

Indexing A/V Documents

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Overview

- Metadata
 - Dublin core
 - MPEG-7
 - IFLA-FRBR / ECHO
- Editing Metadata
- Automatic indexing
 - Text, speech, images, moving pictures



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Metadata

- Metadata: data about data
 - Structured information about data
- Types of metadata
 - Resource discovery
 - Right management
 - Content rating
 - Archival status
 - Etc...



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Metadata

- Manual generation
 - Time consuming: high cost
 - Detailed metadata, if generated by experts
- Automatic generation
 - Fast: Reduced cost
 - Metadata contain noise
 - Imprecision, uncertainty



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Metadata Models

- Dublin core
- MPEG – 7
- IFLA – FRBR / ECHO



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Dublin core

- Flat model of 15 base elements:

Title
Creator
Contributor
Publisher
Subject
Description
Identifier
Date
Language
Type
Format
Coverage
Source
Relation
Rights



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Dublin core

- Additional detail through qualifiers
 - Element refinements
 - Es.: date.created, relation.isPartOf
 - Extensions
 - Es.: audience element (Education, libraries, government)



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Dublin core

- Core vocabulary of terms useful for description
- Cross domain discovery
 - It is not designed for a specific domain
- Interoperability
 - Different digital libraries can talk each other
- Known implementations
 - Open archive initiative
 - Many digital libraries projects
 - Open source and commercial tools



<http://dublincore.org/>
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Dublin core RDF/XML

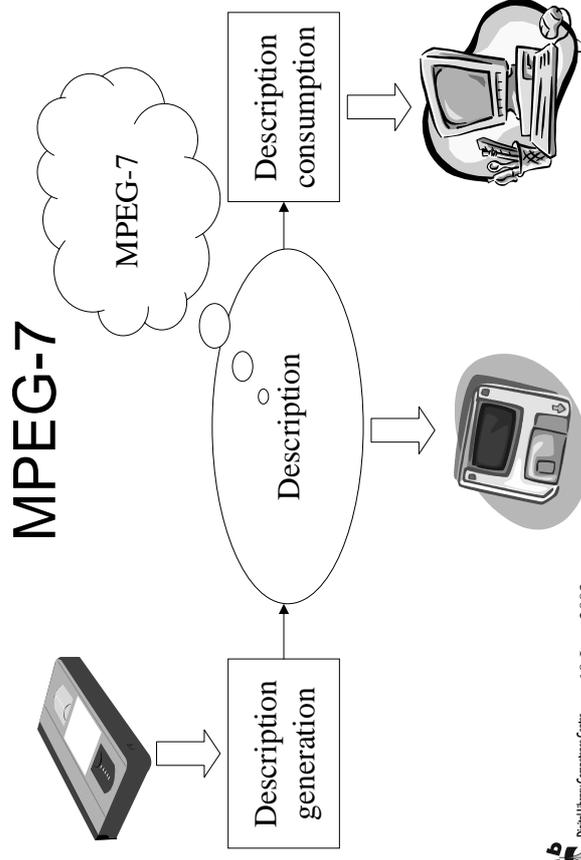
```
<?xml version="1.0"?>
<DOCTYPE rdf:RDF PUBLIC "-//DUBLIN CORE//DCMIES DTD
2002/07/31/EN" "http://dublincore.org/documents/2002/07/31/dcmes-
xml/dcmes-xml-dtd.dtd">
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://purl.org/dc/elements/1.1/">
<rdf:Description rdf:about="http://pc-erato2.iei.pi.cnr.it/amato">
<dc:title>Giuseppe Amato's Home Page</dc:title>
<dc:creator>Giuseppe Amato</dc:creator>
<dc:publisher>ISTI-CNR</dc:publisher>
<dc:date>2002-11-18</dc:date>
</rdf:Description>
</rdf:RDF>
```

MPEG-7

- MPEG-7: standard developed by MPEG
- It is named “Multimedia content description interface”
- Describes multimedia content data
- A broad range of applications are supported
- It has been developed by experts representing
 - Broadcasters, electronic manufacturers, content creators, publishers, right managers, telecommunication service providers, and academia

MPEG-7

- Application scenarios:
 - Image understanding
 - Intelligent vision
 - Smart cameras/VCRs
 - Information retrieval
 - Information filtering
 - Digital libraries
 - Computer based training



MPEG-7

- MPEG-7 components:
 - Descriptors (Ds)
 - Semantics and syntax of feature representation
 - Description schemas (DSs)
 - Structure and semantics of relations between Ds and other DSs
 - Description Tools
 - Set of Ds and DSs
 - Description Definition Language (DDL)
 - Defines new Ds and DSs and extends existing ones

MPEG-7

- Standard description tools
 - MPEG-7 Visual
 - MPEG-7 Audio
- MPEG-7 Multimedia Description Schemes

MPEG-7

- MPEG-7 Visual:
 - Visual description tools covering the following visual features:
 - Colour, texture, shape, motion, localisation, faces
 - There are elementary and sophisticated Descriptors

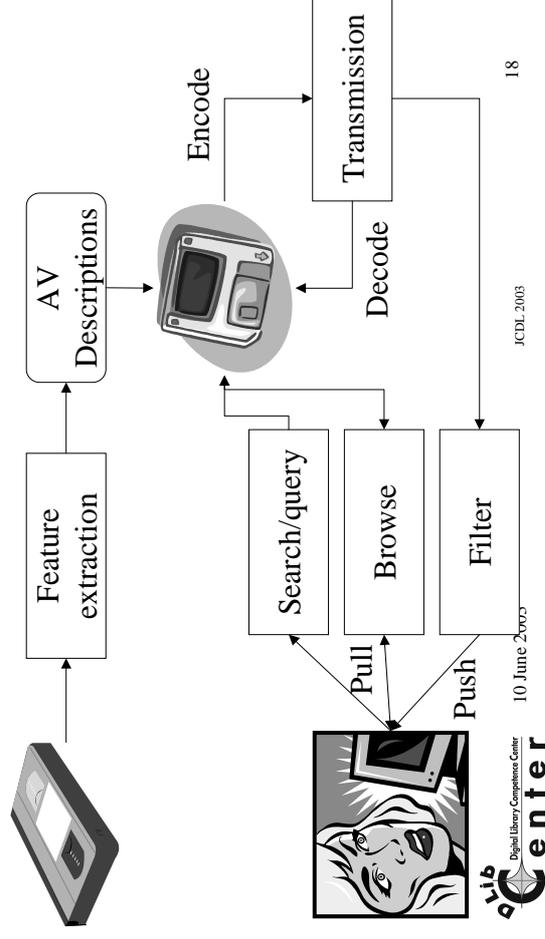
MPEG-7

- MPEG-7 Audio:
 - Audio description tools covering the following:
 - Descriptors:
 - spectral, parametric, temporal features
 - Description Tools:
 - sound recognition, instrumental timber, spoken content, audio signature, melody

MPEG-7

- MPEG-7 Multimedia Description Schemes:
 - Metadata generic structures for annotating audio-visual content:
 - Vector, time, textual, controlled vocabularies
 - Content description: perceivable information
 - Content management: creation, coding, usage
 - Content organisation: collections
 - Navigation and access: summaries, partitions, etc.
 - User interaction: user preferences, usage history

MPEG-7



ECHO Metadata Model

- This model originated from our experience in the **ECHO** project (European CHronicle On-line)
 - ECHO is an EC funded **IST** project
 - ECHO aims at providing
 - remote access to collection of **historical documentary** audio-video resources
 - a software infrastructure to support digital video archives
 - an extensible and interoperable architecture

Preliminary steps

- We have interviewed
 - Content providers
 - Audio/visual archives
 - Technology providers
 - feature extraction, speech recognition, indexing, ...
 - End-Users
 - teachers, researchers, cultural heritage institutions...
 - demand for a more detailed content description and advanced search capabilities

Preliminary steps

- We have considered the efforts of other authoritative groups dealing with this issues
- DC
- MPEG-7
- IFLA-FRBR
-

Requirements

- Traditional audio-video archive access funct.
 - by the name of the producer
 - by the series title
 - by the “tape” identifier, ...
- Advanced audio-video access funct.
 - by key-frames
 - by features
 - by visual abstract
 - by words in the transcript, ...
- Multi-language support

Requirements

- Specific metadata “fields” for
 - speech recognition processing
 - image/video processing
 - digital video abstracting
- to provide advanced search facilities

Requirements

- Each data provider has its own way of cataloguing
- Must be harmonised
 - in general they describe:
 - logical content, using free keywords
 - physical content
 - cataloguing information

The approach

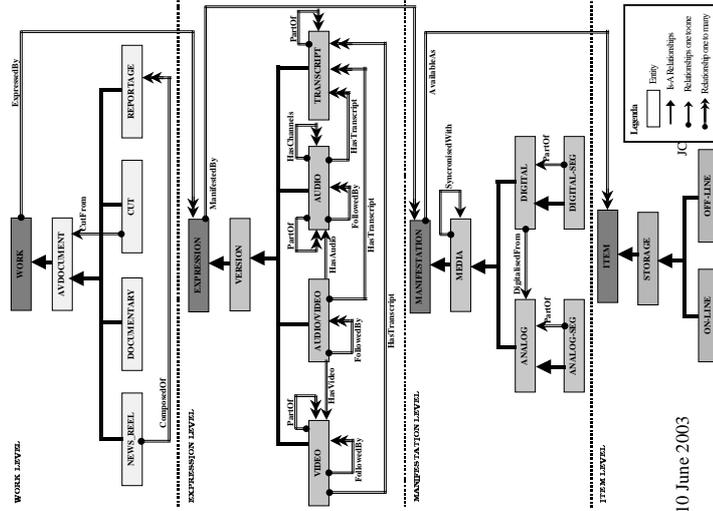
- Hierarchical and Multi-level design
- Provides support for
 - interoperability
 - by using specialisation and generalisation
 - needs of special interest user communities
 - by using multiple view descriptions

The approach

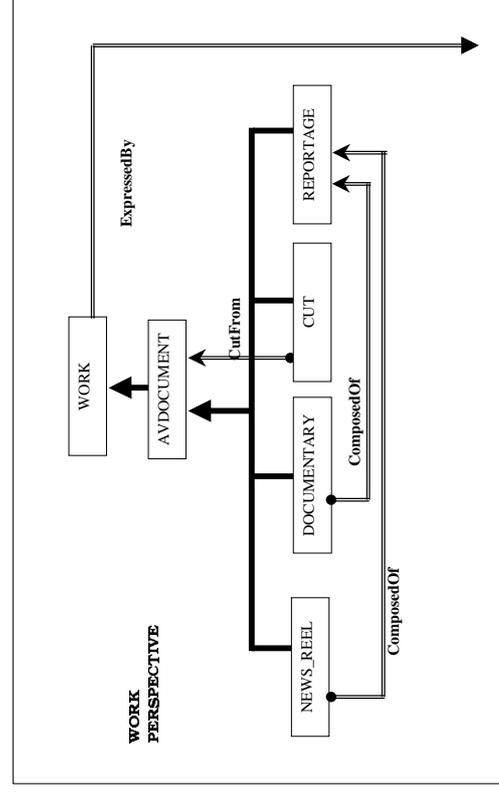
Extends the IFLA-FRBR model

Four entities used to describe different aspect of a resource:

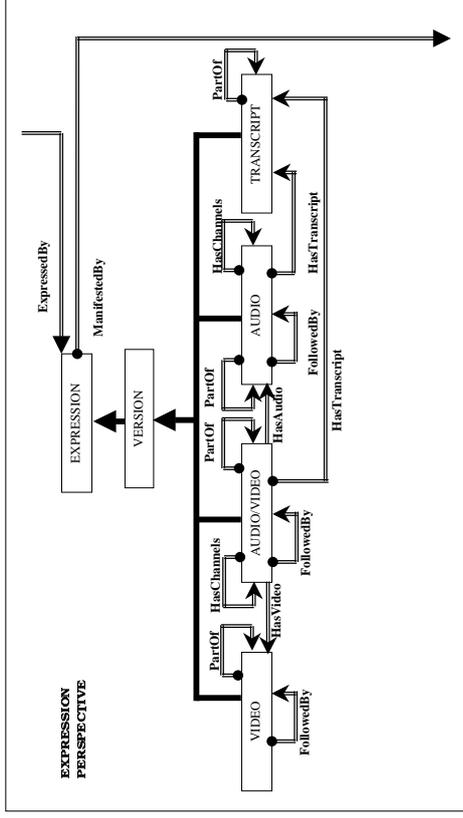
- **WORK**
Describes a distinct intellectual or artistic creation
It is the abstract idea of a creation
- **EXPRESSION**
Intellectual or artistic realization of a work in the form of alphanumeric, musical, or graphic notation, sound, image, etc..
- **MANIFESTATION**
Physical embodiment of an expression
E.g. manuscripts, books, maps, sound, CD-ROM
- **ITEM**
A single exemplar of a manifestation
A documentary on the terrorist attack



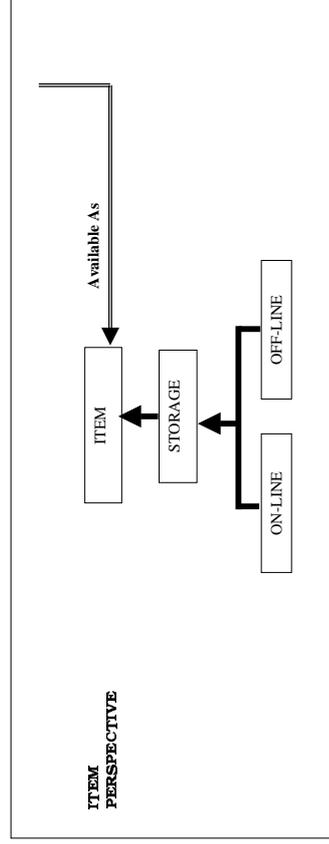
Model



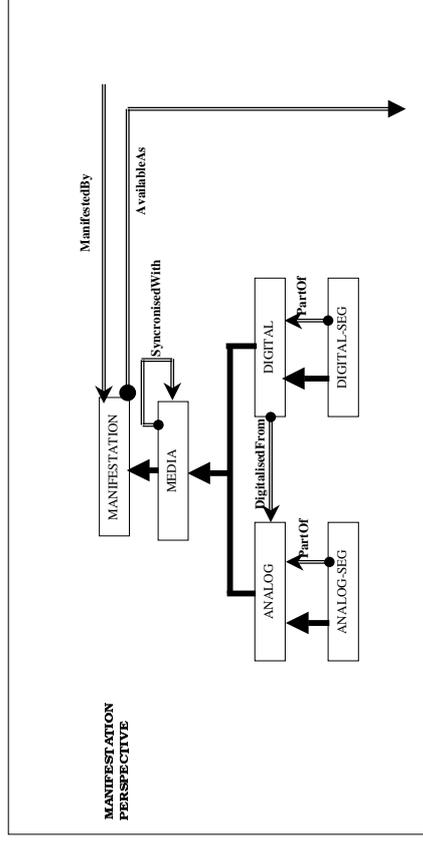
Proposed Model (cont.)



Proposed Model (cont.)



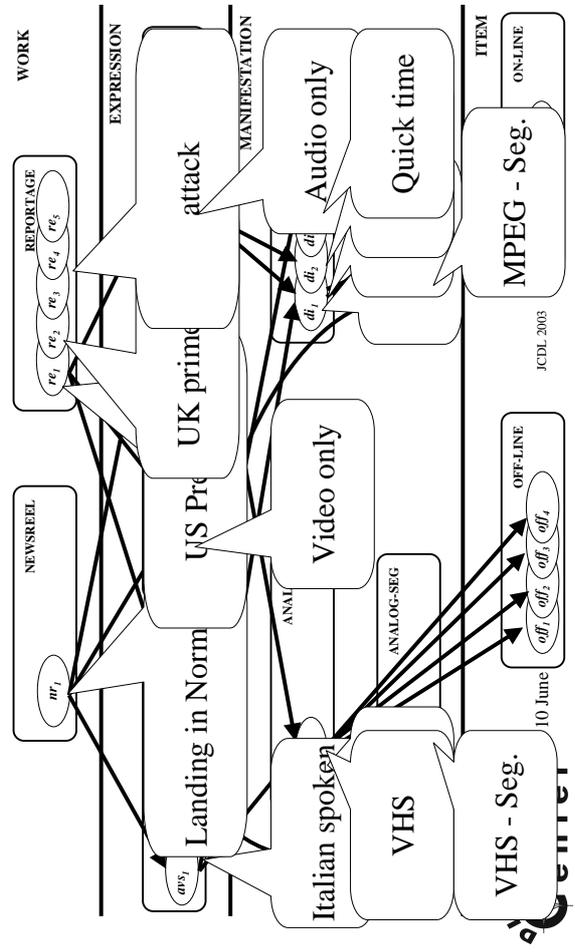
Proposed Model (cont.)



Running example

- Newsreel about the “Landing of the Allied Forces to Normandy”
 - It is composed of several reportages
 - There are several national versions
 - e.g. Italian and French
 - Each version is available on different supports
 - e.g. VHS tapes, MPEG files
 - There are several copies of the VHS tape with different preservation quality
 - There are several copies of the MPEG file with different access speed

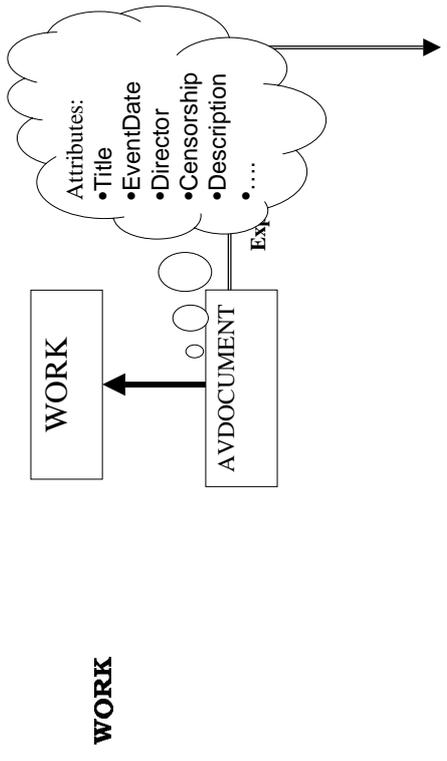
Running example



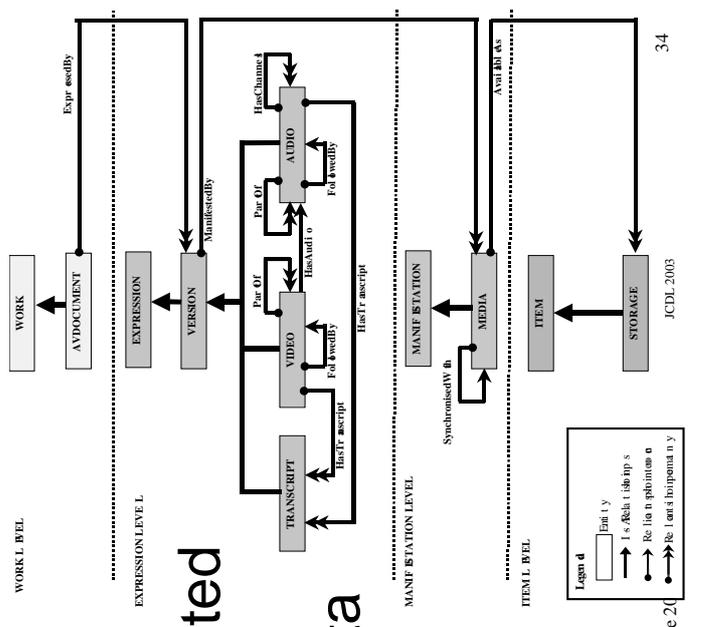
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The ECHO Model



The Implemented ECHO metadata model

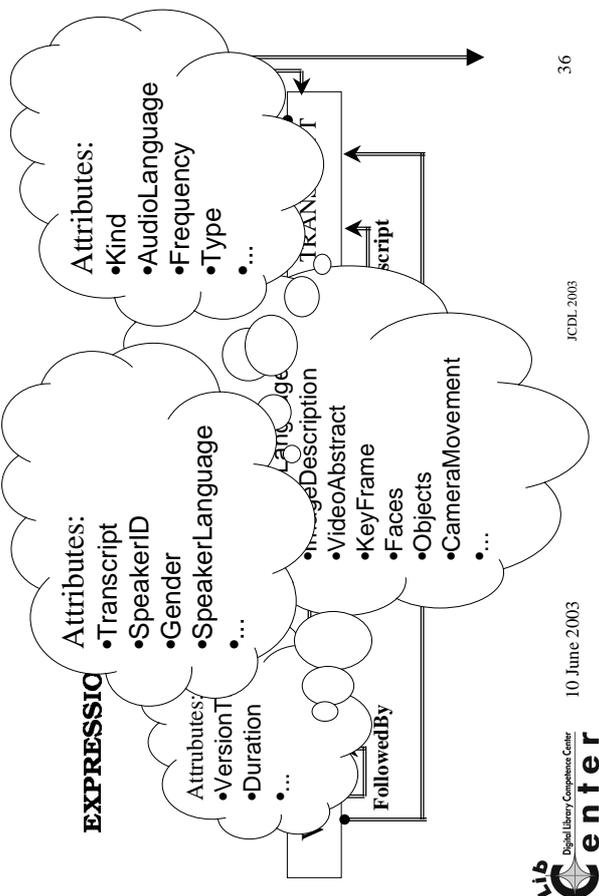


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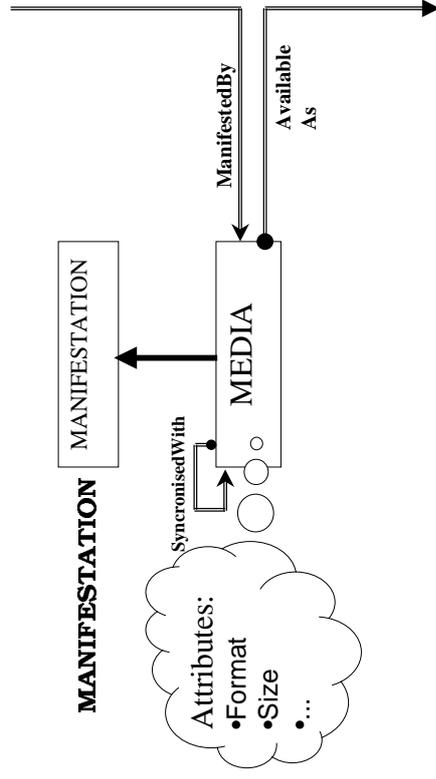
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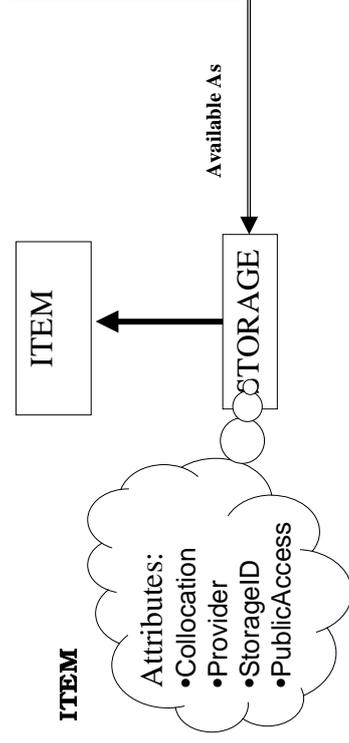
The ECHO Model (cont.)



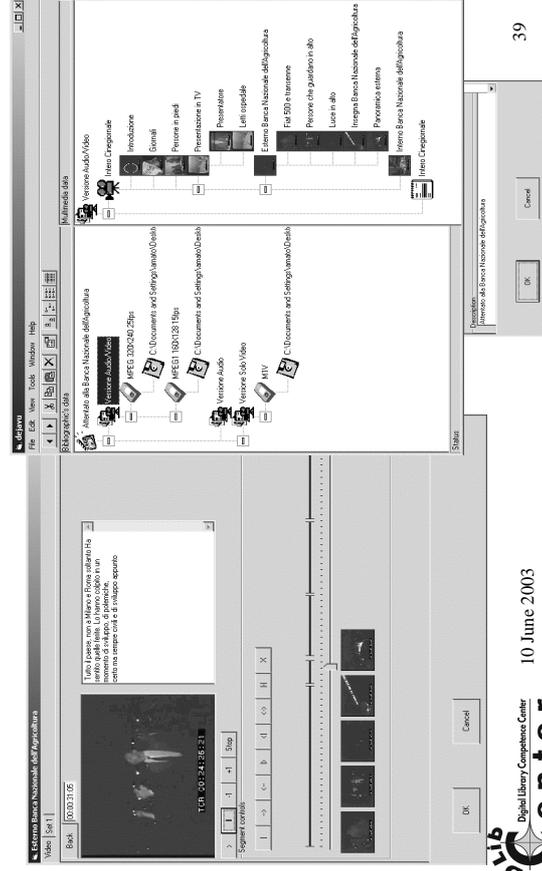
The ECHO Model (cont.)



The ECHO Model (cont.)



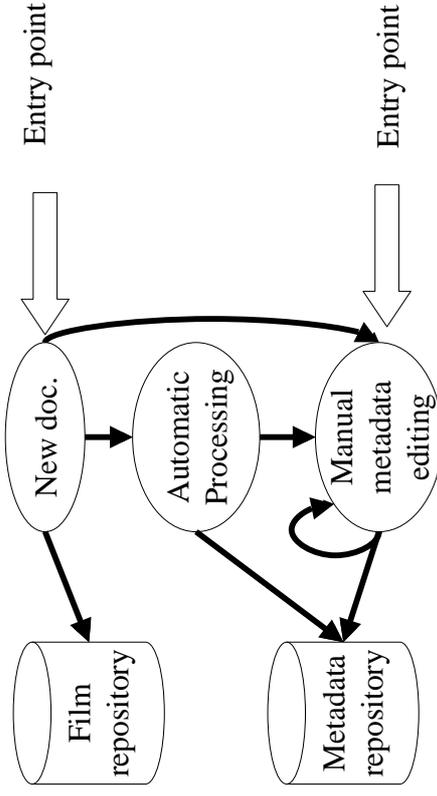
Metadata Editor



Generating metadata: indexing

- Fully Manual indexing:
 - Time consuming and tedious, especially with complex metadata models
- Fully Automatic Indexing:
 - Noise may affect effectiveness
- Manual indexing with automatic support:
 - Could be a good compromise

Work flow



Automatic processing tasks

- Cut detection
- Visual features extraction
- Transcript generation
- Object recognition
- Face recognition
- Geospatial information
- Video abstract generation

Automatic Indexing

- Overview
 - Text
 - Speech
 - Images
 - Moving pictures (videos)

Indexing text

- The indexing process associates (weighted) index terms to documents
- Index terms can be
 - Words chosen from a controlled vocabulary
 - Words automatically extracted
 - Steams (e.g. print-)
 - Noun phrases automatically extracted
 - Other metadata

Indexing text

- Experience has shown that using weighted single terms offers the best performance
- Of course that depends crucially on the choice of the term-weighting system
- Document search is performed by searching for index terms
 - Documents associated with qualifying index terms are retrieved
 - Documents are ranked according to weights of index terms

Indexing text

- The indexing process produces an incidence matrix:

	d_1	...	d_i	...	d_m
t_1	w_{11}	...	w_{1i}	...	w_{1m}
...
t_k	w_{ki}
...
t_n	w_{n1}	...	w_{ni}	...	w_{nm}

Indexing text

- Models to assess document relevance:
 - Boolean model
 - Fuzzy logic model
 - Vector space model
 - ...

Boolean model

- A query may contain logical operator and/or
 - The query “digital and library” retrieves documents associated with both terms
 - The query “digital or library” retrieves documents associated with at least one of the two terms
- Boolean logic is used to process more complex queries

Fuzzy logic model

- Extends the Boolean model in such a way that also weights are considered to assign a score to retrieved documents
- Suppose that term t_1 and t_2 have weight w_1 and w_2 in document d
- d has score:
 - $\min\{w_1, w_2\}$ for query t_1 and t_2
 - $\max\{w_1, w_2\}$ for query t_1 or t_2

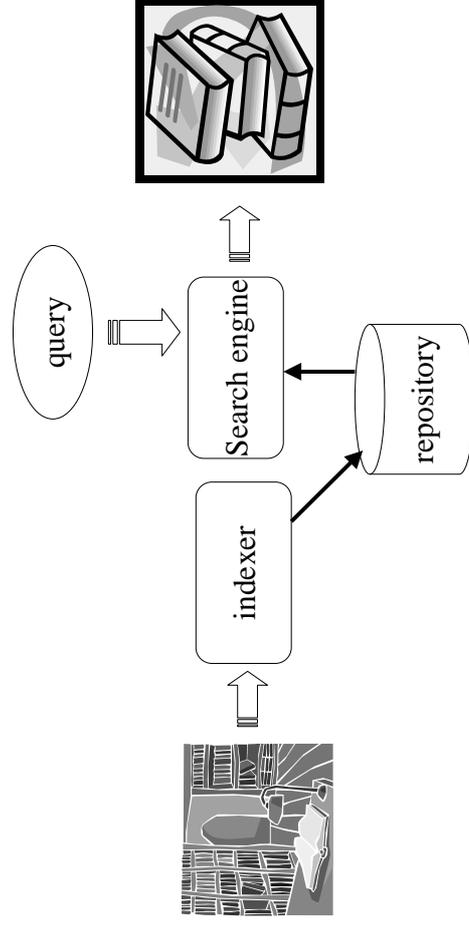
Vector space model

- Documents and queries can be viewed as vectors of weights (each term is a dimension)
- The score is the distance between a query (vector) and the documents (vectors)

Automatic extraction of weighted index terms

- A widely used technique is the *tfidf* weighting function (term frequency inverse document frequency):
 - The more frequently a term appear in a document the more significant it is for that document: term frequency (*tf*)
 - The more frequently a term occur in the entire collection the less selective it is: document frequency (*df*)
- The weight is directly proportional to the *tf* and inversely proportional to the *df* (*idf*)

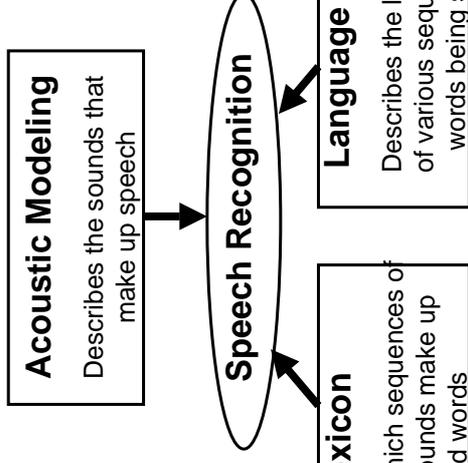
Text documents: Overall view



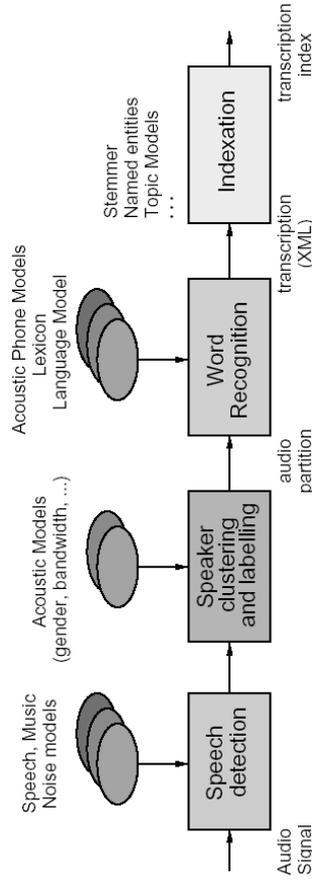
Indexing speech

- Generates transcript to enable text-based retrieval from spoken language documents
- Improves text synchronization to audio/video in presence of scripts
- Supplies information necessary for library segmentation and multimedia abstractions
- Provides speech interface to digital library

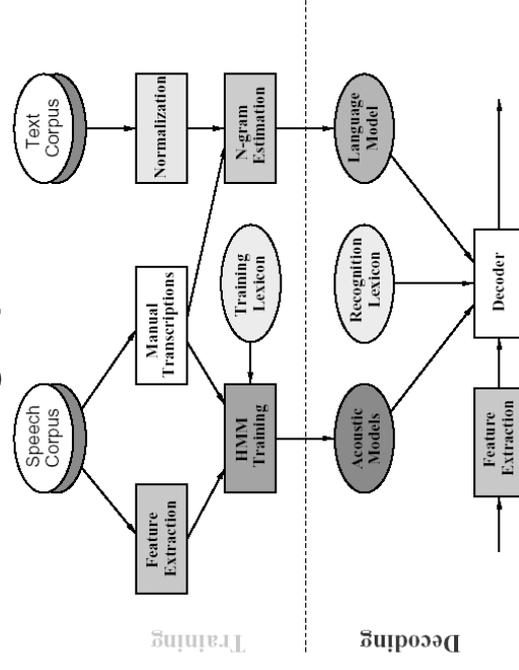
Indexing speech



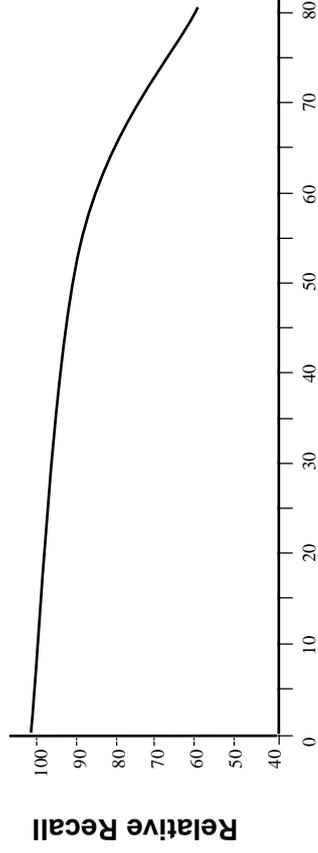
Indexing speech



Indexing speech

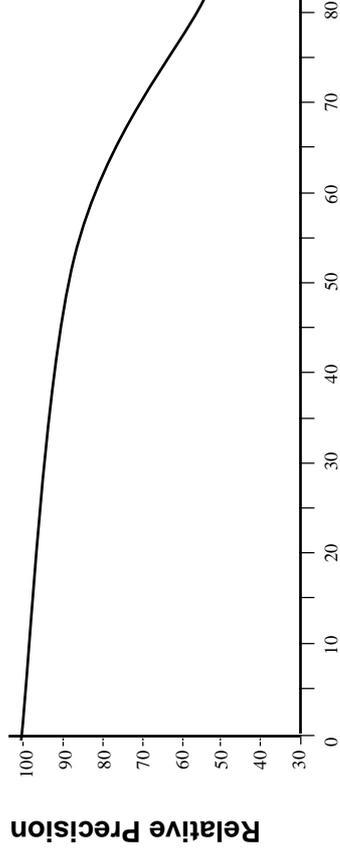


Text retrieval precision vs. Speech accuracy



Word Error Rate

Text retrieval precision vs. Speech accuracy

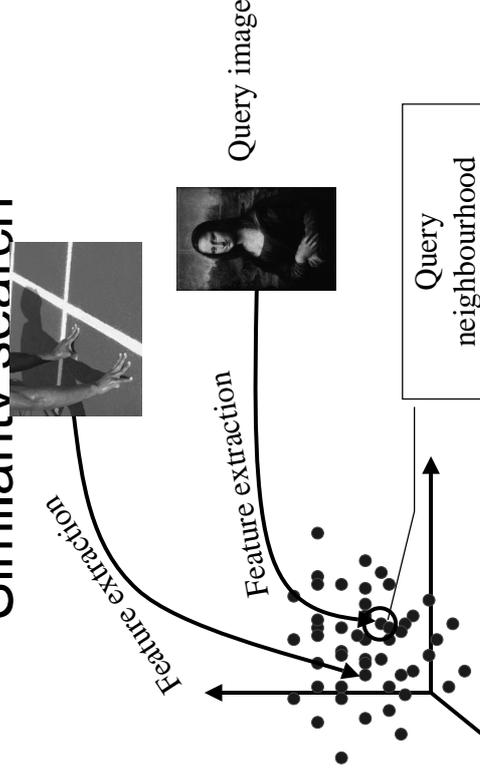


Word Error Rate

Indexing images

- The automatic indexing process associates images with features describing their physical content
 - Colour
 - Textures
 - Shapes
 - Spatial organisation
- Image search is performed by using feature similarity

Similarity search



Indexing images

- Colour spaces
 - The most common and intuitive colour space is the RGB (Red Green Blue) colour space
 - Every perceivable colour can be obtained as the sum of three degree of RGB

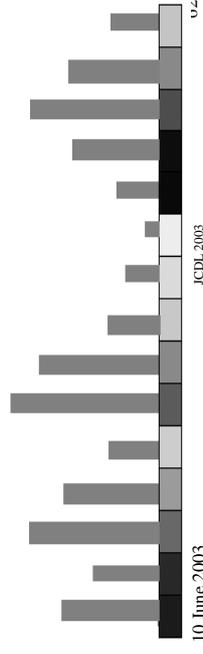
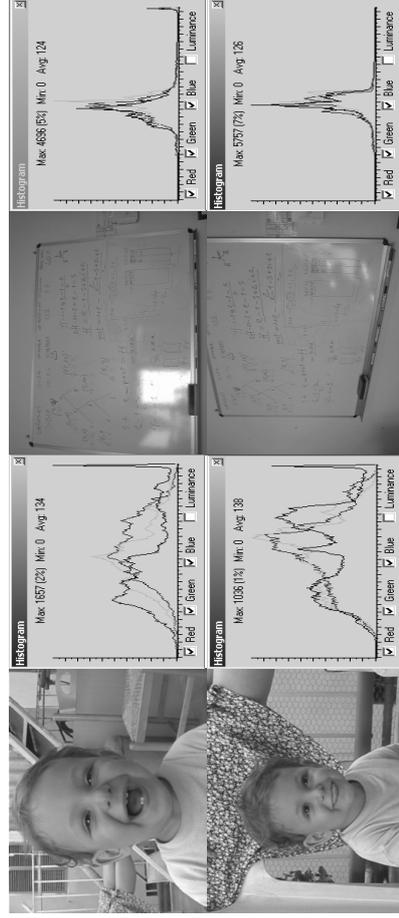


Image indexing

- Colour histograms
 - The colour spectrum is divided into n bins
 - The value contained in each bin is proportional to the amount of pixel having colour of that bin

Indexing images



Indexing images

- Problems with RGB:
 - Colours that are close in the RGB colour space can be distant for the human perception

Indexing images

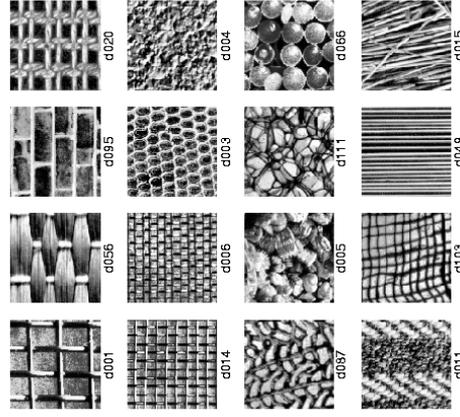
- Wanted properties of colour spaces:
 - Uniformity
 - Close colours are also perceived as similar
 - Completeness
 - All perceivable colours are representable
 - Compactness
 - No redundancy

Indexing images

- Other colour spaces:
 - HSV
 - Hue: Tint of the colour
 - Saturation: Quantity of colour
 - Value (Brightness): Quantity of light
 - YIQ, YUV, YCrCb, etc.

Indexing images

- Textures:



Indexing images

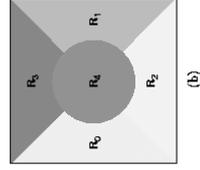
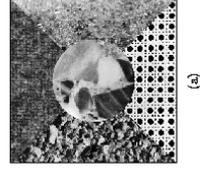
- Textures:
 - Homogeneous patterns
 - Spatial arrangement of pixels
 - Colour is not enough to describe

Indexing images

- Textures descriptions are obtained by using statistical methods
 - Spatial distribution of image intensity
 - Several methods exists
 - Texture descriptions can also be represented as histograms (vectors)

Indexing images

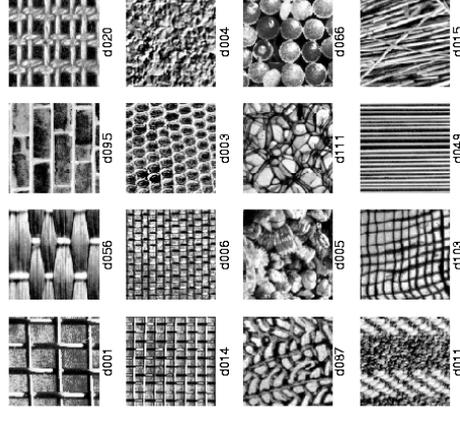
- Shapes:
 - Region extraction
 - Segmentation



Indexing images

- Widely used features for textures are the Tamura features:

- Contrast
 - Distribution of
- Coarseness
 - Granularity of
- Directionality
 - Dominant dire

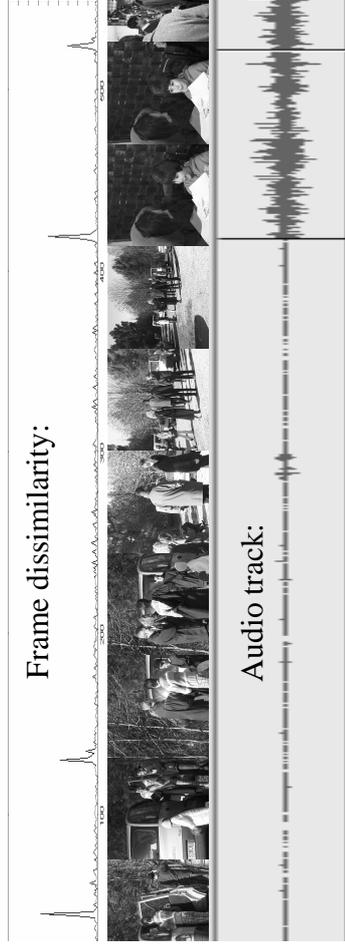


Indexing images

- Colour histograms and textures can be computed for individual regions in addition to entire images
 - Global features
 - Search for images
 - Local features
 - Search for regions in images
- Spatial relationships between region give also additional information
 - Search for images having specific characteristics

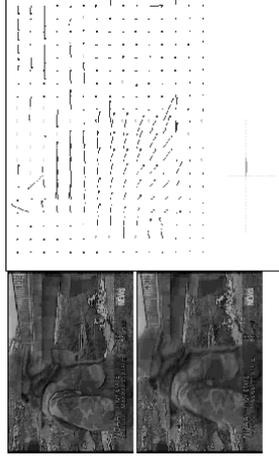
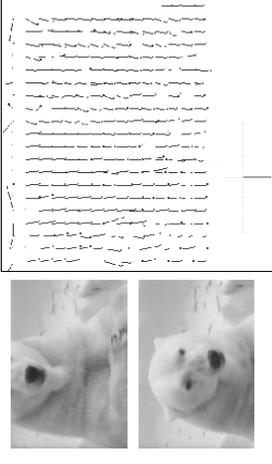
Indexing moving pictures

- Cut/scene detection:



Motion Picture indexing

- Camera and Motion Detection

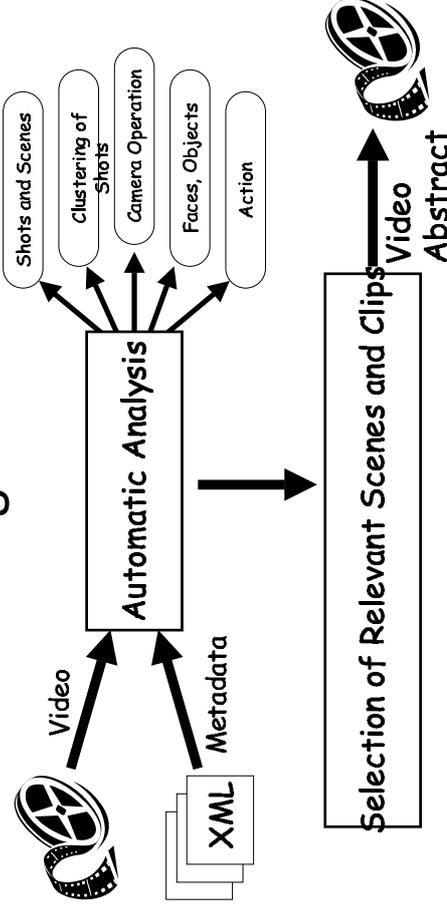


Right object motion
(not pan left)

Video Abstract

- A video abstract is a part of a much longer video, which preserves the essential message of the original video.
- A video abstract does not change the presentation medium.
- The user can see the video abstract without any technical knowledge of the application.

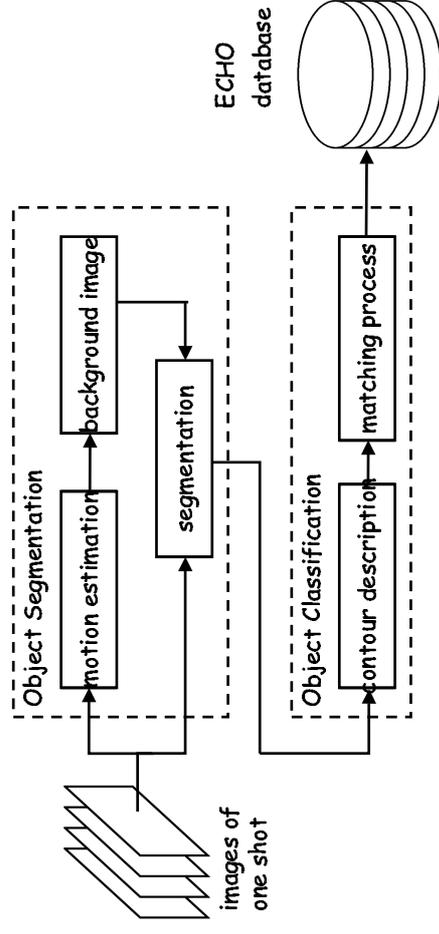
Overview of the Abstracting Algorithm



Moving-Object Recognition

- The system for moving-object recognition consists of two components, a *segmentation* module and a *classification* module.
- For each shot in the video, a background panorama image is constructed. The foreground objects in this background image are removed by means of temporal filtering (median).
- The object is segmented by comparing each frame of the video to the background image.

Moving-Object Recognition



Object Segmentation

- The camera model is calculated and all frames are transformed with this camera model.
- The background panorama image is the median of all pixels at the same position.
- A large differences of the frame and the background indicates an object.



calculated background image

sample video of segmented
and recognized objects (cars)

Object Classification

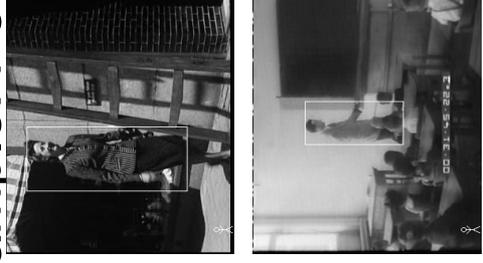
- The classification of the segmented object is based on the feature points of the contour.



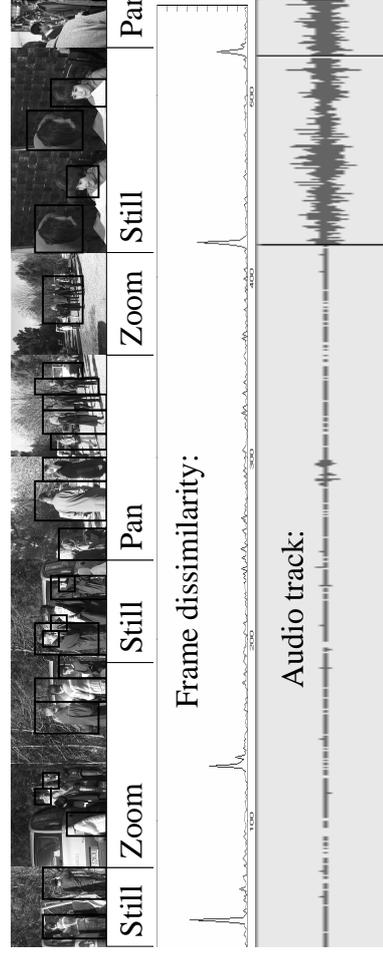
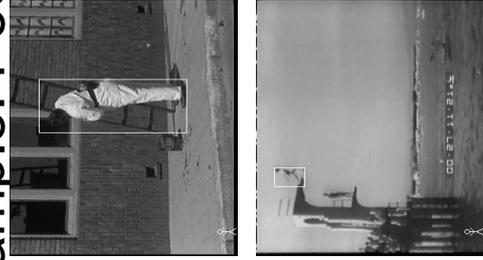
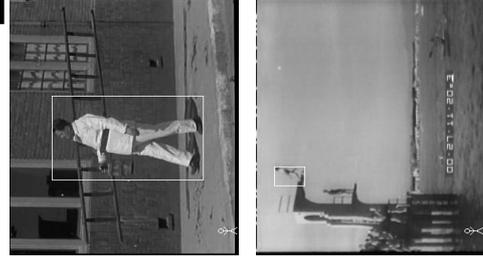
Example: Cars



Example: People



Example: People



Face detection

Object detection

Text detection

Speech recognition

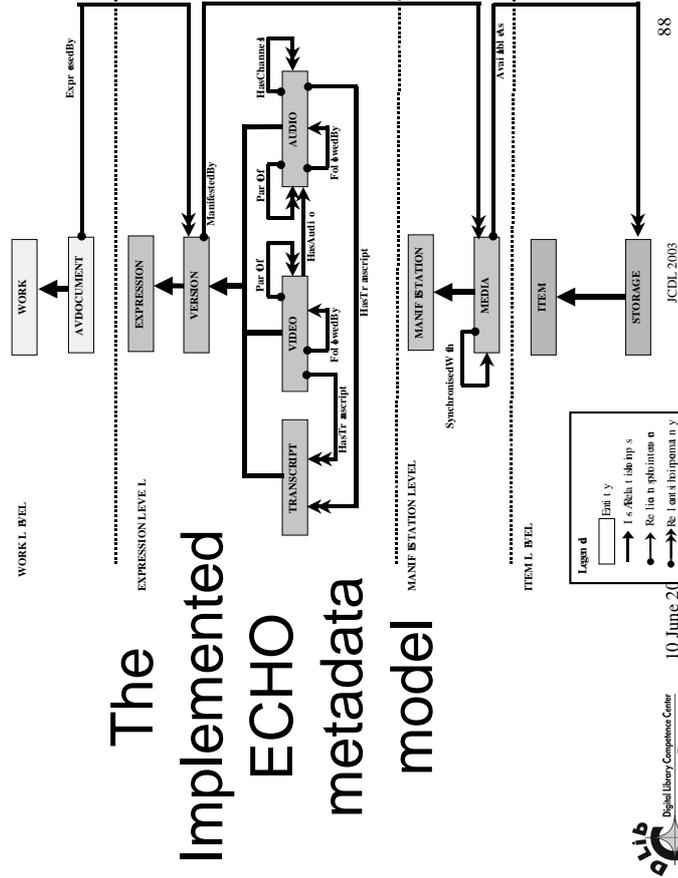
Manual editing tasks

- Automatically generated metadata review
 - scene - shot - sequences review
 - face - object review
 - video abstract review
- Descriptive fields input
 - item fields editing
 - manifestation fields editing
 - expression fields editing
 - work fields editing

The metadata model

- The metadata model is composed of four levels describing different aspects of intellectual or artistic endeavour: *AVDocument*, *Expression*, *Media*, and *Storage*.

Metadata Editor



How the AVDocument is stored

- Each instance of the entities (objects) are stored in an individual XML file in the disk or in the database

Browsing/Editing the Bibliographic section AVDocument

Each entity us associated to a different icon:



- Root of the AVDocument



- Version

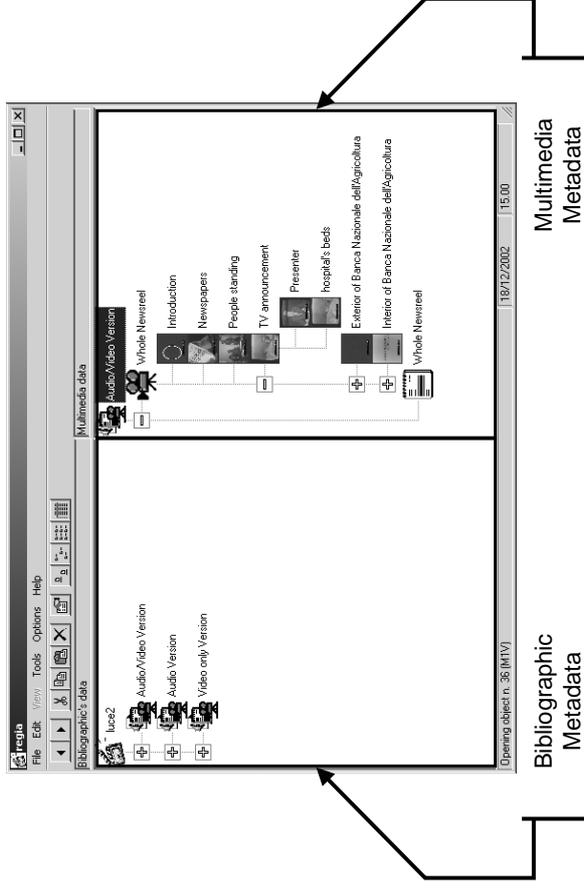


- Media

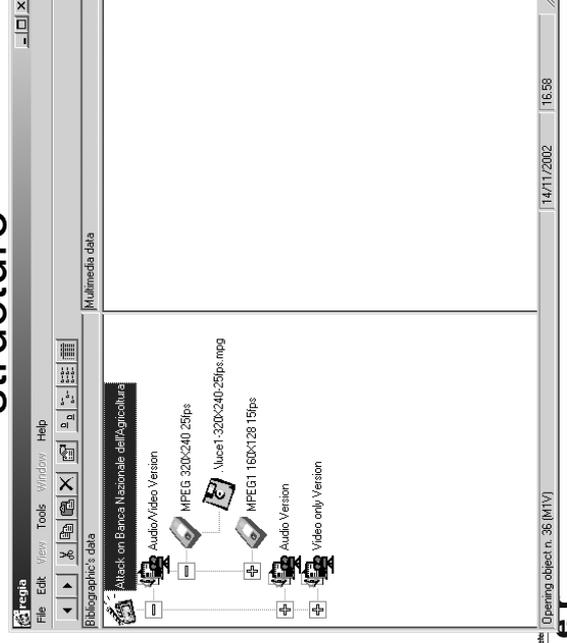


- Storage

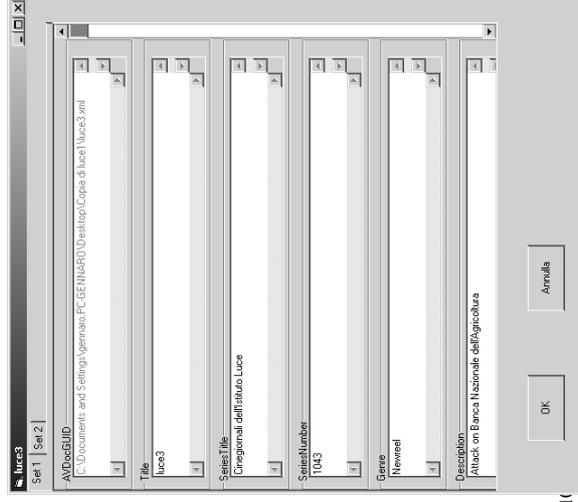
The editor main window structure



The bibliographic metadata structure



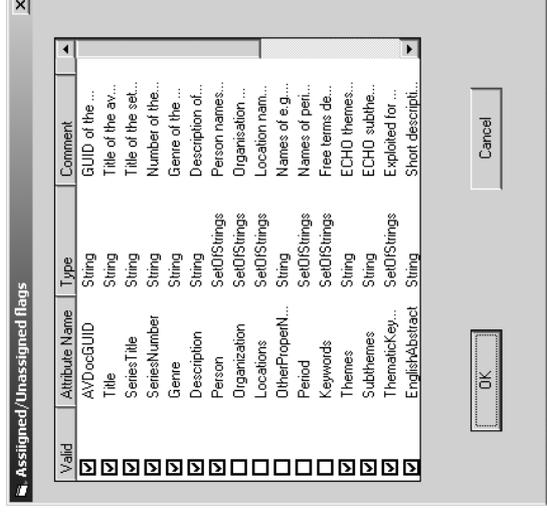
Editing the metadata



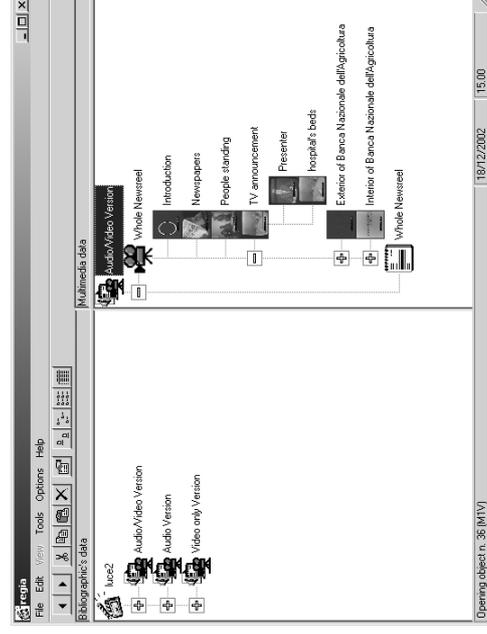
Delete/Add objects

- *Deleting an object and its children*
 - By selecting an object icon and typing the “Del” button on the keyboard it is possible to delete an object and its children.
- *Adding a new child entity*
 - It is possible to add a new child object by selecting its parent, clicking on the right button of the mouse, and clicking on “Add child...”. It will appear an input box asking for the title of the new object. Note that, for the Storage entity the title corresponds to the “collocation” field of its metadata

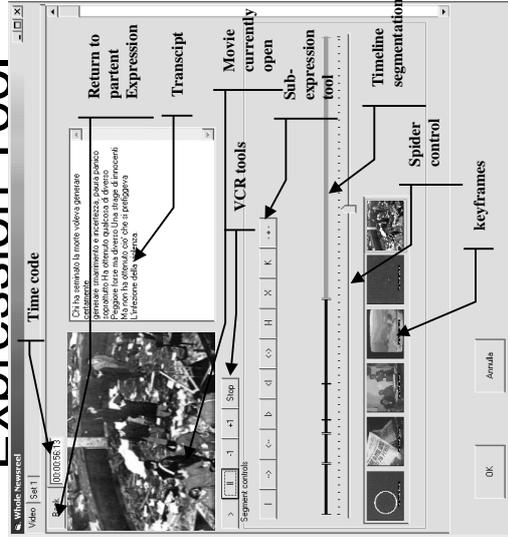
Unassigned and Assigned fields



Multimedia section of AVDocument



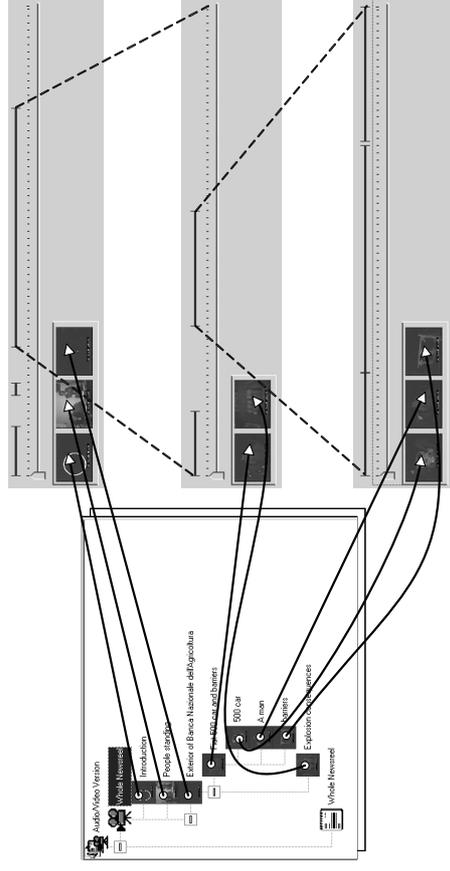
Expression Tool



Create, update and delete

- **Create**
 - move the cursor of the slider and place it at the start time of the shot you want to create, push the button “|”. The timecode and a small line on the timeline start blinking. Move the cursor and place it at the end time of the new segment, push again the button “|”.
 - Push the button “|-|”. A dialog box will allow you to select the start/end timecodes boundaries of the new segment.

Browse the Expression



Create, update and delete (2)

- **Modify**
 - Push the button “|>” (“<|”). This will change the end (begin) of the selected segment to the begin (end) to the (preceding) succeeding segment.
 - Push the button “<->”. A dialog box will allow modifying the start/end timecodes boundaries of the selected segment.
 - By selecting the segments by means of the mouse button and pressing shift button, it is possible to select more than one segment. The selected segments are highlighted by means of a thicker line on the sliding bar, and their keyframes are contained in a coloured frame. By pushing the button “-+” all the segmented will be merged together. Note that, the new merged segmented will hierarch the textual metadata of the selected segment that appeared in green.
- **Delete**
 - Select a segment and push the button “X” or the key “Del” of the keyboard.

Updating the keyframes

- Clicking on the button “K” the keyframe of the current video is updated by the frame currently shown.

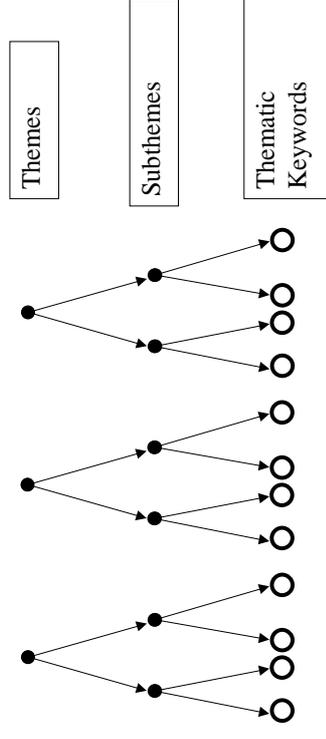
Cross Language features

- Some of the metadata fields of the root of the AVDocument are treated as Cross Language by the editor. The metadata fields involved are:
 - Themes
 - Subthemes
 - Thematic Keywords

Creating a new AVDocument

- In order to create a new AVDocument from scratch, click on the menu item File→New. A new AVDocument will be created. Proceed creating the other entities of the AVDocument.

Keywords tree



Echo Retrieval Interface



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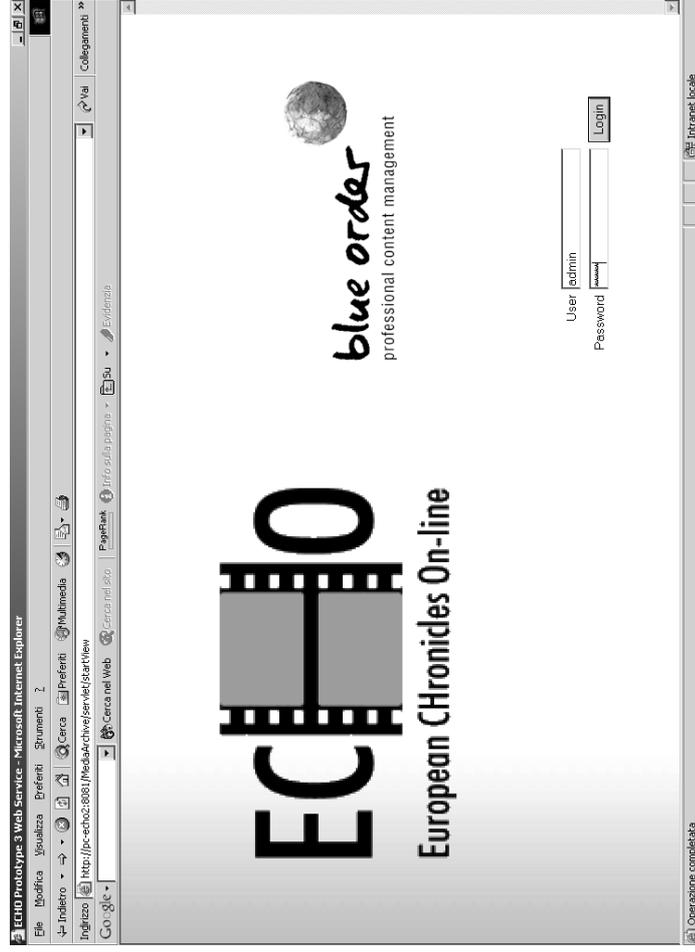
Logging



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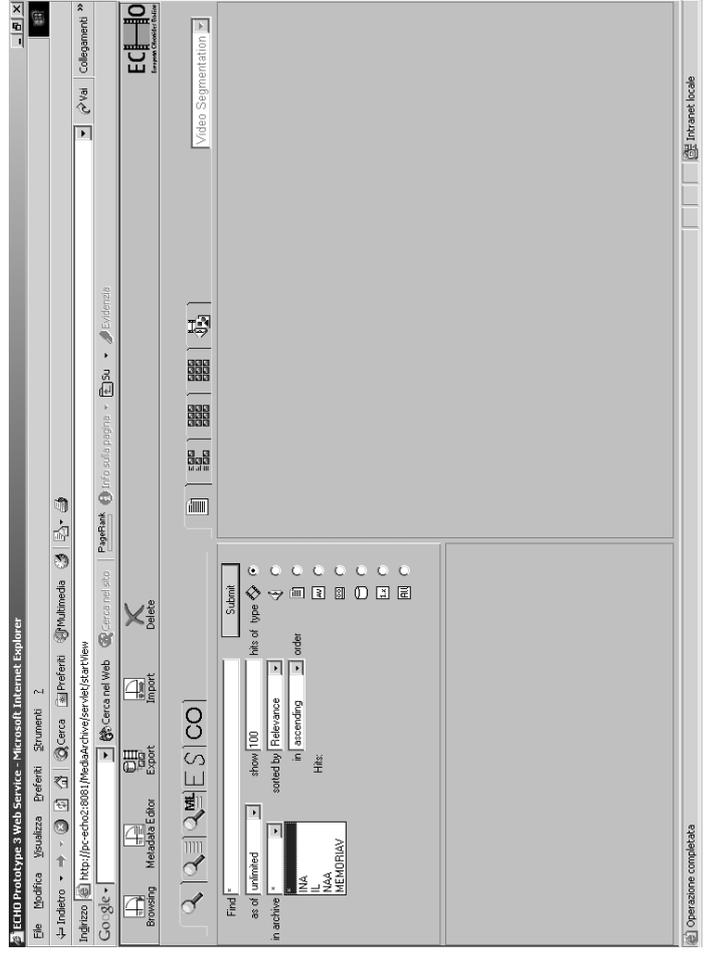
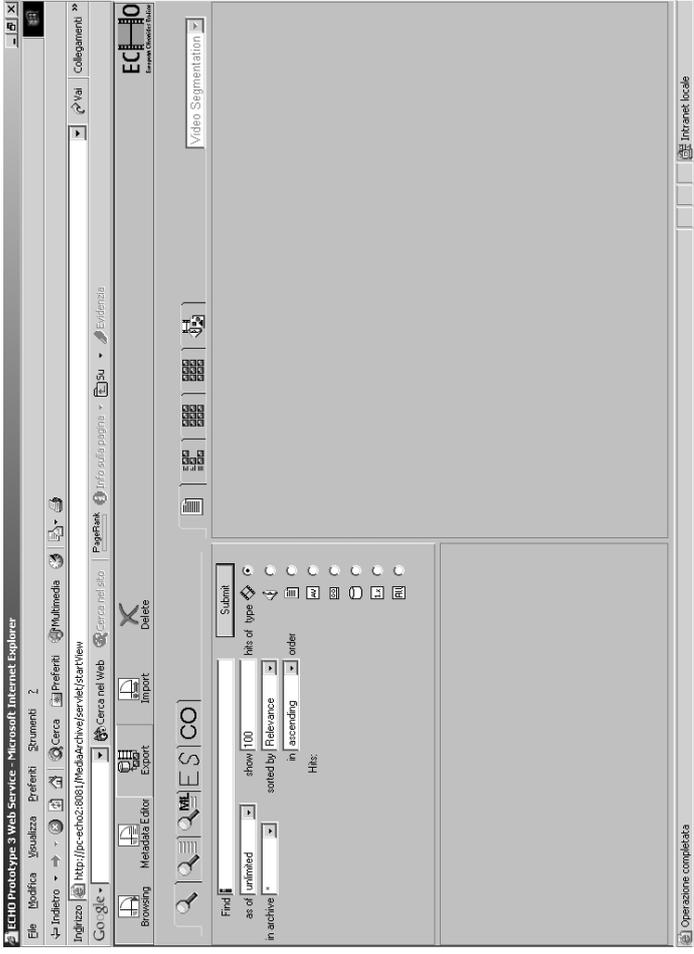
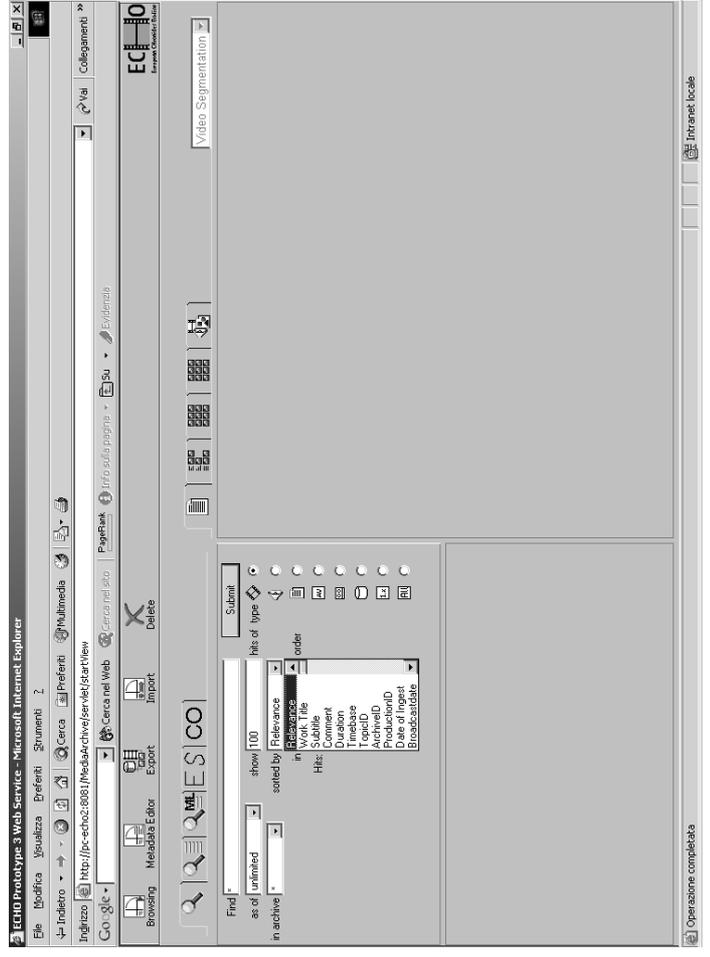
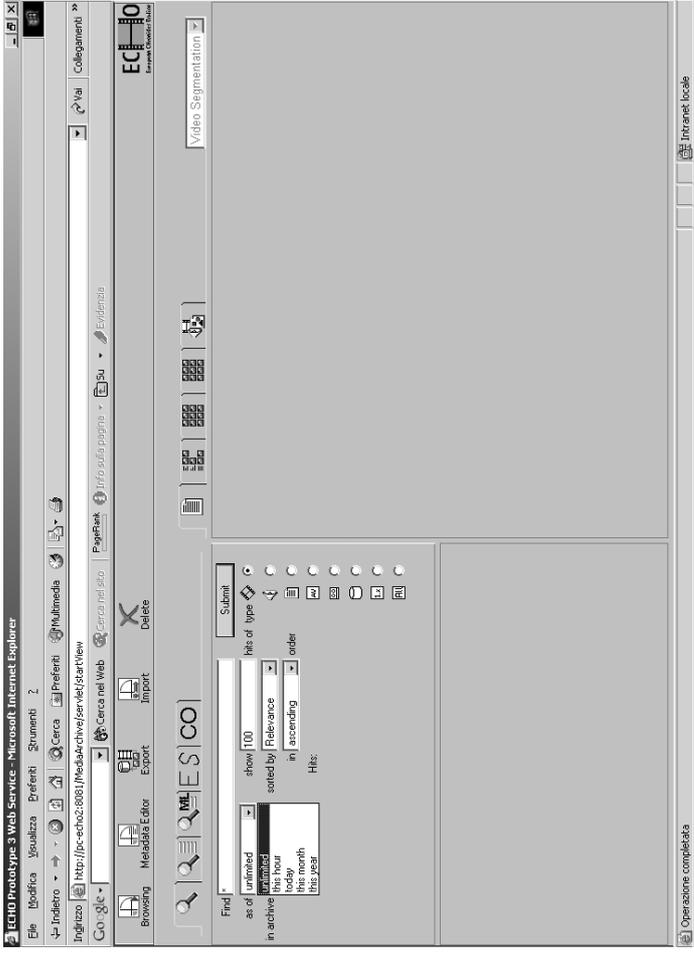
The retrieval Interface features



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EC10 Prototype 3 Web Service - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?

Inglese

Co: g.c.

Browser: Metadatta Editor Export Import Delete

Video Segmentation

Operazione completata

Label: Value

AND OR In Title In Date In Timescode In Copyright In Content In Detail In Position-Info In Technical-Info

in archive: show 500 hits sorted by in ascending order

EC10 Prototype 3 Web Service - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?

Inglese

Co: g.c.

Browser: Metadatta Editor Export Import Delete

Video Segmentation

Operazione completata

Label: Value

AND OR In Title In Date In Timescode In Copyright In Content In Detail In Position-Info In Technical-Info

in archive: show 500 hits sorted by in ascending order

Hits: NAA MEMORY

EC10 Prototype 3 Web Service - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?

Inglese

Co: g.c.

Browser: Metadatta Editor Export Import Delete

Video Segmentation

Operazione completata

Label: Value

AND OR In Title In Date In Timescode In Copyright In Content In Detail In Position-Info In Technical-Info

in archive: show 100 hits of type selected by Relevance in ascending order

Hits: ascending descending

EC10 Prototype 3 Web Service - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?

Inglese

Co: g.c.

Browser: Metadatta Editor Export Import Delete

Video Segmentation

Operazione completata

Label: Value

AND OR In Title In Date In Timescode In Copyright In Content In Detail In Position-Info In Technical-Info

in archive: show 500 hits sorted by in ascending order

Hits: NAA MEMORY

Microsoft Internet Explorer window showing the EC10 interface. The address bar contains the URL: <http://pc-ehc2.8081/MenuArchivio/ServiceList.rvtView>. The interface includes a search bar, navigation buttons (Browsing, Metadati Editor, Export, Import, Delete), and a main search area with various filters (Label, AND OR, In Title, In Date, In Timecode, In Copyright, In Content, In Detail, In Position-Info, In Technical-Info) and a 'Hits' section showing 'show 500' results.

Microsoft Internet Explorer window showing the EC10 interface. The address bar contains the URL: <http://pc-ehc2.8081/MenuArchivio/ServiceList.rvtView>. The interface includes a search bar, navigation buttons, and a main search area with a dropdown menu for 'Genre' (not specified, Not specified, Music, Subtheme, Life, Non ficile) and a 'Hits' section.

Microsoft Internet Explorer window showing the EC10 interface. The address bar contains the URL: <http://pc-ehc2.8081/MenuArchivio/ServiceList.rvtView>. The interface includes a search bar, navigation buttons, and a main search area with various filters and a 'Hits' section showing 'show 500' results. A tooltip is visible over the 'sorted by' dropdown menu, listing options: Title, Production date, Ingest date, and CollaboratorID.

Microsoft Internet Explorer window showing the EC10 interface. The address bar contains the URL: <http://pc-ehc2.8081/MenuArchivio/ServiceList.rvtView>. The interface includes a search bar, navigation buttons, and a main search area with a dropdown menu for 'Genre' (not specified, Not specified, Subtheme, Life, Non ficile) and a 'Hits' section.

Microsoft Internet Explorer - ECHO Prototype 3 Web Service

Indirizzo: <http://ec-ehc2.8881/MediaArchive/Service/ListView>

Generi: not specified

Theme: 1 - Post War

Subtheme: not specified

Keywords: not specified

- 1 - Post War
- 1.1 - The World Wars
- 1.2 - Post War - European Communities
- 1.3 - Post War - Emigration Movements
- 1.4 - Post War - Rebuilding the Military Forces
- 1.5 - Post War - International Prisoners of War
- 1.6 - Post War - Changes in Society

HTC:

Microsoft Internet Explorer - ECHO Prototype 3 Web Service

Indirizzo: <http://ec-ehc2.8881/MediaArchive/Service/ListView>

Generi: not specified

Theme: 1 - Post War

Subtheme: not specified

Keywords: not specified

Archives: IL, INA, Memorial, NCA

Themes: 1 - Post War, 2 - The World Wars, 3 - Sports in the 20th Century, 4 - Cultural Heritage, 5 - Youth Culture in Europe

show 100 hits

HTC:

Microsoft Internet Explorer - ECHO Prototype 3 Web Service

Indirizzo: <http://ec-ehc2.8881/MediaArchive/Service/ListView>

Generi: not specified

Theme: 1 - Post War

Subtheme: not specified

Keywords: not specified

- 1 - Post War
- 2 - The World Wars
- 3 - Sports in the 20th Century
- 4 - Daily Life
- 5 - Youth Culture in Europe

HTC:

Microsoft Internet Explorer - ECHO Prototype 3 Web Service

Indirizzo: <http://ec-ehc2.8881/MediaArchive/Service/ListView>

Generi: not specified

Theme: 1 - Post War

Subtheme: 1.1 - Post War - European Communities

Keywords: Marshall plan, France and Europe, Switzerland and Europe, Geopolitical changes, European politics, European institutions, Raw materials, Energy sources, European social policies, Industry, Agriculture, Farming, Reconversion in Europe, European organisations (CECA)

HTC:

EC10 Prototype 3 Web Service - Microsoft Internet Explorer

Indirizzo: <http://pc-echo2.8081/MediaArchive/servelet/startView>

Co: g: e - train

Operazione completa

Submit

Hits:

Video Segmentation

Intranet locale

Browsing the document structure



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EC10 Prototype 3 Web Service - Microsoft Internet Explorer

Indirizzo: <http://pc-echo2.8081/MediaArchive/servelet/startView>

Co: g: e - train

Operazione completa

Submit

Hits: 19

Work Title: Bergkinder fliegen
Duration: 00:02:29:16
Date of Ingest: 22.11.2001-19:05:50
Material: video
ECHO Model Entry

Version

Media

Storage

Video

Audio

Transcript

Version (abstract)

Expressed by: Bergkinder fliegen

Genre: Newsreel

Description: Text: 1300 Bergkinder // Film über Besuch von Kindern aus den Bergen in Zürich, CH Vals: Graben von Lawennoptem / Verpacken von Reiseprovision / Kinder in Busse steigend, La Brevine, Schüler im

Intranet locale

EC10 Prototype 3 Web Service - Microsoft Internet Explorer

Indirizzo: <http://pc-echo2.8081/MediaArchive/servelet/startView>

Co: g: e - train

Operazione completa

Submit

Hits: 19

Expressed by: Newsreel

Genre: Newsreel

Description: Text: 1300 Bergkinder // Film über Besuch von Kindern aus den Bergen in Zürich, CH Vals: Graben von Lawennoptem / Verpacken von Reiseprovision / Kinder in Busse steigend, La Brevine, Schüler im besichtigend / Rundflug für Kinder / singende Kinder

Keywords: Luft, Weltraum, Jugend

Thematic Keywords: Elementary education

Themes: 4 - Daily Life

Subthemes: 4.3 - Daily Life - Education

English Abstract: Mountain children flying; Text: 1300 mountain children // Film about mountain children in Zürich CH Vals: graves of avalanche victims / packing travel provisions / children getting on a bus / Zürich: arrival at train station, children looking at aircraft / flight for children / singing children

Description: DE

Language: English

Production Date: 1951-05-18

Locations: Vals, La Brevine, Zürich

Intranet locale

ECHO Prototype 3 Web Service - Microsoft Internet Explorer

Find Item: show 100 hits of type [unlimited] in active [all] sorted by Relevance in ascending order. Hits: 19

Work Title: Bergkinder fliegen
Duration: 00:02:23:16
Date of Ingest: 22.11.2001-19:05:50
Material: video

ECHO Model Entity

Available as (Storage object)
Manifested from (Version object)

Diagram: AV-Document -> Version -> Media -> Storage. Video, Audio, Transcript are linked to Version.

Manifested by: (Media object)
Has Video (To Video object)
Has Transcript (To Transcript object)
Has Audio (To Audio object)
Expressed from: (AVDocument object)

Navigation: Berghinder fliegen, 2. Internationale Modellbestellung, NPS.DOC Bleikreuzte, CH Chasso, TI. Italienischer Zöhrer, Steak, keat, Güterverkehr, Lab, Anbauwerk und Arbeitssatz, Operazione complessiva.

ECHO Prototype 3 Web Service - Microsoft Internet Explorer

Find Item: show 100 hits of type [unlimited] in active [all] sorted by Relevance in ascending order. Hits: 19

Work Title: Bergkinder fliegen
Duration: 00:02:23:16
Date of Ingest: 22.11.2001-19:05:50
Material: video

ECHO Model Entity

Available as (Storage object)
Manifested from (Version object)

Diagram: AV-Document -> Version -> Media -> Storage. Video, Audio, Transcript are linked to Version.

Manifested by: (Media object)
Has Video (To Video object)
Has Transcript (To Transcript object)
Has Audio (To Audio object)
Expressed from: (AVDocument object)

Navigation: Berghinder fliegen, 2. Internationale Modellbestellung, NPS.DOC Bleikreuzte, CH Chasso, TI. Italienischer Zöhrer, Steak, keat, Güterverkehr, Lab, Anbauwerk und Arbeitssatz, Operazione complessiva.

ECHO Prototype 3 Web Service - Microsoft Internet Explorer

Find Item: show 100 hits of type [unlimited] in active [all] sorted by Relevance in ascending order. Hits: 19

Work Title: Bergkinder fliegen
Duration: 00:02:23:16
Date of Ingest: 22.11.2001-19:05:50
Material: video

ECHO Model Entity

Manifested by: (Media object)
Has Video (To Video object)
Has Transcript (To Transcript object)
Has Audio (To Audio object)
Expressed from: (AVDocument object)

Diagram: AV-Document -> Version -> Media -> Storage. Video, Audio, Transcript are linked to Version.

Navigation: Berghinder fliegen, 2. Internationale Modellbestellung, NPS.DOC Bleikreuzte, CH Chasso, TI. Italienischer Zöhrer, Steak, keat, Güterverkehr, Lab, Anbauwerk und Arbeitssatz, Operazione complessiva.

ECHO Prototype 3 Web Service - Microsoft Internet Explorer

Find Item: show 100 hits of type [unlimited] in active [all] sorted by Relevance in ascending order. Hits: 19

Work Title: Bergkinder fliegen
Duration: 00:02:23:16
Date of Ingest: 22.11.2001-19:05:50
Material: video

ECHO Model Entity

Manifested by: (Media object)
Has Video (To Video object)
Has Transcript (To Transcript object)
Has Audio (To Audio object)
Expressed from: (AVDocument object)

Diagram: AV-Document -> Version -> Media -> Storage. Video, Audio, Transcript are linked to Version.

Navigation: Berghinder fliegen, 2. Internationale Modellbestellung, NPS.DOC Bleikreuzte, CH Chasso, TI. Italienischer Zöhrer, Steak, keat, Güterverkehr, Lab, Anbauwerk und Arbeitssatz, Operazione complessiva.

ECHO Pro prototype 3 Web Service - Microsoft Internet Explorer

Indirizzo: <http://pc-ehc02.8082/MediaArchives/Service/DetailView>

Co: [SIC](#) - [Iran](#)

Find Item: as of: unlimited, in archive: * (selected), sorted by: Relevance, in ascending order, Hits: 19

Submit: type, order

Work Title: Bergkinder fliegen
Duration: 00:02:23.16
Date of Ingest: 22.11.2001-19:15:50
Material: video

ECHO Model Entity

AV-Document

Version

Media

Storage

Video Segmentation

Video

Audio

Transcript

Bergkinder fliegen (To: Version object)

Has Audio (To: Audio object)

Has (To: Transcript object)

Unit: Whole

Indication: No

Description: Text: 1300 Bergkinder // Film über Besuch von Kindern aus den Bergen in Zürich, CH Vals: Gieber von Lawennoptlem / Verpackung von Reiseproviant / Kinder in Busse steigend. La Brevine: Schüler im Schulzimmer sitzend. Zürich: Entfähr im Bahnhoff / Kinder Flugzeug beschissend / Handlung für Kinder / singende Kinder

Silent: No

Color: BW

Operazione completa

ECHO Pro prototype 3 Web Service - Microsoft Internet Explorer

Indirizzo: <http://pc-ehc02.8082/MediaArchives/Service/DetailView>

Co: [SIC](#) - [Iran](#)

Find Item: as of: unlimited, in archive: * (selected), sorted by: Relevance, in ascending order, Hits: 19

Submit: type, order

Entity

Version

Media

Storage

Video Segmentation

Video

Audio

Transcript

Bergkinder fliegen (To: Version object)

Has Audio (To: Audio object)

Has (To: Transcript object)

Unit: Whole

Indication: No

Description: Text: 1300 Bergkinder // Film über Besuch von Kindern aus den Bergen in Zürich, CH Vals: Gieber von Lawennoptlem / Verpackung von Reiseproviant / Kinder in Busse steigend. La Brevine: Schüler im Schulzimmer sitzend. Zürich: Entfähr im Bahnhoff / Kinder Flugzeug beschissend / Handlung für Kinder / singende Kinder

Silent: No

Color: BW

Operazione completa

ECHO Pro prototype 3 Web Service - Microsoft Internet Explorer

Indirizzo: <http://pc-ehc02.8082/MediaArchives/Service/DetailView>

Co: [SIC](#) - [Iran](#)

Find Item: as of: unlimited, in archive: * (selected), sorted by: Relevance, in ascending order, Hits: 19

Submit: type, order

Video Segmentation

1:00:00.00...00:00:03.02 (00:00:03.02)

00:00:03.05...00:00:06.03 (00:00:02.23)

00:00:06.04...00:00:16.20 (00:00:10.16)

00:00:16.24...00:00:19.04 (00:00:20)

Bergkinder fliegen

2. Internationale Modellausstellung

NFS.DOC. Bleikontakte

CH Chasso. Tl. Italienischer Zöhrne-Strak. Inst. Gütenverfekt.Lahn

Anbauwerk und Arbeitssatz

Operazione completa

ECHO Pro prototype 3 Web Service - Microsoft Internet Explorer

Indirizzo: <http://pc-ehc02.8082/MediaArchives/Service/DetailView>

Co: [SIC](#) - [Iran](#)

Find Item: as of: unlimited, in archive: * (selected), sorted by: Relevance, in ascending order, Hits: 19

Submit: type, order

Video Segmentation

1:00:00.00...00:00:03.02 (00:00:03.02)

00:00:03.05...00:00:06.03 (00:00:02.23)

00:00:06.04...00:00:16.20 (00:00:10.16)

00:00:16.24...00:00:19.04 (00:00:20)

Bergkinder fliegen

2. Internationale Modellausstellung

NFS.DOC. Bleikontakte

CH Chasso. Tl. Italienischer Zöhrne-Strak. Inst. Gütenverfekt.Lahn

Anbauwerk und Arbeitssatz

Operazione completa

The multimedia metadata



Digital Library Competence Center

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Microsoft Internet Explorer - ECHO prototype 3 Web Service

Indirizzo: <http://pc-ehc2.8081/MediaActive/ServiziStartView>

Co: [g3c](#) - [Iran](#)

Find Iran
as of unlimited
in active
show 100
sorted by Relevance
in ascending
order
Hits: 19

Submit
type
hits of
type

Operazione completa

1300 Bergkinder... in Vals, wo der zurückweichende Schnee die Trümmer aus der Lawinnennacht freilegt, schmecken frische Kränze die Gräber der Verschluten; aber in manchen der somerbraunen Häuser war in den ersten Matragen ein heudolles, eierweißes Packen, das sich nicht bewegt, denn, das ist eine Mänserele in die Kammer, wo die Vörsche für Jahre hängen; fürsorgliche Hände bereiten. Reiseproviant zu Rucksäcke wurden prall gefüllt; treudig war der Abschied. Die Zürcher Bergkinder in die grosse Stadt am See geladen. Und wehrend wir dem Abschied der Valserkinder zusehen, während aus anderen Bergdörfern, gebourtsachen und Kirchsachen, die Kinder, von Kirchsachen, von Kirchsachen, spanen im Juredort La Brevine

1300 BERGKINDER...

Microsoft Internet Explorer - ECHO prototype 3 Web Service

Indirizzo: <http://pc-ehc2.8081/MediaActive/ServiziStartView>

Co: [g3c](#) - [Iran](#)

Find Iran
as of unlimited
in active
show 100
sorted by Relevance
in ascending
order
Hits: 19

Submit
type
hits of
type

Operazione completa

Audio Segmentation

Bergkinder fliegen - Browning Player

Pause 01:14:30.01 / 01:14:29

Video Segmentation

00:00:00.00...00:02:29.16
00:00:03.05...00:00:06.03
00:00:06.04...00:00:16.20
00:00:16.24...00:00:18.19
00:00:00.01...00:01:20

Submit
type
hits of
type

Operazione completa

1300 BERGKINDER...

Microsoft Internet Explorer - ECHO prototype 3 Web Service

Indirizzo: <http://pc-ehc2.8081/MediaActive/ServiziStartView>

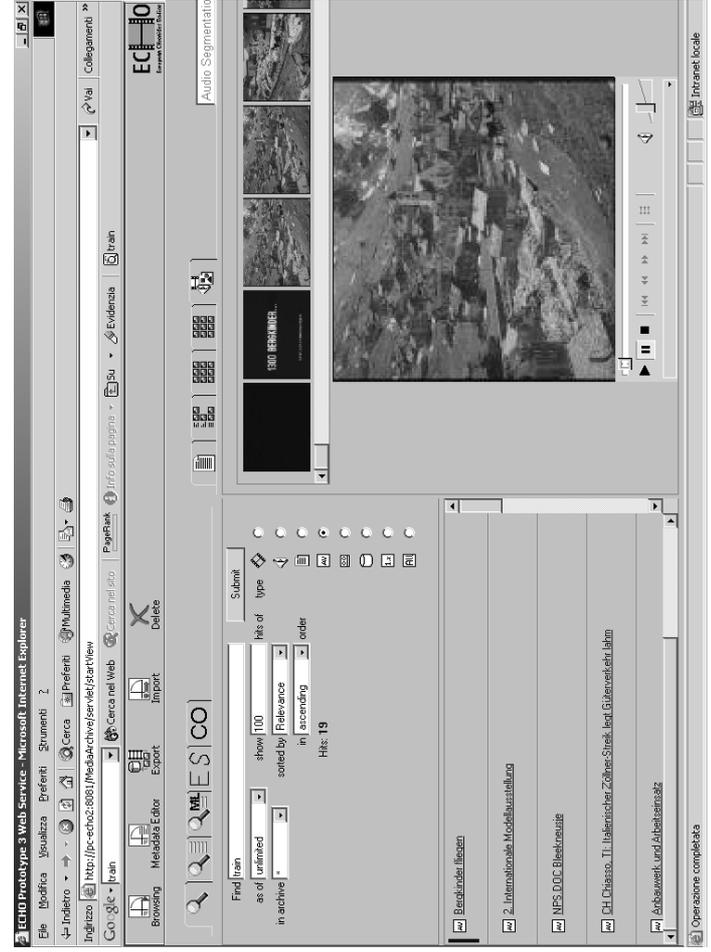
Co: [g3c](#) - [Iran](#)

Find Iran
as of unlimited
in active
show 100
sorted by Relevance
in ascending
order
Hits: 19

Submit
type
hits of
type

Operazione completa

Speech



The fielded search

The screenshot shows the ECHO web service interface. The search results for 'Problemi e soluzioni dell'urbanistica' are displayed. The main entry is 'Problemi e soluzioni dell'urbanistica' with a duration of 00:00:57.15 and a date of 21.08.2002-14:38:29. The material is 'video'. The interface includes a search bar, navigation buttons, and a list of search results. A diagram on the right shows the relationship between AV-Document, Version, Media, and Storage.

Work Title: Problemi e soluzioni dell'urbanistica
 Duration: 00:00:57.15
 Date of Ingest: 21.08.2002-14:38:29
 Material: video

AV-Document → Version → Media → Storage

Version → Audio → Transcript

Problemi e soluzioni dell'urbanistica (Version object)

Title Expressed by: Problemi e soluzioni dell'urbanistica
 Series Title: La Settimana Incom
 Genre: Newsteel
 Thematic: House-building; Families

The screenshot shows the ECHO web service interface. The search results for 'Problemi e soluzioni dell'urbanistica' are displayed. The main entry is 'Problemi e soluzioni dell'urbanistica' with a duration of 00:00:57.15 and a date of 21.08.2002-14:38:29. The material is 'video'. The interface includes a search bar, navigation buttons, and a list of search results. A diagram on the right shows the relationship between AV-Document, Version, Media, and Storage.

Work Title: Problemi e soluzioni dell'urbanistica
 Duration: 00:00:57.15
 Date of Ingest: 21.08.2002-14:38:29
 Material: video

AV-Document → Version → Media → Storage

Version → Audio → Transcript

Problemi e soluzioni dell'urbanistica (Version object)

Title Expressed by: Problemi e soluzioni dell'urbanistica
 Series Title: La Settimana Incom
 Genre: Newsteel
 Thematic: House-building; Families

The screenshot shows the ECHO web service interface. The search results for '50 Jahre Schweizer Pfadfinder, Gant' are displayed. The main entry is '50 Jahre Schweizer Pfadfinder, Gant' with a duration of 00:00:57.15 and a date of 21.08.2002-14:38:29. The material is 'video'. The interface includes a search bar, navigation buttons, and a list of search results. A diagram on the right shows the relationship between AV-Document, Version, Media, and Storage.

Work Title: 50 Jahre Schweizer Pfadfinder, Gant
 Duration: 00:00:57.15
 Date of Ingest: 21.08.2002-14:38:29
 Material: video

AV-Document → Version → Media → Storage

Version → Audio → Transcript

50 Jahre Schweizer Pfadfinder, Gant (Version object)

Title Expressed by: 50 Jahre Schweizer Pfadfinder, Gant
 Series Title: La Settimana Incom
 Genre: Newsteel
 Thematic: House-building; Families

The screenshot shows the ECHO web service interface. The search results for '50 Jahre Schweizer Pfadfinder, Gant' are displayed. The main entry is '50 Jahre Schweizer Pfadfinder, Gant' with a duration of 00:00:57.15 and a date of 21.08.2002-14:38:29. The material is 'video'. The interface includes a search bar, navigation buttons, and a list of search results. A diagram on the right shows the relationship between AV-Document, Version, Media, and Storage.

Work Title: 50 Jahre Schweizer Pfadfinder, Gant
 Duration: 00:00:57.15
 Date of Ingest: 21.08.2002-14:38:29
 Material: video

AV-Document → Version → Media → Storage

Version → Audio → Transcript

50 Jahre Schweizer Pfadfinder, Gant (Version object)

Title Expressed by: 50 Jahre Schweizer Pfadfinder, Gant
 Series Title: La Settimana Incom
 Genre: Newsteel
 Thematic: House-building; Families

Thematic keyword search



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Cross-language search



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Find: ragazzi

Archive: IL INA Memory NCA

Themes: 1 - Post War
2 - The World Wars
3 - Sports in the 20th Century
4 - Other
5 - Youth Culture in Europe

show: 100 hits
Hits: 100

444C475549440087D0A9F56A90520077825718030103000E0F7C1086800000	il	444C475549440087D0A9F56A90520077825718030103000E0F7C1086800000

00:00:34.21...00:00:35.05 (00:00:00.09)
00:00:35.05...00:00:38.11 (00:00:01.06)
pelle di cenerentola
00:00:38.11...00:00:37.04 (00:00:01.18)
00:00:37.04...00:00:44.05 (00:00:07.01)
il suo giovane sovrano ramani terzo va sponsor la **ragazza** americana grazie patizica Kelly una delle più grandi attrici di cl

Find: boy

Archive: IL INA Memory NCA

Themes: 1 - Post War
2 - The World Wars
3 - Sports in the 20th Century
4 - Other
5 - Youth Culture in Europe

show: 100 hits
Hits: 100

444C475549440087D0A9F56A90520077825718030103000E0F7C1086800000	memory	444C475549440087D0A9F56A90520077825718030103000E0F7C1086800000

00:00:00...00:00:21.00 (00:00:21.00)
-Anton Heim sei heischer Auf dem St. Galler Klosterplatz tut sich was. Aber was denn? Nun fast wie im Märchen haben sich Pfadfinder in Heizenmännchen verandelt und brennen darauf... doch ten wir ab und sehen wir zu. auf was für Ideen Heizen**männchen** in der Weihnachtszeit verfallen können.

Find: boy

Archive: IL INA Memory NCA

Themes: 1 - Post War
2 - The World Wars
3 - Sports in the 20th Century
4 - Other
5 - Youth Culture in Europe

show: 100 hits
Hits: 100

444C475549440087D0A9F56A90520077825718030103000E0F7C1086800000	il	444C475549440087D0A9F56A90520077825718030103000E0F7C1086800000

00:00:27.03...00:00:31.00 (00:00:03.22)
altre esto fondelli del porto di cambiar parlare
00:00:31.01...00:00:33.21 (00:00:02.20)
00:00:33.21...00:00:51.06 (00:00:20.10)
mentre la macchina si aspetta che lo scoldabrogio celeste porti d'acqua alle palete relamente venuti i giorni **coperti** in cui l'oreo della piscina è indograbile come di inverno paio della scudie anticler e per la sua greggia i tonni vanno in vacanza e anche le saglie del caffè in vacanza perfino destra

The Image Similarity search



10 June 2003

JCDL 2003

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Kind of Search:
 Nearest Neighbours Range
Strategy:
Tune Parameter:
Hit: 10

DMGid: 444C4755494408970A0F558A90520077626771803010300
Timecode: 00000040
Distance: 1.32621
Value:

DMGid: 444C4755494408970A0F558A90520077626771803010300
Timecode: 00061120
Distance: 1.49315
Value:

Kind of Search:
 Nearest Neighbours Range
Strategy:
Tune Parameter:
Hit: 10

DMGid: 444C4755494408970A0F558A90520077626771803010300
Timecode: 00016720
Distance: 0
Value:

DMGid: 444C4755494408970A0F558A90520077626771803010300
Timecode: 00700240
Distance: 0.877836
Value:

Questions??

