Narrative Semantic Web
—Case National Finnish Epic Kalevala

Eero Hyvönen, Tuomas Palonen, and Joeli Takala

Semantic Computing Research Group (SeCo)
Aalto University, School of Science and Technology, and University of Helsinki
`http://www.seco.tkk.fi/, first.last@tkk.fi`

Abstract. This paper presents the idea of publishing stories and documented processes on the Semantic Web. By using narrative metadata and content descriptions based on ontologies, different parts, concepts, and individuals appearing in a story can be automatically linked to other parts of the narrative and to external related resources. This makes it possible to enrich the reading, searching, and browsing experience of the user. We present a case study, where the narrative story and content of the Finnish national epic Kalevala has been modeled in RDF/OWL and published as part of the semantic portal CULTURESAMPO.

Narratives are an important aspect of culture; they are recounts of stories describing a sequence of fictional events (e.g. in novels, epics, etc.) or real life events (e.g., in history, processes, news, etc.). This paper presents the idea of representing narratives on the semantic web as semantic structures [1] that can be used for enriching end-user reading experience and for supporting folklore research.

The object of our case study is the Finnish national epic Kalevala[1] that has been a constant source of inspiration to Finnish authors, designers, painters, sculptors, and musicians, and that is related to large collections of cultural heritage and research. The epic contains 50 runes (each about 1500 words) in 22,795 lines, was published in two major editions by Elias Lönnrot in 1835 and 1849, and has been translated to some 60 human languages. Now the epic is available also to computers as a translation to RDF/OWL, and has been published on the semantic web[2].

The annotation model has three levels. The poem texts are divided into major *episodes* of the story that are linked with each other to represent story chains. Each episode may be divided into *scenes* that may have further sub-scenes. They represent meaningful fragments of episode texts to the reader. Finally, each scene consists of atomic events whose semantic content is represented in terms of keyword resources (e.g., riding, horse, Kullervo) taken from a set of domain ontologies. The annotations were created by a folklorist with the SAHA editor using ONKI Ontology Servers[3].

---

[1] http://www.finlit.fi/kalevala/index.php?m=163&l=2
[2] http://www.seco.tkk.fi/applications/kulttuurisampo/kalevala/
[3] http://www.seco.tkk.fi/services/saha/

The annotation ontologies used are KOKO (the General Finnish Ontology, 30,000 concepts), Iconclass[4], place and actor ontologies, and two Kalevala specific ontologies of fictive places and actors appearing in the epic. The annotations are related to potentially 129,000 cultural content objects in CULTURESAMPO [2], such as paintings, sculptures, novels, poems, folk music, videos, and agrarian Finnish artifacts in the collections of Finnish memory and media organizations.

Semantic Kalevala is used as follows[5]: a rune is selected for viewing using a table of contents on the screen. By moving the mouse over the text, an explanation is shown of the underlying scene, and semantic recommendation links to related cultural content items in the portal are shown to the user. By moving the mouse to another scene, the recommendations are changed on the fly. Furthermore, the narrative episode-scene structure is visualized in the application as an interactive graph for a quick overview and browsing.

The idea of linking text on the web semantically is related to e.g. Magpie [3] used for browsing web pages enriched with semantic links, and to various RDF browsers. However, in our system: 1) Recommendation links are based on narrative structures, allowing creation of more "intelligent" linking. 2) Semantic rules and SPARQL are used for determining associations and recommendation links between content items. 3) The system provides the end-user with literal explanations of why the recommendation links should be of interest to her. 4) Narrative structures are visualized for navigation.

References

1. Junnila, M., Hyvönen, E., Salminen, M.: Describing and linking cultural semantic content by using situations and actions. In Robering, K., ed.: Information Technology for the Virtual Museum, LIT Verlag, Berlin (2007)
2. Hyvönen, E., Mäkelä, E., Kauppinen, T., Alm, O., Kurki, J., Ruotsalo, T., Seppälä, K., Takala, J., Puputti, K., Kuittinen, H., Viljanen, K., Tuominen, J., Palonen, T., Frosterus, M., Sinkkilä, R., Paakkarinen, P., Laitio, J., Nyberg, K.: CultureSampo— Finnish culture on the semantic web 2.0. Thematic perspectives for the end-user. In: Proceedings, Museums and the Web 2009, Indianapolis, USA. Archieves & Museum Informatics, Toronto. (2009)
3. Dzbor, M., Motta, E., Domingue, J.: Magpie: Experiences with supporting semantic web browsing. Journal of Web Semantics **3**(2) (2007) 224–241

---

4 http://www.iconclass.nl/
5 Available online at http://www.kulttuurisampo.fi/
6 http://www.seco.tkk.fi/projects/finnonto/