PROJECT 2: DESIGNING AND IMPLEMENTATION OF AN INTELLIGENT MASH-UP

1. Introduction

"Web services provide a standard means of interoperating between different software applications, running on a variety of platforms and/or frameworks"[1]. It provides a framework for organizations to (*virtualize* and) enable their services on to the internet and for consumers and applications to consume the offered services. This framework opens up a whole new world of capabilities beyond the simple browsing. Web services and associated standard protocols, if used appropriately provide a scalable, accountable, reliable and efficient way for organizations and customers to interact for delivery and consumption of services. It is not an understatement that applications enabled by web services are the next revolution after the web browser that enabled the "information highway" [2]. Web services (WS) have triggered buzz words "service-oriented architecture-SOA [3] and Software as as Service (SaaS) [ref] that is often used to describe WS-based applications. In Project 1 we learned how to develop and deploy a web service. In this project we will learn how to design and develop a mash up service [4] that consumes web services offered by many well known organizations and other sources of information such as news and stock feeds. We will also *design, build and demonstrate* a truly *pervasive* distributed system by including devices (such as robot or mobile devices, real or virtual).

2. Purpose:

   a. To design and develop a meaningful and useful high quality mash up (composite) application that extracts information from the web service exposed by amazon.com and at least one other web service or web resource (ex: RSS feed) of your choice.
   b. To understand the fundamentals of a distributed systems.
   c. To understand the components, core technologies, architecture and protocols that enable a Web Services-based distributed system.
   d. To create a heterogeneous system with components with widely varying hardware and software characteristics.

3. Preparation before lab:

   a. Let the core of the data center around that offered by amazon.com Electronic Commerce System ECS [5]. Study and understand the information offered by the amazon.com web service.
   b. Prototype a distributed application that consumes a Web service (WSDL).
   c. Also study the services offered by many prominent organizations icnluding Google, Yahoo. Also look for web services available in your areas of ineterest. See for example the music services: http://music2dot0.wetpaint.com/page/Music+Web+Services
   d. Understand the various concepts that we explored in the project 1: XML parsing, web applications, component concept (java beans), jdbc and entity beans and jndi resources and reseource references.
   e. Study the various examples in the Neteans samples and the ones available on youtube.

4. Assignment:

Build a multi-tier distributed system comprising two major sub-systems
   1. Information obtained from Web service offered by amazon.com service (*box 1*)and
   2. Another Internet resource of your choice (*box 3*)(another web service or any XML feed)

The two sub-systems are *loosely coupled* via a database (*box 4*). The block diagram of the system you will implement is given in Figure 1.
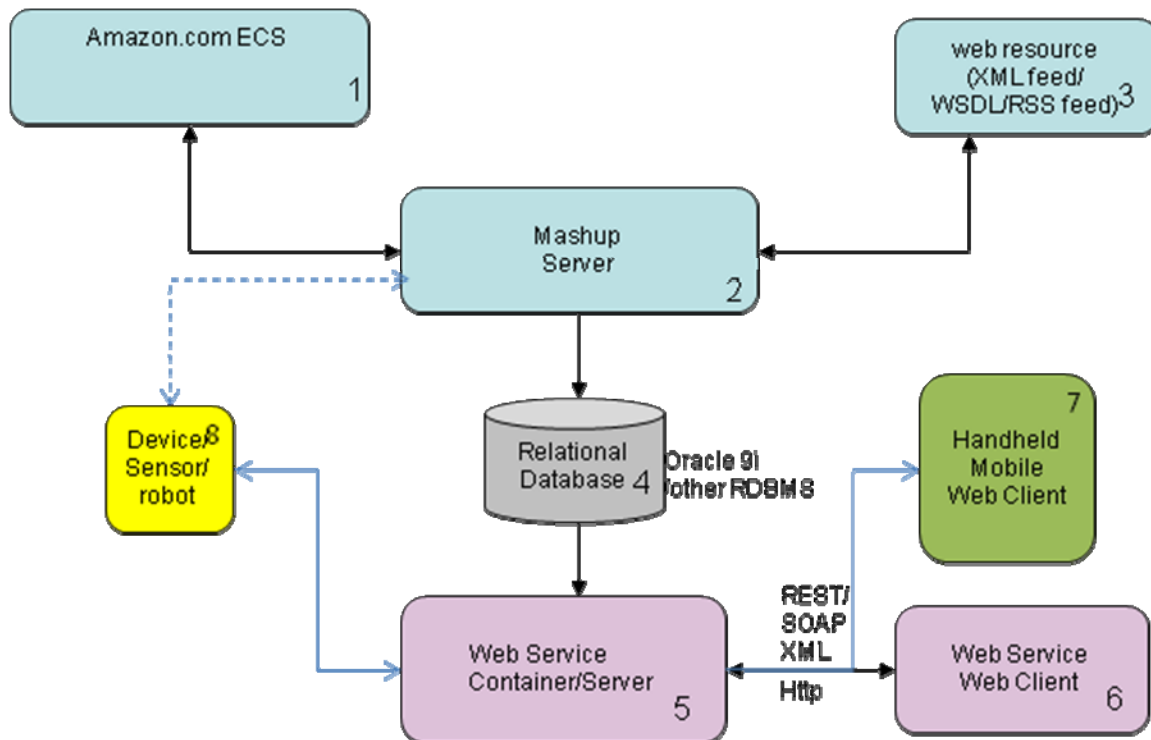

Figure 1: System Model of the Intelligent Mash-Up Distributed System

The Mashup Server (*box 2*) accesses Amazon.com WSDL and acquires information needed for the application. You decide the type of data you need. There are restrictions on storing the actual data from amazon.com. So you may have obtain data, extract the intelligence from the data and store only the intelligence derived into the database.

In the **Web Services** part of the system, the data collected in the database will be processed by the server (*box 5*) and exported as web service. The Web Services client (*box 6*) will be able to query the server for various information related to the data collected. You should allow at least 10 different queries in the domain you have chosen. Your task is to design and implement the complete Web Services-based system indicated by *boxes 4, 5* and *6* of *Figure 1*, and study the operation of the integrated system depicted in Figure 1. In the Project 1 simple User Interface (UI) was acceptable. In this project we would like reasonably user friendly and attractive UI.

Optional + Extra Credit: We will also have two added elements *boxes 7 and 8*. Box 7 is another mobile UI to the services you offer. This can be implemented using simulated mobile devices (sdk available on Netbeans) or real one such as Android. Box 8 is a device that you will include in your system to serve either as an input device or an output device. For example, the Paralax robot we have can sense light and sing songs (given notes). The extra credit will be given only for system that incorporates significant and truly exceptional and practical use of these two components in boxes 7 and 8.

5. **Project Deliverables:**

 a. A mash-up **Server** that obtains information from amazon.com and gathers information and stores the intelligence in the database. It also mashes it up with information from one other source.

 b. A **Web Service** that is able to query the relational database for different information.

 c. A **Web** based **client** created using JSP pages or more sophisticated Rich Interface technology that allows a user to use the various services offered by your web service.

 d. **Optional components in a mobile client and a hardware or virtual device.**

6. **Submission Details:**

Create a compressed deployable distribution of your project. Submit it online.