Semantically-Enhanced Recommendations in Cultural Heritage

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In the Web 2.0 environment, institutes and organizations are starting to open up their previously isolated and heterogeneous collections in order to provide visitors with maximal access. Semantic Web technologies act as instrumental in integrating these rich collections of metadata by defining ontologies which accommodate different representation schemata and inconsistent naming conventions over the various vocabularies. Facing the large amount of metadata with complex semantic structures, it is becoming more and more important to support visitors with a proper selection and presentation of information. In this context, the Dutch Science Foundation (NWO) funded the Cultural Heritage Information Personalization (CHIP\(^1\)) project in early 2005, as part of the Continuous Access to Cultural Heritage (CATCH\(^2\)) program in the Netherlands. It is a collaborative project between Rijksmuseum Amsterdam\(^3\), Eindhoven University of Technology\(^4\) and Telematica Instituut\(^5\).

The problem statement that guides the research of this thesis is as follows: Can we support visitors with personalized access to semantically-enriched collections? To study this question, we chose cultural heritage (museums) as an application domain, and the semantically rich background knowledge about the museum collection provides a basis to our research. On top of it, we deployed user modeling and recommendation technologies in order to provide personalized services for museum visitors. Our main contributions are: (i) we developed an interactive rating dialog of artworks and art concepts for a quick instantiation of the CHIP user model, which is built as a specialization of FOAF\(^6\) and mapped to an existing event model ontology SEM\(^7\); (ii) we proposed a hybrid recommendation algorithm, combining both explicit and implicit relations from the semantic structure of the collection. On the presentation level, we developed three tools for end-users: Art Recommender, Tour Wizard and Mobile Tour Guide. Following a user-centered design cycle, we performed a series of evaluations with museum visitors to test the effectiveness of recommendations using the rating dialog, different ways to build an optimal user model in a short starting time and the prediction accuracy of the hybrid recommendation algorithm.

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1 http://www.chip-project.org/
2 http://www.nwo.nl/catch
3 http://www.rijksmuseum.nl/
4 http://w3.tue.nl/nl/
5 http://www.novay.nl/en/
6 http://www.foaf-project.org/