

# Using GIS for Middle or Low Rate Hotel Reservation

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## **Abstract:**

During the summer and winter of 2003 KCTPI conducted the project of Enterprise Resource Planning with the private sector having the technology in GIS and systems integrations for increasing business revenue and tourists' conveniences for SMTEs in the lodging industry.

There are two key issues on SMTEs in the lodging industry in Korea: to control and remove the irregular room price by seasonality for tourists and to increase the global competence using the internet-based technology for the lodging managers.

This project needed to improve the adoption of SMTEs' information technology for the global competence (ERP systems) and to develop the application to reserve the rooms in real-time between the tourists and SMTEs (e-CRS). This paper presents an overview of the SMTEs' adoption of GIS and ERP in the lodging industry.

**Keywords:** Travel information, Lodgings, Value Cluster Analysis, Value web services, e- CRS, ERP/CRM

## **Introduction**

Korea Culture and Tourism Policy Institute (KCTPI, <http://www.kctpi.re.kr>) is government-sponsored research in such areas as culture, arts and the cultural and tourism industry of the Ministry of Culture and Tourism (MCT). This project administers about 5 hundred hotels and 30 thousand models in 16 provinces in Korea. In Korea, MCT administers 5 hundreds tourist hotels over 30 rooms and the Ministry of Health and Welfare (MOHW) 30 thousands private residences below 30 rooms. Lodging policy is a core of tourism industry and is influenced to tourists visiting the regions. In hotels, 1 hundred hotels of 20% are a high degree over 4 star, others registered by MCT and 30 thousands lodging by MOHW are small and medium tour enterprises (SMTEs) like private houses, guesthouses, and motels.

SMTEs did not open their price of rooms in a high-demand season and a tourist could not confirm of the quality of their rooms. It is hard to control between SMTEs' price and visitors'

complaints. Although MOHW manages the business affairs of most of SMTEs, the visitors do not know about it and infer results from MCT's responsibility because MCT conducts most of the tourism policies related with destinations, tourists, and industry.

This project focuses on SMTEs below 30 rooms operated by the organizations or the families and individuals. These are some of the business issues between the operators and the visitors.

### **Key Issues in Lodging Industry**

The lodging of SMTEs is a core infrastructure of supply chains in internal tourism industry in perspective of low or medium price and at least lodging function. SMTEs lodgings play an important role of improving the quality of life and welfare and increasing the opportunities in the leisure times. Although many of tourists would like to reserve the high quality in lodgings, there is a limitation of supply. The surplus demands tend to choose the SMTEs' lodging facilities depending on the tendency of tourist or the lack of supply. But it concentrates on some of the lodgings that are located on near the beach or beautiful scenery in one of four seasons. The managers in SMTEs expected to make total revenue per year in one season. These operations evolve increasing the price and customers' complaints, decreasing the service quality, and declining the image of tourists' attractions and regions. This causes from seasonality and the lack of information, in detail, tourism information.

One of issues is seasonality as the characteristics in the lodging industry. Many time series display seasonality. By seasonality, we mean periodic fluctuations. It related to economic values and operation. For example, the lodging tend to peak for the summer vacation season and then decline after it. So time series of retail sales will typically show increasing the visit in July and August and declining them in winter season. It is under the influence of the rooms' price. Most of the hotels has pronounced the tourist on the high-demand or holidays room rate and low-demand. But, SMTEs do not pronounce them in this season. Therefore, it is impossible the visitors to know the exact because of the turbulence of the room price in a high-demand season. When they arrived the attractions, they could not have the proper rooms because the lodging manager sold them out in the unknown price. The unknown price is at least over 2 times of it. If they would like to reserve the room near the beach, it is at least over 3 times. Tourists who visited in Gwangwon province from 1995 to 1999 have been concentrated on May and August (Figure 1). Many of lodgings focus on considering of revenue, not operation and services during the high-demand seasons.

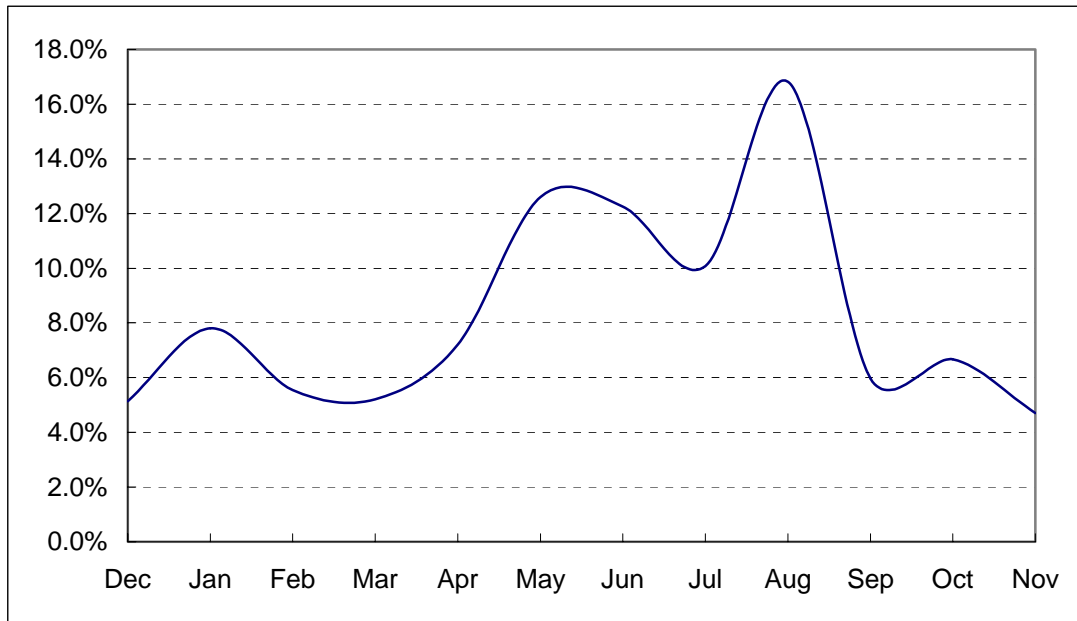


Figure 1. Visitors' average rate monthly in Gwangwon province, S. Korea ('95~'99)

Secondly, it is the lack of information for tourists. It is the difficulties of finding and reserving the lodging location in detail. SMTEs in the lodging are lack of the marketing approach like promotion and place. It has been better and better than before adopting the Internet between the visitors and the lodgings. But it is not the level of satisfaction from the technology to the contents. Most of all, the lodgings could not serve the real-time reservation and the visitors could not find the room for a resting place because of a lack of information in SMTEs. SMTEs is not well to adopt the information technology. The retention of lodgings' homepage is under the 10% in 1,400 lodgings (table 1).

Table 1. SMTEs' information technology infrastructure based on the Internet

Lodgings types	Homepage X	Homepage	Online CRS	Realtime CRS	e-payment	Total
5 Star (Gold)	-	41(100)	17(41.4)	19(46.3)	-	41(100)
5 Star (Silver)	11(18.3)	49(81.7)	27(45.0)	10(16.7)	-	60(100)
1 <sup>st</sup> Degree	79(44.6)	98(55.4)	69(39.0)	7(4.0)	1(0.6)	177(100)
2 <sup>nd</sup> Degree	71(73.2)	26(26.8)	15(15.5)	4(4.1)	-	97(100)
3 <sup>rd</sup> Degree	46(73.0)	17(27.0)	14(22.2)	1(1.6)	-	63(100)
Family Hotel	6(46.2)	7(53.8)	1(7.7)	-	2(15.4)	13(100)
Youth Hostel	28(57.1)	21(42.9)	5(10.2)	-	-	49(100)
Condominium (Over 100 rooms)	8(11.1)	64(88.9)	12(16.7)	23(31.9)	-	72(100)

Condominium (Under 100 rooms)	3(15.8)	16(84.2)	3(15.8)	2(10.5)	-	19(100)
Pension	96(58.5)	68(41.5)	21(12.8)	25(27.5)	12(7.3)	164(100)
Motel	1037(95.2)	52(4.8)	6(0.6)	-	2(0.2)	1089(100)
Private Lodging	362(91.6)	33(8.4)	6(1.5)	-	-	395(100)

\* Lodgings recommended Korea National Tourism Organization (Jan. 2004)

One of the business and IT issues is the privacy of customers that is related to visitors and tourists. Most of Lodgings in SMTEs have not yet accomplished some of marketing activities. They do not feel the need to collect and use customers' information for their business and do not have the skill to access to the Internet. Additionally, the online reservation sites using the Internet have met a difficult situation of increasing the cost maintaining the customers' database and limited room blocking and communicating to lodgings. Lodgings have known the risk of customers' information security that is related with revenue. They would like to have and control in their hands.

These kinds of issues are related on business itself. The market and players is going to the different way. Policies need to intervene in this situation for improving the competitiveness and quality of lodging.

### **Value Web services in SMTEs**

Today, many firms are moving to the new electronic space for at least some of their value-creating activities (Cartwright and Oliver 2000). Cartwright and Oliver suggests a new way to understand re relevant value-creating activities in an information-dominant firm: the Value Cluster Analysis (VAC). VAC is representation of a firm's value-adding activities and processes; that is, those activities whose benefits exceed their costs.

At the edge of the enterprise is where connections among suppliers, dealers and customers are made. Those connections are getting easier thanks to Web services technologies that help companies put together networks of specialist businesses to deliver a product or service (<http://www.forbes.com/2002/11/26/1126mckinseyweb.html>). Web services - new technologies that spring from the Interent and are used mostly to automate linkages among applications-might at last make such connections not only possible but also easy and cheap (Hagel III, 2002).

Tourism is an information intensive industry.

The principle of pursuing the activities in the enterprises can be met close at hand to the survival of the organization. The target of relationships is creation of the values in business. These values are related to costs, time, revenues, and sustainable growth. Furthermore, the

achievement of the target evolves the mainspring of activities to the organizations. In detail, the business values are 4 cores;

- Reducing the costs
- Increasing a revenue
- Saving the times
- And creating marketing channels for sustainable growth

SMTEs have three business issues; seasonality, lack of information, and security. MCT have launched and choused SMTEs' value web services as a tool to approach and solve them

SMTEs' business issues in tourism policy are 3 cores;

- Removing or reducing the effect of seasonality in the room price for the market
- Being easy to find the lodging in the reasonable price for the visitors and tourists
- Keeping the visitors privacy data

There is the object to promote a operation and stabilize a revenue through overcoming the seasonality. It is choused the real-time solution which is the computer reservation system through the Internet. The selection of Lodgings, which is informing reasonable prices, has expand the opportunities to visitors and save the time and costs to search them. It shows a guidance to select the lodgings that is near the tourists attraction based on geographic information system by NGII. At the last, customers' privacy created by them is a core of marketing tool. The organizations owning customers information collected through direct guests, visitors, memberships, and online communities applies a new process, which is Customers Relationship Management, to do the segmentations and personalization in their markets. It is important to appeal to the visitors for revisiting.

Table 2. SMTEs' policies, values, and IT solutions;

Policy	Value	IT solution
Removing or reducing the effect of seasonality	Revenue (profit)	Electronic Computer Reservation
Being easy to find the lodging	Cost/Time (productivity)	Geographic Information
Keeping the visitors privacy	Growth (market)	System integration (ERP)

The basic principles of developing the solutions are real-time reservation and easiness of retrieval. According to SMTEs' IT solution [table 2], the model of SMTEs' value web services provides travel and lodgings information in real-time and promotes to revisit for creating a revenue. Additionally, it needs to develop the solution fitting to the level and skill of users.

This project has cooperated with the private sector such as GIS engine developers, system

integration enterprises, and marketing enterprises.

SMTEs' web services are

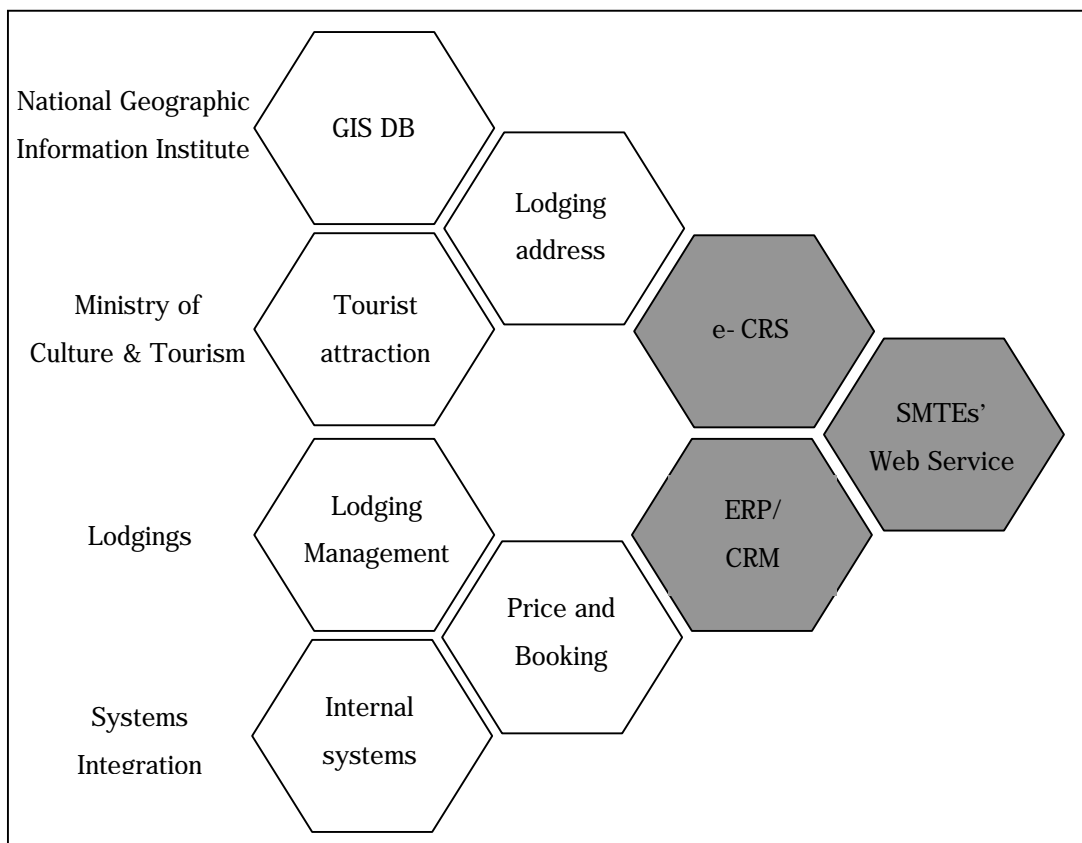
- Serving information to choose a price of a lodging and reserving real-time
- Enabling to choose a lodging near the tourist attractions
- Promoting re-visits for creating a sustainable revenue
- Developing a light system fitting the level of systems in the lodgings.

Table 3. Issues and systemization

Issues	Data	DB manager	Systemization
Seasonality	Market	CEO/Manager	Price/Real-time (open)
Easy	Location	Government	GIS (open)
Privacy	Customer information	CEO/Manager	ERP/CRM (close)

The model is developing the new services. For tourists and lodgings, there are some of database; MCT's tourism resources information and lodgings address, NGII's geographic map(1:50,000), and regional information. Business process based on EDI (Electronic data Interchange) is required to develop to ERP including a account and CRM for guests in systems integrations. This integrated system between ERP and CRM focus on lodgings operation for web services.

Figure 1. Value Cluster Analysis in SMTEs' Web Services Model



## e-Computer Reservation Systems based on GIS for SMTEs

e-CRS(e-Computer Reservation Systems) provides a various retrieval such as geographic, region, types of lodgings, and brand or names. Main page is shown the characteristics of lodging and 16 Korean provinces. In the next step, it displays geographic map located on lodgings, and attractions and streets. The each of lodging links its subpages or homepages shown room types, interior and scenery, description of lodgings increasing the trust between operators and customers. After that, potential visitors will select their room for holidays or vacations. The last picture they reserve the room through the online depending on available or not.

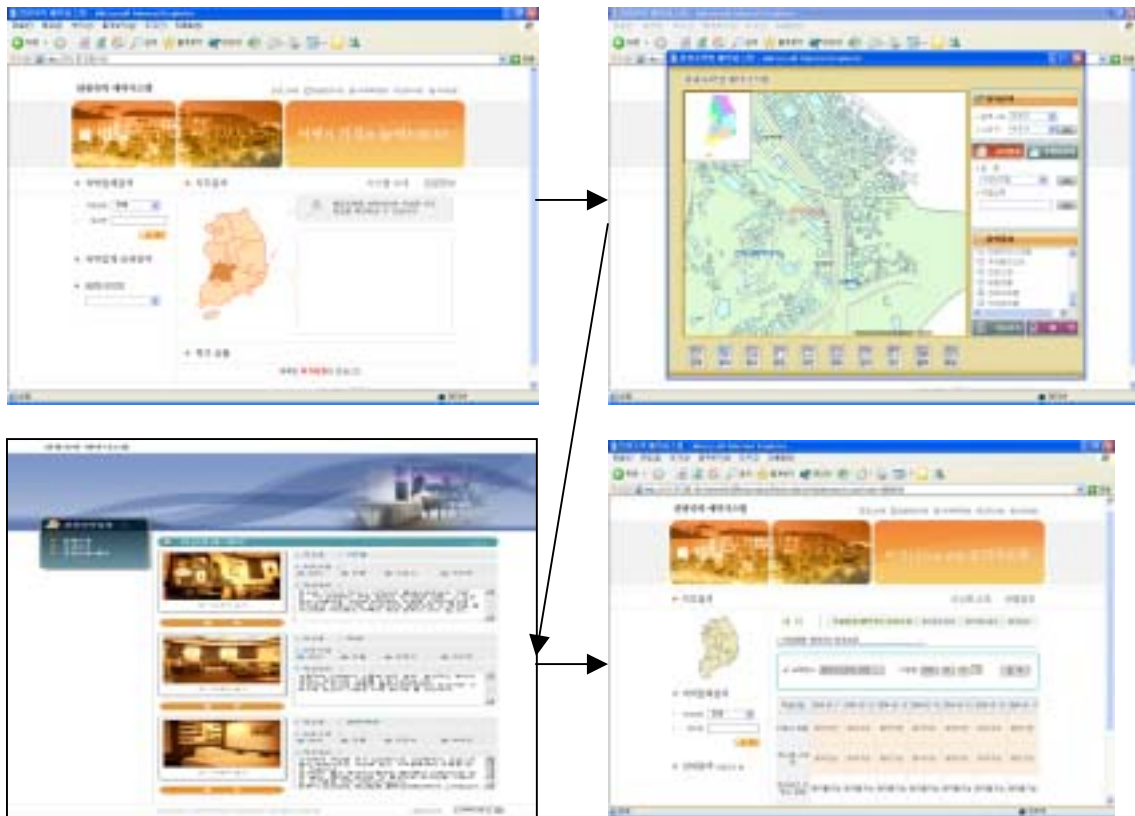


Figure 2. e-CRS based on GIS

## ERP / CRM

The operators or managers input their information, prices, location, and available rooms for reserving online in ERP for lodgings, and then, e-CRS interchanges database and information of

lodgings. After that, e-CRS operates a online reserving process. ERP for operations interchanges e-CRS for reservations through online per 5 minutes.

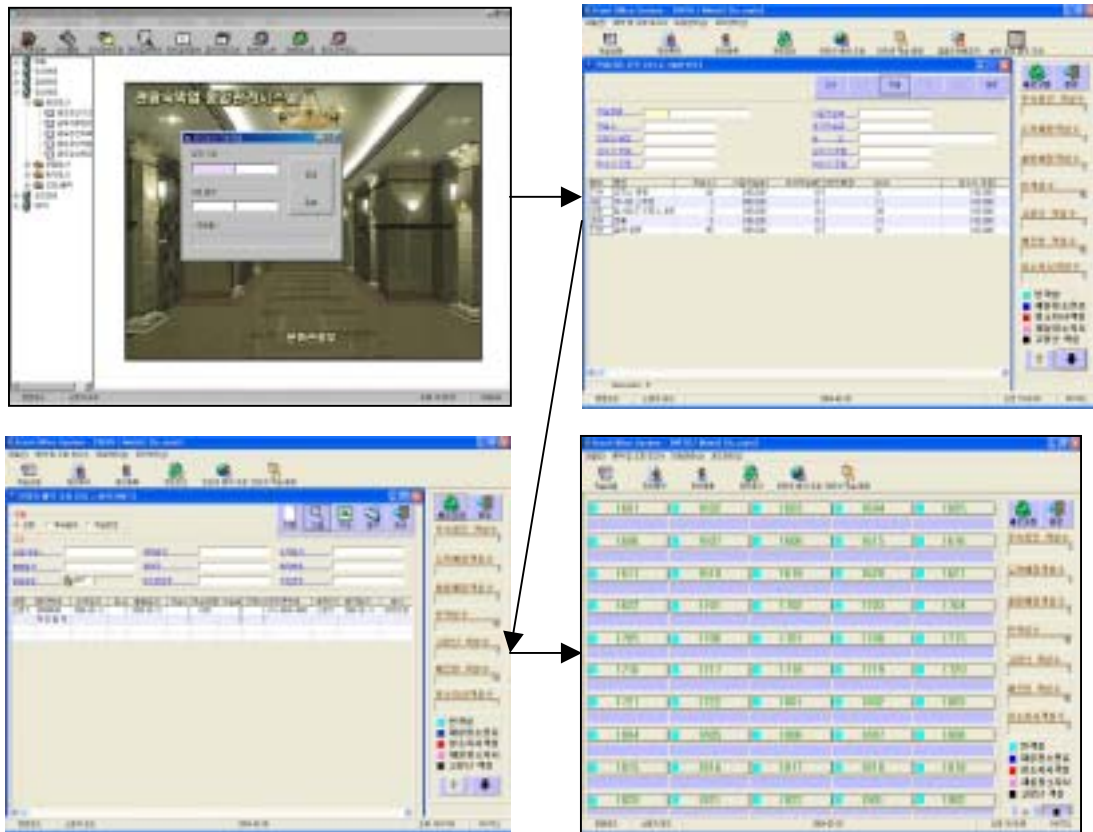


Figure 3. ERP solution for SMTEs

### SMTEs' Web Services

A core application of SMTEs' web services is a real-time interface through the xDSL. For interchanging guests' reservations A real-time interface provides information to lodgings, e-payments ASP enterprises, banks, ERP in lodgings, and guests. The flexibility of operators and managers is applied on the mobile phone messenger services serving from banks

SMTEs' value web services are generating their business strategies. They had not done some tools of marketing and strategies until now. Information technology is changing business issues in lodgings; a shift from prices-oriented perspective toward marketing-oriented perspective, and a shift from current visitors focus toward potential market and revisitors focus.



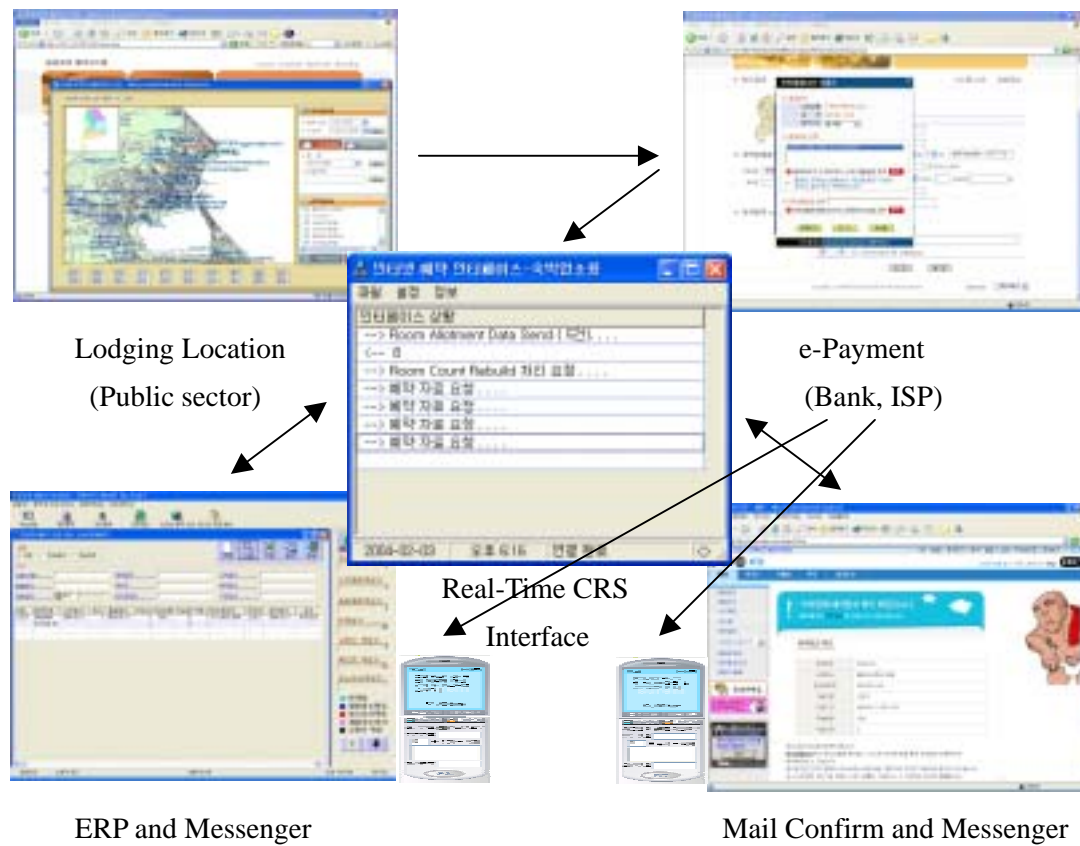


Figure 4. SMTEs' value web services

## Conclusion

The SMTEs' web services based on GIS and ERP look like it will be successful in providing tourism information for tourists, marketing tools for lodgings, and approaching to solve the business issues in perspective of the public area. While this paper presents only brief descriptions of some of the functions available in Korean language. It can be seen that such a operator does provide various language to generating useful tourism information. We also show an application study that simulates future growth in 2 regions by way of showing an example. This system will be open after demonstrating some of regions.

\* This project will be open on July 1, 2004. after making a selection of operating organization in a public area. ERP for SMTEs is starting up from Dec. 2003.

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