Hotel Management System Integration Services

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Abstract. It is generally accepted that the role of the web services in businesses is undoubtedly important. More and more commercial software systems extend their capability and power by using web services technology. Today the e-commerce is not merely using internet to transfer business data or supporting people to interact with dynamic web page, but are fundamentally changed by web services.

Keywords: Hotel management; Systems; Integrated services.

Introduction

The World Wide Web Consortium's Xtensible Markup Language (XML) and the Xtensible Stylesheet Language (XSL) are standards defined in the interest of multi-purpose publishing and content reuse and are increasingly being deployed in the construction of web services. Since XML is looked as the canonical message format, it could tie together thousands of systems programmed by hundreds of programming languages. Any program can be mapped into web service, while any web service can also be mapped into program. In this paper, we present a next generation commercial system in hotel industry that fully integrates the hotel Front Office system, Property Management System, Customer Relationship Management System, Quality Management System, Back Office system and Central Reservations System distributed in different locations. And we found that this system greatly improves both the hotel customer and hotel officer’s experiences in the hotel business work flow. Because current technologies are quite mature, it seems no difficulty to integrate the existing system and the new coming systems (for example, web-based applications or mobile applications). However, currently in hotel industry there are few truly integrated systems used because there are so many heterogeneous systems already exist and scalability, maintenance, price, security issues then become huge to be overcome. From our study on Group Hotel Integration Reservation System (GHIRS), there are still challenges to integrate Enterprise Information System (EIS), Enterprise Information Portal system (EIP), Customer Relationship Management system (CRM) and Supply Chain Management system (SCM) together because of standardization, security and scalability problems, although GHIRS is one of few integration solutions to add or expand hotel software system in any size of hotel chains environment.

We developed this system to integrate the business flow of hotel management by using web services and software integration technologies. In this paper, firstly we describe a scenario of hotel reservation and discuss the interaction between GHIRS and human. Secondly we analyze details of design and implementation of this system. The result and implications of the studies on the development of GHIRS are shown in the later part. Finally we discuss some problems still need to be improved and possible future directions of development.

Hotel Reservation: A Business Case Study

Our initial thinking to develop GHIRS is to minimize the human interaction with the system. Since GHIRS is flexible and automated, it offers clear benefits for both hotel customers and hotel staff, especially for group hotel customers and group hotel companies. Group hotel companies usually have lots of hotels, restaurants, resorts, theme parks or casinos in different locations. For example, Shangri-La group has hundreds of hotels in different countries all over the world. These groups have certain customers who prefer to consume in hotels belong to the same group because they are
membership of the group and can have individual services.

The first step of a scenario of hotel reservation is that the consumer plans and looks for a hotel according the location, price or whatever his criteria and then decides the hotel. Then he makes a reservation by telephone, fax, internet, or mail, or just through his travel agent. When hotel staff receives the request, they first look if they can provide available services. If there is enough resource in the hotel, they prepare the room, catering and transportation for the request and send back acknowledgement. At last the guest arrives and checks in. The business flow is quite simple; however, to accomplish all these tasks is burdensome for both the consumer side and the hotel side without an efficient and integrated hotel management system.

Telephone may be a good way to make a reservation because it is beyond the limit of time and space. Guests can call hotels at any time and any place. However, it costs much when the hotel is far away from the city where guest lives; especially the hotel locates in a different country. Moreover, if there is a group of four or five people to make reservation together, it would take a long time for hotel staff to record all the information they need. Making reservation by travel agent saves consumers’ time and cost, but there is still millions of work for agent to do. They gather the requirements from consumers, then distribute to proper destination hotels. Because these hotels don’t use a same system (these thousands of hotels may use hundreds of management systems), someone, agent or hotel staff, must face the problem how to handle information from different sources with different hotel management systems to different destinations.

Web service becomes the tool to solve these problems. Our web services integrate the web server and hotel management system together, and everyone gets benefit. Booking a room easily anywhere and anytime becomes possible by using GHIRS. Consumer browses websites and finds hotel using his PC, PDA or mobile phone (WAP supported), after his identity is accepted, he can book a reservation. Two minutes later he can get the acknowledgement from the hotel by mobile phone text message or multimedia message, or email sent to his email account or just acknowledgement on the dynamic web page, if he hasn’t leave the website. The response time may take a little longer because when the hotel receives the quest, in some circumstance, hotel staff should check if there is clean and vacant room left. The web service is a standard interface that all travel agents can handle, gather and distribute the reservation information easily through internet. When the reservation request is acknowledged, hotel staff prepares the room, catering, and transportation for guests. Since the information already stored in the database, every part in the hotel chains can share it and work together properly. For example, staff in front office and housekeeping department can prepare room for guests according to the data, staff in back office can stock material for catering purpose and hotel manager can check business report in Enterprise Information Portal integrated with GHIRS by his browser. Then room rent-ratio reports, room status reports, daily income reports and other real time business reports are generated. Managers of the group can access any report of any hotel by the system. In the later part of this paper, we will show how consumers, agents, and hotel staff can efficiently work together by GHIRS.

GHIRS is scalable for small-to-large hotel chains and management companies, especially good for hotel group. It truly soars with seamless connectivity to global distribution systems thereby offering worldwide reservation access. It also delivers real-time, on line reservations via the Internet.

### Integration of Hotel Management System

#### Existed System

GHIRS is developed on the base of an existed hotel management system called FoxhisTM. FoxhisTM shares the largest part of software market in hotel industry in China. FoxhisTM version 5 has distributed Client/Server architecture that the server runs SCO-UNIX and client runs Microsoft Windows and it use Sybase database on UNIX. The system includes Front Office system, Property Management system, Quality Management system, Human Resource Management system, Enterprise Information Portal system (EIP), Customer Relationship Management system (CRM) and Supply Chain Management system (SCM).
This system is largely based on intranet environment. Most of the work is done in a single hotel by
the hotel staff. It’s no customer self-service. If a consumer wants to book a room, hotel staff in local
hotel must help the guest to record his request, although Foxhis™ system already done lots of
automatic job.

When the systems are deployed in different hotels that are parts of a group, sharing data becomes a
problem. Just as an example, if the group has ten hotels, there would be at least ten local databases to
store the consumers’ data. Because hotels need real time respond of the system, so these ten hotels
can’t deploy a central database that does not locate in the same local network. Thus one guest may
have different records in different hotels and the information cannot be shared. By web services as an
interface, these data can be exchanged easily.

Design

Recall that our initial thinking to deploy GHIRS is to save hotel staff, travel agents and consumers’
labor work the system is to link all the taches of hotel business chains.

Consumers could be divided into two categories. One is member of hotel group, who holds
different classes of memberships and gains benefits like discount or special offers. These consumers
usually contribute a large part of the hotel’s profit then are looked as VIP. The hotel keeps their
profiles, preferences and membership account status. The other category is common guest. All these
two kinds of guests and travel agents who may trade with many other hotels face the web-based
interface that let them make a reservation. For common guest, the system just requires him to input
reservation information such as guest name, contact information, arrival and departure the system.
The central processing server then distributes the information to appropriate hotel. Since web services
technology is so good for submitting documents to long running business process flows, hotel staff
could easily handle this data in and out of database management system and application server. As
the membership of hotel, a user just inputs his member id and password, room information, arrival
and departure date, then finish the request. Because hotels keep members’ profile, and systems
exchange profile across all hotels of the group by web services, hotel staff in different hotels could
know the guest’s individual requirement and provide better services.

The agents work for consumers get benefits from GHIRS as well. They may also keep the
consumers’ profile and the web services interface is open to them, it is easy to bridge their system to
hotel management system. Before GHIRS is deployed, the agents should separate and process the
reservation data and distribute them to different hotels, which is an onerous job. But now the agents
could just press one button and all the hotel reservation is sent to destination.

Hotel staff receives all request from different sources. Some policies are applied to response the
request. For example, some very important guest’s request is passed automatically without
confirmation, the guest could get acknowledgement in a very short time. The request triggers all
chains of the hotel business flow and all the preparation work is done before his arrival. But for the
common customer, hotel staff would check on the anticipate date if there is vacant and clean rooms
available. Because all the Foxhis™ components are integrated together, staff users needn’t change
computer interface to check the room status. If it is a valid request with enough guests’ information
and there is enough room left, a confirmation is sent back. If there is not enough vacant room, hotel
staff will ask if guest would like to wait time or transfer to other hotels in the hotel group or alliance
hotels. In order to transfer guest’s request, data flows from local database to the central server through
local web server, then it is passed to another hotels database by web services interface.

Implementation

Today there are lots of platforms that could provide capabilities to integrate different system and offer
other features such as security and work load balancing. The two main commercial products are Java2
Enterprise Edition (J2EE) and Microsoft.NET. They offer pretty much the same laundry of list of
features, albeit in different ways. We choose .NET platform as our programming environment,
however, here we don’t advocate which platform is better or not. Our target is to integrate these
decentralized and distributed systems together. In fact, both of these platforms support XML and SOAP to accomplish our task.

We use Microsoft Internet Information Services (IIS) as web server and Sybase database server. The firewalls separate the local networks from the public networks. This is very important from the security point of view. Each hotel of the group has a database server, an application server and a web server to deploy this multi-tier system that includes the user interface presentation tier, business presentation tier, business logical tier, and the data access tier. C# is adopted as the programming language for the core executable part. XML is the data exchange standard format.

References


