

Development of effective convergence type medical tourism platform

Jong-Youel Park[†], Young-Hyun Chang^{††}

[†]*Dept. of Smart IT, Baewha Women's University, Korea*

^{††}*Dept. of Smart IT, Baewha Women's University, Korea*
pjy@baewha.ac.kr, cyh@baewha.ac.kr

Abstract

Current medical tourism is focused on the services of large hospitals and it is hard to find ways to attract the users. Users collect information for medical tourism through various paths in order to receive the medical consultations and customized tour services. To expand medical tourism to small and medium sized hospitals, it is necessary to have the customized medical consultations, tours and interpreter services, which are the key elements of medical tourism. This study suggests ways to provide the services based on information on medical consultations, tours and interpreter services that users had experienced directly, and also based on the platform for the essential items integrated from users, hospitals and guides' viewpoints. With information on hospitals that provide medical consultations and guides who are able to provide professional services in translation, interpretation and customized tour, users may accumulate and share the information about hospitals and customized tours verified by other users from the integrated platform. To match the contents provided by hospitals and guides with information experienced by users into a system, this study suggests the construction plan for the service model that can match the experience information between users and hospitals, between users and guides and between hospitals and guides systematically by operating the data in the universal container.

Keywords: *Medical Tourism, User, Hospital, Medical Consultation, Experience-based Matching*

1. Introduction

The influx of medical tourism into Asia is rapidly increasing and medical tourism draws attention as a growing business. The main reasons why foreign tourists choose Korea for medical services and tours include the excellent level of medical technology (34.6%), recognition of medical teams (24.5%), cost (14.3%) and multiple services (13.9%) such as tourism and shopping [1]. Areas that foreign tourists were satisfied with in Korea were in order of public order (stability), accommodations, shopping and foods, in which the tourism package was not included, and the lowest satisfaction area was communication [2].

According to the data from the Korea Health Industry Development Institute, plastic surgery, dermato

logy and rehabilitation medicine had the highest demands. Medical tourism in Asia secured competitiveness in terms of cost and services [3]. It is necessary to have content that makes it easier to share complex information with various attributes such as users, hospitals and guides including interpreters, translators and tour services, which are the most important elements of medical tourism. Now, medical tourism needs a platform that can match hospitals and guides systematically with each other, while still being centered on the users. This will increase the reliability of medical tourism and make obtaining the information easier by having everything in one place. This is done by connecting and sharing the necessary items through automatic matching for content based on experience information of users, hospitals, and guides and through resources from users, hospitals, and guides.

In this study, in order to provide the services including medical consultations and tours in one platform, a connection must be established among the key elements of the medical tourism: the users, the hospitals, and the guides. Interworking with the accumulated experience information by other users can provide the services needed for each other in one platform. This study suggests the method to attract new users through analyzing user experience information with hospitals and guides, information experienced by guides and content information provided by hospitals and guides, choosing the best matched content and sharing it with other users.

2. Related Studies

2.1 Medical Tourism

The decision-making process for medical tourism can be divided into preliminary preparation, before and after entering Korea. Before entering Korea, users can compare and analyze the cost needed for the disease to be treated in preliminary preparation stage, check the information regarding the hospitals and specialists about the disease to be treated through Internet or acquaintances, and also check the promotional materials. In order to prepare thoroughly, users visit the hospitals' homepage to see what their specialties are and collect as much information as possible by checking reviews through various channels. They select the hospital that is right for their diseases by making sure that the content of the promotional materials matches with the content of the reviews, and they estimate the cost for the disease [4]. Users are spending a lot of time searching everything separately in order to go on a medical tour, including searching for specialized hospitals for the disease, searching for a professional interpreter in case the user needs an interpreter, and searching for a tour guide for travel. In addition, they are spending a lot of time trying to verify the specialized hospitals for the disease, interpreters and tour guides.

2.2 e-Government Standard Framework

Standard Standard framework facilitates development efficiency, ease of maintenance and scalability by providing software development tools, guidelines and an environment that is a frame to software development. The e-Government Standard Framework-based development method, utilizes the parts needed for reusability from the Presentation Layer, Business Layer, and Data Access Layer [5].

2.3 Responsive Web-based Platform Technology

Responsive web means to express on web pages in desktops and smart phones flexibly in response to device screens of different environments in one program depending on the type of device. It provides the web content information in optimized screen fit for the characteristic of each device, and the devices are mutually interlocking between them so the users can use the contents regardless of the device anytime and anywhere, while different devices are sharing the same content. Responsive web should support the

resolution regardless of various devices, and for a specific device, a limited application may be possible. On an N-Screen there should be an interface that one content is visible from all other devices [6]. Provides public data using a web-based platform[7].

3. System Design and Implementation

3.1 System Matching Design

The convergence service used in this study suggests the method to be appropriate for the study based on the standard framework. Overall interface and system flowchart to be implemented in this paper is shown in Figure 1.

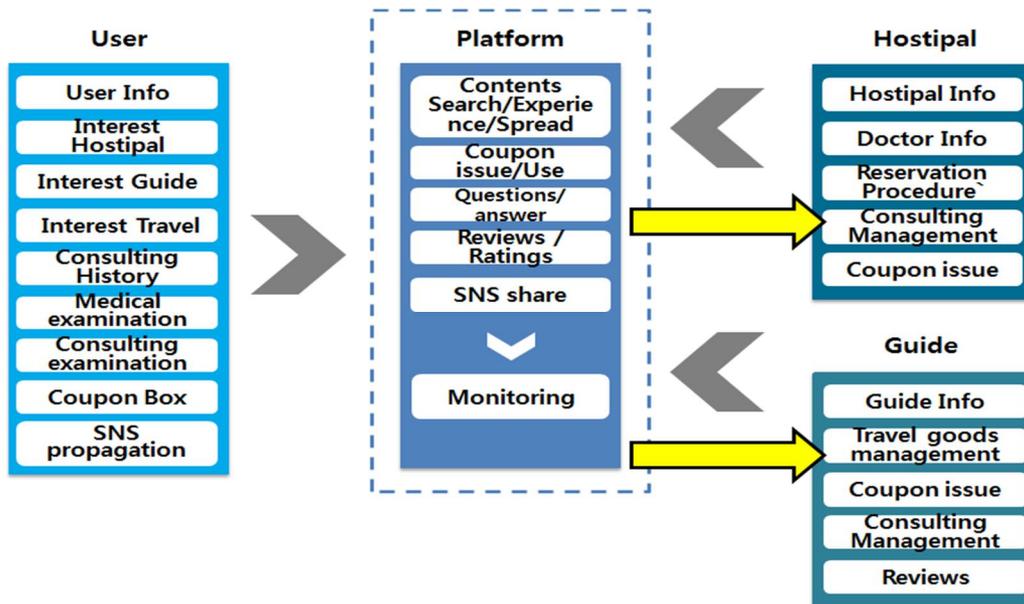


Figure 1. Integrated matching platform flow

There are two methods to produce the core content: one is produced by tourist who is the user of the platform and the other is produced through the processing by the administrator using the link service of the platform. Automatic matching is a service that is provided by merging services, and it is provided to visitors through customized treatment, tour and guide services optimized with accumulated experiences and information.

It represents the matching monitoring service interface, and it is a web service that reports the degree of activation such as medical resources, travel resources, interpreter resources and automatic matching by processing the information obtained through operational status of platform services. It is designed to have all services done within the platform by utilizing information experienced by users, hospitals and guides, matching the information required for users and providing applicable services.

3.2 Database Design

Among detailed database diagrams and structures used in this study, there is a hospital related table. Figure 2 is the master database centered on hospitals. In the hospital related database, the user registers the basic information about the hospital, and the user can obtain the detailed information about the hospital such as departments, closing information, and what is needed for specialty treatment and try to match the doctor

by checking the reviews by other users who used that hospital. Multilingual support will be provided for information on basic information and detailed history of the hospital, closing information and doctors who can provide the multilingual services.

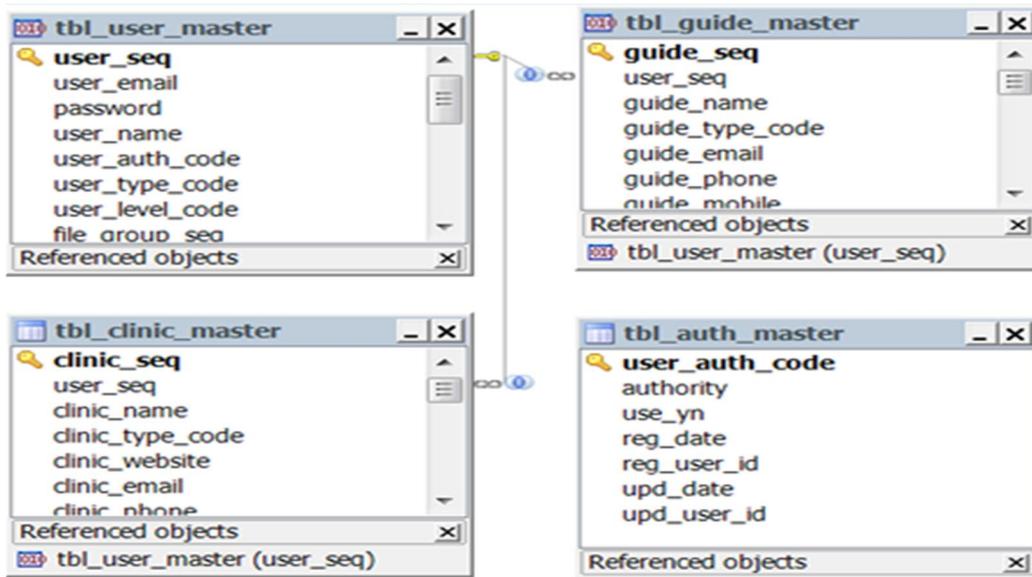


Figure 2. Master Database Construction

Users can obtain the basic information for the hospital from the hospital master tbl_clinic_master, check the consultation request and reply status and select the hospital after checking the reviews of other users.

3.3 Implementation of Medical tourism Platform

The program developed in this study implements a development framework based on the standard framework, and the program consists of user matching, hospital management, guide management and common management of the administrator.

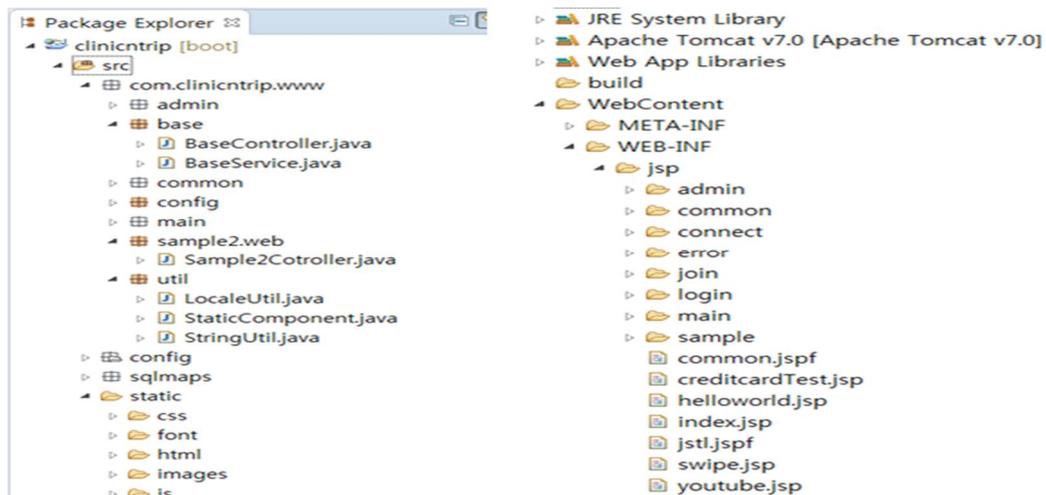


Figure 3. Eclipse Framework

The development framework used in this study implements three service groups including screen processing,

business processing and data processing provided by the spring framework based on the standard framework. The file location and structure within Eclipse are shown in Figure 3.

Request data sent to the server is returned back to the client through Controller→Implement→DAO (Data Access Object) according to the structure of e-government framework, and Controller Class, Service Class, Implement Class, Data Access Object Class, Data Transfer Object Class, Value Object Class, and SQL Map modules operate and process the program services.

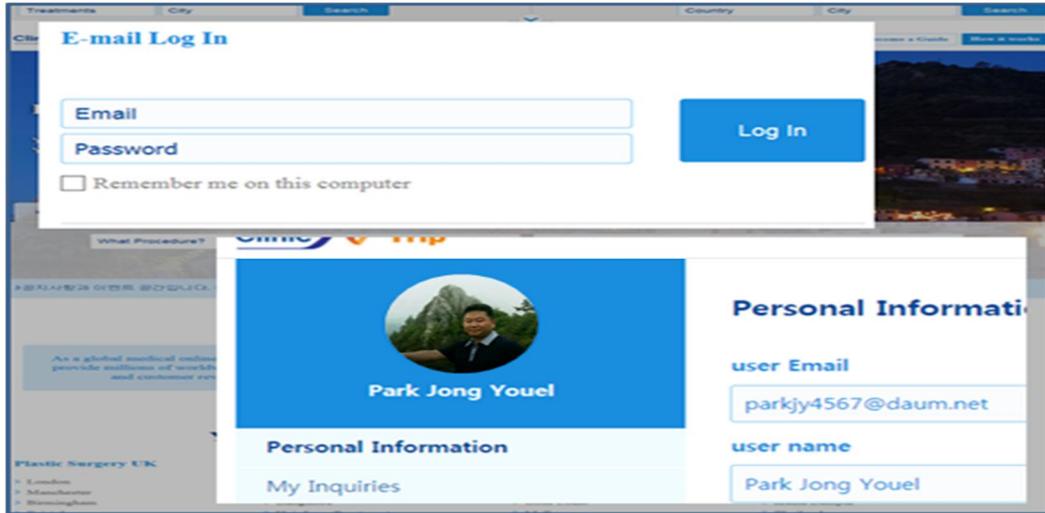


Figure 4. User authentication screen

Figure 4 is a screen to authenticate users, which is a module that processes the service for user authentication process. In UserDetailsService module, the data processing value is generated by using VO of userDomain and the service for registration and authentication for the user is processed commonly. Once the authentication is successful, it is possible to check the personal information. To use the experience information usefully by users through storing and managing, it needs to select the database appropriate for characteristics of information generated. For storing the structured data, the data access objects are abstracted based on the Spring, is packaged and implemented as a data model.



Figure 5. Manager Menu Management

Figure 5 is a hospital management screen that registers and modifies the contents to be shown to users by hospital to

provide the medical consultation. It is possible to check the location of the hospital through the location-based services. The hospital provides detailed information to users including hospital information, doctor information and available fields for services.

4. Conclusion

As medical tourism is attracting attention as a future growth engine industry, the users, who are the key elements, process the complex information that has various attributes such as hospital information, medical service consultation inquiry, guide, interpreter and tourist information that meet the user's needs into the form of contents that is easy to share, and the system is to increase the visits by connecting and sharing the appropriate resources through automatic matching to contents that attract many interests and to match the hospital and guide systematically centered by the user. Compared to existing methods, the convergence platform suggested in this study is able to reduce the search time and obtain the credibility for users who look for reliable medical information in order to receive the medical consultation and customized tourism product, and provide the information to other users based on accumulated experience information for medical consultation. Analyzing the contents provided by hospitals and guides based on accumulated data by users and applying the automatic matching technology allowed the inflow of new users, thereby, raising the interest.

For future study, the extensive studies are needed for Internet of Things which is the unique function of smart phone linking with location-based services through interlocking with App while modifying and complementing the problems and improvement.

References

- [1] Ko, Seol, Doo, Kyung Il, "A Study on Application of Modern UI for Activation of Responsive Web in N-Screen Environment", JOURNAL OF THE KOREAN SOCIETY DESIGN CULTURE, Vol. 22, No. 2, pp. 15-25, 2016.
DOI: <https://doi.org/10.18208/ksdc.2016.22.2.15>.
- [2] Jong-Youel Park, Dea-woo Park, "Global O2O Matching Platform research based on Clinics", Journal of the Korea Institute of Information and Communication Engineering, Vol. 20, No. 8, pp. 1517-1523, 2016.
DOI: <https://doi.org/10.7236/IJASC.2017.6.4.4>.
- [3] Ki-Nam Jin, Eun-Joo Lee, "A Comparative Analysis of Official Medical Tourism Websites : Korea, Thailand, Malaysia", JOURNAL OF THE KOREA CONTENTS ASSOCIATION, Vol. 15, No. 2, pp. 408-418, 2015.
DOI: <https://doi.org/10.5392/JKCA.2015.15.02.408>
- [4] Center for Health Industry Information & Statistics, "Weekly Healthcare Industry Trends", Korea Health Industry Development Institute, vol. 155, pp.1-2, 2015.
- [5] Hyunki Park, Jaekyoung Ahn, "A Study on Demand Forecasting Module Implementation Based on the e-Government Standard Framework", Journal of Korean Institute of Information Technology, Vol. 14, No. 4, pp. 119-127, 2016.
DOI: <https://doi.org/10.14801/jkiit.2016.14.4.119>.
- [6] J. J. Kim, J. M. Park, S. K. Hong, "A Study on Interface Component for the Realization of Responsive Web", KOREA SCIENCE & ART FORUM, Vol. 15, pp. 153-165, 2014.
DOI: <https://doi.org/10.17548/ksaf.2014.03.15.153>.
- [7] Young-Hyun Chang, "A Study on the Public Data Activation Strategy based on App Developed by Non-Profession User", International Journal of Advanced Smart Convergence, Vol. 6, No. 1, pp. 32-38, 2017.
DOI: <https://doi.org/10.7236/IJASC.2017.6.1.32>.