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# Reusable Intelligent Content Objects (RICO)

**Tobias Bürger, STI Innsbruck**

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- *What is the problem?*
  - *The amount of multimedia content is huge; all of which is potentially reusable*
  - *Reusability potential of content is low and retrieval is hard*
- *Why is it a problem?*
  - *Multimedia content lacks metadata and formal descriptions*
- *My solution?*
  - *A model to semantically describe multimedia content on the Web to support efficient retrieval including a methodology to improve content selection for reuse*
- *Implications?*
  - *The model provides a single source of access for the description of multimedia content on the Web and the methodology provides more relevant search results for reusable media*

1. Content Description
  - People search based on the aboutness which is hard to derive autom.
  - Sometimes tags available; still ambiguous
  - Auxiliary information is available, but sometimes not correctly indexed
2. Metadata
  - Licenses and conditions of use typically encoded in Web pages for human consumption; hard to index automatically
  - Mostly metadata is not explicitly provided
3. Diversity of publication intentions across domains and cross site search difficult
4. Granularity of descriptions
  - PDF files or videos are described using tags but are mostly global
  - Sub-parts can not easily be found

## 1. Findability

- Describe content using high – and low level features
- Attach appropriate metadata
- Acknowledge different users in the multimedia content value chain

## 2. Adaptability

- Make structure explicit
- Provide means to add fine granular descriptions

## 3. Cross-Community Interoperability

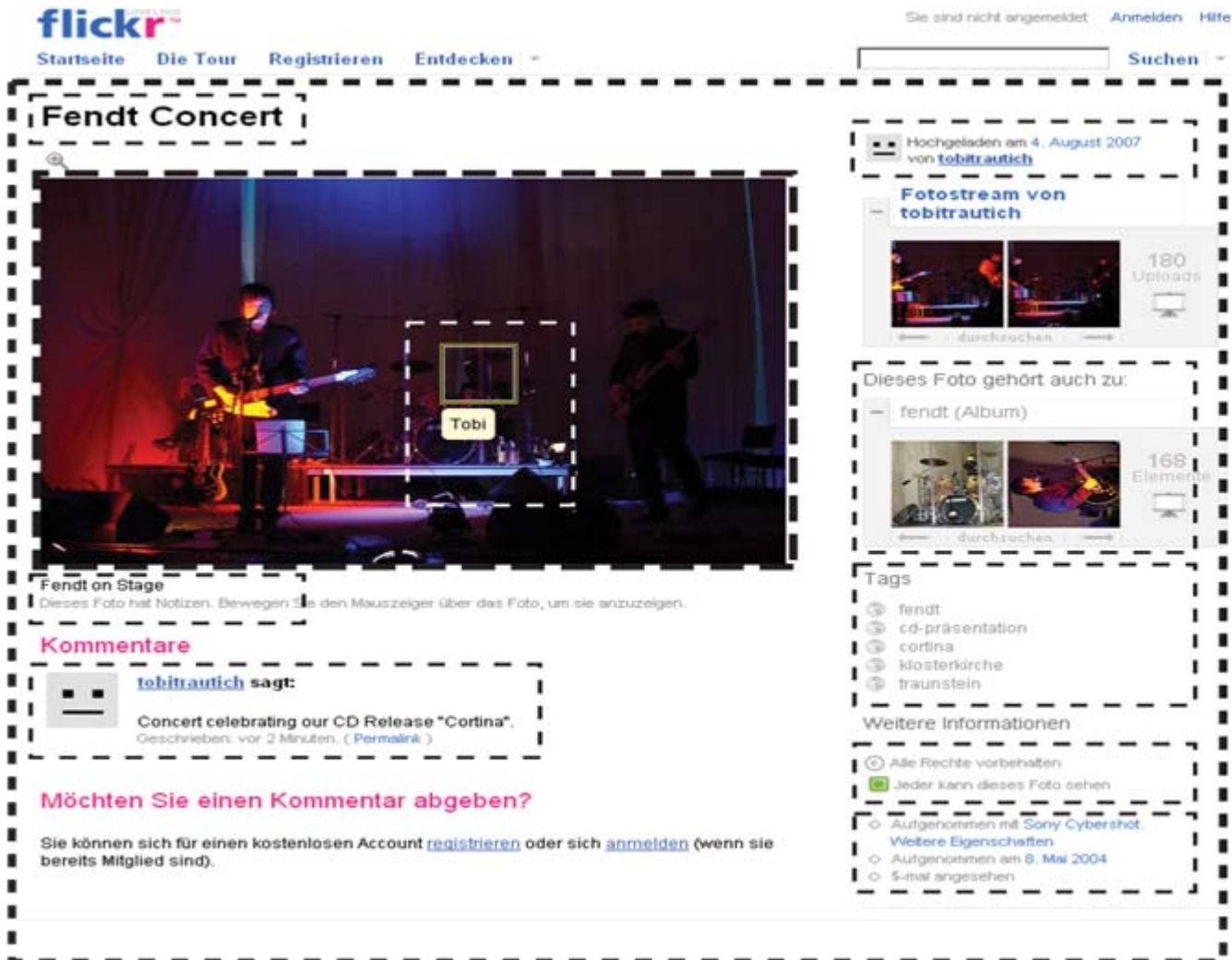
- Ensure basic compatibility with domain specific metadata standards

# RICO: A Conceptual Model for Intelligent Content for the Semantic Web



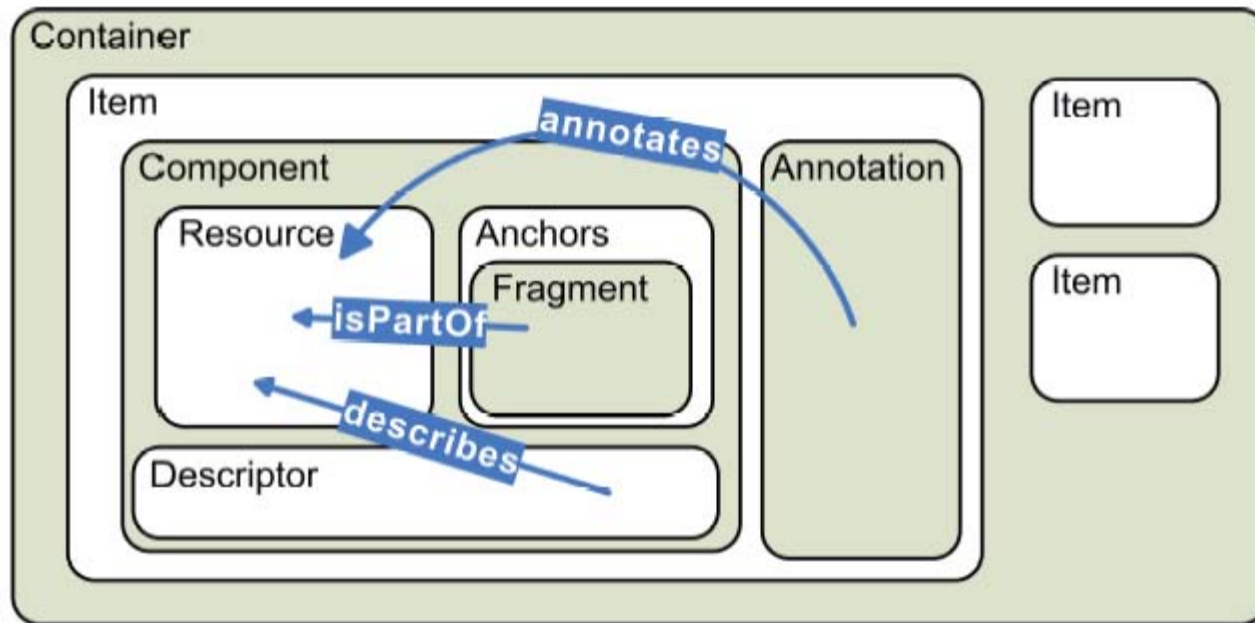
- Use of annotations and semantic descriptions
- Descriptions are explicitly linked to the content
- Multimedia content is accompanied by rich metadata sets.
  
- Basic building blocks
  - RICO data model
  - RICO metadata model: MARCO (“Metadata for Reusable Content Objects”)

# RICO: A Multimedia Resource Centric View of typical HTML Pages



The screenshot shows a Flickr page for a photo titled "Fendt Concert". The page is annotated with dashed boxes highlighting various multimedia resource elements:

- Page Header:** The Flickr logo and navigation links (Startseite, Die Tour, Registrieren, Entdecken) are highlighted.
- Main Photo:** A large photo of a band performing on stage. A smaller inset photo of a person is highlighted with a yellow box and labeled "Tobi".
- Caption:** The caption "Fendt on Stage" and its description are highlighted.
- Comments:** A comment by "tobitraulich" is highlighted, including the user's profile picture and the text of the comment.
- Form:** The form for submitting a comment is highlighted, including the prompt "Möchten Sie einen Kommentar abgeben?" and the registration/login information.
- Right Sidebar:** Several elements are highlighted:
  - The upload information: "Hochgeladen am 4. August 2007 von tobitraulich".
  - The "Fotostream von tobitraulich" section, showing a grid of photos and "180 Uploads".
  - The "Dieses Foto gehört auch zu:" section, showing a link to the "fendt (Album)" with "168 Elemente".
  - The "Tags" section, listing tags like "fendt", "cd-präsentation", "cortina", "klosterkirche", and "traunstein".
  - The "Weitere Informationen" section, including a copyright notice, a privacy setting, and technical details like "Aufgenommen mit Sony Cybershot" and "Aufgenommen am 8. Mai 2004".

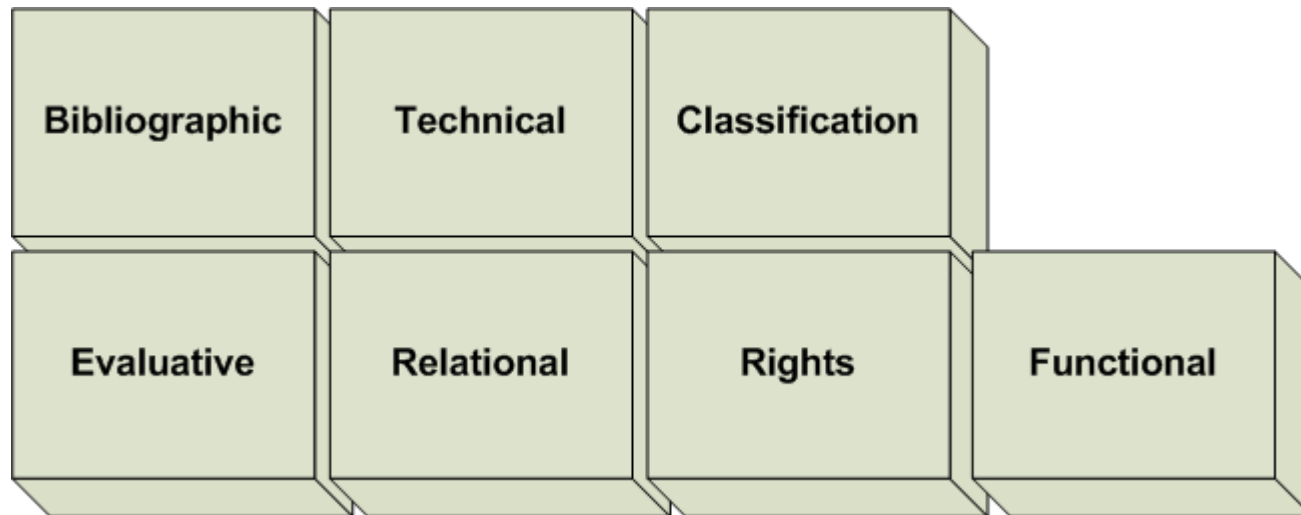


**Figure 1: Main Elements Within the MPEG-21 Digital Item Declaration Model Used in RICO**

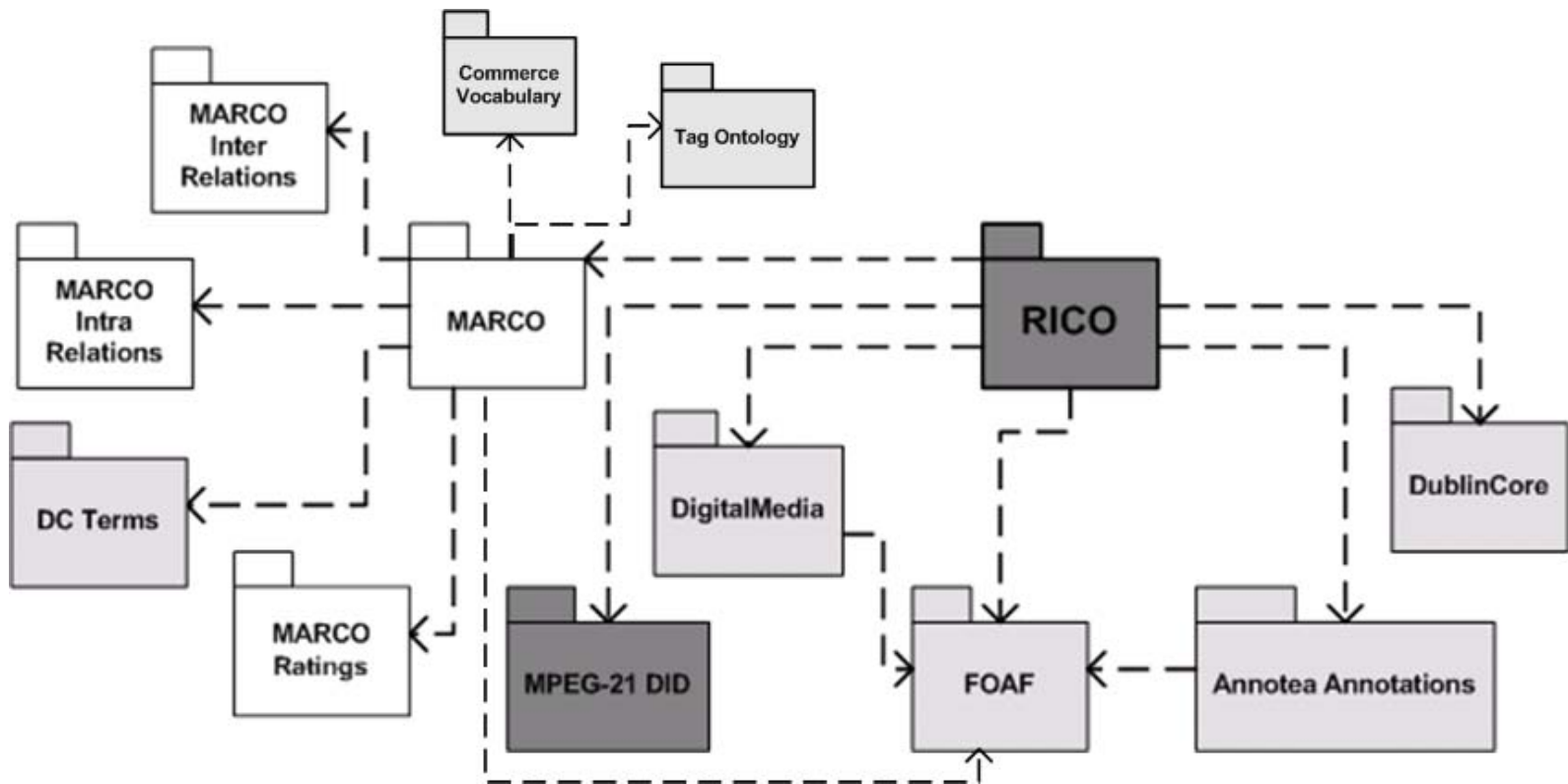


- Acknowledges different users in the content lifecycle and their different roles
- Supports basic metadata in different categories which are proven to support efficient retrieval
- Realized by a set of ontologies to guarantee interoperability

# MARCO – Building Blocks

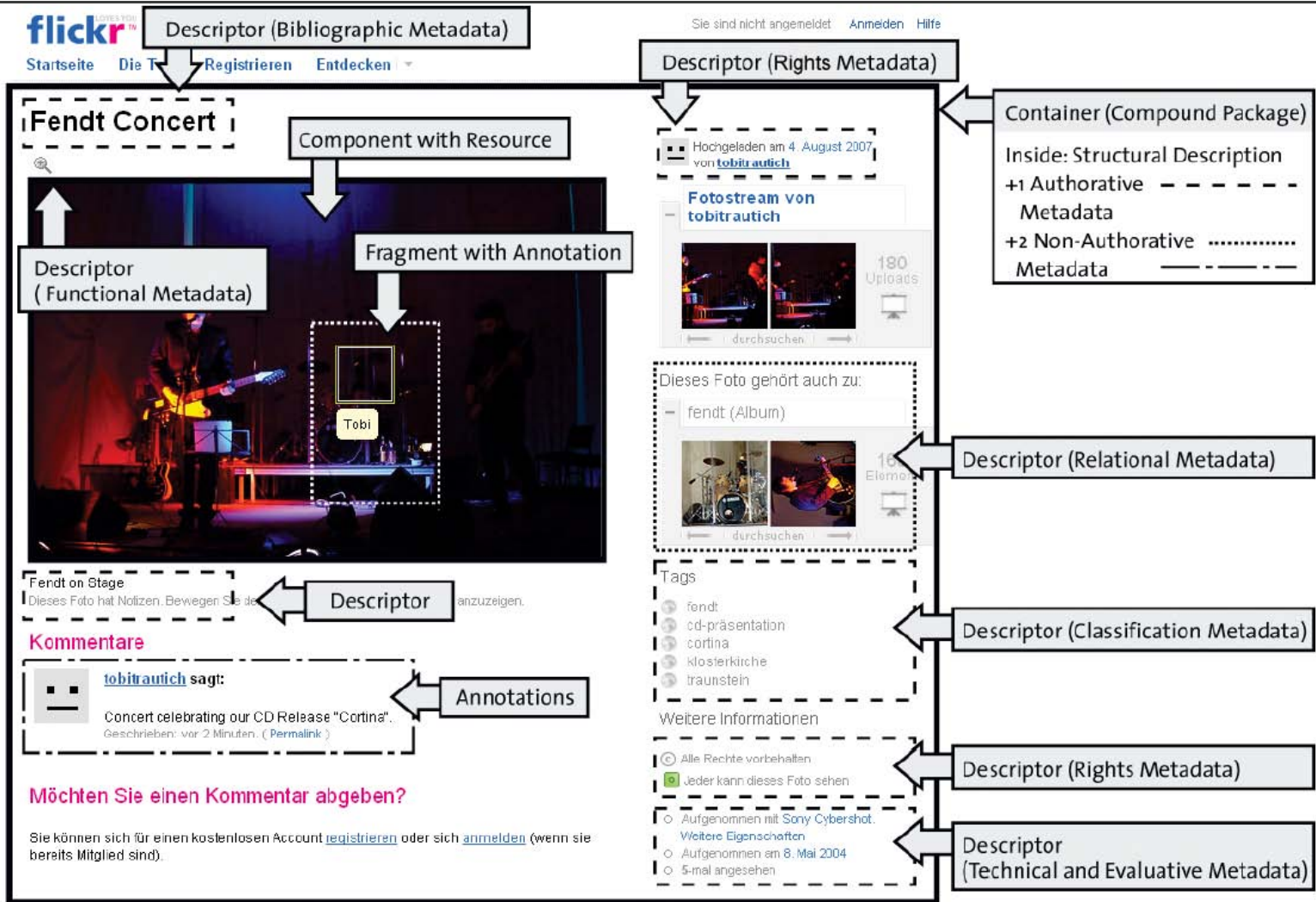


# Realisation: The RICO ontologies

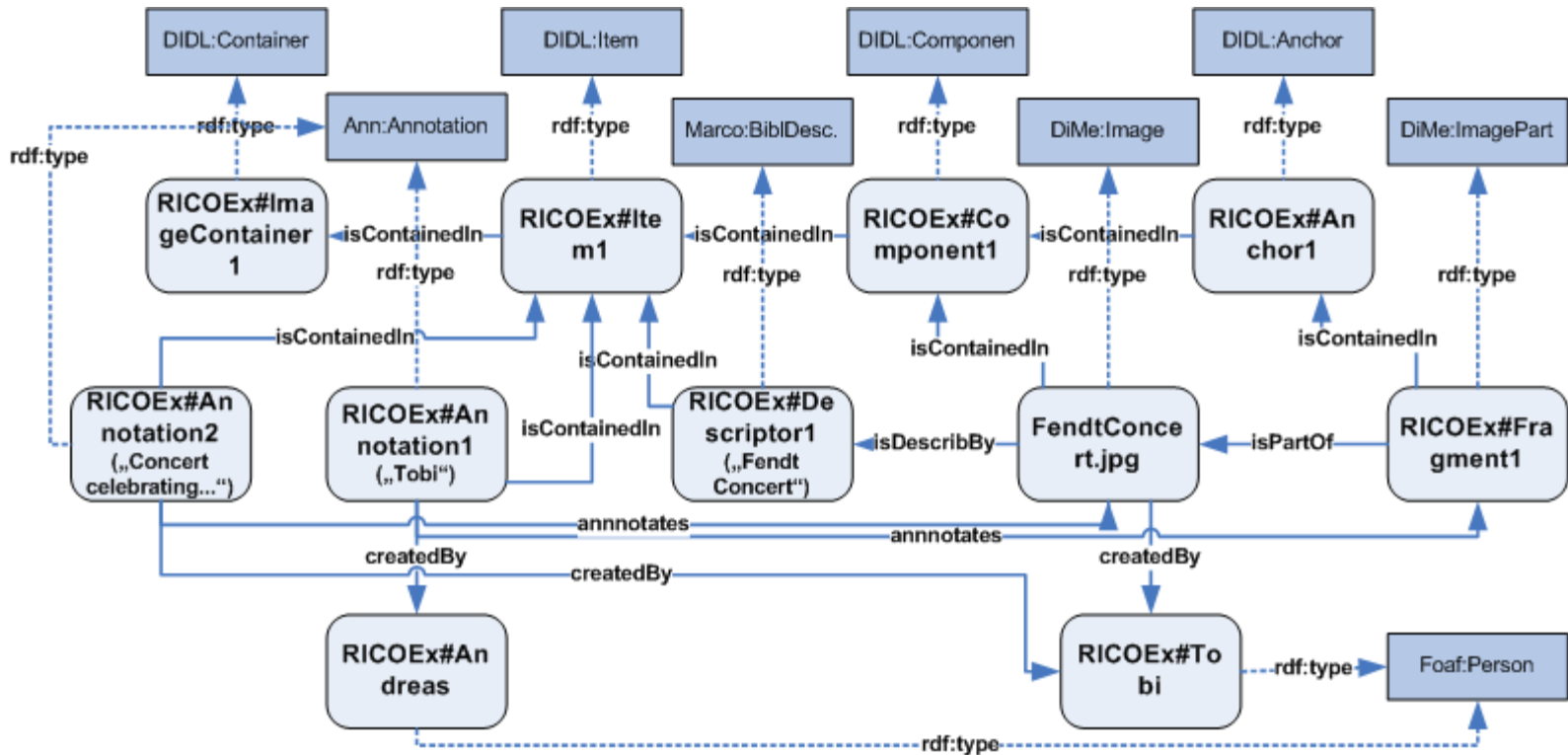


- Specialization of RICO for specific media types
- Uses specific technical metadata standards
- Uses specific facilities to identify and select fragments
  
- RICO4Images
  - Uses EXIF metadata standard for technical metadata
  - Uses SVG to specify regions in images (as applied in the Mindswap Digital Media ontology)
  - Uses PLUS („Picture Licencing Universal Standard“)  
Imaging Licensing Schema

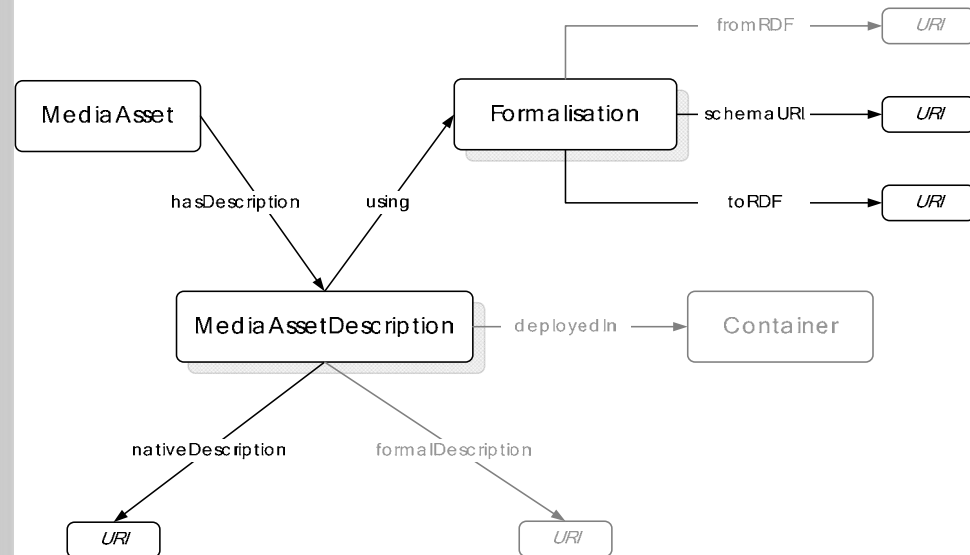
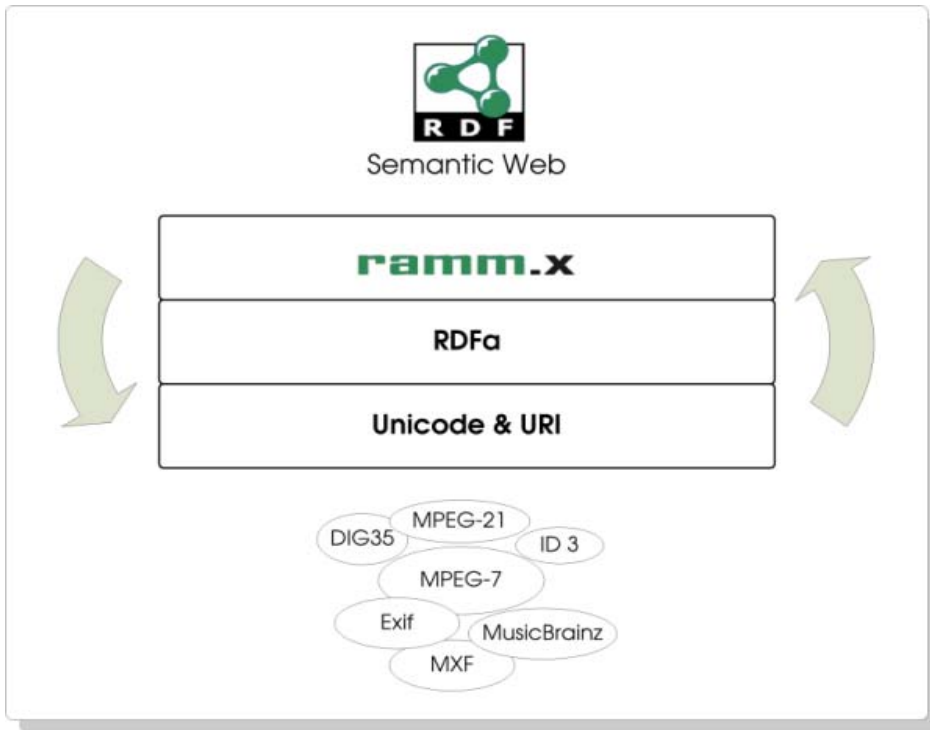
# RICO ("Reusable Intelligent Content Objects") - Revisited



# RDF from the Flickr Example



# Deployment of RICOs on the Semantic Web: Ramm.X

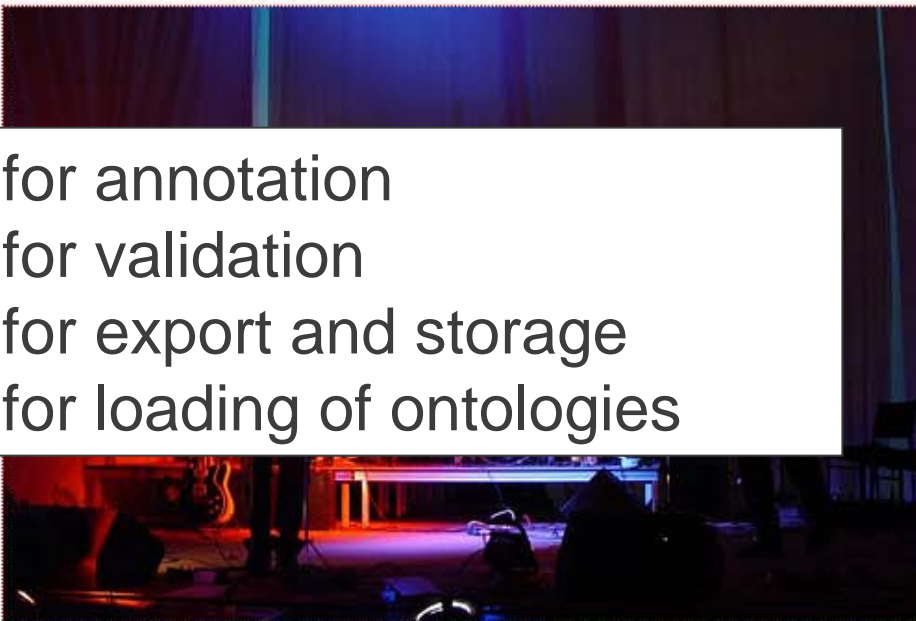


RDFa deployed multimedia metadata (Ramm.X)

# RDFa from the Flickr Example

```
1. <html xmlns:did="http://purl.org/did#" xmlns:digmed="http://purl.org/digital-media#"
2. ..
3. <body typeof="did:Container" about="#FlickrContainer">
4. ...
5. <div id="Main" typeof="did:Item">
6. <span about="#Main" rel="did:isContainedInDirectly" resource="#FlickrContainer"/>
7. ...
8. <span rel="did:containsDirectly" href="#title_div1006595501">
9. <h1 typeof="did:Descriptor" id="title_div1006595501" property="dc:title">Fendt Concert</h1>
10. </span>
11. ...
12. <span rel="did:containsDirectly" href="#description_div1006595501">
13. <div typeof="did:Descriptor" id="description_div1006595501" class="photoDescription">Fendt
    on Stage&nbsp;</div>
14. </span>
15. ...
16. <div> ...
17. <span src="#Main" rel="did:containsDirectly">
18. </div>
19. <span about="img/1006595501_fa5b4597ed.jpg" rel="did:isDescribedBy"
    resource="description_div1006595501"/>
```

## Fendt Concert



- Support for annotation
- Support for validation
- Support for export and storage
- Support for loading of ontologies

### Fendt on Stage

Dieses Foto hat Notizen. Bewegen Sie den Mauszeiger über das Foto, um sie anzuzeigen.

### Kommentare

**tobitraulich** sagt:

Concert celebrating our CD Release "Cortina"

Geschrieben: vor 4 Monaten. ( [Permalink](#) )

### Möchten Sie einen Kommentar abgeben?

Sie können sich für einen kostenlosen Account [registrieren](#) oder sich [anmelden](#) (wenn sie bereits Mitglied sind).

Hochgeladen am 4. August 2007  
von [tobitraulich](#)

**Fotostream von tobitraulich**

178 Uploads

← durchsuchen →

Dieses Foto gehört auch zu:

fendt (Album)

166 Elemente

← durchsuchen →

### Tags

- fendt
- cd-präsentation
- cortina
- klosterkirche
- traunstein

### Weitere Informationen

- Alle Rechte vorbehalten
- Jeder kann dieses Foto sehen
- Aufgenommen mit [Sony Cybershot](#).  
[Weitere Eigenschaften](#)
- Aufgenommen am 8. Mai 2004
- 13-mal angesehen

- RICO
  - *isA* conceptual model for the description of multimedia content
  - *supports* reusability
  - *isDesignedFor* the use on the Semantic Web
  - *consistsOf*
    - RICO data model
    - MARCO metadata model
  - *isRealizedBy* a set of OWL DL ontologies
  - *isDeployed* using Ramm.X
  - *isSupportedBy* the RICO Firefox plugin
  - *owl:DisjointWith* foaf:Agent



# Questions?



**Tobias Bürger**

Researcher

tobias.buerger@sti2.at

<http://members.sti2.at/~tobiasb>