

METADATA GENERATION FOR CULTURAL HERITAGE

Creative Histories – The Josefsplatz Experience

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Österreichische
Nationalbibliothek

Talk Outline

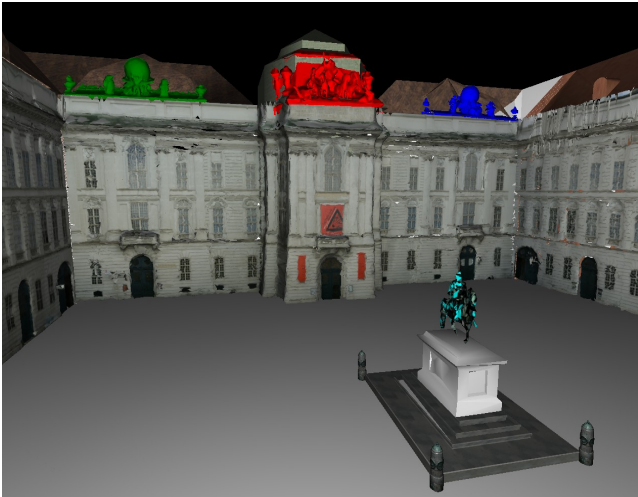
- introduction
- project overview
- metadata extraction
- metadata processing
- speech synthesis
- automatic tour generation
- summary

Creative Histories



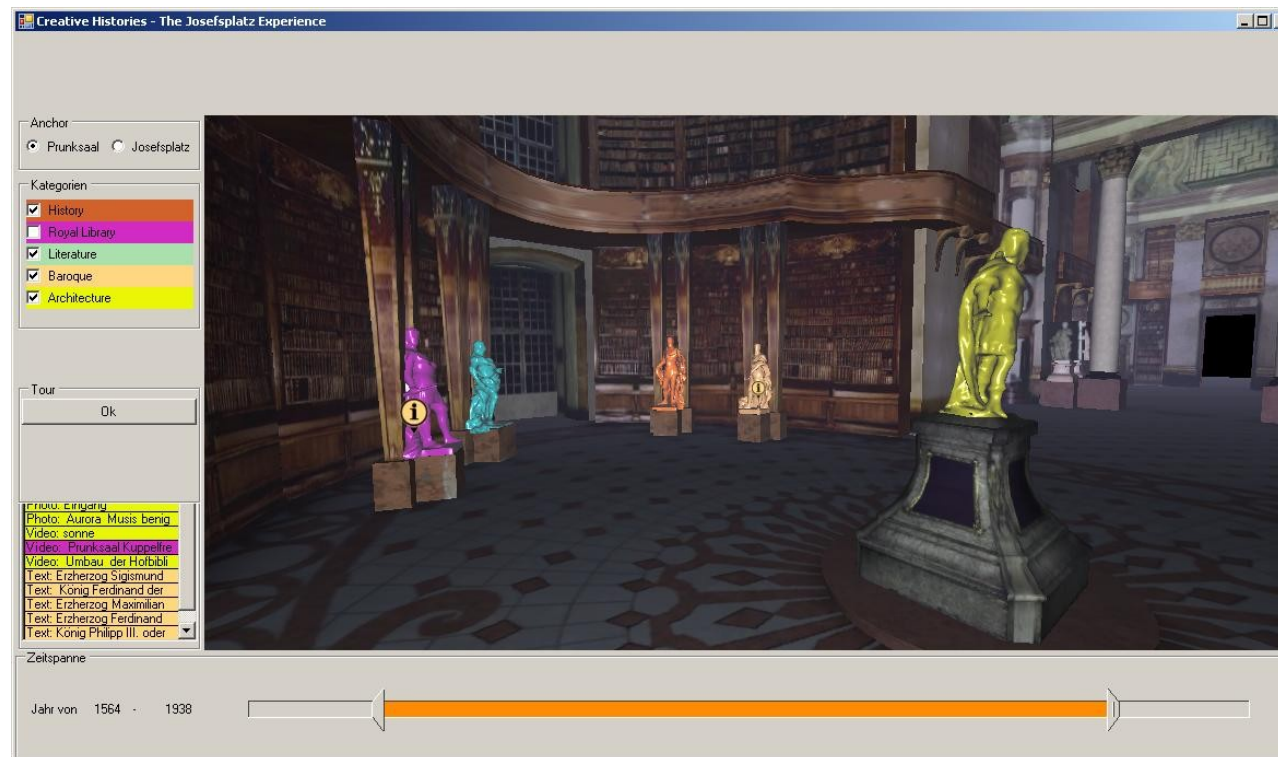
Creative Histories

3d model of the Josefsplatz & Prunksaal
reconstructed from (historic) photographs,
paintings, maps



Creative Histories

navigation of 3d space and embedded meta-information across different epochs on PC and mobile phones



Conceptual Model

depending on

- spatial and temporal position in the model
- user interests (categories, level of detail)
- already accessed information (history)
- device used (mobile phone, desktop)

the 3d model will change and

different information will be accessible to the user

Metadata Component

Main Tasks:

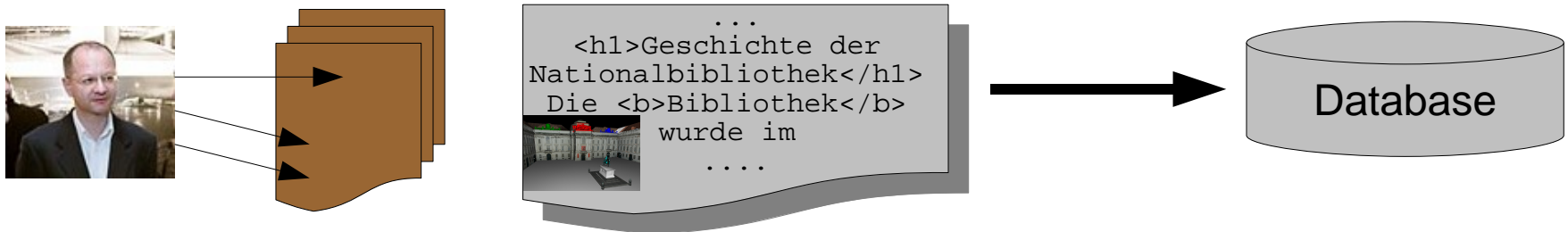
extraction of metadata from legacy documents

semantic representation & querying of
metadata

automatic generation of presentations
adapted to context, content and device

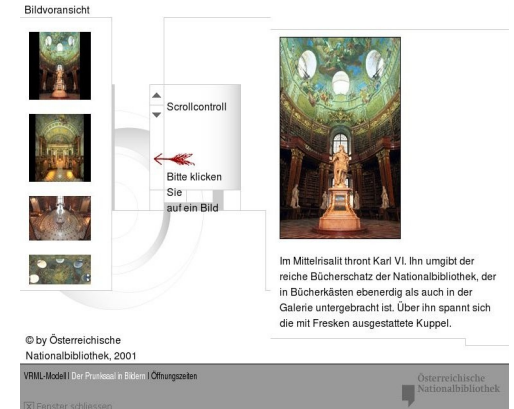
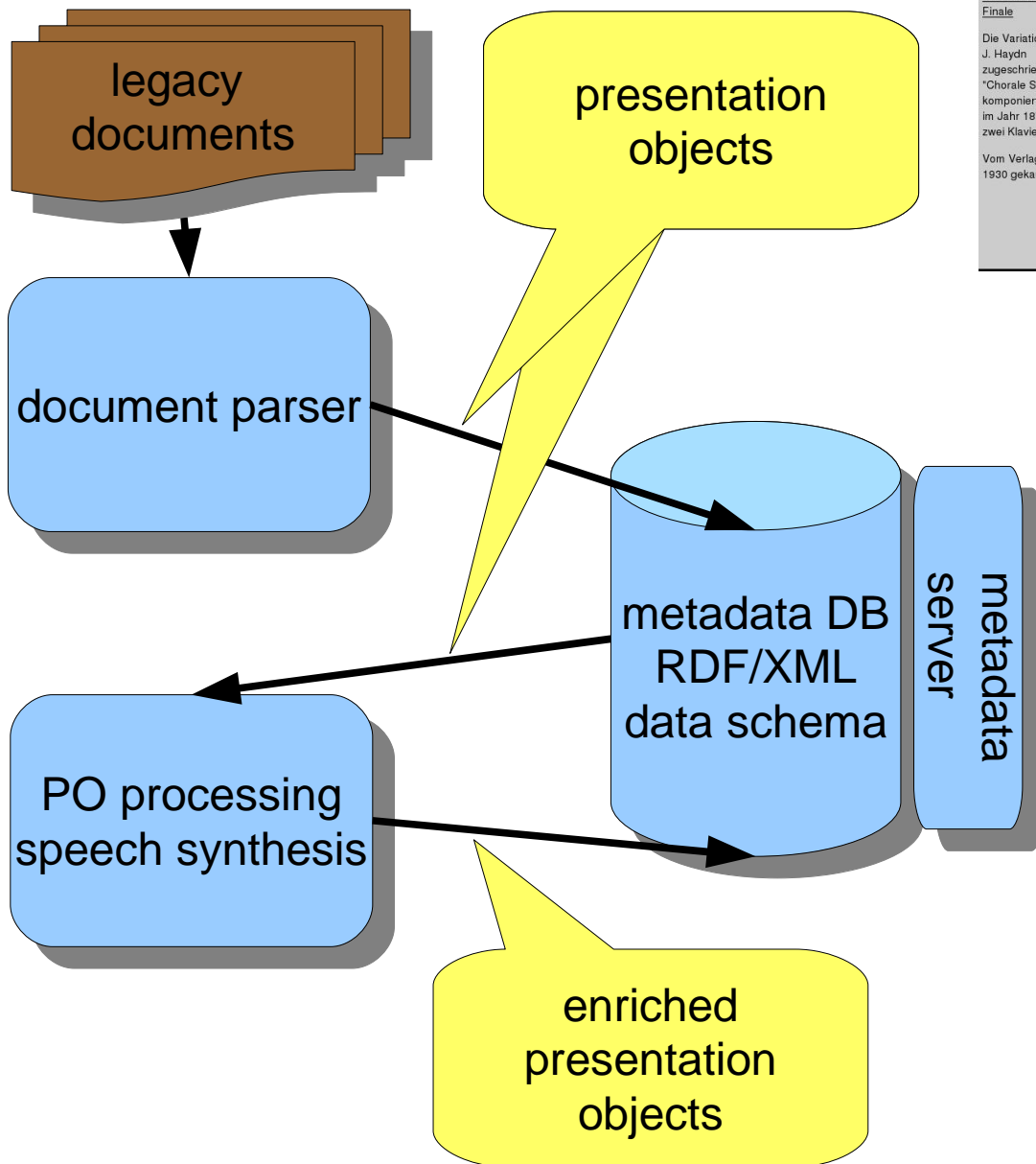
Metadata Extraction

- selection of relevant documents by a human expert
- documents courtesy of the ONB include html documentations, encyclopaedias, exhibition materials
- automatic extraction of metadata using document structure and mark-up (citations)



Metadata Processing

- interlinked 'presentation objects' (PO) of types *image, text, video, audio, vrml model* are stored in a RDF/XML framework
- PO are enriched with meta-information such as temporal and spatial anchors, category, file size, image dimensions, duration
- textual data are stored sentencewise



3rd party tools used:

Database & Modeling:

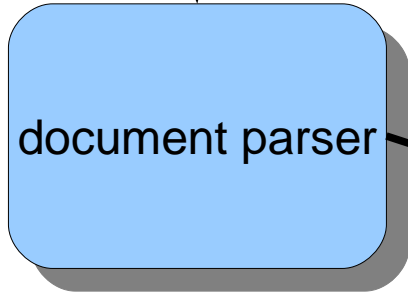
- Sesame RDF Database
- Apache Tomcat
- Protege Ontology editor

Text-to-Speech Synthesis:

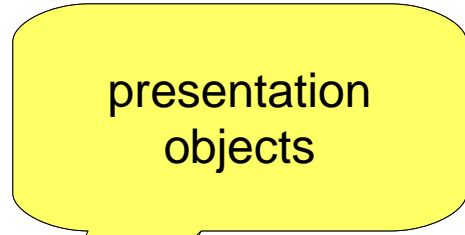
- MARY (diphone)
- Loquendo (unit selection)



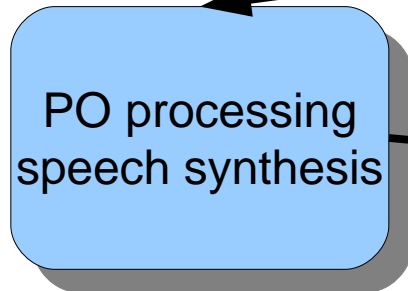
legacy documents



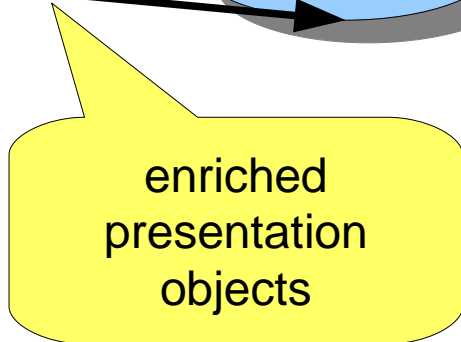
document parser



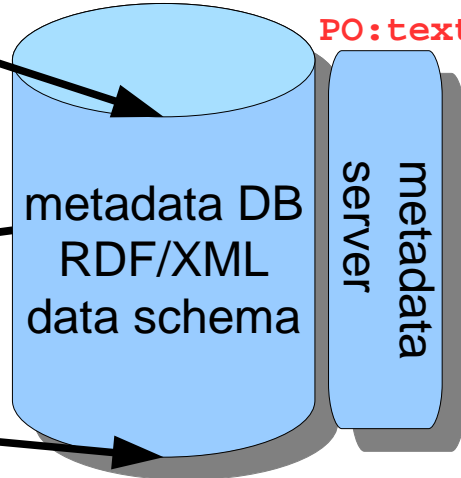
presentation objects



PO processing
speech synthesis

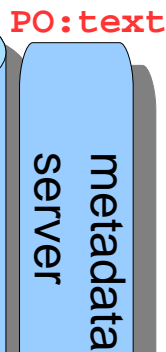


enriched presentation objects



metadata DB
RDF/XML
data schema

PO:text

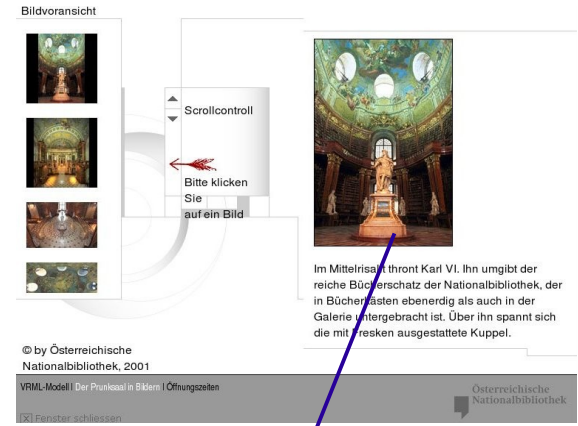
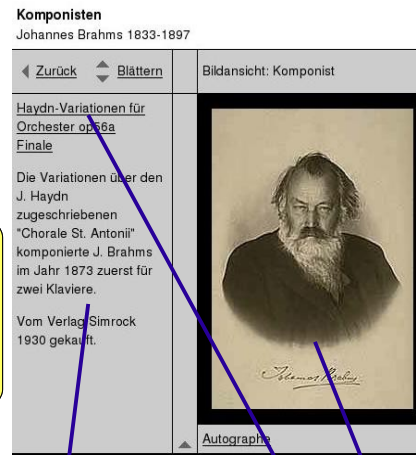


metadata server

links

PO:audio

PO:image



PO:image

legacy documents

document parser

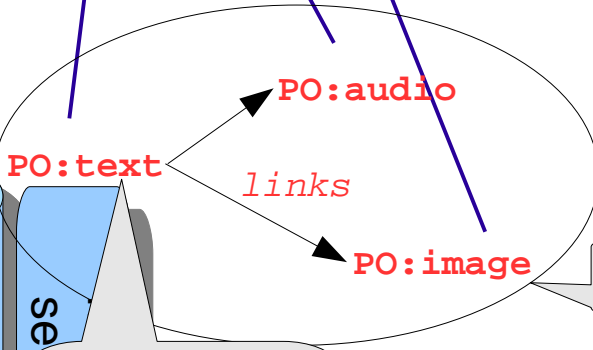
PO processing
speech synthesis

presentation objects

enriched presentation objects

metadata DB
RDF/XML
data schema

text to speech
synthesis



minimal presentation unit (MPU)

Komponisten
Johannes Brahms 1833-1897

◀ Zurück ▶ Blättern

Bildansicht: Komponist

Haydn-Variationen für Orchester op.66a
Finale

Die Variationen über den J. Haydn zugeschriebenen "Chorale St. Antonii" komponierte J. Brahms im Jahr 1873 zuerst für zwei Klaviere.

Vom Verlag Simrock 1930 gekauft.

Autograph

Bildvoransicht

Scrollcontroll

Bitte klicken Sie auf ein Bild

Im Mittelraum thront Karl VI. Ihn umgibt der reiche Bücherschatz der Nationalbibliothek, der in Bücherkästen ebenerdig als auch in der Galerie untergebracht ist. Über ihn spannt sich die mit Fresken ausgestattete Kuppel.

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VRML-Modell | Der Prozess | In Bildern | Öffnungszeiten

Österreichische Nationalbibliothek

[X] Fenster schließen

Speech Synthesis

motivation:

restrictions on display of text on mobile devices,
flexibility of presentation

tools:

- automatic preprocessing
- computer-aided compilation of domain lexicon
- Loquendo (unit selection)
- MARY (diphone)

Loquendo
VOCAL TECHNOLOGY AND SERVICES

MARY **T**ext **T**o **S**peech

Speech Synthesis

unit selection quality low for domain vocabulary
diphone synthesis better adaptable

... den Schatz Friedrichs III. nach ...



... den Schatz Friedrichs *des dritten* nach ...

The screenshot shows a software interface for speech synthesis. At the top, there is a text input field containing the sentence: "Neukonstituierung der Hofmusikkapelle <say-as interpret-as='date' format='y'>1498</say-as>". Below the text field is a control bar with buttons for "P.Seen", "Prev", "Play", "Next", "N.Unseen", "Stop", and "Goto". Underneath are input fields for "Abbrev:", "Text:", "SAMPR:", and "Method:", each with a corresponding "Insert" or "Play" button. A row of buttons includes "Add 2 lexicon", "Add 2 phrases", "Add 2 abbrev", "Clear 'seen words'", and "Clear 'seen sents'". The "Input file" section shows a "File set:" field with the path "/net/gurke/josefsplatz/SMIL/getlexicon.smil" and a "Browse" button, and a "Single f:" field with the path "/net/gurke/josefsplatz/SMIL/getlexicon/xml/8El_pomo_doroimgd1.xml" and another "Browse" button. At the bottom, there are buttons for "Save config", "HELP", "verbose", and "Exit".

Pallavicinipalais, Redoutensäle,
Mittelrisalit,...

Tour Generation

online generation of interactive tours
adapted to

- device requirements,
- context (user interest, position, history),
- content (media types, categories)

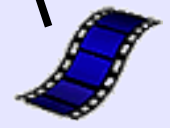
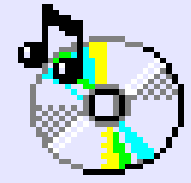
minimal presentation unit

minimal presentation unit

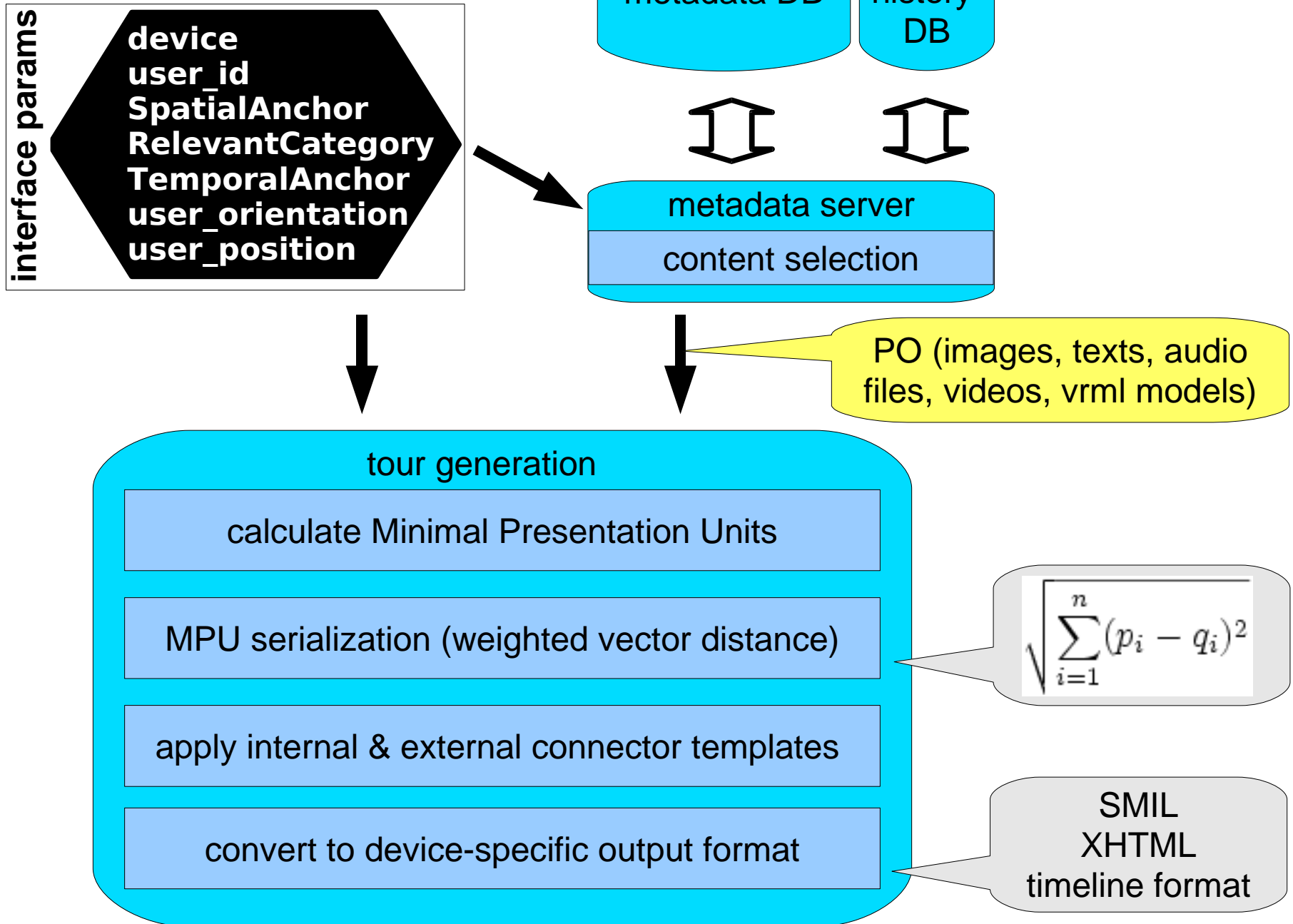
composed of:
(representations of)
presentation objects,
internal connectors,
external connectors;
player control commands
(position, orientation)

minimal presentation unit

user interaction:
navigate forwards/backwards
view/skip optional material
return to 3d model view



TOUR



Tour Generation: Alignment

images are temporally aligned with speech

- temporal position of pictures determined by link position and clause structure
- extraction of timing information using MARY



<break>

<break>

<break>

<break>

... zeigen das Haus Österreich, die Steiermark, Tirol, und Kärnten, die Länder in denen ...



Summary

major characteristics revisited:

automatic extraction and processing of presentation objects from legacy documents

storage of presentation objects along media type and interface dimensions (such as category, temporal anchor) in RDF/XML format

online generation of interactive tours adapted to context, content and device

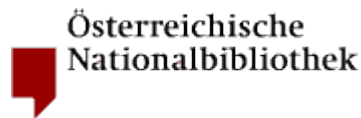
Project Partners



Creative Histories – The Josefsplatz Experience www.josefsplatz.info



Austrian Research Institute for Artificial Intelligence (OFAI)
www.ofai.at



Austrian National Library (ÖNB)
www.onb.ac.at



Zentrum für Virtual Reality und Visualisierung (vrvis) www.vrvis.at



Forschungszentrum Telekommunikation Wien (ftw)
www.ftw.at