

Service-Oriented Rich Client Applications Supported By Internetware Browser Middleware

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1. INTRODUCTION

Since many web sites provide their own services and a web browser becomes a rich client platform, a new type of web application that is constructed by assembling web-delivered services in web browser, called Service-Oriented Rich Client (SoRC), emerges. Typical SoRC applications include web OSEs and mashups. Due to the increasing complexity of SoRC, we propose a new type of middleware, which is embedded in web browsers and encapsulates reusable solutions for common problems of SoRC, including a container for component instances, a set of mechanisms for interactions within the browser, between the browser and server. Different SoRC applications can be constructed easily in high quality based on this middleware. We implement a prototype of the Internetware browser middleware, and then build two SoRC applications based on this prototype: 1) a web-based BPEL editor, iServiceStudio; 2) a mashup environment, iMashup.

2. AN ILLUSTRATIVE EXAMPLE

In this section, we build a hotel reservation application by using iServiceStudio and iMashup. The application follows such process: 1) a user provides some search criteria; 2) the application gives some hotel recommendations; 3) if the user finds a proper hotel, he/she can make a reservation and pay for the for the hotel booking; 4) if not, he/she can refine his/her search criteria, and the process will go to step 2.

The application can be partly implemented by assembling some existing web services, including “retrieving hotel list”, “retrieving hotel detail”, “making reservations” and “payment” services. iServiceStudio is web-based WS-BPEL editor, which allows users to create WS-BPEL process in drag-and-drop manner. Developers can import existing web services and link them. The final process, as shown in the top part of Figure 1, can be deployed in standard BPEL engines.

Unfortunately, the hotel reservation process cannot be fully automatic without any user interaction, since there is no usable “hotel recommendation” service. Therefore the process requires workers

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who provide optional hotels by the search criteria. However, this kind of human computer interactions (HCI) is not covered by WS-BPEL.

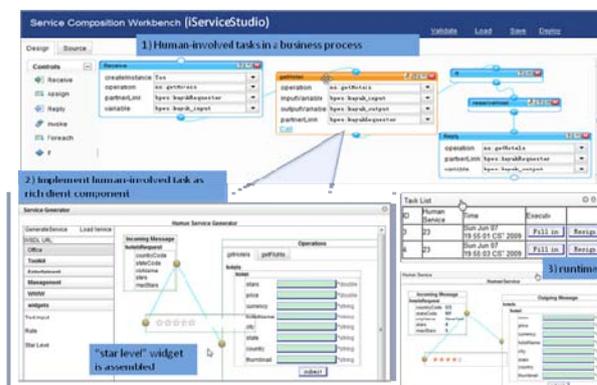


Figure 1. The Hotel Reservation Scenario

iMashup 0, which is a mashup environment, provides a SoRC and BPEL process integration mechanism to support HCI in business process. A developer can build a “hotel recommendation” HCI activity by following steps: 1) the developer selects the “hotel recommendation” activity in the BPEL process; 2) iMashup generates a SoRC application stub by parsing expected input and output of the activity; 3) the developer can refine the stub to build user-friendly SoRC application. For example, in this scenario, the stub application will combine with a star level widget which displays the level of expected hotels in visual manner. The mashup result is shown in the bottom left hand corner of Figure 1.

When the process executes to the “recommendation” activity, iMashup will get a notification of waiting process and remind the workers. When a worker begins to deal with the incoming query, the mashup application will be instantiated and display the search criteria. The worker will provide optional hotels, which are returned to the process. And then the process will continue its execution. The execution of process is shown in the bottom right hand corner of Figure 1.

3. REFERENCES

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