

Analysis and Prototype Design for Price Comparison in China and Korea

Jong-Hoon Park, Chul-Won Kim, Member, KIMICS

Abstract—Korea-China with the fastest speed Internet Broad Band, has achieved many progresses on Internet shopping. Especially, Korea has made a great effort on comparison website construction. A research prototype design and exploratory analysis are presented to assess success factors and impacts of Korea and China price comparison websites. For different user groups, the relationships between the characteristics of technology and tasks, usage, and organizational impacts were analysed. It shows us how to improve the applicability of fit-viability of the price comparison websites in China after analysis.

These results indicate a need for simple but highly functional price comparison applications. And we designed a sample model to include an interactive web service system for price comparison sites that complement existing information systems. This paper provides a basis for further research aiming to improve the design and management of business applications based on emerging technologies of web service and browser for information management.

Keywords—price comparison, web service, prototype, analysis

I. INTRODUCTION

This paper examines the effect of rapid growth of Internet on the future industrial growth in China. According to the author, the global economy has been profoundly affected by the use of the Internet. China's Internet is the fastest expanding market in Asia. The number of Internet users in China doubled every six months in the last two years. Studies show that most barriers to the wider distribution of network technology tend to fall into three broad categories[1].

As the use of the Internet began to spread through many sectors of China society, the leaders had to decide whether to allow this new media to keep spreading and how to control it. Competitions among China's nternet service providers have results in improving service quality and decreasing charges[2]. In the last decade, China's economy has grown rapidly, and Internet business sector has grown at very high rates annually. Price comparison has been contributed to Internet shopping expansion in many countries, especially in Korea, which points to a

positive correlation between price comparison and Internet business growth world-widely. Growth of the Internet in China is not alien to this trend, so we explore the development of the Internet in China, starting with background of Internet in China, analysing several commons Korea Internet price comparison websites models, and discussing price comparison function to the growth of Internet shopping in China, Finally, an overview of several leading new technology implication for price comparison system will be presented and forecasted.

II. ANALYSIS FOR PRICE COMPARISON BETWEEN CHINA AND KOREA

A. Introduction

This websites don't require any special technical knowledge, and it is designed for users who are buyers to the Internet and Internet shopping. This price comparison websites outline the online website comparison. It begins from explanations on how to use this website to a complete list of the programs features. This online comparison needs Internet shopping malls to create a website modifying it as frequently as the customers require and managing all the files (figures and information), which will be displayed on price comparison website.

B. The present condition of the China price comparison website

To connect the China comparison website(<http://www.chajia.com>), sometimes the customers need to login to seller's account. The main reason they need to login is to make sure that get members' service. Generally, each user is given his own username and password. A username is required so that the server knows who it is if there are multiple users, and it is able to let each user access their corresponding service. (The username and password will be assigned to general user and merchant user (Fig. 1)). Users need to type in the URL of user's website address. Users will then be prompted to enter in your username and password (Fig. 2).

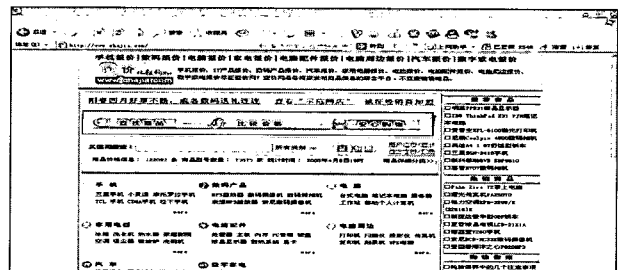


Fig. 1 [chajia.com](http://www.chajia.com) content on the web © www.chajia.com

Manuscript received September 2, 2005.

Jong-Hoon Park is with the Computer Multimedia Department, University of Joongbu Korea, (corresponding author to provide phone:+82-41-750-6609, E-mail:jhpark@joongbu.ac.kr)

Chul-Won Kim is with the Computer Engineering Department, University of Honam, Gwangju, Korea, (corresponding author to provide phone:+82-62-940-5403, E-mail:cwkim@honam.ac.kr)

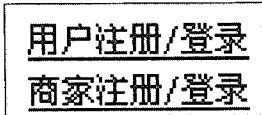


Fig. 2 User login and registration screen on [chajia.com](http://www.chajia.com)
© www.chajia.com

As 21 century new form's large-scale merchandise price comparison website, [chajia.com](http://www.chajia.com) broke normal information regulations with other websites, it provides the fastest way to get the products from computers, the electrical products, cellular phones, cars etc for price comparison. By browsing the website www.chajia.com, there is abundant information, ocular swift service, which make consumers find good and inexpensive items while staying indoors, consumers can also save their money, time as well as their efforts. [chajia.com](http://www.chajia.com), according to the equality offers multiple services, such as price comparison, accurate information of the goods, relevant forum and the minimum quotations express delivery of the goods every day, etc., make consumer fully enjoy the inherent product value and glamour of Internet shopping. Under the website's support and participation of mass members, this website can become the best platform of interchanging the product price information for consumers and sellers in China.

C. The present condition of the Korea price comparison websites

Fast Product Searching with Indexing Service help users search for particular products. Simply entering the websites, product shoppers can look for relevant information in the search box and hit the search button. A list of products is presented next. To fitter shoppers' results, you need to select a manufacturer, a price range and in certain case, as well as products feature, and then you can also browse a special list by category [3].

Fast Product Searching Service is similar with Indexing Service that is a part of Windows O/S, once activated; it works in the background to maintain an up-to-date index of all the products in selected areas of the database. What makes it especially useful is that it keeps details of the content of the products as well as more mundane information like products names, model, price, etc. As a result, the searching result can come out instantly when consumers search for a product by category. It only takes a few seconds to find out the results of the information you want.

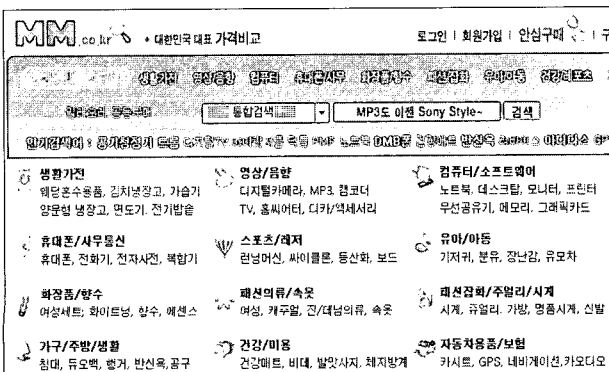


Fig. 3 Homepage of one price comparison website in Korea

Considering its power and usefulness, Indexing Service is a surprisingly neglected feature. This may be because: it is turned off by default and the interface is very user-friendly. These two issues are shown in www.enuri.com.

번호	제조사	모델명	요약설명	가격	최저가	등록수	조회수
<input type="checkbox"/>	캐논	EOS-350D(18-55mm USM)	820만화소(1.07,CMOS)/1.8"LCD/SLR/착수/35준속광/연사/CF카드/별책	1,170,000	1	1	4
<input type="checkbox"/>	캐논(연합)	EOS-350D(18-55mm USM,패키지)	820만화소(1.07,CMOS)/1.8"LCD/SLR/착수/35준속광/연사/CF카드/별책	1,330,000	1	1	4
<input type="checkbox"/>	캐논	EOS-350D(28-105mm USM)	820만화소(1.07,CMOS)/1.8"LCD/SLR/착수/35준속광/연사/CF카드/별책	1,330,000	1	1	4
<input type="checkbox"/>	캐논(연합)	EOS-350D(28-105mm USM,패키지)	820만화소(1.07,CMOS)/1.8"LCD/SLR/착수/35준속광/연사/CF카드/별책	1,550,000	1	1	4
<input type="checkbox"/>	캐논(연합)	Powershot-A510(패키지)	330만화소(0.37")/1.8"LCD/4배줌/동영상·녹음/USB1.1/SD카드	291,000	1	1	4

Fig. 4 Indexing Service on price comparison site
© www.enuri.com

This example has shown us this fact that consumers can get results from Indexing Service very easily. Indexing Service has transformed the speed and eased with which consumers can access the database.

D. Analysis of two countries price comparison sites' characteristics

China price comparison sites do not sell anything directly to users; they just provide a service for Internet merchants to list their products for sale on their website. But though Korea price comparison site, shoppers can contact the merchant directly by clicking on the merchant's logo or the "Buy at Seller" button. The shoppers can purchase products directly [4].

China price comparison site is only a venue. The website acts as online marketplace for shoppers to find and transact with sellers. But Korea price comparison sites are like brokers, which is a party to some agreement that the shoppers make with the sellers. In China, the sellers always are the manufactory companies, especially in Korea; the sellers are always online shopping malls. And the comparison-shopping sites with related service respect consumers' personal privacy. This is a new and effective privacy policy.

Meanwhile, all the Korea price comparison websites participate in the Businesses Certified Program. As the sells in the price comparison website increases, the efficiency for consumers to search may also suffer, because each additional seller make the consumer incur extra searches and evaluation costs. The returns to a search decrease steadily[3]. As the cost of searching and evaluating new alternatives rises, a point is reached where the expected cost of considering additional alternatives is greater than the expected benefits. At this point, the consumer will terminate the search for alternatives. Since the searching costs of Internet make purchase decisions whether it can provide greater value is still an open question. Some consumers may consider price comparison search effort to be low but others may not. The present study explains it is very necessary for consumers to examine product categories efficiency.

Being the first in the industry to venture into the Internet enables the Korea comparison sites to enjoy several significant competitive advantages over other conventional and online China price comparison sites. Because the Internet has the access to the customers from the global market and being the first mover, it has great brand awareness among the Internet users. Users of the Internet as a marketing and advertising tool means it could reduce cost and minimize inventory, which provides a more efficient economic model by reducing sales staff and overhead cost compared to their competitors. In terms of customer reach, it is already one of the most popular shopping sites on the web. It has already established a strong customer loyalty and strong commitment to users with friendly interface design and useful display of product related information. It will generate high levels of repeat purchases.

III. PROTOTYPE DESIGN USING WEB SERVICE

A. Product order and price comparison dynamically in real time

Currently, Price comparison sites can receive the inputs of product information and price manually after being joined by related shopping mall companies, and can't support automatically the price fluctuation of products in real time. But how to solve these problems is to use an application of web service technology under distributed environment and needs the system designs to fetch product information from shopping mall companies in real time and to order products directly in a price comparison site [5]. And it needs the browser supporting the registry search in a client application and the registry publication of binding information in shopping mall.

Therefore, we design and implement the browser for information management of UDDI registry and the web service system based on SOAP for an interactive product order and a price comparison dynamically using web service technologies in real time.

B. Prototype Design

1) Development tool of system and development environment

The development environment of this system is consisted of MS windows 2000 for operation system, j2sdk1.4.1_03 for java environment, Weblogic server of BEA SYSTEM Company for EJB environment, MySQL for database tool and MySQL-front for user interface tool of MySQL [6, 7]. This system is implemented with the JWSDP (Java Web Services Developer Pack) distributed by Sun company for development tool of web service. Key elements in this toolkit are JAXR (Java API for XML Registries) and JAX-RPC (Java API for XML-based RPC) [8]. JAXR provides API of standard Java to search and store the information in access to XML registry consistently and JAX-RPC provides Java API for the development of web service client and server system to use RPC methods based on SOAP message [9]. Tomcat server distributed in Apache Group is the container to execute served and JSP and contains an internal web server too.

2) Design and implementation of system

In Fig. 5, we designed and implemented the modules in boxes. This web service system forms the client and server modules. The client module contains the functions of various sorts to compare price and search products by users, and it forms the functions processing product orders from the users. The server module consists of java system for web service and EJB for database management. As there are many on-line shops, many server modules can exist concurrently. The browser for information management of UDDI consists of finding, publication and deletion modules. The server module and the client module of web service contain this browser.

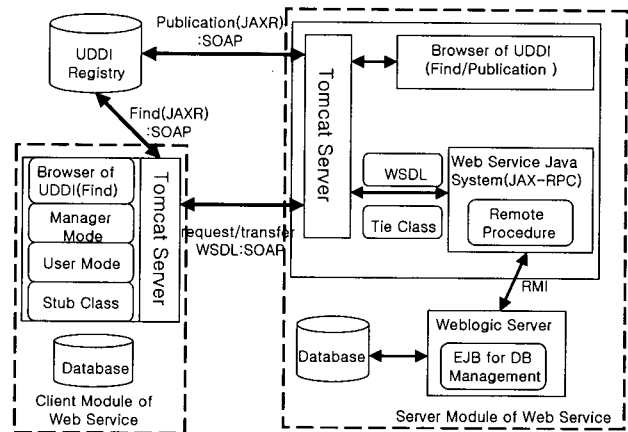


Fig. 5 Design structure of web service system

We implemented the system to exchange information based on standard environment of SOAP among the client module, the server module and the UDDI registry. Therefore, this web service system can support the independence of a platform and a flexible portability in environment conforming to SOAP, WSDL and UDDI standards.

3) Web service system for price comparison

In Fig. 6, relations of process modules to contain the web service client, the web service shopping mall and the EJB for database management are shown. The web service client and the web service shopping malls can construct the web service extensible easily in relation (1 - many).

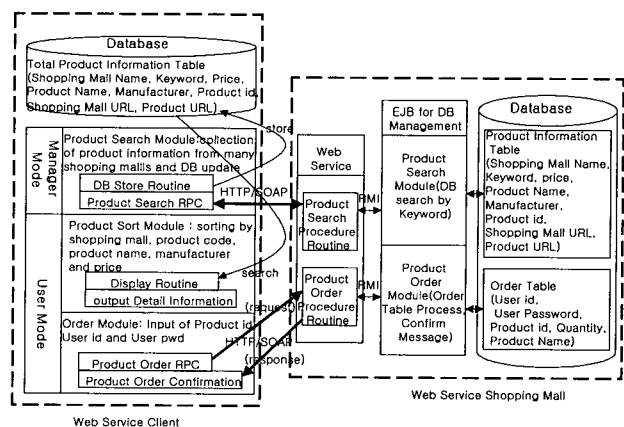


Fig. 6 Process modules of web service system

(1) Web service client

This module is devised into user mode and manager mode. In real time, after the client module receives product information of database in many shopping malls, the manager mode can update database of the client module. And the user mode has the user interface functions containing various sorts of methods for price comparison by products, and it has the process functions for related product order and the functions of shopping bag.

(2) Web service(shopping mall server)

This system contains remote procedures, and the WSDL document defining input/output specifications of web service and tie classes to communicate with client. This system executes remote procedures requested from web service clients and notifies the web service clients of process results about them again.

(3) EJB module for database management

We designed the EJB for database management and used server environment of Web logic Company. This environment adopts RMI methods under distributed environment. This EJB module contains functions managing the database owned by related shopping malls, searching by products and processing product orders from a client.

(4) Browser for information management of UDDI registry

We designed the browser of UDDI registry to publish information of shopping mall and WSDL, and to search information of registry. Public UDDI registries are registries of Microsoft and IBM implemented in standard specifications of UDDI. This browser executes functions to publish and search business entity, business service, binding template, technical model and etc. in a standard data structure of UDDI.

(5) Execution results

① Browser for information management Search screen by company name is shown in Fig. 7. Functions of UDDI search are search by sorts, information objects, company name or tModel. If user clicks execution button, browser will fetch data from IBM UDDI registry.

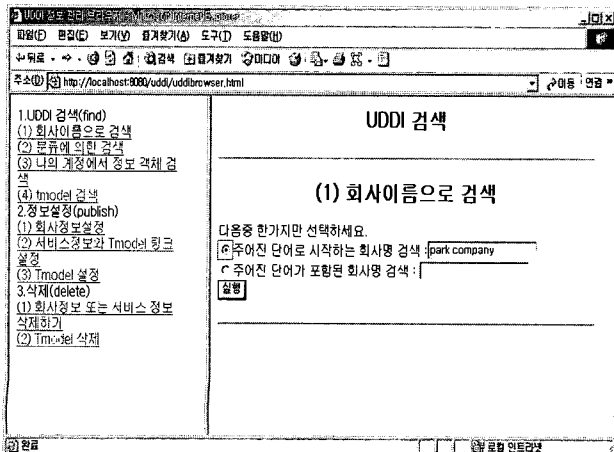


Fig. 7 search screen by company name

Information deletion of business entity or business service is shown in Fig. 8. Functions of UDDI deletion are deletions by company information(business entity), business service information and tmodel. To delete information of UDDI registry, user should input id, password and company name.

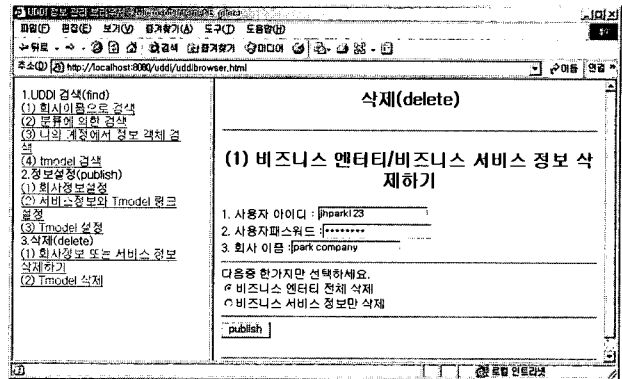


Fig. 8 Information deletion of business entity or business service

2) Web service system for price comparison

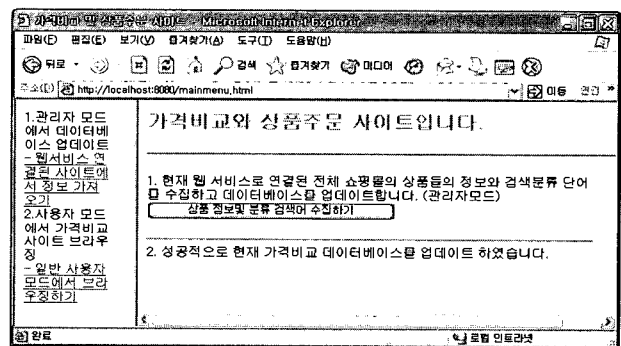


Fig. 9 Searching product information linked to web service in management mode

(1) Modes of price comparison site are management mode and user mode. Searching product information linked to web service in management mode is shown in Fig. 9. Manager of price comparison site can update product information of database in real time. Price comparison site fetches dynamically product information from database of shopping mall sites linked by web service in using SOAP protocol.

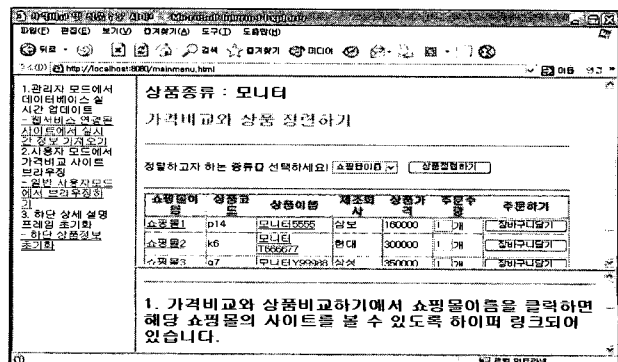


Fig. 10 Screen sorted by price in user mode

(2) After user searches database with a keyword ("monitor"), screen sorted by price in user mode will be produced in Fig. 10. The kinds of various sorts are shopping mall names, product codes, product names, manufacturers and product prices.

(3) If customer orders a p14 product of shopping mall1 directly, the result list of order table stored in database of shopping mall1 is produced as Fig. 11. The shop1 database is shopping mall1's and has an order table and a product table. The last item ordered from customer is inserted into the order table which has user id, password, product id, quantity and order date.

userid	userpwd	productid	quantity	orderdate
mob2e111	1234	p2	1	2005year3month7date3hour34
mob2e989	1234	p8	1	2005year3month7date3hour19
xxxx	1234	p4	1	2005year3month7date4hour19
mob2e111	1234	p9	1	2005year3month7date4hour38
mob2e444	1234	e7	1	2005year3month7date4hour
engelbest	test	p8	1	2005년 4월 5일 11시 30분
black	blackbox	p14	1	2005년 4월 10일 11시 59분

Fig. 11 List of order table stored in database

IV. CONCLUSIONS

The results of the analysis are not universally applicable. However, they do provide some significant insights about the impact of the online shopping on the price comparison strategies and explain the tendency to move toward real-time strategy observed in comparison applications. By analysis, compare with price comparison websites in China and Korea, we learned the Korea sites complete advantages, the result provides a more efficient and perfect price comparison website model for Internet shopping. In this case, the sites can supply better integration of the order entry, fulfilment, and delivery cycles. In other words, customers can get the convenience and speed of service.

And then we designed and implemented the browser for information management of UDDI registry and the web service system based on SOAP for an interactive product order and a price comparison dynamically using web service technologies in real time. This web service system, browser for information management and UDDI registry can exchange information based on SOAP messages.

REFERENCES

- [1] CNNIC. (2004) Semi-annual survey report on the internet development in China (2000).
- [2] China Business Times. (2000). Surveys of China's e-business. September 28, 2000.
- [3] Alok Gupta, Bo-chiuan Su, and Zhiping Walter An Empirical Study of Consumer Switching from Tradition to Electronic Channels: A purchase-Decision Process Perspective International Journal of Electronic Commerce Spring 2004, Volume 8.
- [4] Federal Trade Commission. FTC releases report on consumers' online privacy, Federal Trade Commission Press Release (1998).
- [5] Schneiderman, B. Designing the User Interface, 2d ed. Reading, MA; Addison-Wesley, 1982.
- [6] Bea systems, Bea weblog platform 8.1, http://www.bea.com/framework.jsp?CNT=homepage_main.jsp&FP=/content.
- [7] MySQL, "MySQL reference manual", <http://dev.mysql.com/doc/>.
- [8] Janice J. Heiss, "Jax-RPC brings Potability to Web Services", <http://java.sun.com/features/2003/01/jax-rpc.html>.
- [9] W3C, SOAP Version 1.2 (part0, part1, part2) Recommendation, <http://www.w3.org/2002/ws/>, 2003.



Jong-Hoon Park

Received the B.S. and Ph.D. degrees in computer engineering from University of Kwangju, Korea, in 1987 and 1995, respectively. From 1995 to 1998, he worked at National Computerization Agency. Since 1999, he has been a professor in Dept. of Computer Multimedia, Univ. of Joongbu, Korea.



Chul-Won Kim

Received his M.S. and Ph.D. Degrees in Department of Computer Engineering from Kwangju University, Seoul, Korea, in 1984 and 1996, respectively. From 1988 to present, he is a professor, Department of Computer Engineering, Honam University.