Building Service-Based Applications for the iPhone Using RDF: A Tourism Application

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Abstract. The Resource Description Framework (RDF) language is a widely used tool for information representation among several agent-based frameworks and applications. In this paper, one of these applications is introduced: a tourism application that allows the user to find touristic hotspots and venues matching specific criteria, an application that is used via an interface designed specially for the Apple iPhone™. Besides, this application uses a modern and efficient agent platform with RDF support to power the whole architecture.

1 Introduction

The Resource Description Framework (RDF) is a language for representing information that is widely used in web service technologies. Over the last few years, it has also been used on the Agent and MAS research field. Some agent platforms provide support for RDF to some extent, but in these cases RDF is usually only offered as a Content Language. However, the expressive power of RDF can be used not only in agent communication but also as a general form of managing information for MAS. RDF supports ontologies created by the user, according to its specific needs; it also supports system ontologies which can be specified to support flexible organization schemes, semantic querying and collaboration. Also, RDF provides a semantically rich and uniform user interface for building applications.

The development of one of these agent-based semantically rich applications is presented in this paper. Such application is a tourism application that allows a user to find a restaurant that matches with its particular needs, be it regarding price, quality or even details of the dishes and food present in the restaurant. As part of the process of building this application, a suitable agent platform with semantic capabilities should be chosen. Also, this application has to be designed to support multiple user interfaces, but its main one has to be a user interface designed and optimised for the Apple iPhone™.

Throughout this paper, the development of this application will be presented, along with a small review of the use of RDF in Multi-Agent environments. In section 2 such review is introduced. In section 3 the development of the tourism application is revealed. Following, in section 4, a more detailed look at the data flow within the application is seen, along with some implementation details in section 4.1. Finally, in section 5 some conclusions and leads to future works are presented.
2 Using RDF as a Knowledge Base Representation Language

RDF is a language for representing information about resources present on the World Wide Web. By generalizing the concept of a Resource on the Web, RDF can also be used to represent information about elements which are not directly located on the Web. RDF is based on the idea of identifying things using Web identifiers (called Uniform Resource Identifiers, or URIs), and describing resources in terms of simple properties and property values. The underlying structure of any expression in RDF is a collection of triples, each consisting of:

- **A Subject.** The subject can be any resource,
- **A Predicate.** The predicate is a named property of the subject, and
- **An Object.** The object denotes the value of that property.

A set of such triples is called a RDF graph (see figure 1). A RDF graph can be expressed by means of a XML-based format (called RDF/XML) which allows to storage and process these graphs with previously existing technologies (such as XML parsers). RDF is intended for situations in which the information needs to be processed by applications, rather than only being human-readable.

RDF was initially designed for the Semantic Web, but it can also be used in agent technology for storing information representation, exchange it and make queries. It is

![Fig. 1. Example of a RDF graph](image_url)