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# A Framework for Adaptive Management of Multimedia Contents

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## *A Framework for Adaptive Management of Multimedia Contents*

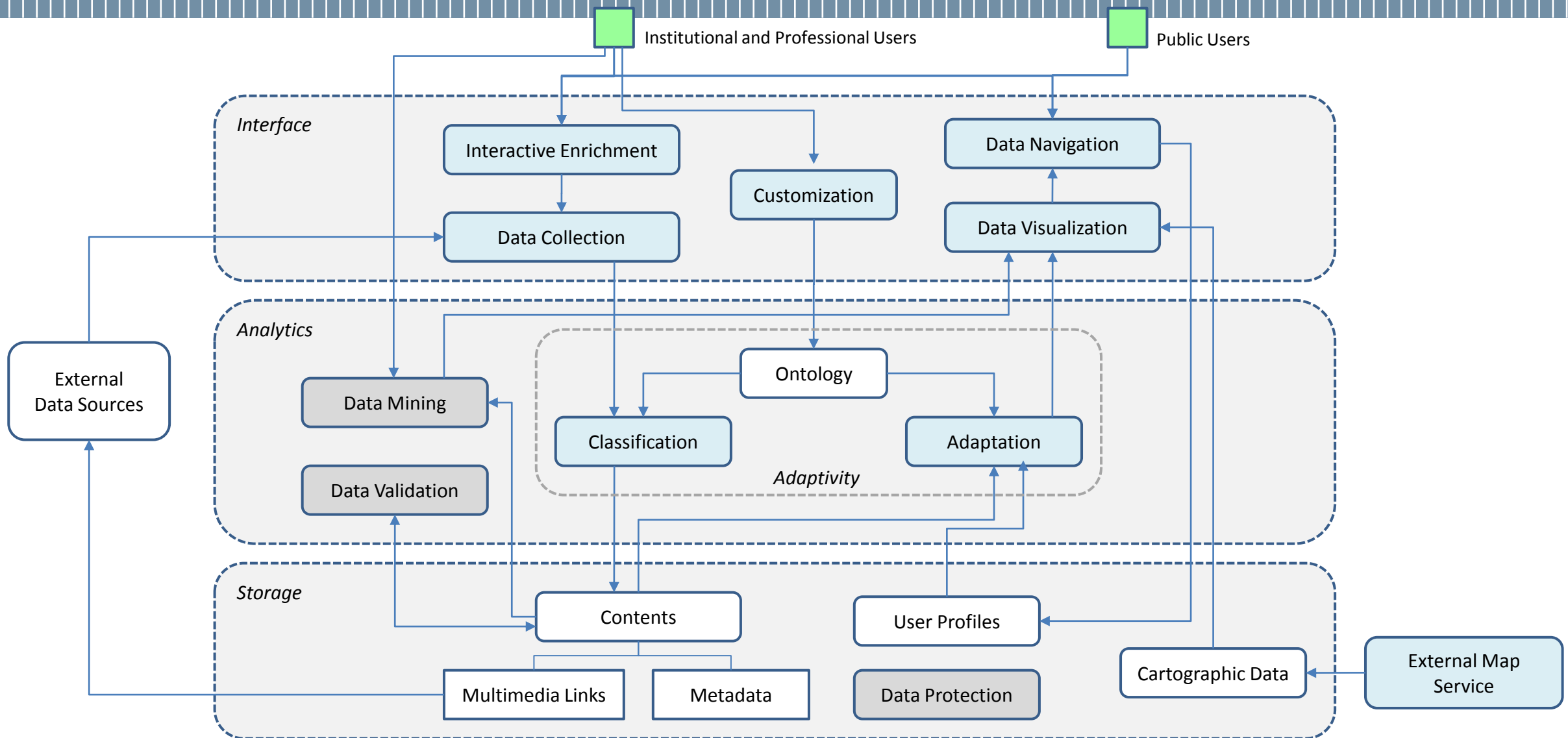
- A software platform where knowledge is associated to **cartography**.
- Designed to be **self-adaptable** to different contexts.
- Early Stage: developing specifications and running some experiment.

# Key Features

*Our framework is focused on three main features*

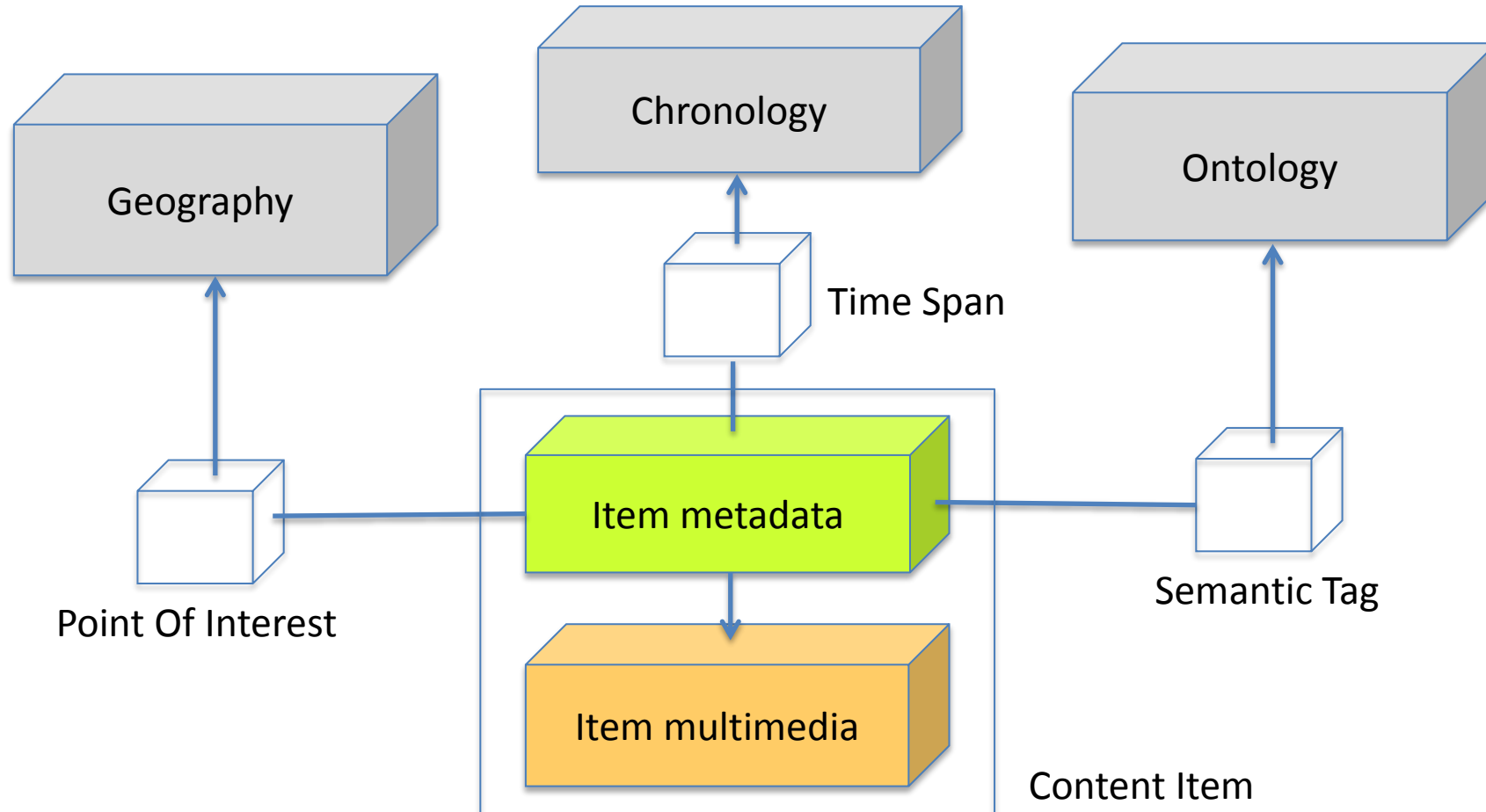
- Multimedia contents. Knowledge is expressed by **unstructured data**: texts, images, video, podcast or any kind of linked documents provided with adequate metadata.
- Multi-dimensional structure. Contents are organized along three **knowledge dimensions**: space, time, topic.
- Adaptability: content navigation can adapt both to **user profile** and to **domain context**. Adaptation is a dynamic process and is mostly automated.

# Framework Outline

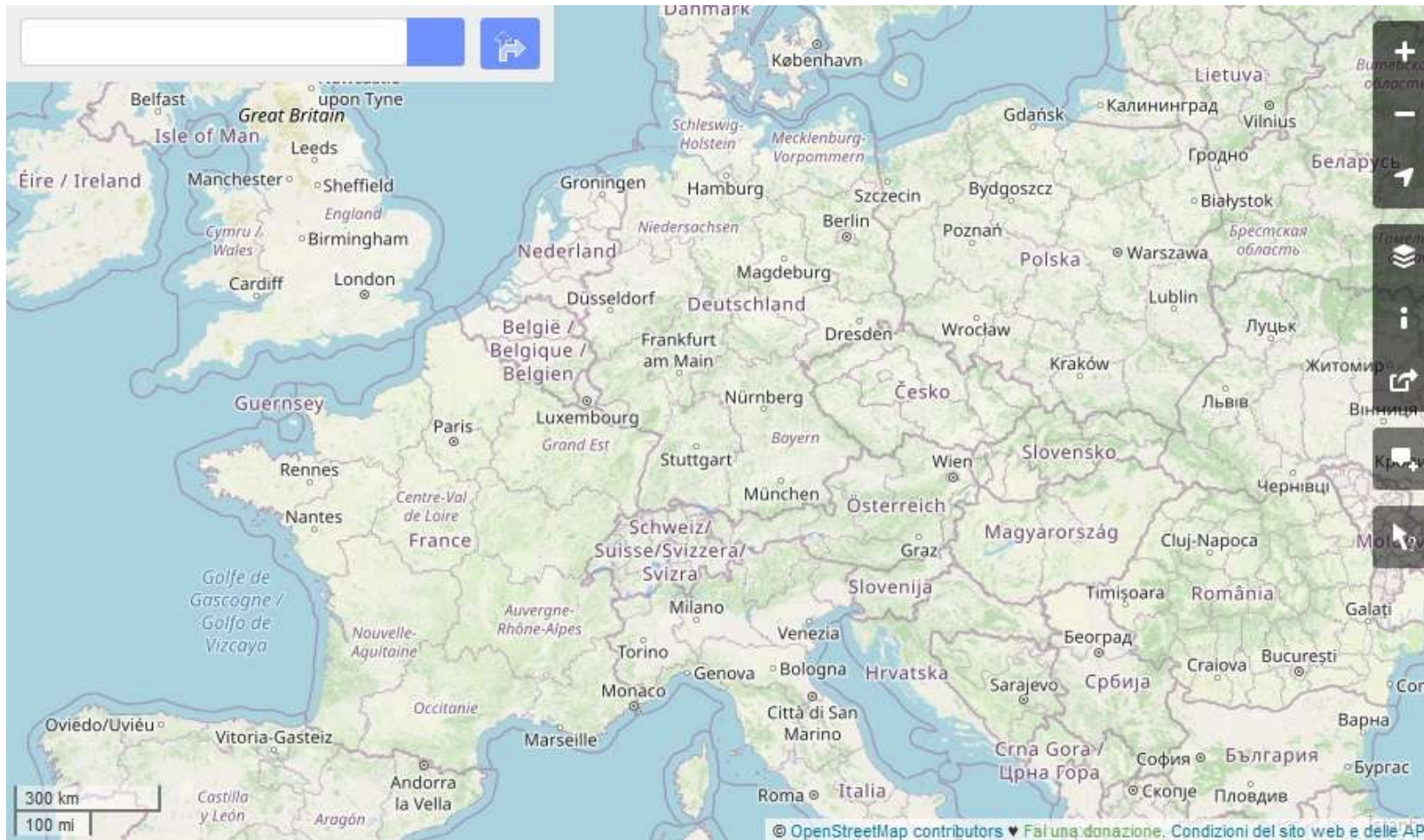


# Data Dimensions

*Contents are organized along three knowledge dimensions: space, time and topic*



# Space and Time



*Pan, Zoom, Geolocation*

*Chronological Filters*

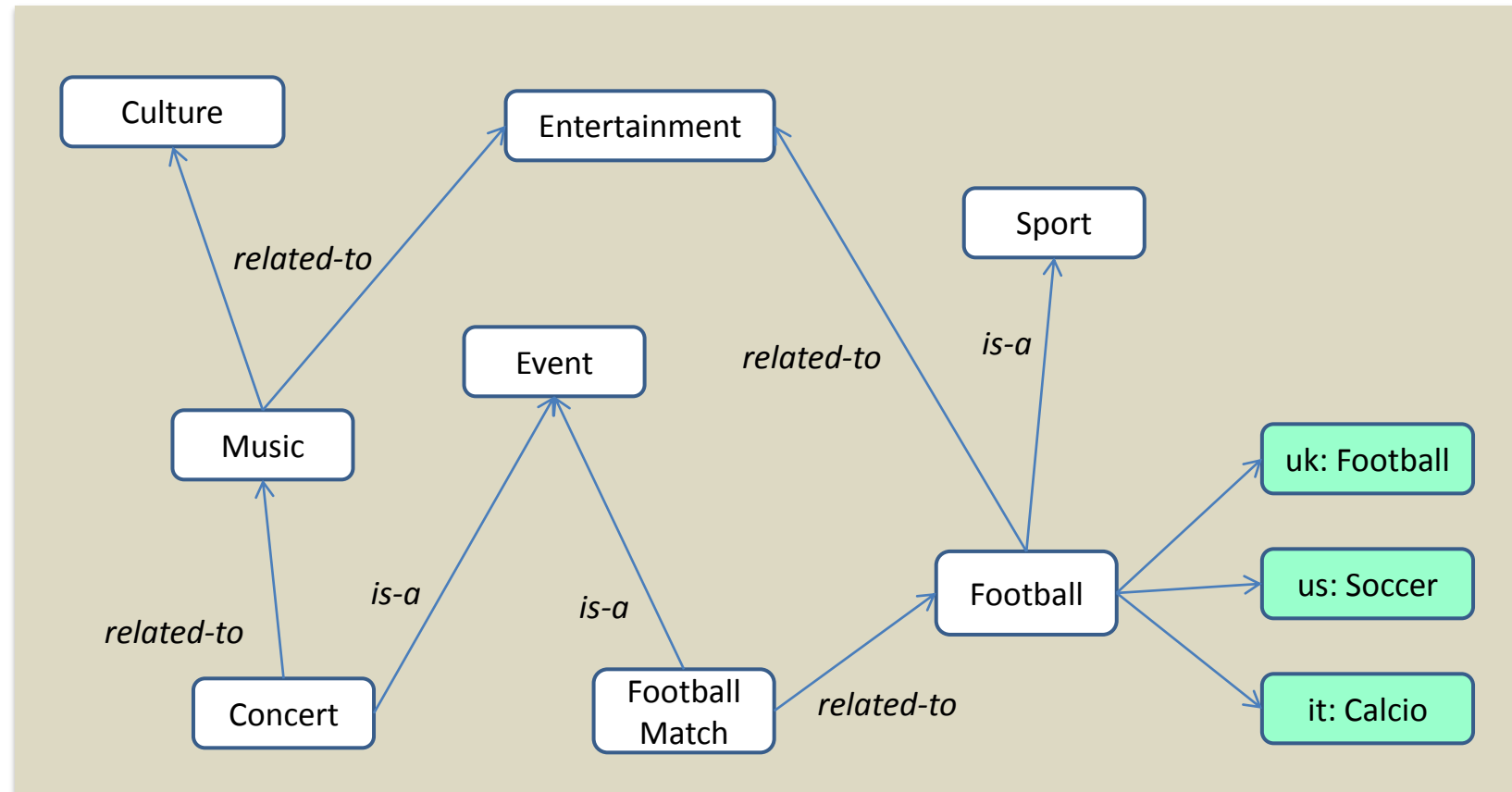


# Topic Ontology

Tags are organized with the support of an ontology that connects the tags in a semantic network

Why we need an ontology ?

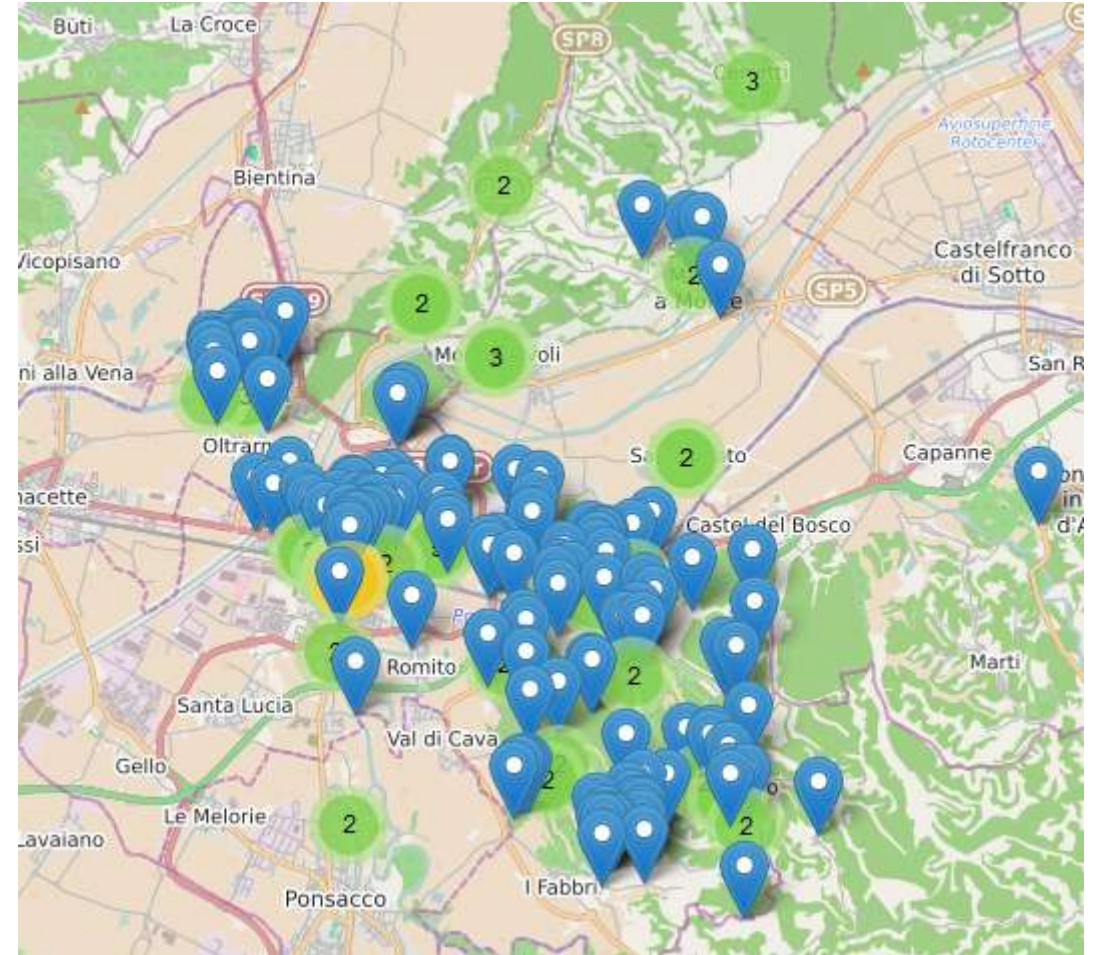
- **Topic-connections**
- **Language-independence**



# Information Overload

*We want to avoid the information overload that would occur when showing all the contents at the same time:*

- We address the overload problem by grouping contents. This information reduction process is dynamic and based on a semantic classification of content items.
- This classification is adaptable to the domain context and takes place while uploading content items, by exploiting their metadata.





# Content Navigation

*The navigation interface will offer different tools to reduce information overload in a way that is adaptable to the context:*

- **Filters:** selecting a subset of contents;
- **Layers:** dividing contents based on sub-topics or other properties;
- **Clusters:** grouping contents based on different criteria;
- **Ranking:** proposing first the most relevant contents.

# Adaptability

*What is the system adaptable to?*

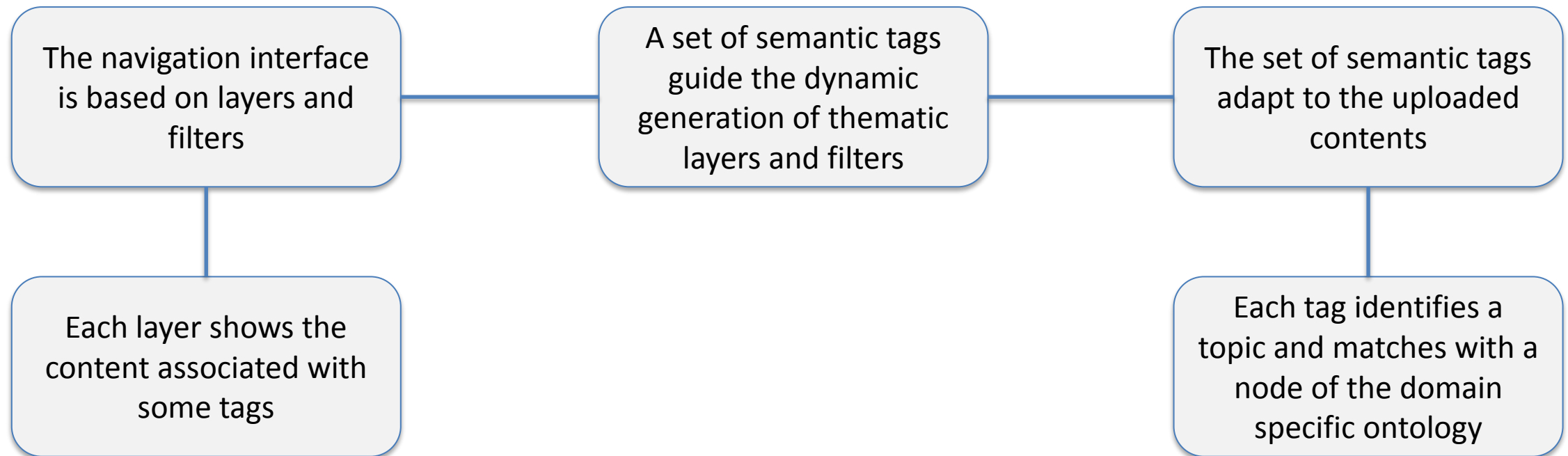
- It adapts to the execution context, which consists of the current user and the application domain:
  - to the user profile, for it presents contents that are suitable for user and its authorizations, and that take into account its preferences.
  - to the application domain, for it relies on the topics of available contents.

*How is the system adaptable ?*

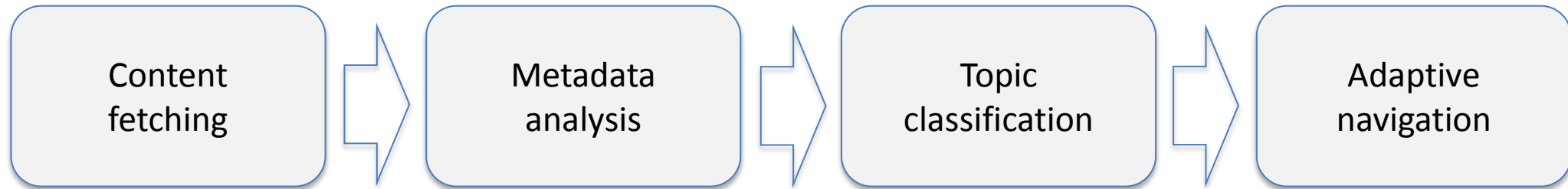
- The system adapts by modifying the navigation interface, according to the user profile and to the content topics available at that time.
- Adaptation to space and time bonds is more straightforward, through implicit and explicit navigation filters.

# Adaptive Navigation

*Adaptability is aimed at reducing the information presented to the user. The system adapts by modifying the navigation interface according to the user profile and to the available contents.*



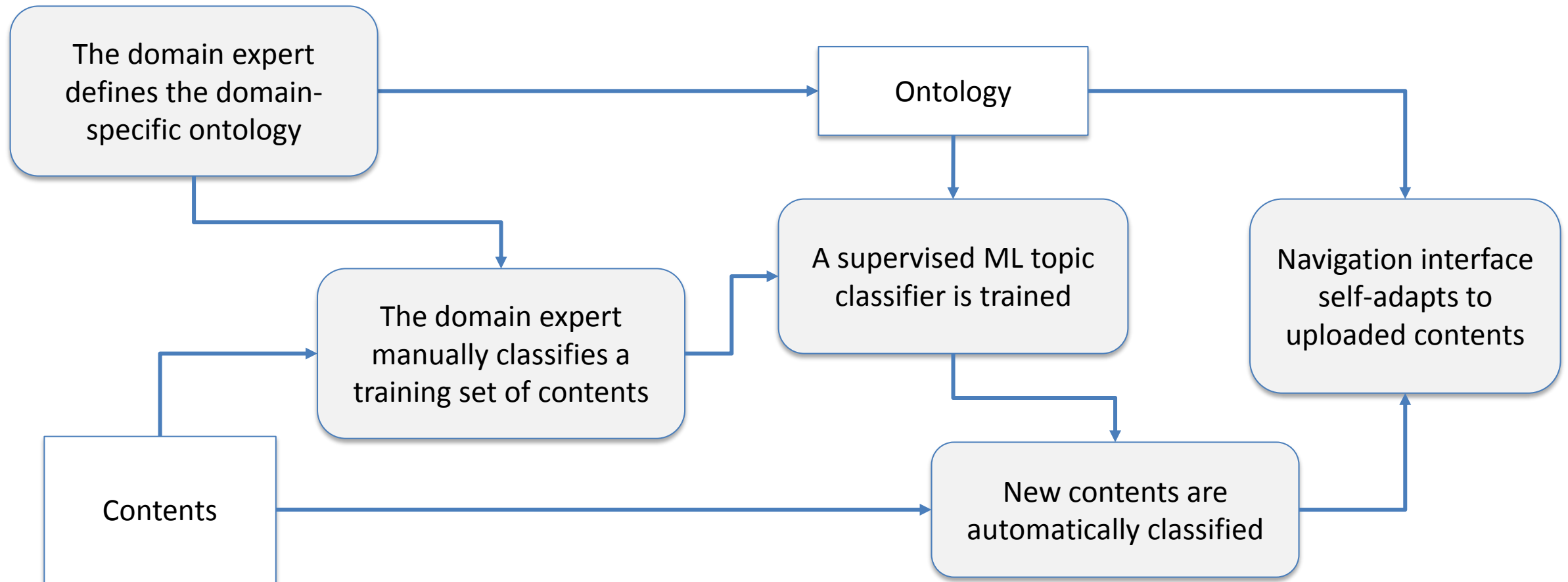
# Content Classification



- To be effective, topic classification must be specific to the application domain context.
- For **large datasets**, classifying contents one at a time, with the help of a domain expert, is a too costly operation, while having them classified by volunteer contributors is likely to produce a too sparse and heterogeneous classification.
- Therefore, we consider a way to classify them **automatically**, starting from textual metadata associated with each content item.

# Machine Learning Classifier

We are following an hybrid approach between an **expert-driven** and a **supervised ML-driven** classification.



# Conclusion

- We identified many possible **application domains** : intangible and tangible cultural heritage, tourism, history, nature and environment, agriculture, risk monitoring, news and citizen journalism.
- A prototype is now being developed on the domain of **local news** from local media websites and local news blogs.
- We are currently developing the content **classification module** and we are testing different NLP-ML algorithms.

# Thank You!



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