Improving Personal Information Management by Using Activities in the Physical World to Bridge the Semantic Web and the Semantic Desktop

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Abstract

Personal information refers to the information used by individuals to complete their daily tasks and is not intended to share with the public. Such information can come from two major sources: the Web and personal devices such as laptops. The Semantic Web is a technology stack which provides capabilities to organize the information on the web, while the Semantic Desktop can associate the related data and files on people's personal devices. In order to complete everyday tasks, people often need to combine the information from both of the two sources. However, the two information universes are not directly connected. In this work, we propose to use activities in the physical world to bridge the Semantic Web and the Semantic Desktop, associate the information items from the two universes, and provide individuals with a personal information space.

1. Introduction

Individuals use information from both the web and their personal devices to complete their everyday tasks. Figure 1 shows the situation that most people encounter in their daily life. The Semantic Web and the Semantic Desktop has provided capabilities to organize the information in their own universe. However, they cannot fulfill the requirements of personal information management since the data in the two information universes are separated and are not logically organized together.

Figure 1. The information people need to use in their daily life

2. Activities in the Physical World and Their Digital Footprints

Information from both the Semantic Web and the Semantic Desktop are employed by individuals to complete their activities in the physical world. Meanwhile, people's activities in the physical world often have their corresponding digital footprints in the two information universes. For example, when preparing a paper for a conference, people may create and edit a document on their laptops, and may also open several related papers at the same time. Similarly, the conference, which contains a series of human activities, also has its corresponding footprints, such as an official page, a record in Freebase or in WikiCFP, on the web. Figure 2 shows the relations among activities in the physical world and their corresponding digital footprints on the Semantic Web and the Semantic Desktop.

3. Activity Ontology

In this research, we propose activity ontology which can associate the information items from both the Semantic Web and the Semantic Desktop. Specifically, we use an example of attending the ACM GIS 2012 conference to demonstrate our work (See Figure 3).

4. Prototype

Employing the activity ontology and the ACM GIS conference example, we have designed a prototype as a plugin on the Gnome Activity Journal on the Zeitgeist semantic desktop. When searching "ACM GIS" on the user interface, we can see the detailed conference information, a list of related personal, and the local data and files that are used in this activities. Figure 4 shows a screenshot of the prototype.

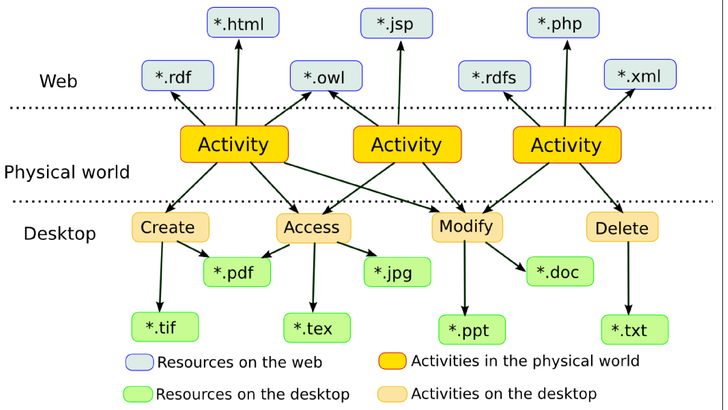

Figure 2. Activities in the physical world and their corresponding information resources on the web and desktop

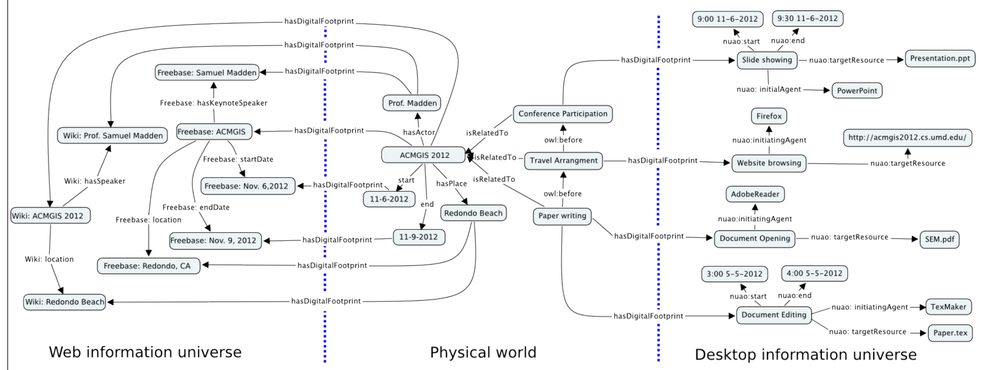

Figure 3. Activity ontology for attending the ACM GIS 2012 conference

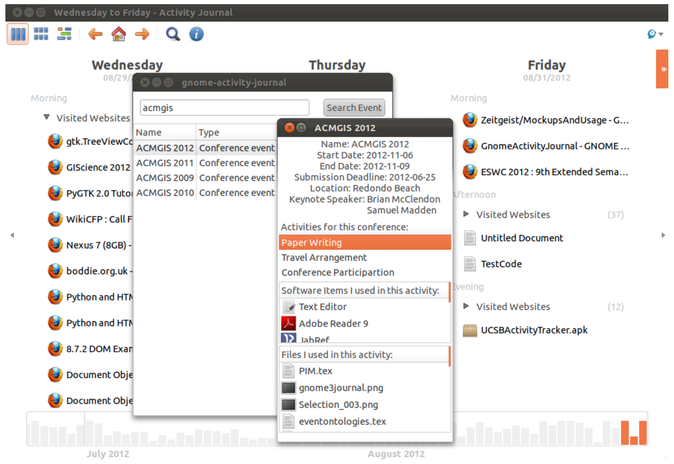

Figure 4. Graphic user interface of the plugin for the Gnome Activity Journal

5. Conclusions

In this work, we propose activity ontologies to bridge the Semantic Web and the Semantic Desktop to construct a personal information space. Information items in this personal space can be logically associated together even though they may come from different information universes. We discussed the implementation of one activity ontology (conference activity), and designed a prototype to show that the information from different universes can be linked to facilitate personal information management.