Research and Implementation on Component Based Enterprise Information System Development

Project Proposal

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Problem Description

Along with the rapid development of the world wide e-commerce market, more and more enterprises increasingly take advantage of the web as their main business platform to support their operations and global business alliances. The market requires that business must also be able to respond to changing business and competitive environment in near real-time. This requires quick reconfiguration and collaboration among distributed software components. However, traditional software design approaches usually lack the web orientation and explicit support for componentization. Also, traditional development process of enterprise information system has problems in aspects such as flexibility, lifecycle, cost and secondary development. Therefore, CBSD (Component-Based Software Development) methods were introduced and component-based web applications will find their places in aforementioned scenarios.

In web application systems that are implemented by static HTML pages, JSP (Java Server Pages), Servlet and classes, it’s easy to develop the system but difficult to maintain and reuse the functionalities in new projects. For example, POJO can be easily reused inside JSP pages as a bean; however, it’s not a truly reusable component since it normally does not have interfaces implemented and could not be reused from componentization perspective by other applications. So our project will aim at the problem that how we can design and implement a component-based web application system and make whole or part of it reusable. In our project, we are going to research and propose approaches to standardize component-based development for web applications.

Methodology

According to [2], a web component is a system that has been pre-compiled to provide certain functionality. Based on this definition, we conclude that each web component should consist of several main parts: a set of JSP pages that provide client view for the component, bean classes that implement the data and behavior of the component, entity classes provide persistence function for the component and deployment descriptor files provide glue function for above subcomponents.

In the research phase of our project, we are going to study all these parts, related techniques and technologies, as well as detailed development process. While in the implementation phase, we are going to implement a clinic information system as a prototype to illustrate this approach. The brief procedures we will follow are as following.

1. Identify each business entity based on analysis of clinic enterprise information system;
2. Define and implement business EJB object for each entity, for example patient and doctor EJBs;
3. Define and create client views following the MVC framework;
4. Created entities, EJBs and JSPs that will be bundled and integrated as a single web component to provide a key function, this component will be deployed into an application server;
5. Test created web components through new deployment or implementation by other applications.

![Diagram of web component development process]

**Results Expected**

By implementing a web application system, we expect to further learn component-based SDLC process. We expect that this project produce a formulized component development model for web based applications so that others can use this approach to develop component-based web applications. The web components developed with this approach can be easily reused and maintained and they can be integrated into existing portals and e-business applications or used to create new J2EE applications.

**Resources**

J2EE/EJB, JBoss application server, Spring framework, Eclipse, MySQL

**Schedule**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Dates</th>
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<tbody>
<tr>
<td><strong>Research</strong></td>
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<tr>
<td>Go through related papers to enhance the background for component-based web application development</td>
<td>June 17 – June 20, 2010</td>
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<tr>
<td>Research on EJB 3 platform technologies</td>
<td>June 21 – June 23, 2010</td>
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<tr>
<td>Research on Spring framework</td>
<td>June 24 – June 26, 2010</td>
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<tr>
<td><strong>Design &amp; Development</strong></td>
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<td>Analyze the clinic information system, apply proper approach to identify components and find a feasible way to replace non-component facets</td>
<td>June 27 – June 30, 2010</td>
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Set up EJB 3 and Spring based development environment, and integrate relevant technologies  
July 1 – July 3, 2010

Based on component-based technologies, implement a clinic information management system with componentization methodology  
July 4 – July 15, 2010

Testing and refactoring  
July 16 – July 21, 2010

**Project Report**

Write report, finalize the project  
July 22 – August 13, 2010

References


