify the date when a piece of work, or a particular copy, was/will be made publicly available
- Identify the date of modification of a copy, in order to locate the latest version.
- Support the capture of multiple language versions of an abstract, for translations.

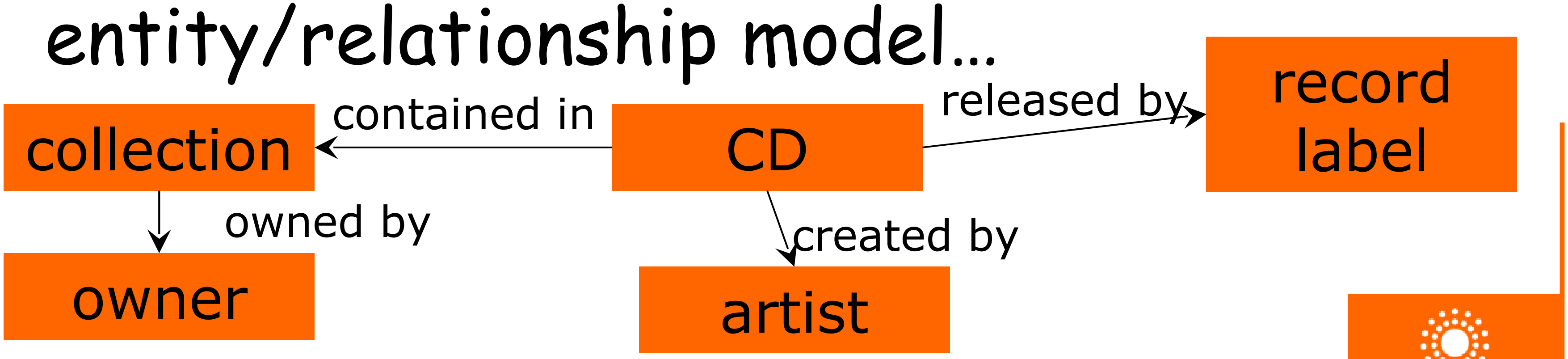
The requirements demanded a more complex metadata model …

The eprints application model

Andy

What is an application model?

- the set of **entities** that we want to describe
- and the key **relationships** between those entities
- e.g. a CD collection entity/relationship model…



Why have an application model?

- entities appear in the application model because we want to provide descriptions of them
- AND we only want to describe each instance of an entity only once
- the application model can be documented using UML class diagrams or E/R diagrams or in plain text or …

Model vs. model

- **IMPORTANT** - the application model and the DCMI Abstract Model are completely separate
- the application model says what things are being described
- the DCAM says what the descriptions look like

A note about FRBR

- Functional Requirements for Bibliographic Records
- an application model for the entities that bibliographic records are intended to describe
- FRBR models the world using 4 key entities
  - Work, Expression, Manifestation and Item

FRBR entities

- **A work is a distinct intellectual or artistic creation**. A work is an abstract entity
- **An expression is the intellectual or artistic realization of a work** in the form of alpha-numeric, musical, or choreographic notation, sound, image, object, movement, etc., or any combination of such forms. An expression is the specific intellectual or artistic form that a work takes each time it is "realized."
- **A manifestation is the physical embodiment of an expression** of a work. The entity defined as manifestation encompasses a wide range of materials, including manuscripts, books, periodicals, maps, posters, sound recordings, films, video recordings, CD-ROMs, multimedia kits, etc.
- **An item is a single exemplar of a manifestation**. The entity defined as item is a concrete entity.

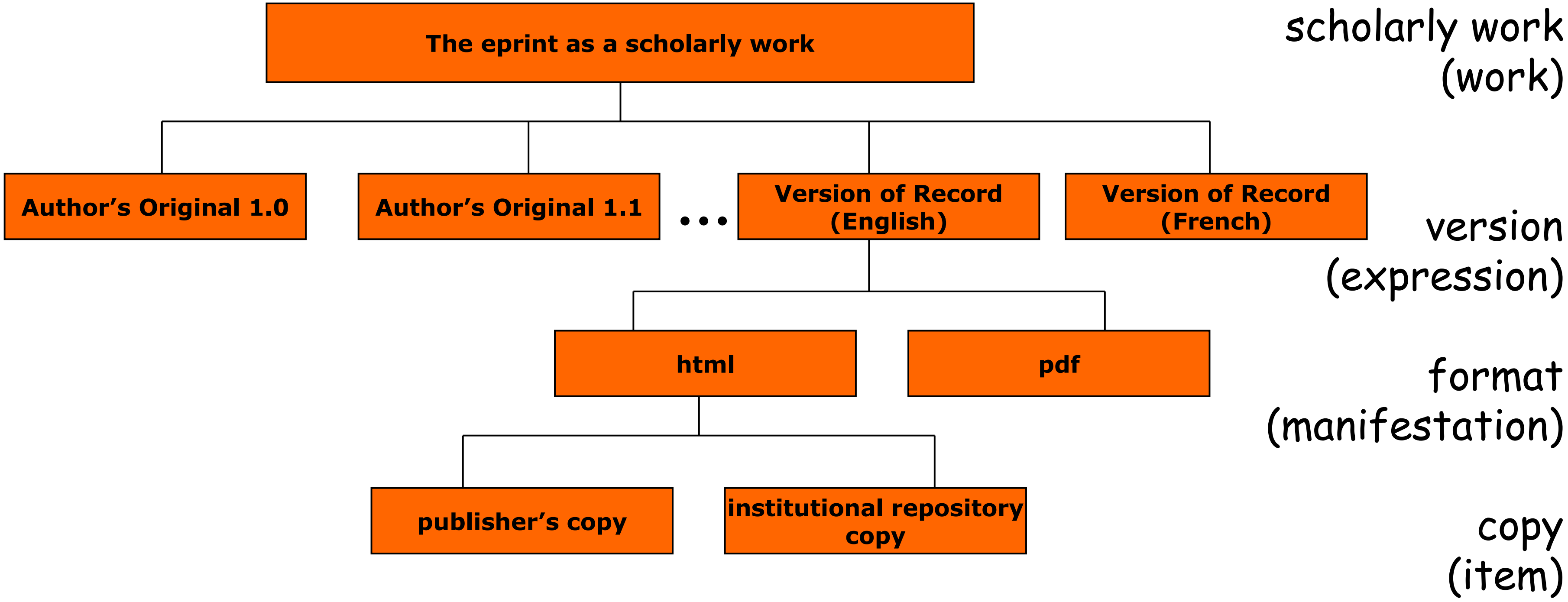
FRBR relationships

- FRBR also defines a set of additional entities that are related to the four entities above - 'Person', 'Corporate body', 'Concept', 'Object', 'Event' and 'Place' - and a set of relationships between each of the entities.
- the key entity-relations appear to be:
    - Work -- is realized through --> Expression
    - Expression -- is embodied in --> Manifestation
    - Manifestation -- is exemplified by --> Item
    - Work -- is created by --> Person or Corporate Body
    - Manifestation -- is produced by --> Person or Corporate Body
    - Expression -- has a translation --> Expression
    - Expression -- has a revision --> Expression
    - Manifestation -- has an alternative --> Manifestation

FRBR and eprints

- FRBR is a useful model in the context of eprints because it allows us to answer questions like
  - what is the URL of the most appropriate copy (an item) of the PDF format (a manifestation) of the pre-print version (an expression) for this eprint (the work)?
  - are these two copies related? if so, how?

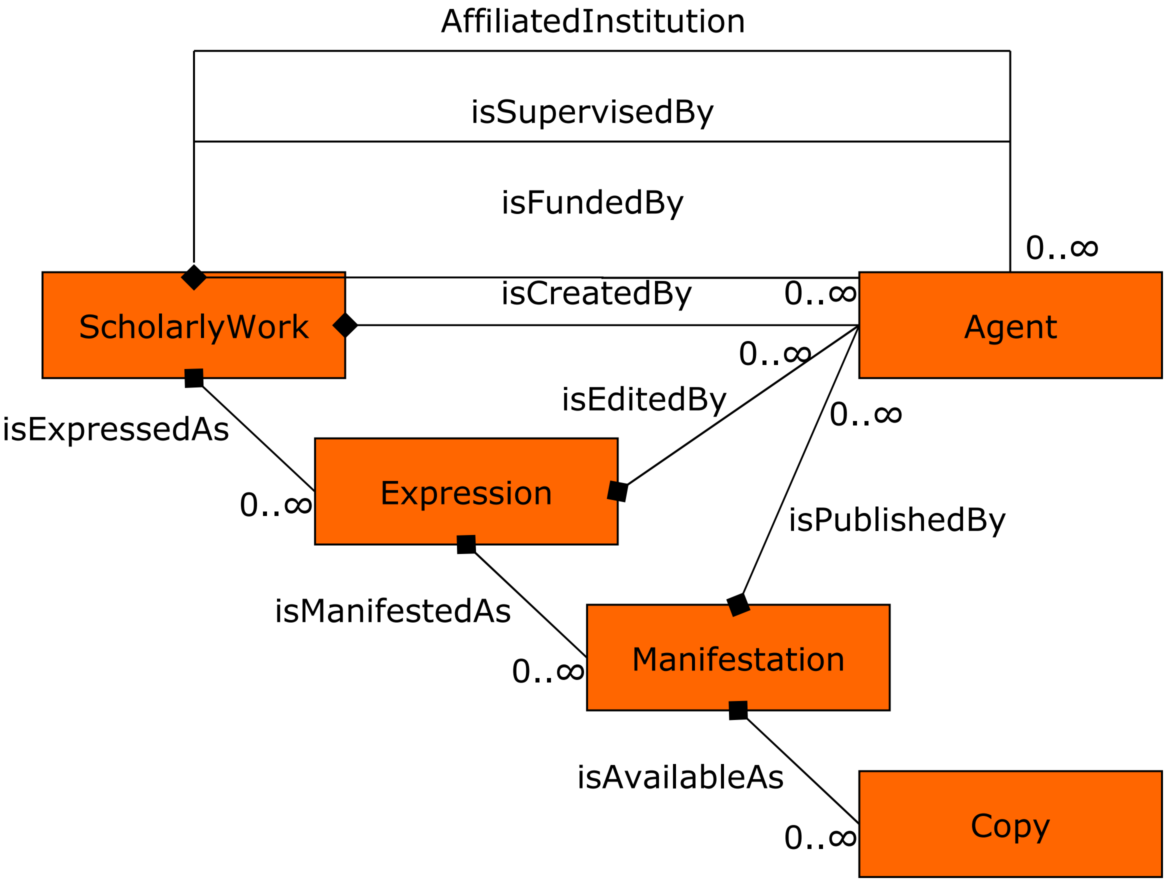
FRBR for eprints



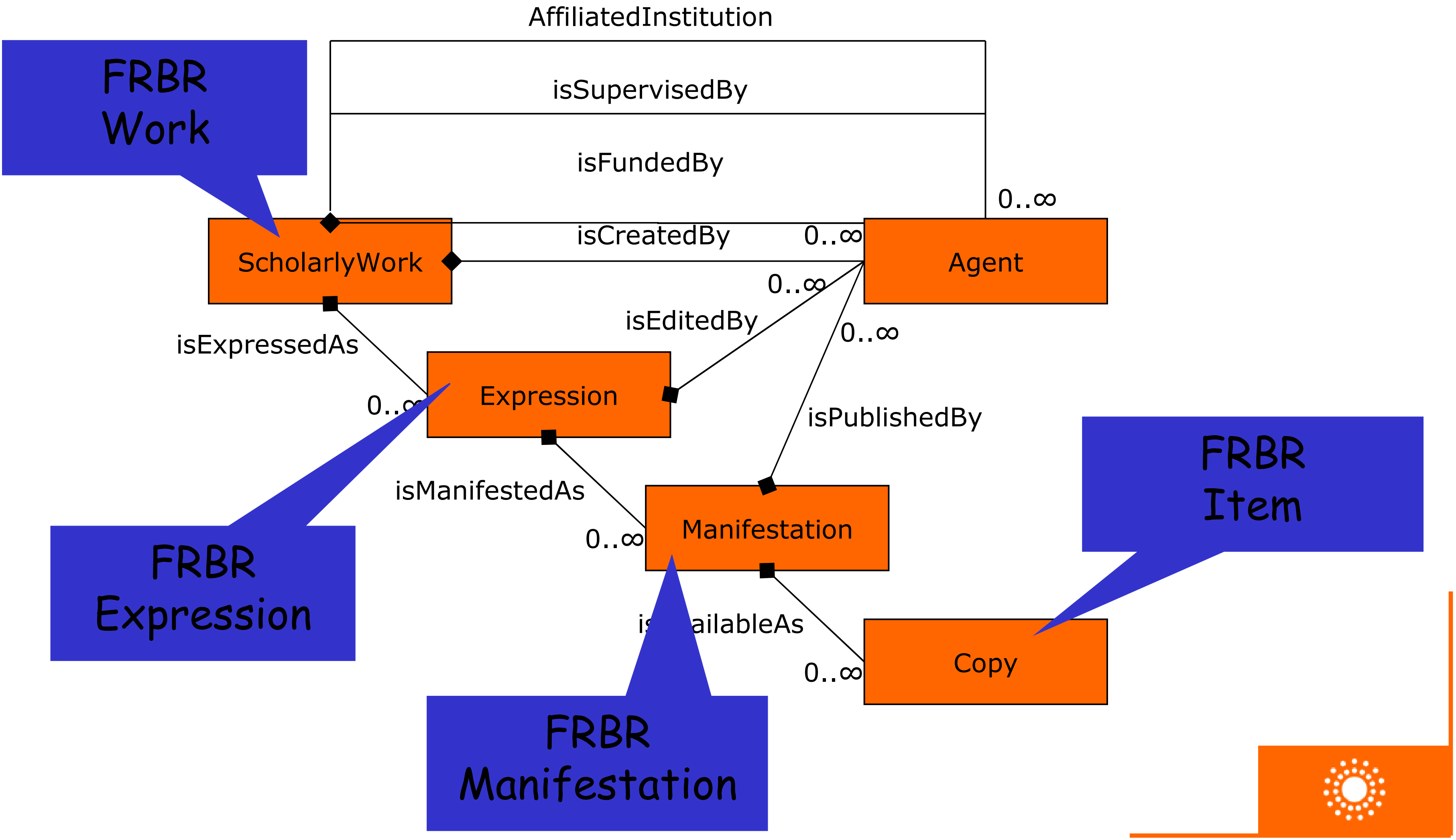
Eprints application model

- based on FRBR
- but some of the labels have been changed - to make things more intuitive, e.g.
  - Work → ScholarlyWork
  - Item → Copy

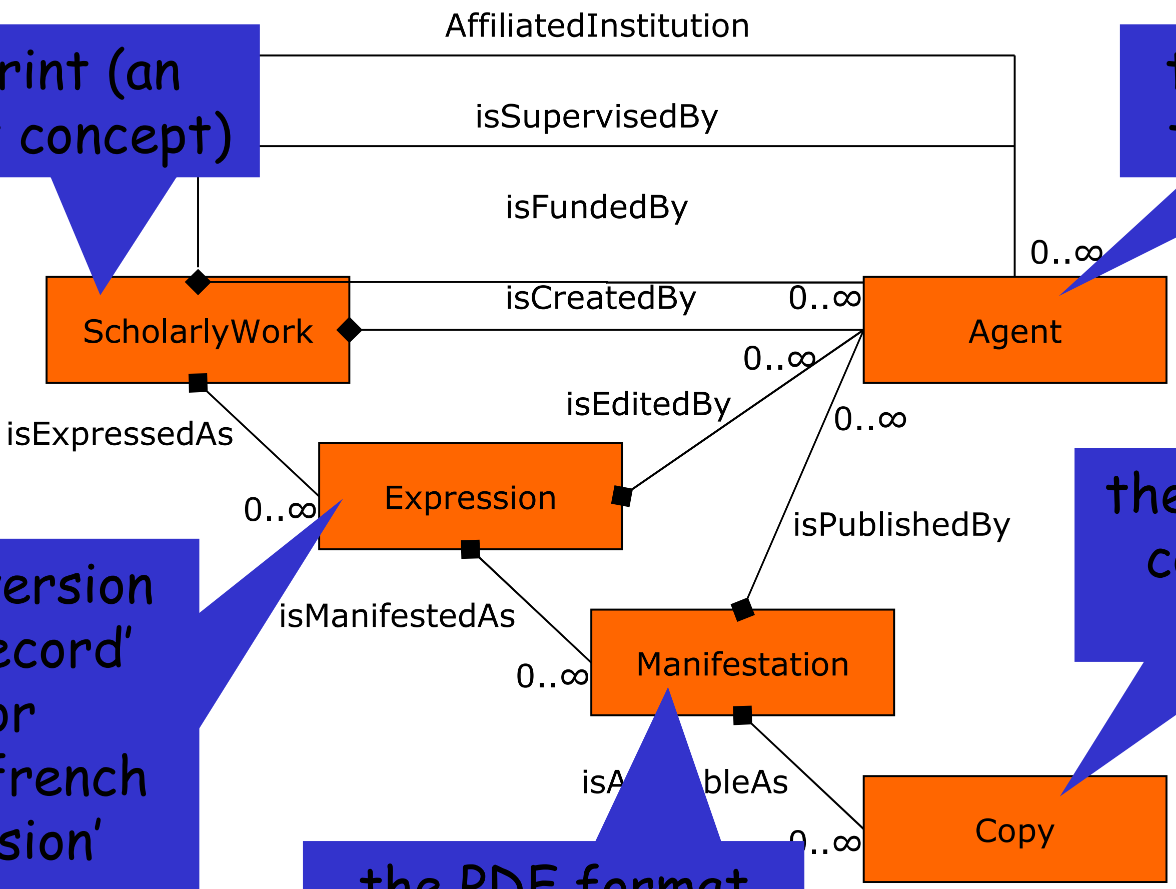
Eprints application model



Eprints model and FRBR



Eprints model and FRBR



the eprint (an abstract concept)

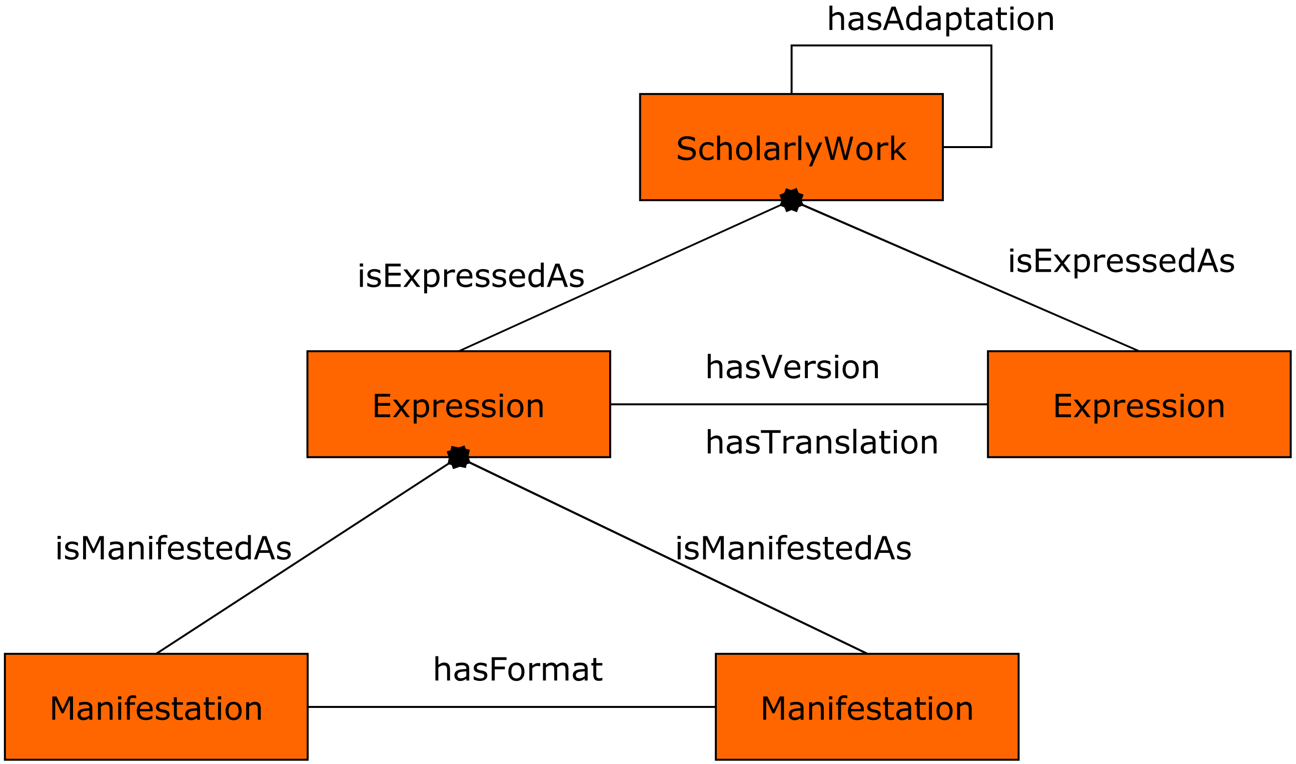
the author or the publisher

the 'version of record' or the 'french version' or 'version 2.1'

the PDF format of the version of record

the publisher's copy of the PDF …

Vertical vs. horizontal relationships



Attributes

- the application model defines the entities and relationships
- each entity needs to be described using an agreed set of attributes

Example attributes

ScholarlyWork:
title
subject
abstract
identifier

Expression:
title
date available
status
version number
language
genre / type
copyright holder
bibliographic citation
identifier

Manifestation:
format
date modified

Copy:
date available
access rights
licence
identifier

Agent:
name
type of agent
date of birth
mailbox
homepage
identifier

How is this complexity captured in DC?

- the DC Abstract Model provides the notion of 'description sets'
- i.e. groups of related 'descriptions'
- where each 'description' is about an instance of one of the entities in the model
- relationships and attributes are instantiated as metadata properties

Final thoughts on the model

- this model makes it easier to rationalise ‘traditional’ and ‘modern’ citations
  - traditional citations tend to be made between eprint ‘expressions’
  - hypertext links tend to be made between eprint ‘copies’ (or ‘items’ in FRBR terms)
- adopting a simple underlying model now may be expedient in the short term but costly to interoperability in the long term
  - the underlying model need to be as complex as it needs to be, but not more so!
- a complex underlying model may be manifest in relatively simple metadata and/or end-user interfaces
- existing eprint systems may well capture this level of detail currently – but use of simple DC stops them exposing it to others!

The application profile and vocabularies

Julie

The application profile and vocabularies

- Available at
  www.ukoln.ac.uk/repositories/digirep/index/EPrints_Application_Profile
- Contains recommendations, cataloguing/usage guidelines and examples
- Little is mandatory, prescriptive statements are limited
- Structured according to the model
  - ScholarlyWork
  - Expression
  - Manifestation
  - Copy
  - Agent

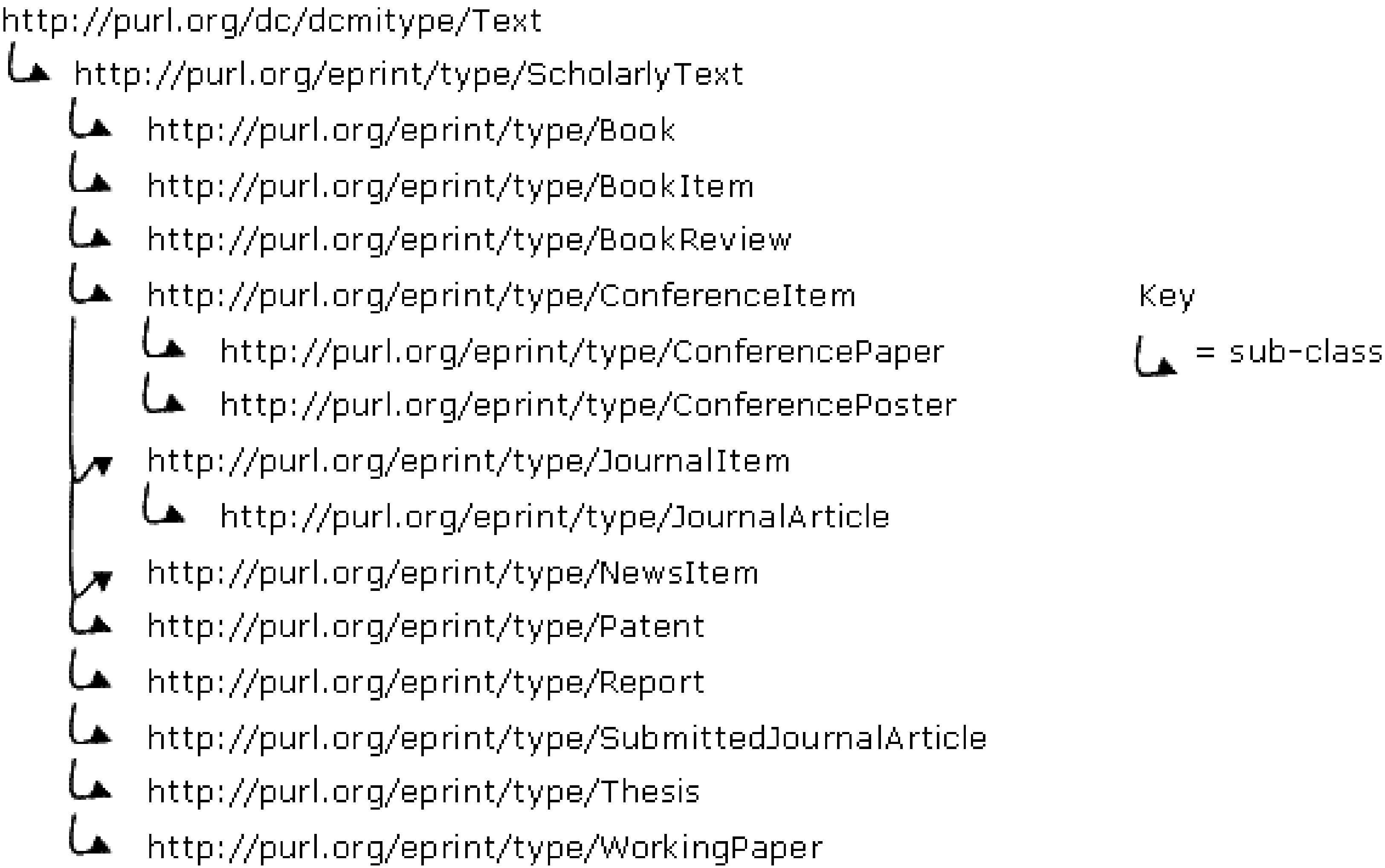
The application profile

- Contains:
  - Simple DC properties (the usual suspects …)
    - identifier, title, abstract, subject, creator, publisher, type, language, format
  - Qualified DC properties
    - access rights, licence, date available, bibliographic citation, references, date modified
  - New properties
    - grant number, affiliation institution, status, version, copyright holder, status
  - Properties from other schemes
    - funder, supervisor, editor (MARC relators)
    - name, family name, given name, workplace homepage, mailbox, homepage (FOAF)
  - Clearer use of existing relationships
    - has version, is part of
  - New relationship properties
    - has adaptation, has translation, is expressed as, is manifested as, is available as

The vocabularies

- Eprints EntityType Vocabulary Encoding Scheme
  - ScholarlyWork
  - Expression
  - Manifestation
  - Copy
  - Agent
- Eprints Status Vocabulary Encoding Scheme
  - PeerReviewed
  - NonPeerReviewed
- Eprints AccessRights Vocabulary Encoding Scheme
  - Open Access
  - Restricted Access
  - Closed Access
- Eprints Type Vocabulary Encoding Scheme

ePrints type vocabulary encoding scheme



- http://purl.org/dc/dcmitype/Text
  - http://purl.org/eprint/type/ScholarlyText
    - http://purl.org/eprint/type/Book
    - http://purl.org/eprint/type/BookItem
    - http://purl.org/eprint/type/BookReview
    - http://purl.org/eprint/type/ConferenceItem
      - http://purl.org/eprint/type/ConferencePaper
      - http://purl.org/eprint/type/ConferencePoster
    - http://purl.org/eprint/type/JournalItem
      - http://purl.org/eprint/type/JournalArticle
    - http://purl.org/eprint/type/NewsItem
    - http://purl.org/eprint/type/Patent
    - http://purl.org/eprint/type/Report
    - http://purl.org/eprint/type/SubmittedJournalArticle
    - http://purl.org/eprint/type/Thesis
    - http://purl.org/eprint/type/WorkingPaper

Key

↳ = sub-class

Example

- Expressed in DC-Text
- Uses terms from the following schemes:

```
@prefix dc: <http://purl.org/dc/elements/1.1/> .
@prefix dcterms: <http://purl.org/dc/terms/> .
@prefix eprint: <http://purl.org/eprint/terms/> .
@prefix foaf: <http://xmlns.com/foaf/0.1/> .
```

- The description set contains descriptions, or links to the descriptions, for each entity.

```
DescriptionSet (
```

Example : description of a scholarly work

```
Description (
    Resource URI ( <http://eprints.soton.ac.uk/22934/> )
    Statement (
      Property URI ( dc:type )
      ValueURI ( <http://purl.org/eprint/entitytype/ScholarlyWork> )
    )
    Statement (
      Property URI ( dc:identifier )
      Value String ( "http://eprints.soton.ac.uk/22934/" )
      Syntax Encoding Scheme URI ( dcterms:URI )
    )
    Statement (
      Property URI ( dc:title )
      Value String ( "Structurally integrated brushless PM motor for miniature propeller
     thrusters" )
    )
    Statement (
      Property URI ( dc:creator )
      Value String ( "Abu Sharkh, S.M.A. (Suleiman)" )
      DescriptionRef ( AbuSharkhSM )
    )
    Statement (
      Property URI ( dc:creator )
      Value String ( "Lai, S.H." )
```

Each entity has an identifier

Points to a related description within the description set

Example : description of a scholarly work contd.

```
Statement (
   Property URI ( dcterms:abstract )
   Value String ( "The design, analysis and performance of a brushless PM motor that … " )
  )
  Statement (
   Property URI ( dc:subject )
   Vocabulary Encoding Scheme URI ( dcterms:LCSH )
   Value String ( "T Technology--TC Hydraulic engineering. Ocean engineering" )
  )
  Statement (
   Property URI ( dc:subject )
   Vocabulary Encoding Scheme URI ( dcterms:LCSH )
   Value String ( "T Technology--TK Electrical engineering. Electronics Nuclear engineering" )
  )
  Statement (
   Property URI ( dc:subject )
   Vocabulary Encoding Scheme URI ( dcterms:LCSH )
   Value String ( "T Technology--TL Motor vehicles. Aeronautics. Astronautics" )
  )
  Statement (
   Property URI ( eprint:affiliatedInstitution )
   Value String ( "University of Southampton" )
   DescriptionRef ( sotonuni )
  )
  Statement (
   Property URI ( eprint:isExpressedAs )
   Value URI ( <http://dx.doi.org/10.1049/ip-epa:20040736> )
  )
```

The referenced expression has a DOI

Example : description of an expression

```
 Description (
   Resource URI ( <http://dx.doi.org/10.1049/ip-epa:20040736> )
   Statement (
    Property URI ( dc:type )
    ValueURI ( <http://purl.org/eprint/entitytype/Expression> )
   )
Statement (
    Property URI ( dc:type )
    Value URI ( <http://purl.org/eprint/type/JournalArticle> )
   )
   Statement (
    Property URI ( dc:identifier )
    Value String ( "http://dx.doi.org/doi:10.1049/ip-epa:20040736" )
    Syntax Encoding Scheme URI ( dcterms:URI )
   )
   Statement (
    Property URI ( dcterms:available )
    Syntax Encoding Scheme URI (dcterms:W3CDTF )
    Value String ( "2004" )
   )
  Statement (
    Property URI ( eprint:status )
    Vocabulary Encoding Scheme ( eprint:status )
    ValueURI ( <http://purl.org/eprint/status/PeerReviewed> )
   )
```

Each expression has at least one Type value

The Status VES is used to indicate if an expression is peer reviewed

Example : description of an expression contd.

```
Statement (
     Property URI ( dcterms:copyrightHolder )
     Value String ( "Institution of Engineering and Technology" )
    )
    Statement (
     Property URI ( dcterms:bibliographicCitation )
     Value String ( "IEE Proceedings - Electric Power Applications, 151, (5), 513-519 (2004)" )
     Value String ( "&ctx_ver=Z39.88-
    2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=article
    &rft.atitle=Structurally+integrated+brushless+PM+motor+for+miniature+propeller+thrusters
    &rft.jtitle=IEE+Proceedings+-+Electric+Power+Applications&rft.volume=151&rft.issue=5
    &rft.spage=513&rft.date=2004&rft.issn=1350-2352
    &rft.aulast=Sharkh&rft.auinit=S+M+A
    &rfr_id=info:sid/eprints.soton.ac.uk"
       Syntax Encoding Scheme URI ( <info:ofi/fmt:kev:mtx:ctx> ) )
    )
    Statement (
     Property URI ( eprint:isManifestedAs )
     DescriptionRef ( manifestation1 )
    )
    Statement (
     Property URI ( dc:language )
     Value String ( "en" )
    )
```

A text bibliographic citation and OpenURL Context Object can be supplied

Example : description of a manifestation

```
Description (
  DescriptionId ( manifestation1 )
  Statement (
   Property URI ( dc:type )
   ValueURI ( <http://purl.org/eprint/entitytype/Manifestation> )
  )
  Statement (
   Property URI ( dc:format )
   Vocabulary Encoding Scheme URI ( dcterms:IMT )
   Value String ( "application/pdf" )
  )
  Statement (
   Property URI ( dc:publisher )
   Value String ( "Institution of Engineering and Technology" )
  )
  Statement (
   Property URI ( eprint:isAvailableAs )
   Value URI
  ( <http://scitation.aip.org/getpdf/servlet/GetPDFServlet?filetype=pdf&id=IEPAER00
  0151000005000513000001&idtype=cvips&prog=normal> )
  )
 )
```

Each entity has an EntityType value

Example : description of a Copy

```
Description (
    Resource URI
      ( <http://scitation.aip.org/getpdf/servlet/GetPDFServlet?filetype=pdf&id=IEPAER00015100000500
      0513000001&idtype=cvips&prog=normal> )
    Statement (
      Property URI ( dc:type )
      Value URI ( <http://purl.org/eprint/entitytype/Copy> )
    )
    Statement (
      Property URI ( dcterms:licence )
      Value URI ( <http://www.ietdl.org/journals/doc/IEEDRL-home/info/subscriptions/terms.jsp> )
    )
    Statement (
      Property URI ( dcterms:accessRights )
      Value URI ( <http://purl.org/eprint/accessRights/RestrictedAccess> )
    )
    Statement (
      Property URI ( dcterms:isPartOf )
      Value URI ( <http://www.theiet.org/> )
      Value String ( "Institution of Engineering and Technology" )
    )
    Statement (
      Property URI ( dcterms:isPartOf )
      Value URI ( <http://www.ietdl.org/> )
      Value String ( "IET Digital Library" )
    )
  )
```

This Copy is restricted access

This Copy is supplied by the IET Digital Library

Example : description of an Agent (organisation)

```
Description (
  DescriptionId ( sotonuni )
  Statement (
    Property URI ( dc:type )
    Value URI ( <http://purl.org/eprint/entitytype/Organization> )
  )
  Statement (
    Property URI ( foaf:name )
    Value String ( "University of Southampton" )
  )
  Statement (
    Property URI ( foaf:homepage )
    Value URI ( "http://www.soton.ac.uk/" )
  )
)
```

The foaf standard provides agent information

Example : description of an Agent (person)

```
Description (
    DescriptionId ( AbuSharkhSM )
    Statement (
      Property URI ( dc:type )
      Value URI ( <http://purl.org/eprint/entitytype/Person> )
    )
    Statement (
      Property URI ( foaf:givenname )
      Value String ( "Suleiman" )
    )
    Statement (
      Property URI ( foaf:familyname )
      Value String ( "Abu Sharkh" )
    )
    Statement (
      Property URI ( foaf:homepage )
      Value URI ( <http://www.soton.ac.uk/ses/people/AbuSharkhSM.html> )
    )
    Statement (
      Property URI ( foaf:workplaceHomepage )
      Value URI ( <http://www.soton.ac.uk/> )
    )
  )
 )
```

Dumb-down issues

Andy

Dumb-down

- so… how do we get from these complex descriptions to simple DC descriptions?
- first need to decide what the resulting simple DC description is going to be about?
- the eprints application profile descriptions contain descriptions about all the entities in the model…

Dumb-down to what?

- some options for dumbing-down:
  - one simple DC description about the ScholarlyWork
  - one simple DC description about each Copy
  - separate simple DC descriptions about every entity
  - separate simple DC descriptions about the ScholarlyWork and each Copy

ScholarlyWork and Copy

- we have chosen to dumb-down to separate simple DC descriptions of the ScholarlyWork and each Copy
- rationale:
  - simple DC about the ScholarlyWork corresponds to previous guidance about using simple DC to describe eprints
  - simple DC about each Copy useful for getting to full-text, e.g. by Google

Dumb-down algorithm

- not covered here…
- see detailed documentation in the Wiki

http://www.ukoln.ac.uk/repositories/digirep/index/Mapping_the_Eprints_Application_Profile_to_Simple_DC

Community acceptance

Julie

Community acceptance plan

- Application Profile as a start
- Community take-up will validate
  - UK initially
  - Benefits of global acceptance
- Deployment by developers, repositories, services
  - Statements from Eprints.org, DSpace, Fedora, Intute and EDINA
  - Early adopters from established projects and repositories
- Dissemination
  - This workshop
  - Workshop at Open Scholarship 2006
  - Ongoing, e.g. through Dlib, Ariadne, Open Repositories 2007, discussion list etc.

Discussion