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Palette

Pedagogically sustained Adaptive LEarning Through the exploitation of Tacit and
Explicit knowledge

Integrated Project

Technology-enhanced learning

D.IMP.02 –First implementation of the PALETTE Web Services repository.

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Summary

This deliverable describes the first prototype version of PALETTE Web services repository. We essentially present its generic functionalities and current state, pointing the main issues to be addressed in the future.

The Web services repository enables PALETTE developers to browse available Web services by category, to discover needed Web services and to test them following their location link. Web services providers access the Web Service repository in order to add/delete/modify their own Web services.

In its current state, the Web Services repository considers only the storage of Web services descriptions using WSDL (Web Service Description Language). Further options will be addressed in the future versions. The repository will include a Web services registry. The registry is a way of storing meta-information about entries in the repository in order to facilitate their discovery. Issues such as semantic dimension of Web services and discovery mechanisms will be of major concern. Moreover, issues related to Web services composition and orchestration will be addressed. Web services composition deals with the implementation of a Web service whose application involves the invocation of operations offered by other Web services. An orchestration model specifies the executable process of a composite service.

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1 Motivations

PALETTE project aims at providing CoPs with end-user services that may integrate different software components implemented by different developers. For this, *sharing* and *reusing* such software components is of major concern. Web services are defined as loosely coupled, reusable software components that refer to programmatic interfaces for application-to-application communication. The paradigm of Web services has been adopted in PALETTE in order to (1) increase interoperability between autonomous developers for efficient distributed computing and resource sharing, (2) develop and deploy rapidly services for CoPs members.

A PALETTE developer should be able to access the repository, search for Web services that satisfy his/her needs, invoke these Web services and compose them in order to offer a specific *service* to an end-user (CoP member). More precisely, this clearly makes the distinction between the *service* concept, which is what will be provided to CoP members and Web services which are the software components that will materialize this service.

2 Main Functionalities

PALETTE Web Service repository acts as an entry-point to PALETTE developers Web services. The goal is to enable users¹ to discover adequate Web services and to compose them to perform a specific task. The main functionalities of PALETTE Web Service repository include: the repository, Web service discovery, and Web service composition. Moreover, the PALETTE repository manages access rights for Web services providers allowing them to add, delete and/or update their Web services descriptions.

2.1 The repository/Registry

The repository deals with description of Web services. For the moment, Web services are described using a textual description (that indicates their main goals), a WSDL file (that acts as a contract between Web service provider and users), and a location (which is a link to the Web service itself). To enable Web services browsing, they are currently registered using three main categories (Information services, Mediation services and Knowledge management services). The notion of Web services registry is tied to the notion of Web services discovery. In general, it is defined as the process of locating Web services that fulfil a user request. For the moment, we only implement a *keyword-based discovery approach* (keywords from a user request are matched against keywords from Web services descriptions). Such approach should be extended to semantic discovery approach using controlled vocabularies and explicit Web service semantics.

¹ Users here refers to PALETTE developers

2.2 Provider management

Each Web service provider signs on the repository for the first time to get a login (username and password). Providers could then either add new Web services or modify existing ones (a provider has the right to delete and/or modify only his own Web services).

3 Future work

The main issues to be addressed are:

- (1) The definition of a formal description of Web services including semantic dimension.
- (2) Development of Web service discovery techniques using such semantic dimension.
- (3) Establishment of composition and orchestration interfaces for proposed Web services.

4 Implementation issues

The web service repository has been developed using new technologies (on the edge). The whole web site has been made in Ruby On Rails 1.8.5. Based on a MVC architecture, it allows the web site to be a very agile solution, easy to change and improve. The web application will be stored on a Server apache 2.2 with mongrel_cluster. The database is in mysql and is stored on the same server.

Concerning the registry, we are using for the moment a simple classification. Standards like UDDI could be used. UDDI² is an industry effort that provides a standardized set of categories for organizing Web services. Through a well-defined API, software developers can browse the UDDI catalogue in order to discover existing web services potentially relevant to the applications they are developing. However, the current UDDI repositories only enable users to search services based on keywords specifications. This method is clearly insufficient because it first requires a shared understanding of the application domain between the service provider and the service consumer. Second, if users are not familiar with the pre-defined service categories, they usually cannot retrieve required services. Moreover, keywords do not suffice for accurately specifying users' information needs. Other solutions especially those involving Web services semantic dimensions will be studied in the future.

Appendix

In the following, we present some screenshots of the current version of PALETTE Web services repository.

² http://www.uddi.org/pubs/Iru_UDDI_Technical_White_Paper.pdf



Figure 1. PALETTE Web Services repository: main interface



Figure2. Visualization of existing services.



The screenshot shows the Palette Web services repository interface. At the top, there is a navigation bar with the Palette logo, the text "Web services repository", and a search bar with a magnifying glass icon. The main content area displays the following information:

Home | Knowledge Management | Information | Mediation

Edit | Back

Html2Xml

Provider : Reflection IT

Description:
The Html2Xml Webservice takes an Html text and converts it into an Xml text. Some corrections are done to the Html to make it well-formed Xml.

Examples of use:
hello world -> <string><html>hello world</html></string>

WSDL : <http://www.html2xml.nl/Services/html2xml/version1/Html2Xml.asmx?WSDL>

Location : Html2Xml

Release date: 2002-08-12

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Figure 3. An example of a Web service description.

You are logged in as **bastien.vaucher@gmail.com** | [Log out](#)



Web services repository [Advanced search](#)

Editing service

Name:

Tags:

Description:
`The Html2Xml Webservice takes an Html text and converts it into an Xml text. Some corrections are done to the Html to make it well-formed Xml.`

Provider:

Category:

Figure 4. Service editing interface.