

# Media fragments in media metadata - the state in research and industry

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# Media description usage in industry

- Metadata's main purpose for media is indexing and retrieval
  - Descriptive metadata for media characteristics
  - Provenance metadata to credit source and specify rights
  - Conceptual metadata to reflect what media is perceived to represent

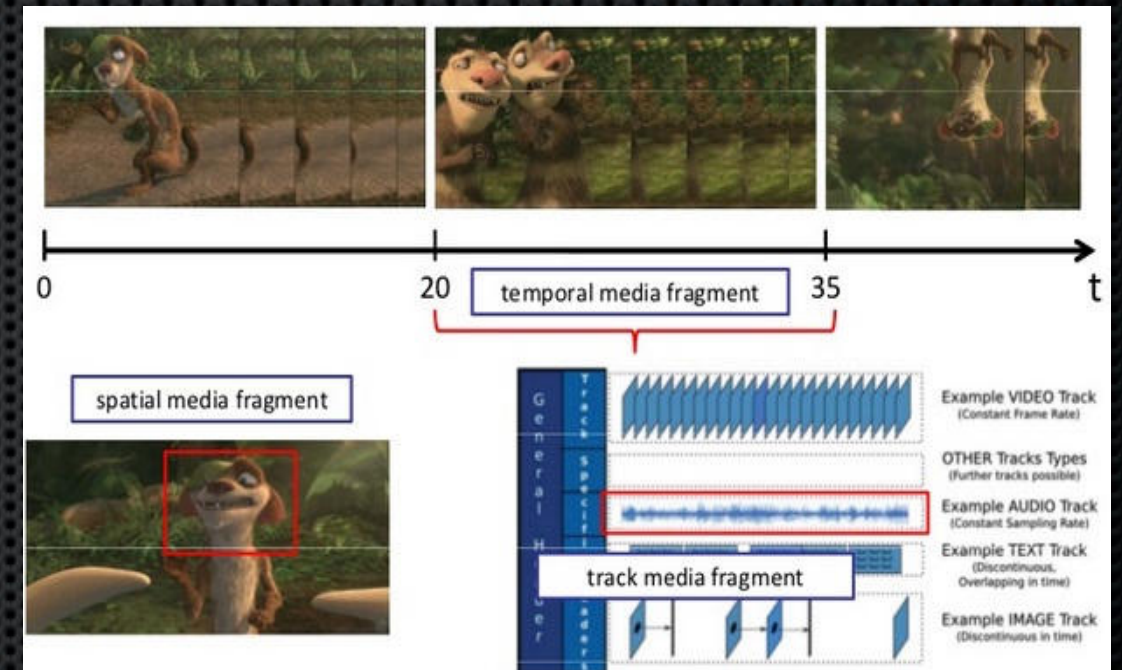


# MediaMixer issues

- In our use cases, we identify requirements to annotate media at fragment level with unambiguous concepts.
- These media descriptions may be shared with other systems so we need interoperable data models and vocabularies.
- This leads to our technology recommendations of the Media Ontology, Media Fragments Specification and Linked Data URIs.

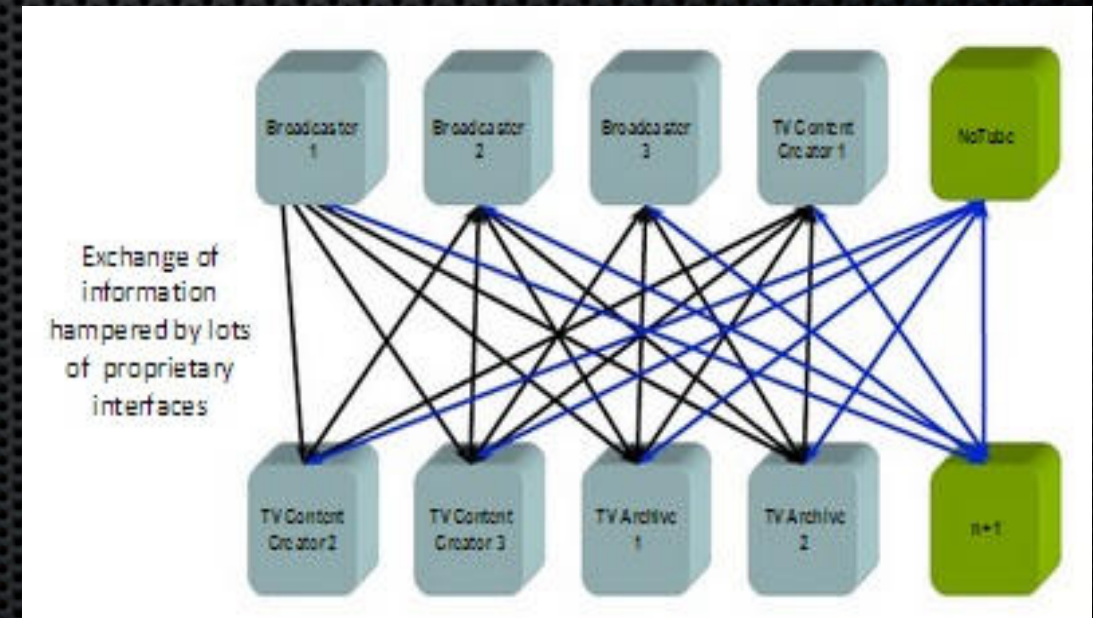
# Media fragments

- The subject of media description is typically the whole media asset
- Parts of media can represent distinct concepts, but how to refer to them?
- MPEG-7 provided for media segmentation but wasn't well defined (how does an external application refer to a media segment?)
- W3C Media Fragment URI Specification defines an agreed syntax for spatial and temporal parts of audio-visual materials on the Web



# Media description models: which one?

- Highly heterogeneous: varying coverage depending on originating community
- W3C Media Ontology defines a shared subset of all metadata properties with (rough) mappings
- More a basis for metadata interoperability than a metadata schema to be used directly

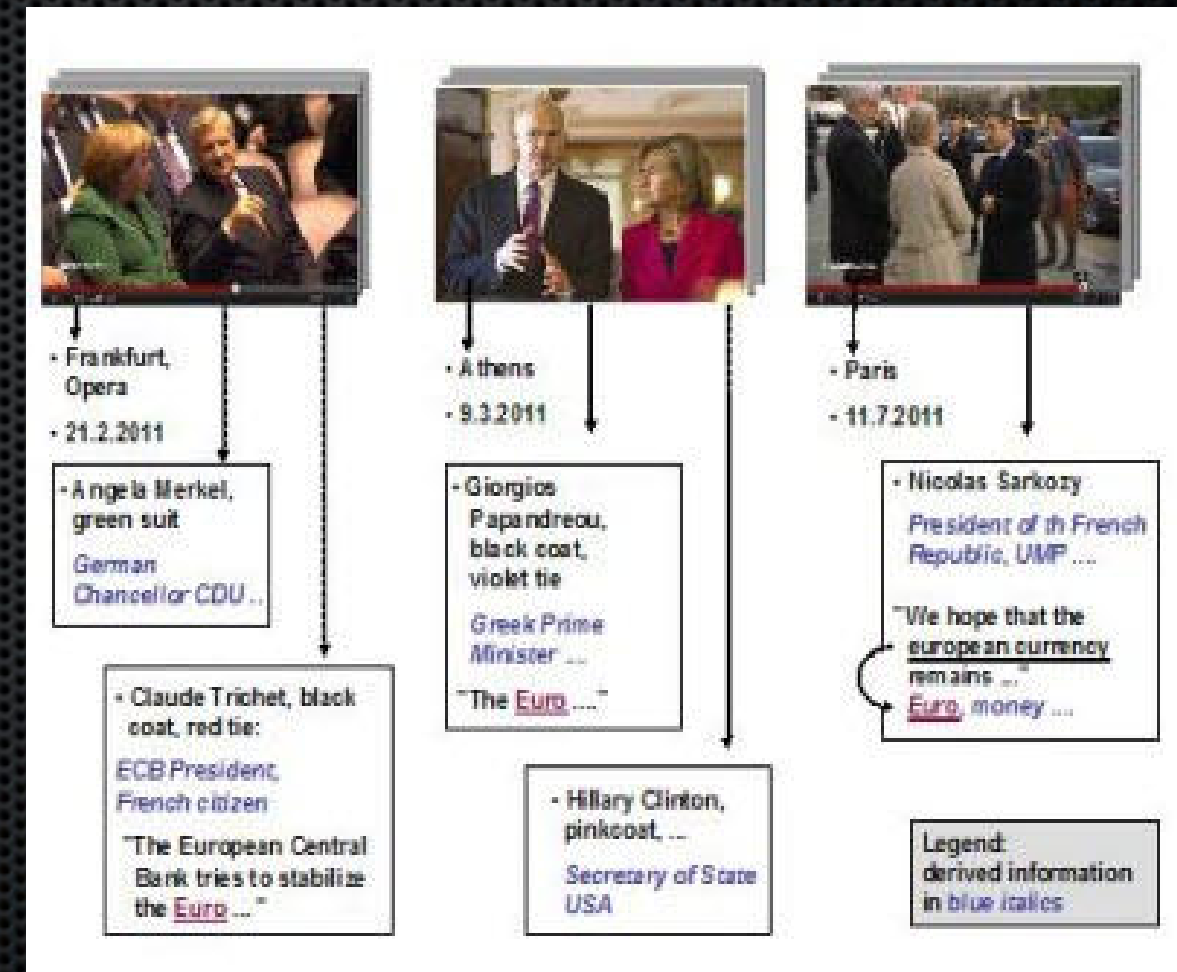


# Conceptual representation of media

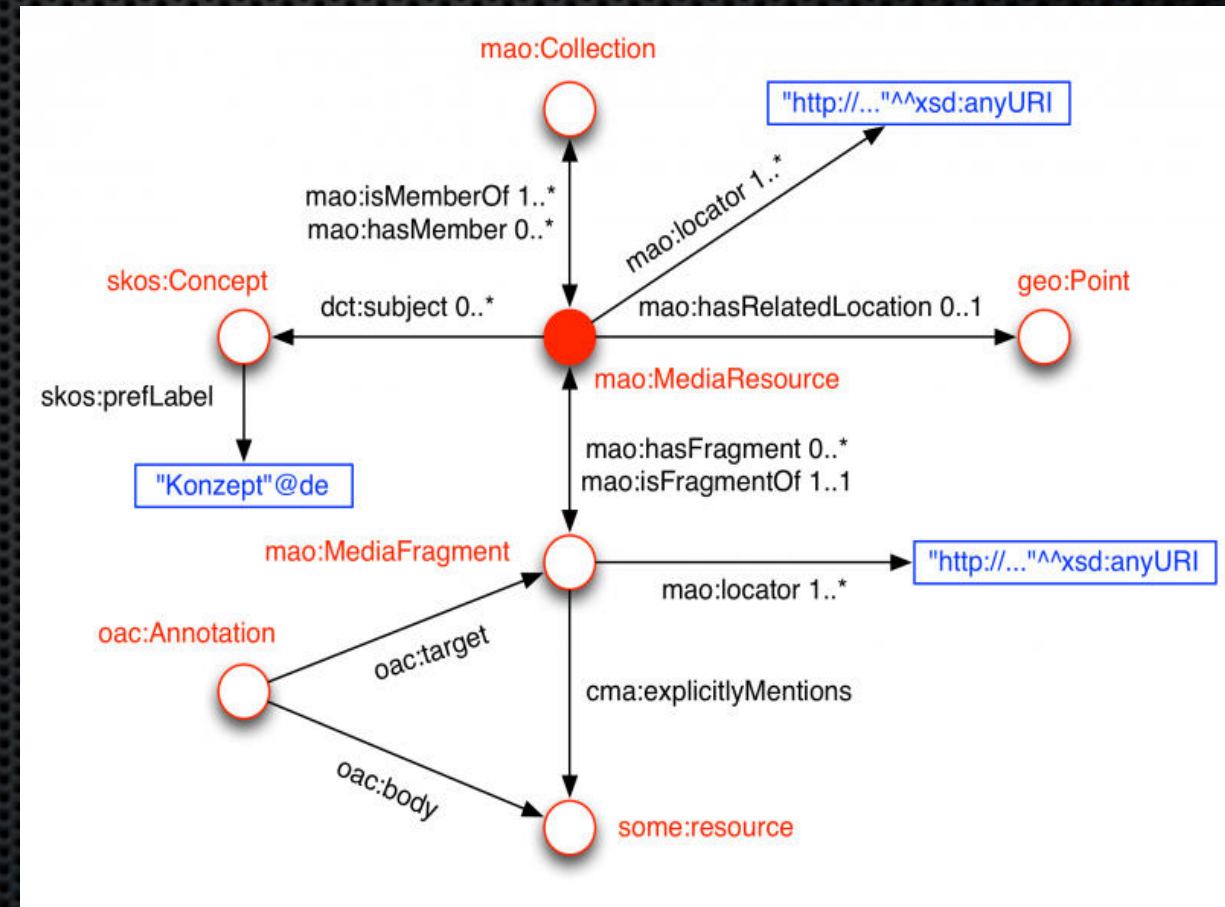
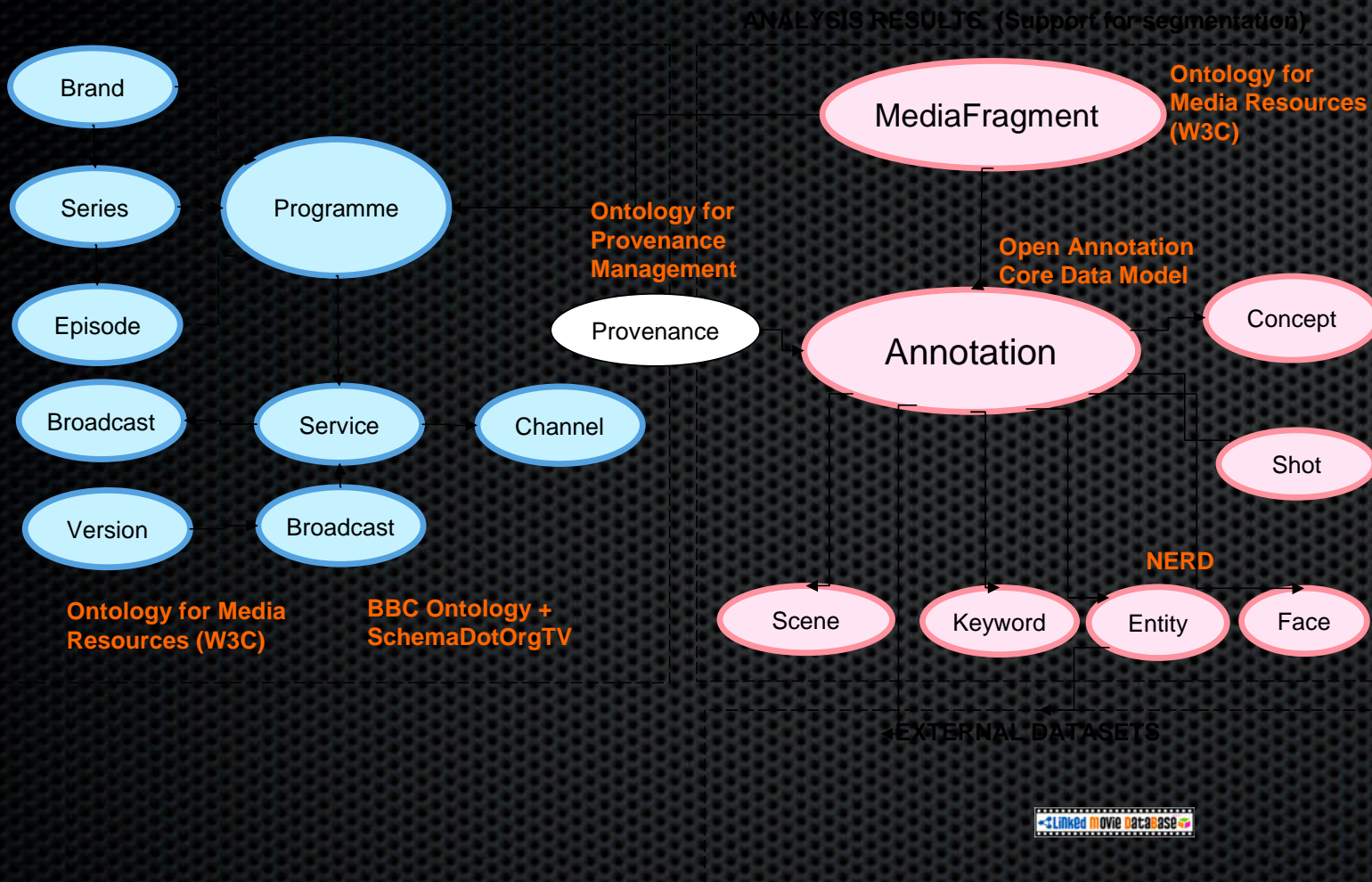
- Conceptual annotation is limited in media metadata
  - How much was the Semantics DS used in MPEG-7?
  - Typically whole media items are annotated with labels (strings) or a local controlled vocabulary (examples from EPG data: title, description, tags, categories, genres)
  - Media Ontology has only the „keyword“ property to connect media to concepts that it describes & does not enforce any means to identify the concepts referred to

# Concept space

- Globally unambiguous identifiers for any concept needed
  - Ideally more information about the concept itself is available via the identifier
- Use of Web URIs → Linked Data concept space
- Would allow for inference of concept type and relationship to other concepts



# Linked Media ontologies

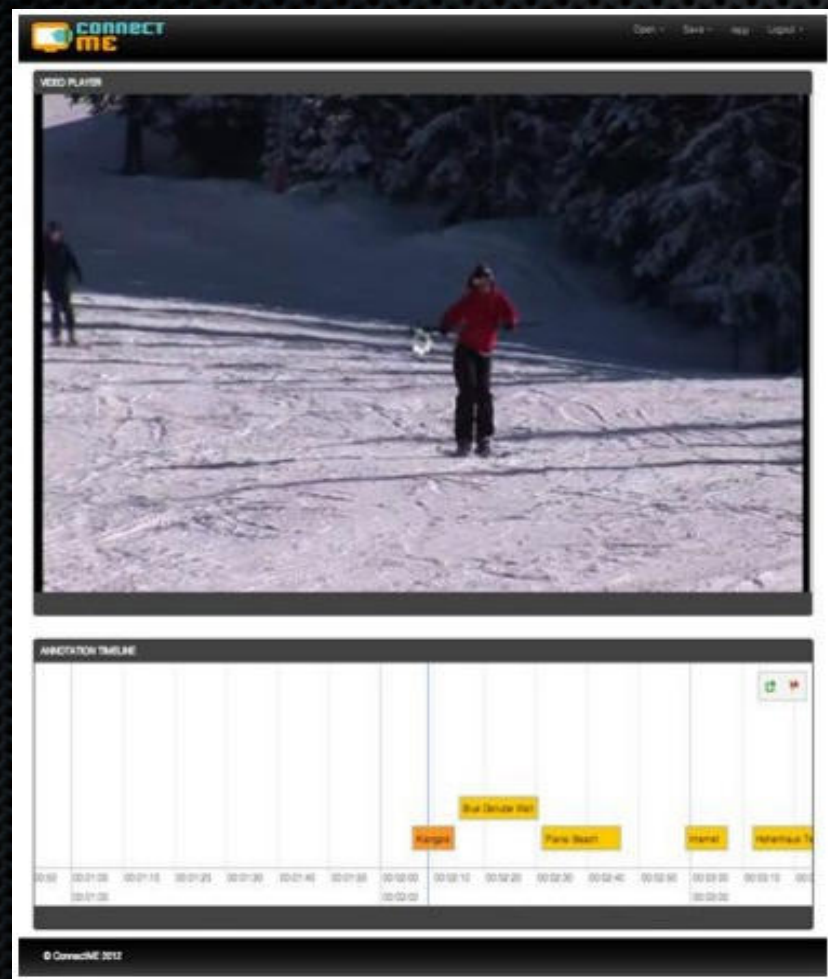




# Creating annotations using these ontologies requires tools

We can also lower the manual annotation effort by preceding this step with media analysis which can pre-identify relevant media fragments and associate terms to those fragments.

# ConnectME video annotation tool



HTML5 Web based tool

- opens annotated videos from instances of the ConnectME Framework
- can also accept new video URL (and registers the video on the ConnectME Framework)

Allows to add/change/delete annotations

- intuitive timeline view
- concept input by text (autofill)

Saves annotations in ConnectME Ontology format (RDF)

<http://annotator.connectme.at>

# LinkedTV Metadata Generator

## TV Metadata Generator

Automatic conversion of television content metadata into RDF.

- Instructions >
- Select Video Resource >
- Choose Metadata Files >
- RDF Generation >
- Upload Results to Triplestore >
- Queries over the RDF Data >

### 1. Introduction

Here we present the tool "TV Metadata Generator", developed by [Eurecom](#) under the scope of the European Project [LinkedTV FP7](#). In a nutshell, this application takes a video and its corresponding metadata files, available in different formats, and produces a RDF representation of the whole information. The knowledge graph obtained as result is suitable to be interlinked with other data in the Web, and allow the execution of complex queries that can bring the viewers a new way of enjoy Television.

#### Documentation

The serialization of television content metadata into RDF is a complex process in which various well-known ontologies are involved (like [The Open Annotation Core Data Model](#), the [Ontology for Media Resources](#), or the [Programmes Ontology](#)). For extra information about this conversion, consult the following document:

[LinkedTV Derivable D2.2](#)

#### LinkedTV Ontology

The LinkedTV model aims to make TV content and Web information seamlessly interconnected. This ontology defines a list of classes that can be relevant in the vast domain of television content, like for example Chapters, Scenes, Concepts, Objects... and allows to link them with information in external datasets.

[LinkedTV Ontology](#)

The first step for serializing metadata about a certain television content is to choose the corresponding video. For starting the process, click on:

[Select Video](#)

Open a video by URL loads the associated metadata on the LinkedTV Platform:

- ExMARaLDA analysis results
- TV Anytime
- SRT subtitles
- Output from NERD tool

Converts and aggregates all into a RDF description using the LinkedTV Ontology

<http://linkedtv.eurecom.fr/metadata>

# Conclusions

We don't need to enforce a common media schema but we do need to seek interoperability across media schemas → W3C Media Ontology as basis

Media schema need consistent approaches to describing media structure and content → Media Fragment URI Specification, Linked Data URIs

Use of media semantics leads to need for semantic data repositories to store, index and make retrievable our media fragment descriptions.

\* Ideally these repositories have inherent Linked Data and (taxonomic) reasoning support built-in. \* Is REST, SOAP or „other“ the preferred interface? Also tools (to generate, visualise or enable human editing of annotations) are tied to specific media schema and the repositories where they are stored