BigTrumpet.com

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INTRODUCTION

This article presents a case study on the world's first nationwide portal, BigTrumpet (BT), which showcases an early adoption of the evolving Web-services technology. BT is intended as a community portal that will touch the lives of Singaporeans through the concept of multiagency participation. BT is unique due to the technology behind it, the connectivity enabled by BT's applications, and the collaborative partnerships in its implementation.

Web-Services Overview

Web services is a new, emerging technology that is increasingly being called the next driver of growth in the IT arena. Gartner (2003) estimated that global spending on Web services and portals by the year 2005 would amount to $156 billion, and IDC (2002) expects Web services to drive total software, services, and hardware opportunity to $34 billion by year 2007. Web services hold much potential, like EDI (electronic data interchange), but without the associated problems of rigidity, a fixed data representation, or the requirement of expensive, specialized software (Glikson, 2003; Hartman, Flinn, Beznosov, & Kawamoto, 2003).

Technically, a Web service is a software application identified by a URI (uniform resource identifier) whose interfaces and binding are capable of being defined, described, and discovered by XML (extensible markup language) artifacts. It supports direct interactions with other software applications using XML-based messages via Internet-based protocols (Adams, Gisolfi, Snell, & Varadan, 2002).

Web services are a standards-based technology (Oei, 2003) that leverages on Internet technologies like the hypertext transport protocol (HTTP). Web-services standards define the format of the message, specify the interface to which a message is sent, describe conventions for mapping the contents of the message into and out of the programs, implement the service, and define mechanisms to publish and discover Web-services interfaces (Newcomer, 2002a, 2002b). The four basic Web-services standards consist of XML, the simple object access protocol (SOAP), the Web services description language (WSDL), and universal description, discovery and integration (UDDI).

The key benefit of Web services is that they enable interoperability between diverse applications and platforms (Tan, 2003). Furthermore, the use of HTTP makes Web services pervasive as even firewalls are designed to allow HTTP access (Bochsler, 2003).

Interoperability means unfettered information flows and therefore better integration of disparate internal and external IT applications. A reduction in integration complexity can help build better relationships with customers and external partners, and also lead to improved cycle times (Oei, 2003).

Interoperability also gives companies the flexibility to adopt the technology that is most suited to their own needs without having to take into consideration their partners' systems. Considerations of using the .NET or J2EE (Java 2 Platform, Enterprise Edition) platforms need not be made with reference to the systems of others (Hartman et al., 2003). Hence, Web services using XML provide a flexible model for data interchange with partners while at the same time allowing a company to build a tailored IT infrastructure internally.

BT Background

BT was initiated with a vision to unite the three *P*s: people, the private sector, and the public sector. It was designed to be a one-stop solution for a wide range of services delivered in a personalized manner using the Web-services technology.

BT was a combined vision of the software giant Microsoft and IDA,[1] both of whom wanted to promote and build a showcase Web-services project. It was created within a broader framework called .NETMySingapore crafted between the two stakeholders in 2002.

The BT portal is hosted by NTUC (National Trade Union Congress) Income (also referred to as Income), who has championed the project and become the main service aggregator for the portal. Though initiated by IDA, BT has been implemented as a private-sector initiative with decisions and actions governed by market demands. BT

is therefore very different from another platform called E-Citizen (Ke & Wei, 2004), which is an e-government showcase championed, funded, and developed entirely by public agencies in Singapore.

NTUC Income

NTUC Income is Singapore's only insurance cooperative, which was formed in 1970. It has grown rapidly over the years, having over 1.5 million policyholders by the end of 2002. In addition to insurance plans, Income also offers special benefits like loans, 24-hour repair services, house-moving services, tuition services, health screenings, fitness-center memberships, and will-writing services. Its broader mission is to help improve the quality of life of Singaporeans.

Income has always been at the forefront of using technology. It was the first insurer in Singapore to install a mainframe computer system in 1980. Since then, it has enhanced its IT capability regularly in order to raise the level of service to its policyholders.

Income was the first insurer to launch an Internet Web site in 1995. Today, the Web site attracts over 7 million hits per month and about 4,500 visitors per day.

DESCRIPTION OF BT

The BT portal offers a wide range of services to consumers who no longer need to visit different sites to perform many common tasks. A total of 16 services, called Web-services scenarios, have been implemented in BT so far. These services pull data from 14 different agencies at the back end: 6 from the government sector and 8 from the private sector. All services, for the most part, are synchronous in nature whereby users get an instant response after sending their request from the BT portal. These 16 services also demonstrate how collaboration, aggregation, and orchestration can be used to offer distributed services from one, single, common platform.

Before describing each Web-services scenario in more detail, it is important to discuss some general core services that form an important component of BT design.

Core Services

The BT portal offers five general core services that can be utilized together with any Web-services scenario at the users' convenience. They are Calendar, Profile, List, Contacts, and Alerts. All these services allow the users to store personalized information.

- **Calendar:** This service provides users with a digital organizer that allows them to record important events or appointments at their ease. Relevant dates relating to any of the Web-services scenarios can be tagged onto the user's personalized calendar.
- **Profile:** The profile service enables users to store their personal profiles, search preferences, and upload their resumes. In addition, users can customize their Web page via subscription and management of various e-capsules available.
- **List:** Users can store three different types of lists under this service: a shopping list, job list, and course list.
- **Contacts:** It allows users to store, categorize, and control access to their businesses and personal contact information.
- **Alerts:** This last core service offers users a choice of notification via either electronic mail, short message service (SMS), or the BT Web page.

Web-Services Scenarios

BT offers 16 Web-services scenarios that were implemented in three phases. Five scenarios were implemented in Phase 1, which was completed in October 2002.

Phase 1 Web Services

- **myCareer:** This scenario is provided in collaboration with the Ministry of Manpower (MOM),[2] which opened up its back-end job databank and exposed it as a Web service. Users can search for jobs in accordance to their preferences that are stored in their profile.
- **myClub:** This scenario consists of different forums based on different interests, schools, activities, and hobbies made available for discussion.
- **myFolder:** This allows users to store their important documents online such as wills, school certificates, or transcripts in a safe and trusted manner. myFolder is essentially the backbone of myWill as the online will stored in this folder is accepted in the eyes of court as the original copy. The electronic will is stored in a trusted vault located at TrustedHub's[3] premises.
- **myHome:** This scenario aims to help users locate a range of domestic improvement services for their home. For example, users can search for a suitable tutor or register themselves as a tutor. Similarly, electricians, plumbers, and renovation contractors can be contacted according to users' preferences. myHome also includes online shopping through a joint effort with FairPrice[4] that has over 5,000 grocery and household items.
- **myMoney:** This service aims to help users keep charge of their monetary matters. Users can check

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