Ideas for a layered data model for an AR tours app based on CIDOC CRM and geodata

Virtual Campus project

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Virtual Campus project

Context:

• University of Cologne
  - Department of Geography
  - Department of Digital Humanities
  - University Library
  - Computing Center
  - Center for Teacher Education

• 2023–2026

• Funding for ‘Quality improvement in studies and teaching’

• https://virtueller-campus.uni-koeln.de/

Goals:

• Explore how AR and VR can bring improvements for students

• Improve finding one’s way on the UoC campus

• Improve (information on) accessibility of buildings and paths

• Create a 3D representation of (some of) the UoC campus
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Products:

- 3D models
- Mobile app
- 360° tour of the University Library
- CAVE-Kompakkt integration
- Teaching
  - Hackathon: projects combining geodata and AR/VR applications

Mobile app (Flutter + Unity):

- Help students navigate the UoC campus with its almost 300 buildings, e.g.
  - Find lecture halls and other rooms
  - Find books/media
  - Routing according to accessibility filters
  - Map and AR modes, outdoors and indoors
- Location-based information
  - What is this building, what is in it
  - Opening hours
- AR tours of University Library to get to know the library services
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Planned addition: AR tours on UoC history

• Tours with topics like
  - History of UoC in a nutshell
  - UoC and colonialism
  - The first woman student at UoC
  - Brutalist architecture at UoC

Why AR?

• The AR navigation feature will exist anyways
• AR tours: interactive, location-based, can be done at any time, multisensory, hopefully compelling

What could these tours look like?

Different ideas, in planning stage:

• AR navigation
• Guided tour: Tour stops in a specific order
• Explorative: Looking around the campus triggers content
• Present relevant multimedia content (audio, video, image, text, 3D model), either/or:
  - Not in AR, but just as popup
  - Show 3D reconstructions of previous building states in AR
  - Show historical photographs in AR, recreating the photographer’s view
Data model / knowledge base for AR tours on UoC history

Benefits:

• Potentially very large amount of data, data from different sources → common format
• Sustainability of data beyond the lifespan of this app
• Data could be queried according to tour designer’s or user’s interests
• Enable students of different disciplines to create their own tours
What to model and how to model it? Some of our ideas:

• **Base data**
  - Buildings, ensembles, squares, etc., their parts and location → E53 Place / E4 Period
  - Events, also related to buildings → E11 Modification and similar
  - Persons, their role at UoC → E21 Person
  - Multimedia objects → E 36 Visual Item etc.
  - 3D models of some buildings (being created in the project); refer to specific parts of the geometry?
    → 3D Tiles standard (and/or annotations / IIIF 3D / Kompakkt)?

• **Base data → information presented to user → E73 Information Object**

• **Suggested tour order → CRMact actE2 Activity Plan**
  - Links to the base data as presented to the user
  - Parallel with series of annotations in storytelling

• **View point of photographer / observed area → issue 579**
Data model / knowledge base for AR tours on UoC history

Next steps?

• Feedback from you?

• Start a UoC knowledge base based on a simplified model
  – Add UoC-related items from Wikidata and other sources
  – Extend it based on research literature

• Decide on one type of AR tour to start with (and implement it in the app)
  – Including the use of Activity Plan and/or specific areas recorded by photographs

• Gradually expand both knowledge base and model as necessary

• Involve Digital Humanities students in modelling

• Involve students from other disciplines to research and design content of tours