Thinkbase: A Visual Semantic Wiki

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ABSTRACT
Thinkbase is a visual navigation and exploration tool for Freebase, an open, shared database of the world’s knowledge. Thinkbase extracts the contents, including semantic relationships, from Freebase and visualizes them using an interactive visual representation. Providing a focus plus context view the visualization is displayed along with the Freebase article. Thinkbase provides a proof of concept of how visualizations can improve and support Semantic Web applications. The application is available via http://thinkbase.cs.auckland.ac.nz.

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D.2.2 [Software Engineering]: Design Tools and Techniques - User interfaces. H.5.3 [Information Interfaces and Presentation]: Group and Organization Interfaces - Collaborative computing.

General Terms
Design, Experimentation, Human Factors.

Keywords
Semantic Web, Wiki, Visualization, User Interface.

1. MOTIVATION
According to a recent estimate, more information will be created in the next five years than has been created in the whole of human history [4]. Information overload is thus a huge problem and as most information is accessible through the internet and intranet, the web community is particularly interested in addressing this issue. The web has already seen some significant change in what is often summarized as the “Social Web” or Web 2.0 [7]. New technologies and tools, but most importantly new behavioral and usage patterns have led to the widespread adoption of wikis and other social networking software. These help to organize content and better cope with information overload. By using social software users annotate the content with meta data in an organic, bottom-up fashion. This enables software agents to better process the content. Search algorithms and recommendation systems are examples of doing this. A more recent approach which provides a rather top-down and formal creation of meta data is the Semantic Web [1]. The idea of the Semantic Web is to make the web more intelligent by annotating information with meaning (that is, providing structured meta data) so that not only humans but also machines are able to reason with it. The problem of information overload is therefore decreased by delegating more and more tasks to software agents. Even though the organic approach of creating meta data in the Web 2.0 and the structured approach of the Semantic Web seem to be contradictory, more and more applications, such as Freebase [5], provide successful examples of how structured data can be created collaboratively. A further and more general approach of how to cope with information overload is represented in the field of information visualization. Visualizations provide effective methods for representing and organizing information- and knowledge-rich scenarios [6]. They make use of the human cognitive processing system in order to create and convey content more efficiently [3].

2. APPROACH AND OBJECTIVE
Our approach when building Thinkbase, a “Visual Semantic Wiki”, was to integrate interactive (graph based) visualizations with a “Semantic Wiki”. We define a Semantic Wiki as a collaborative knowledge repository which provides semantically enriched contents. The Semantic Web with its meaningful meta data provides not only the opportunity to automatically reason with the content, but also to transform and reuse the content in ways which add significant value. We see a transformation of textual content into an alternative visual representation as a way to demonstrate some of the potentials and benefits of the Semantic Web. Our objective is to provide a proof of concept of how visualizations can improve Semantic Web applications. Existing approaches which visualize unstructured wiki content (e.g. WikiNavMap [9]) quickly run into difficulties such as coping with the complexity of a large repository. We demonstrate how to overcome this by using a structured source.

Figure 1. The user interface of Thinkbase.
4. EVALUATION AND CONCLUSIONS

We undertook a qualitative evaluation in the form of an online survey among 14 participants in order to find out about the usability of Thinkbase. The questions were aimed to investigate how the visualization on top of Freebase improves different tasks (create, organize, transfer, search/navigate information). The overall consensus was that Thinkbase adds most value for search and navigation, followed by organizing and transferring. A specific type of search which could be called “search by exploration” was described as being “incredibly addictive”. We concluded that creating a visual exploration tool on the basis of structured data has the advantage that semantics can directly be translated into meaningful visual icons, and filter mechanisms can automatically be applied which helps to deal with complexity.

5. FUTURE WORK

Future work for Thinkbase focuses on three different areas: (1) improving its usability as a visual exploration tool, e.g. more control over the display, advanced filtering mechanisms; (2) extending features such as the ability to explore relationships between multiple nodes will add new metaphors of information discovery; and (3) we have a proof of concept for a “Visual Wiki”, which demonstrates some of the potentials and benefits of the Semantic Web and can now be explored for further Semantic Web applications.

6. REFERENCES