



PHOENIX Research: Web Enabled Real-Time Enterprise Applications

A Research Project at the School of Information Systems, Victoria University,
Melbourne, Australia

URL: <http://www.staff.vu.edu.au/PHOENIX/phoenix/>

Introduction

PHOENIX Research at Victoria University brings together special talents and skills in exploring how the modern cutting-edge technologies may work with existing traditional technologies. The project carries out innovative solutions assisted with Enterprise Application Integration (EAI) processes and infrastructure to support real-time service oriented enterprise tasks. PHOENIX project covers a range of the related academic research initiatives, techniques, as well as industry specific issues, namely Web Services, intelligent user interfaces, HCI, natural language processing (NLP), systems integrations, intelligent agents, data mining, software reuse, application composition framework and knowledge management.

Advanced EAI Solutions

The advanced EAI infrastructure as being developed within PHOENIX aims to link and utilize different technologies, tools, software packages, as well as existing data/information sources supported by knowledge management and data management techniques with the assistance of traditional EAI tools. An example of the use of the PHOENIX framework is for companies or business that do not own a sophisticated information system such as ERP system, have the virtual access to the required services in a flexible and cost-effective way. In this scenario, PHOENIX provides values adding and back-end coordination services including connection to ERP systems e.g. SAP ERP systems to automate value-chain transactions, facilitate data warehouse applications as well as systems integrations through SAP NetWeaver.

Innovations and Technologies Breakthroughs

The key technical strengths are reflected in real-time enterprise solutions supported by the integration of knowledge management and data management, and the collaborative information delivery service across network including wired and wireless networks. The Knowledge Management component (KM) of PHOENIX is specialized in handling business logics and business process information in a flexible, efficient and dynamic way with knowledge workers at different levels such as decision makers, domain experts, and professionals from various disciplines. One example of KM service is that business logic or business process information can be efficiently mapped into the PHOENIX KM module, a software component that supports plug-and-run with an existing software system or other components. This is achieved with no additional programming or software development effort, i.e. leading to cost saving for business. The fundamental KM services include automated support for knowledge creation, knowledge capturing,



knowledge maintenance, and knowledge execution. Knowledge execution has direct impact on how existing enterprise data or information (which are often in large volumes) may be used at the computing levels. The technical breakthroughs come from the unique dynamic memory-based knowledge driven problem-solving models that can accurately detect and filter through (from large volume of data regardless locations and format, an ubiquitous computing initiative) the application/project required data in real-time. This has virtually put a wide range of information/data resources under effective control to support user centric applications. PHOENIX KM component is integrated with its data management component and can also work other data management systems (e.g. RDBMSs, data warehouses etc) outside PHOENIX environment. So far, a teaching version of the PHOENIX Knowledge Management module has been deployed into the tutorial labs at several campuses of Victoria University (i.e. City Flinders Campus, City Queens St Campus and Footscray Park Campus) through a special teaching grant from the Head of the School, Information Systems, Victoria University. Students have been able to gain first-hand experiences in their studies.

Business Benefits

The capability of integrating business logic with existing large volume and diverse range of business information/data sources and software packages (such as EIS and legacy systems) to deliver customer focused solutions has potential business values. It allows e-Business solutions to be delivered collaboratively over the network and in real-time fashion. Users can adopt the technologies in a flexible, friendly and cost-effective way to maximize the potential value of existing information resources and capitalize the technologies investment in the past. To better address the industrial links, we aim to offer a flexible and independent research vehicle to test out new and cutting-edge concepts such as SAP NetWeaver Integration, Intelligent Web Services, Mobile Knowledge Management and On-line Decision Support. These initiatives have led to a number of applications with industry significance.

Major Application Services

Mobile Knowledge Management

One of the core technologies from the project is INDEX knowledge management system. We extend it into a web based knowledge management system by using various mobile devices such as Laptop, Personal Digital Assistants and Mobile phone. This work aims to identify new approaches for mobile knowledge management and initially target an application scenario with SAP R/3 back-end system.

Intelligent Web Services Application

The application aims to overcome the existing weakness of Web Services Technologies in performing transactional tasks and integrations with greater complexity.

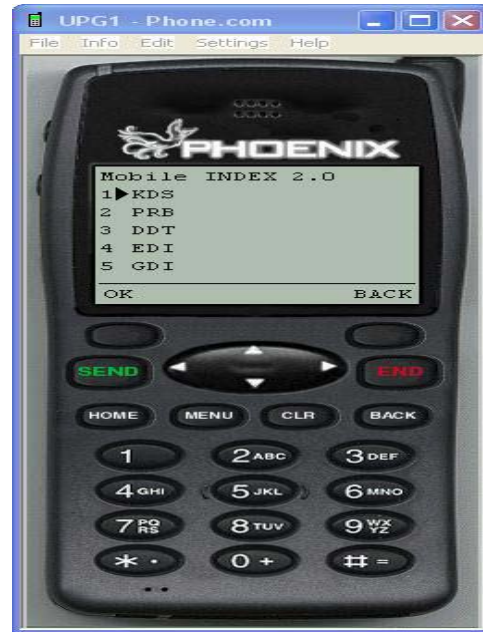


Figure 1. Mobile INDEX Services on Different Devices

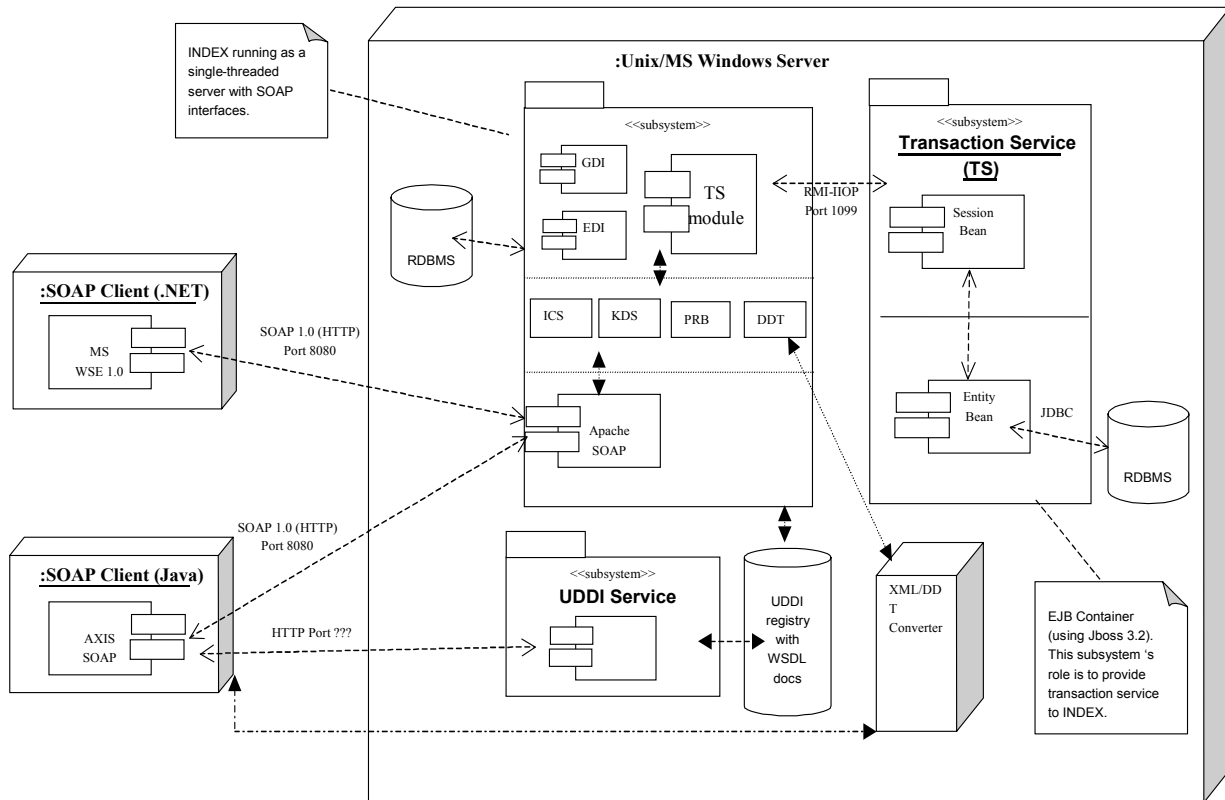


Figure 2. Intelligent Web Services Applications



The approach is to use our knowledge management component to integrate and control traditional Web Services applications. Figure 2 outlines such an initiative from technical perspectives. The technical diagram combines the current work from three different teams/areas: (1) J2EE and Transactions Processing, (2) Integration of Web Services with Knowledge Management Component (INDEX), and (3) Web Services Coordination. The teams are progressing towards the targets in the well-coordinated way.

On-line Data Management and Decision Support

This application offers a lightweight solution managing virtually large volume data and information across the network regardless of format, location and volume. It helps unleash the values from existing data sources in relation to business needs (e.g. decision support). This is achieved through PHOENIX knowledge management component that has extensive capability of handling business logic.

SAP NetWeaver Integration

SAP NetWeaver is the engine that drives solutions based on Enterprise Services Architecture and is the foundation for the SAP xApps and mySAP Business Suite solutions portfolio. The University has received from SAP the full software suite of SAP NetWeaver (refer to resources link of PHOENIX Website) and is at the forefront in teaching and research on ERP systems. SAP systems are often used as teaching examples. The technical focus from PHOENIX in this area is on E-Business Technologies Integration where SAP NetWeaver is used to link the University (Java-based) knowledge management application with the rest of the SAP systems. Preliminary experimental results have been obtained.

Acknowledgement

The materials from PHOENIX represent the collective contributions from the teams.

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