Guest Editors’ Introduction

Web Services-Based E-Business Systems

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Web services are a reality! Their applications are growing and Web services are gaining the interest of enterprises and other stakeholders. Most of the next generation Internet- and intranet-based e-business systems will be based on Web services. According to a 2004 Yankee Group’s report, 83% of Fortune 1000 companies were already deploying applications based on Web services.

Web services are “services offered by one application to other applications via the World Wide Web.” Developers can aggregate the services to form an end-user application, enable business transactions, or create new Web services. Web services are software components and applications that use Internet technologies and standards, and they can be accessed through the Internet, intranet, or extranet. They can bind together autonomous heterogeneous applications, data, services, and components residing in distributed environments. Thus, Web services facilitate universal interoperability and integration, which have long been sought after.

Enterprises have wanted to move to a more “plug-and-play” business IT infrastructure for some time. They can now realize this vision by adopting Web services. Web services provide them the ability to design, create, and deliver applications more quickly and cost-effectively. The new-generation e-business systems could compose services dynamically, as needed, by binding several lower-level services. Web services-based approach to application development overcomes major limitations of traditional Web/software development and evolution. Though Web services are relatively young, a new breed of Web applications based on Web services have been successfully deployed in financial, manufacturing, travel, and e-business sectors.

Web services could also leverage the creation of business networks through which aggregations of products and services can flow freely. They have the potential for transforming how businesses and enterprises interact within themselves and with other enterprises. Besides being a catalyst for transformation, Web services offer businesses the agility to configure and implement e-business and information systems in pace with the business growth and demands. The flexibility, the ability to evolve and grow, and potential cost savings make Web services very attractive for a range of enterprise and e-business applications. Web services is expected to fuel a new wave of electronic business, application integration, and business-to-business (B2B) interactions, as the industry moves towards application and service integration, rather than dedicated system development that require extensive design, deployment and integration efforts.

Despite significant potential benefits and promise of Web services, so far only some large enterprises have deployed Web services-based applications; adoption of Web services by small- and medium-sized enterprises (SMEs) have been very low. The low adoption is partly due to problems and challenges in developing and deploying real-life applications based on Web services. This area deserves further investigation and study, and hence this special issue.
IN THIS ISSUE

Articles in this issue on “Web services-based e-business systems” deal with challenges in deploying Web services-based applications, development methodology, application modelling, Web service orchestration and choreography, and Web services usage measurement.

In the first article, “Challenges of Deploying Web Services-Based E-Business Systems in SMEs,” Ranjit Bose and Vijayan Sugumaran discuss challenges for deploying Web services-based e-business systems in small- and medium-sized enterprises (SMEs) which play a vital role in generating employment opportunities and fostering economic growth globally. The authors present a framework for studying the factors that impact the deployment and use of Web services.

In the next article, “Process-Oriented Assessment of Web Services,” Jan-Hendrik Sewing, Michael Rosemann and Marlon Dumas propose a four-phase methodology which facilitates the evaluation of use of Web services in e-business systems both from a technical and from a strategic considerations. The methodology is based on business process models, which are used to frame the adoption of Web services and to assess their impact on existing business processes. The application of this methodology is described using a procurement scenario.

Iain Morrison, Bryn Lewis and Sony Nugrahanto, in their article, “Modelling in Clinical Practice with Web Services and BPEL,” discuss their approach to modelling clinical information and service. Their modelling approach uses tools and techniques that are gaining increasing acceptance in the e-commerce domain, which shares many of the technical and interoperability problems present in e-health.

Next, in the article, “Insights into Web Service Orchestration and Choreography,” Florian Daniel and Barbara Pernici provide an overview on Web service orchestration and choreography. They discuss problems and solutions regarding orchestration and choreography of Web services, from a conceptual point of view, and also highlight mutual dependencies that exist among orchestration and choreography.

Usage monitoring is a key factor in the business of Web services. Arun Kumar, Neeran Karnik, and Vikas Agarwal, in their article “Usage Metering for Service-Oriented Grid Computing,” discuss metrics that are required to capture service usage and present an architecture for usage metering of grid services. They describe pricing, charging and business models and discuss how service usage can be measured, aggregated and communicated in a uniform way. They also report on a prototype design and implementation.

FURTHER RESEARCH

While the Web services-based applications continue to grow, application developers and enterprises wanting to embrace Web service face several technical and organisational issues and challenges in designing and implementing Web services-based systems. Key areas that need further study include: Web services standards, security and privacy, reliability and availability, performance, quality of service, appropriate business models, testing and validation, and development methodologies.

With the proliferation of mobile computing and wireless communication devices, the demand for accessing Web applications through these mobile devices will grow. Adaptation of existing Web service architecture to the wireless environment posses some unique new challenges; they are primarily due to the unpredictable nature of the wireless network, the limited processing capabilities and power on mobile devices and quick response demanded by mobile users. This will be a hot topic of research for years to come.
San Murugesan is professor of information technology at Southern Cross University in Australia. His research interests include e-business, information retrieval, personalization, mobile and wireless computing, Web engineering, and information systems. Dr. Murugesan is a distinguished visitor and tutorial speaker of the IEEE Computer Society. He was general chair of the 5th International Conference on Web Engineering, held in Sydney in July 2005, and he has served as co-chair and organizer of other international workshops and conferences. He also serves as associate editor of the Journal of Web Engineering, International Journal of E-Business Research, and International Journal of Health Information Systems and Informatics. Prior to joining the faculty of Southern Cross University, Dr. Murugesan served in various senior positions at the University of Western Sydney in Australia and the Indian Space Research Organization in Bangalore, India. He also served as senior research fellow of the U.S. National Research Council at the NASA Ames Research Center in Mountain View, California, USA. He can be reached at: Faculty of Business, Southern Cross University, Coffs Habour, NSW 2457, Australia; e-mail: smurugesan@scu.edu.au.

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