Gaining Insight into Cultural Heritage Using Event Descriptions

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Agenda

- CultureFinland portal as a demonstration system
  – Thomas Häggström
- Content description and search methods
  – Tuukka Ruotsalo
CultureFinland

- Virtual exhibition with the Semantic Web as a knowledgeable guide
  - An integrated publishing portal
  - All content is searchable and browsable with the same UIs
  - Content interweaved through semantic connections.
CultureFinland

• Material from dozens of museums and organizations
  – Items, works of art, photographs, video, sound, skills and processes, text documents etc.
  – Annotated with shared vocabularies
    » YSO, MAO, ICONCLASS

• Diverse content described in different ways and on different levels of granularity
  – Still a lot of interesting links
    » Epic poem Kalevala has inspired Gallen-Kallela’s paintings
    » Gallen-Kallela painted at Paris in 1880s
Research problem

- **Problem**
  - Content not interoperable because of heterogeneous metadata schemes
  - How to integrate the content for users?

- **Solutions**
  - Ontology based description methods
  - Search and recommendation methods
Target users and needs

- **Professional users**
  - Museum personnel, curators, researchers
  - Known item seeking, exhaustive research

- **Utilizing users**
  - School children, teachers, students
  - Historical and cultural context. The story behind the painting! Exploratory seeking, exhaustive research

- **Entertainment user**
  - People who are usually interested in museums and culture
  - Entertaining and educational. Exploratory seeking
CultureFinland

- Faceted search
  - with timeline and map visualisations of search results
- Virtual exhibitions
  - built with rule language
- Semantic recommendations
  - browsing the content through semantic connections
- Theme pages
  - edited content
- Roundup search
  - A roundup of one items relation to other portal content
- Multimedia experience
  - Video, images, sound and text
CultureFinland proto
Integration problems

1. Metadata scheme has to be general and precise at the same time
   1. Preserve precision
   2. Enable interoperability
2. One information object’s data can simultaneously be another object’s metadata
3. Domain specific programming and mapping between domains
Precision and interoperability

- Precise metadata schemes are domain dependent
  - Painting metadata scheme might allow metadata:
    » creatingPlace: Paris

- General metadata schemes are not precise
  - Biography sentence “Gallen-Kallela painted in Paris at 1880s”, could be annotated:
    » dc:subject: Paint
    » dc:subject: Gallen-Kallela
    » dc:subject: Paris
    » dc:subject: 1880s
  - But we want to know how annotations are related to each other. Who did what, when and where?
Data vs. metadata

- Creator: Gallen-Kallela
- …During his studies in Paris Gallen-Kallela was inspired by Kalevala and painted the Aino-triptych…
Domain specific programming

• To achieve precision there is a need of enumerating attributes
  – manufacturingPlace, creatingPlace, livingPlace

• To achieve generality, an interpreting program has to know how these are related
  – Binary relations capture too much semantics
    » CreatingPlace(x,y) of Painting(x) is actually an n-ary relation: Painting(x), Paint(x,z), Place(z,y)
    » Why don’t include this information to the ontology?
Activity hierarchy

• Reference ontologies already have hierarchies for activity
Event descriptions and thematic relations

- Event descriptions represent the activity and the related objects
  - Related objects are connected to the activity with thematic relations
  - Thematic relations specify the type of role the object has in the activity
- State what the content actually is (not just keywords)
- Integrate the metadata and content description
Content

A section of epic poem Kalevala:

…The maiden Aino Drowned herself into the sea in the morning…
... Gallén started depicting Kalevala, which had fascinated him for many years. First he painted the three parted Aino-painting, which he finished in 1889. It won the second place medal in the Paris worldfair the same year ...
Processes and narratives

- Event descriptions are connected to other to formulate a narrative
Methods

- Content and metadata can be annotated with a single event description scheme.
- The methods can be applied to event description scheme instead of creating domain specific applications.
  - Thematic relations are a closed set of relations that the application / agent has to analyse.
Methods

- Match the query to event frames instead of blind graph search
- Search
  - Exact match
- Recommendation
  - Match with a amount of variance
- Virtual exhibitions
  - Queries following each other
Search example

• Tell me about Artistic work in France that is somehow related to Epic Poems
Summary

- Heterogeneous data from heterogeneous domains need to be integrated to provide insight into the content
- Need for precise but general description method enabling cross-domain interoperability
- A clear separation between data and metadata can not and should not be made
- Traditional annotation schemes use binary relations and force to create domain specific programs to preserve precision
- Event descriptions with activity as the central concept
  - Activity is the glue between cultural objects
  - Processes and narratives are continuums of activities
- Domain independent event description based search and recommendation methods can be developed