Chapter 3
Spreadsheet-Based Orchestration for Describing and Automating Web Information Access Processes

Jun Fujima
Hokkaido University, Japan

Shohei Yoshihara
Hokkaido University, Japan

Yuzuru Tanaka
Hokkaido University, Japan

ABSTRACT

A spreadsheet is one of the most widely used applications by office workers. It provides an end user with a programming environment. In this chapter, the authors propose a spreadsheet-based environment in which end users can orchestrate multiple Web applications. First, the authors provide a method for embedding various Web resources in spreadsheet cells as visual components that can be reused on the spreadsheet. Second, they propose a method by which these embedded components can be accessed by using special functions via the formula language. Third, they present these special functions to describe loop structures. Their approach enables users to define the complex coordination of multiple Web applications on

DOI: 10.4018/978-1-61520-851-7.ch003
Resources on the World Wide Web are now rapidly increasing in terms of their variety and storage volume. Such resources may contain not only static documents in Hypertext Markup Language (HTML) but also dynamic content created by server-side technologies such as Common Gateway Interface (CGI), client-side script languages, and Asynchronous JavaScript + XML (Ajax). Through the Internet, users can access various data and application tools such as search engines and database forms, as well as more advanced systems such as recommendation systems and data-mining applications.

People now commonly perform everyday tasks such as shopping and travel planning in this new environment. For instance, a Japanese person wanting to buy some CDs can access a number of CD shopping sites and retrieve the desired CDs’ cost including shipping cost. If, however, a particular person accesses a shopping site that is not a Japanese site, he/she may then have to calculate the total cost of the desired product in Japanese yen by accessing a currency exchange rate software on a currency conversion Web site. After doing such research the shopper may then choose the least expensive shopping sites for that purchase. In this way, even a small but complicated task can be achieved through access to the Web.

Such common, everyday tasks can be better achieved by combining a series of atomic tasks. In the previous example, the following can be considered as such a series of atomic tasks: accessing a number of CD shopping sites, retrieving the price of a specific CD, calculating the total price including shipping cost, and converting the total price to Japanese yen. Although people can perform such tasks in combination by manually transferring data from one to another, it becomes burdensome when such tasks must be done repetitively, and current computer systems offer little support for the automation of such repetitive combined tasks.

Therefore, in order to facilitate people’s daily access of information on the Web, it is necessary to provide a framework for describing, reusing, reediting, and sharing combined tasks. In the domain of Web service architecture, the creation of such a combined task is called orchestration. Only after externalizing the orchestration in information systems can the combined task be shared among people for reuse and automatic processing by computer systems. The externalization of this orchestration also allows people to edit one or more parts of a combined task in order to create a new combined task.

Spreadsheet-Based Orchestration for Web Information Access Processes

the spreadsheet using its formula language. Further, they describe their prototype implementation, which uses Microsoft Excel and its user interface support to utilize the embedded Web applications.
Alignment: The Activity Domain in the Centre

www.igi-global.com/chapter/alignment-activity-domain-centre/39681?camid=4v1a