Ending the Tyranny of the Browser - The Semantic Web in support of the Interactive Experience

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Abstract. In this paper we describe a pervasive computing application that uses Semantic Web technologies in support of creating, operating and analysing an interactive multiuser experience. Rather than asking how to build interactive applications to use the Semantic Web, our research asks how to use the Semantic Web to build such interactive applications.

Introduction

As part of the Equator project, which focuses on the integration of physical and digital interaction, we are utilising the Semantic Web to enable interactive applications using pervasive computing devices. Our work challenges the common assumption that interaction with the Semantic Web is about Web browsers and semantically annotated Web sites, with the de facto point-and-click hypermedia interface [1]. One example of this intersection of Semantic Web and pervasive computing is the use of Semantic Web descriptions of user context in support of context-aware applications [2], so that the user receives the right information at the right time on the right device– this can be likened to using context as a query. Our emphasis on the user is reflected in our approach to context-awareness, which involves modelling of task and domain as well as location and device [3]. In this short paper we report on a recently deployed pervasive computing application that uses Semantic Web in support of the lifecycle of an interactive experience from authoring to analysis, illustrating the role of Semantic Web in both designing and delivering the interactive experience.

The Chawton Experience

Chawton House Library is an Elizabethan manor house that once belonged to Jane Austen's brother Edward, and is now owned by a charitable foundation that operates it as a study centre of early English women's writing. To further investigate the use of Semantic Web technologies in the construction of pervasive computing systems, we have developed a pervasive information system to allow the curators of Chawton

House Library to create user experiences that reveal the connections between the house and grounds, and that expose the rich history of both. We have been working with the curators at Chawton and also a local school, focusing on using the landscape as a writing aide – the teachers leave (digital) instructions and activities for the children at various locations around the grounds, along with selected audio clips created by the curators as part of a separate visitors system. During a trip to the site, the children record their own annotations for access later when writing their stories.

The pervasive infrastructure comprised wireless networking, location sensing technology (GPS and RF pingers) and PDAs carried by the children. On top of this infrastructure sat the generic information system, an orchestration tool (constructed using EQUIP, the EQUator Infrastructure Platform) alongside a triple store (the AKT 3store). This was responsible for delivering information to participants and capturing information during the interactive experience, which was re-used back in the classroom. Orchestration was based on the child's current context and metadata attached to the content. For the initial trials, content creation involved the in-situ recording of audio content by the curators which was marked up with appropriate context metadata. The teachers then constructed their own scenario of activities re-using the content produced by the curators.

The RDF content was expressed through a card metaphor. Different cards had different functionality associated with them, for instance a simple information card might have a piece of audio attached to it to be played, or an activity card might ask the children to record a description of the particular part of the grounds they were in. Cards can then be arranged into sequences and decks for particular activities. By using a standardised ontology for representing the cards, the results of an activity (i.e. the recording of a description) can be made available to the other users of the system as information. Similarly, the information cards created by the curators can be included in sequences in the literacy scenario by the teachers. Logging of activities occurs using the same ontology, facilitating the immediate re-use of information during the trials, where the result of one child's activity provides content for other children, and allowing for easy re-use of the data collected during analysis post trials. It is anticipated that the information space will evolve over time with the further curated information and accumulation of cards from previous activities, supporting all phases of the creation of future experiences.

References

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