Semantic media application with user created content to enhance enjoying cultural heritage

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Content

• Project background and the StorySlotMachine application
  • User scenarios and screen shots before and after the journey

• User experience

• Application development
  • Utilising media content
  • Utilising ontologies and experiences of the ontology based application

• Future development opportunities
Rich semantic media - Project description

• A project where the potential of the Semantic Web is being explored from the media companies' point of view
• Media companies have interest in developing new media products and service concepts
  • To utilise the existing media archives to a larger extent
  • To give users a more active role in media consumption
    -> to combine commercial media content with user created material.
    -> to automatically generate media presentations from commercial and private content.
    -> promote the service by making it possible to share content with others
    -> make media consumption more entertaining
StorySlotMachine application

- To help in choosing a travel destination and to get background information relating to the sights
- To take material with you to enrich the visit
- To create your own travel story by combining existing material with your own

- The application has material relating to the Ox road of Häme, a historical route in the South of Finland
Use scenarios

• Before a trip
  • Search places and sights the user is interested in
  • Search background information of selected sights
    • Play with content objects
    • Content is offered as theme stories (like historical events and life stories) which user can select to build a collection - Travel plan.
  • Create travel plan (slide show & printed version)

• During the trip
  • The travel plan can be utilised as a guide material during the trip (at the moment in printed format).
  • User take photos, write notes

• After the trip
  • The user may add his/her own photos.
  • Combine commercial as well as content of other travellers with his/her own content
  • Search for additional information (background information, facts)
  • To make automatically travel story (slide show & printed version) based on chosen content.
  • Share their content and travel story with others.
Before the trip: Choosing places and sights to visit

Sort sights by history, nature, culture

Hämeenlinna

Tykkistömuseo

Sortahistoriallinen erikoismuseo on sisä- ja ulkonaapuratalon vanhasta kallionmäen louhasta. Tykkistömuseo on saanut historian Suomen historiallisesta 1400-luvulta tähän päivään, min. 9,8 eriästä tykkistä. Multimediakäytö "Taidin-herkulan suurtaanesto" käsissä 1944, jossa multimediakäytöstä kertoaancer "Taidin-herkulan suurtaanesto" käsissä 1944. Avoinna kesäisin päivän alla, talvisin päivän alla, klo 12-17. Musukahvila Café Kivi

Palanderin talo


Add sights that you are interested in into the list
Create theme stories

Theme label: Life stories

Include a theme story into your travelling guide

Play with the content:

- View pictures and videos (commercial and user created)
- View and build theme stories
- Try different themes

Sibelius Jean


Some of the themes include subcategories.

For example, history is divided into historical periods.

If there is some content relating to a category, the category is shown to user, otherwise it is left out.

### Esihistoria

<table>
<thead>
<tr>
<th>Hämeen harkätie tuhatvuotinen valtavälä Eurooppaan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuu tuu tupakkirulla -kansanrunosta tuttu Hämeen Harkätie on Suomen varhainhistorian tärkein tie. Hämaläistä korpea ja varsinaissuomalainen jokinaisemaa hakovaa reittä ovat käytännäet niin kauppiat, sotilaat, pyhiinvaeltajat kuin kuninkaatkin - ensimmäisen kerran jo viilikäikoina, yli tuhat vuotta sitten. Tuosta ajasta muistuttaa meitä mm. Lidon Vanhalinna, joka mainitaan ainoana suomalaiskohteena myös Euroopan Neuvoston julkaisemassa viilikirahtippaassa.</td>
</tr>
</tbody>
</table>


### Keskiäika

### Ruotsin vallan aika
Saving the travel plan

Travel plan

Photos and descriptions of the chosen sights

Theme stories

The travel plan is available as a slide show and a printable version

Can be used during the trip as guide material.

Matka Hämeenlinnaan

Hämeenlinna: Vankilamuseo


Hämeenlinna: Sibeliuksen syntymäkoti

After the trip: Travel story (private and commercial content)
Uploading content and adding metadata

Who the photo can be shown to
(all, family)

Keywords
• Tags suggested based on the ontology
• User's own freely selected tags

Genre

Save
Searching additional information

Combining own content with commercial and other users' content

User's own content

Text

Media content

The user can browse through the available photos and videos.

They can be added to the travel story.

Kirjoita teksti ja lisää sisältöjä

Hämeenlinna Hämeen linna Aulangon luonnonsuojelualue

Kuvateksti:

| Tälienna |

→ Selaa muita aiheeseen liittyviä sisältöjä: kuvat | videot | tekstit
→ Täsmähaku
Combining one's own content with commercial and other users content.

Additional photos, videos and texts can be searched and add to travel story.
Content can also be searched with the help of tags, both user's own tags and tags suggested based on ontology.
After a trip: Create travel story

Travel story

Created by combining user's own content with commercial content

Can be viewed as a slide show and printable version.

Hämeen linna
User needs and expectations

- Studied with interviews and prototype tests
  - 32 schoolchildren (12-18 years old), 4 teachers

- Requirements for the system (in the context of school excursions)
  1. arouse interest and offer necessary facts in beforehand
     - illustrative view to contents, e.g. a map
  2. enable *experiencing* the stories on the trip
  3. give additional information about
     - the themes studied & themes NOT possible to study on the trip
  4. support creating a personalised travel story (during/ after an excursion)
  5. enable rich metadata about texts and pictures
     - also memories and feelings
     - details, comments and hints for other travellers
User test results

• User experiences
  + more pleasant than traditional search machines
  + relevant content easily as stories
  + adding metadata into own pictures was intuitive
  - the idea of mixing own and media content was not clear in the prototype
Media content

- The commercial media content of the pilot consists of
  - newspaper articles and images
  - encyclopaedia articles
  - articles from the Häme Ox road magazines
  - mainly general content that is not directly connected to the sights
  - meant for background information, not specific travel information like opening hours or prices.

- Requirements for ontologies:
  - The domain ontology needs to include knowledge of how different concepts like persons, events, objects and nature are related to the target area. Based on that information, also general media content can be searched and utilized.
  - Different types of content -> requirements for implementation
    - different metadata vocabularies (newspaper articles -> IPTC, encyclopaedia -> their own)
    - multiple media formats
StorySlotMachine ontologies

**Target ontology**
Describes the knowledge related to place, route or sight. The target ontology contains information that has relevance to places of interest like persons, events, objects and nature.

**Media ontology**
Describes the media content. DC and IPTC Newscode are utilized in determining the relevant information for the application.

**Presentation ontology**
Contains the knowledge of what kind of media content (subject, genre, time) is searched for presentations in relevance to places of interests. Presentations (e.g. background information for a travel plan) are based on themes like everyday life now and before, stories and fairy tails, historical events, art and culture, life stories, news, nature, and wars.

**YSA ontology**
An ontology based on YSA - a Finnish language general-purpose thesaurus is utilised as kind of upper ontology for classifying the knowledge and subjects of the media content. The idea is to replace this later with YSO (Finnish General Ontology), which is under development, but was not available when we created the demonstration.

**Time ontology**
Time-ontology defines a taxonomy of different time eras and periods by intervals. It is based on the ontology developed in the MuseumFinland-project (http://museosuomi.cs.helsinki.fi).

**IPTC**
IPTC ontology is used to determine the subject of newspaper articles. The ontology is based on IPTC ontology developed in the Neptuno-project (http://nets.ii.uam.es/neptuno/iptc/).

**Wsoy Facta ontology**
The content of the Finnish encyclopaedia called Facta uses its own taxonomy.
Searching content for theme stories

• Target, media and presentation ontologies are connected to each other by the concepts of upper YSA-ontology.

• The knowledge of the target ontology and the search rules (determined with presentation ontology, java application and SPARQL queries) are utilised in offering relevant media content to users.

  • Media content is not linked directly to the various themes. The criteria of how the media is combined with a theme (subject, genre, time) is determined in the presentation ontology.

  • The Java application creates SPARQL queries for searching relevant media content based on the knowledge of presentation ontology.

    • Searches utilise

      • a) the knowledge of target ontology (e.g. Life stories -> persons related to the sight).
      • b) subjects related to themes (e.g. Wars)
      • c) restrictions like time (e.g. Historical events) or genre (e.g. Stories and fairy tails)

• The advantage is that the search criteria are not hidden inside the Java code, but they can be changed by changing the instances of the ontology. Also, themes may be created, changed or deleted by changing the classes of ontology or it's instances.
Searching commercial content to complement user's own content

• Offering media content to complement user's own content is based on the metadata (place, sight, tags) given by user at importing and the knowledge of target ontology.

• First, the media content that is related directly to the sight is searched. After that more general media content relating to events, persons and places are searched for.

• The relevance of the media content is determined based on the order of the searches (searches vary from exact search to more general searches).
Benefits of ontologies

• Ontology makes it possible to search content from multiple directions (sights, events, persons etc.).
  • Also general media content can be utilized.
  • Same content can be utilized from different angles, e.g. to create different views or themes about the historical roads according to interest of user.
    • For example user might be interested in the historical places and events of the Ox road during the 19th century or he/she is interested only in churches during the trip.
    • The work done gives plenty of possibilities to study different ways of visualisation to show available content in interesting ways. This includes using timelines, cause-effect diagrams, dialogues, trees, maps of related resources.
• Ontologies are utilised in the automatic production of aggregations
• The benefits of the automatic linking of content become significant when the amount of the content is large and increases continuously.
Future development opportunities

- StorySlotMachine can be used as a platform to test
  - users (travellers and service providers) as knowledge providers (populating the instances of ontology)
    - adding knowledge should be easy e.g. with help of tags.
    - In the current system, users can add tags to describe their content, but tags could be utilised also more widely, for example, to describe media content, travel plans, and sights.
    - We'll need mechanisms to combine tags with more formal semantics and to analyse the reliability of user generated knowledge.
  - user experiences and expectations, for example how the users want to mix and play with media content, and how they would like to share their work with each others.
    - collaborative storytelling
      - creating one travel story from contents of all group members
    - real time travel story
      - topical and updating information
Future development opportunities

• Development of commercial travel application. Additional features are needed such as
  • exact travel information (like opening hours, prices)
  • map and mobile user interface
  • collecting feedback (rates, comments, recommendations) from users
• Development of a learning application, for example for teaching local history.
• The application that is being built in the project deals with travel related content, but similar applications could be built for different topics such as hobbies or collecting glimpses of life during different time periods.
Questions or comments?

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