A SCHEMA DESIGN FOR WEB MAP SERVICE ON THE TRAVEL INFORMATION USING GOOGLE APP ENGINE

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ABSTRACT: Web Map Service (WMS) will be able to acquire or to search for end-user with various geospatial databases by internet browser. A WMS request defines the geographic layer(s) and area of inter to be processed. The response to the request is one or more geo-registered map images that can be displayed in a browser application (OGC Standards-WMS implementation specification, 2011). This interface based on the Server-Client structures as a simple HTTP interface. However this interface has some limitations such as server overload, slow performance, network bottlenecks and dependencies of a particular RDB (Relational database). The Cloud Computing can be solving these limitations with Parallel Distributed Processing with multiple servers. The Cloud Computing has advantage that possible to gain access to databases anywhere, anytime. In addition, users might not be downloading and installing application on their own devices (A Brief Guide to Cloud Computing, 2010). All processing and storage is maintained by the Cloud Computing server. With these strengths, we could be designed a new WMS in Cloud Computing. Our WMS aimed to support information, to make schedules for tourist (or travelers). We designed geospatial database schema, as geographical layers as local weather information, terrain information and transportations. This database would be stored in the 'Bigtable' in Google.

1. Introduction

The travel information services are increasing on the Web GIS and smartphone. It uses Client / Server Architecture. It is composed with GIS server, Web server, DB. And also the service which uses smartphone consist of Client/Server methods of Application forms. Today, the travel information service provides one-sided information for user. However, the Travel information service based Web GIS should be able to provide the Travel information which is suitable in objective of the traveler. And It should be able to satisfy popularity, diversity and individuality.

We expect to design the participation travel information service through a useful smartphone. The participation can be defined as PPGIS(Public Participation GIS). The PPGIS provides the travel information that the natives is sharing and users traveled. So, everyone was able to two-way communication (Koh, 2006; Lee et al, 2007).

Choi and Chung(2005) obtained the current position with the GPS of mobile. And, it used the way of providing open web services. In a mobile environment, it did research which is designing and implement the Web Map Service for mobile. Kang and Yoon(2004) collected user information and requirement with mobile. It has filtered the collected travel information to meet the needs of users.

As two researches are 3-tier structure, the development environment is complex and has the disadvantage of difficult implementation. Therefore, this study is simple the development environment and make it easily. And, It provides the travel information to maintain the latest information and to satisfy user′s demands. It designs the travel information service used the Mash-up of open API, GPS linkage, PPGIS with Google App Engine based Android.

2. System architecture and design

In this Study, System structure used the improved 2-Tire unlike the existing 3-Tire. It shows the structure of the overall design. The system is divided into three major parts. (Google App Engine, Android, PPGIS module) (Figure 1)
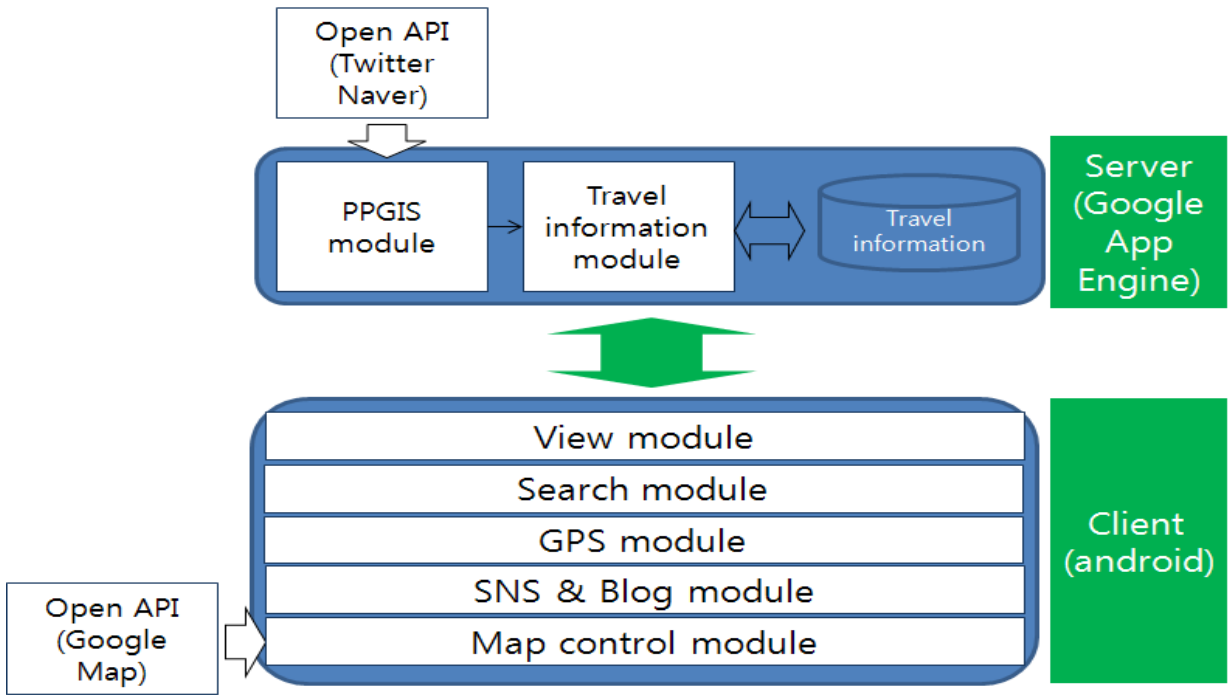
Figure 1. System architecture

2.1 Mobile (Android) design

Recently, users of Location Based Service (LBS) are increasing because the smartphone has propagated rapidly. LBS can be provided information and applications using the smartphone in real-time (Choi and Chung, 2005).

Smartphones have Global Positioning System (GPS) receiver. It is able to obtain the location information easily, to provide various services (Bae, 2010).

This study designed the travel information service based android for being provided travel information in real-time. Input associated with the module is composed of GPS module, Search module, SNS & Blog module. Output associated with the module is composed of Map control module, View module.

Is a diagram of data flow (Figure 2).

First, android received location information from GPS. And, it can receive travel information by search based the location information.

As SNS & Blog module is associated with PPGIS, user can provide travel information or receive the public comment.
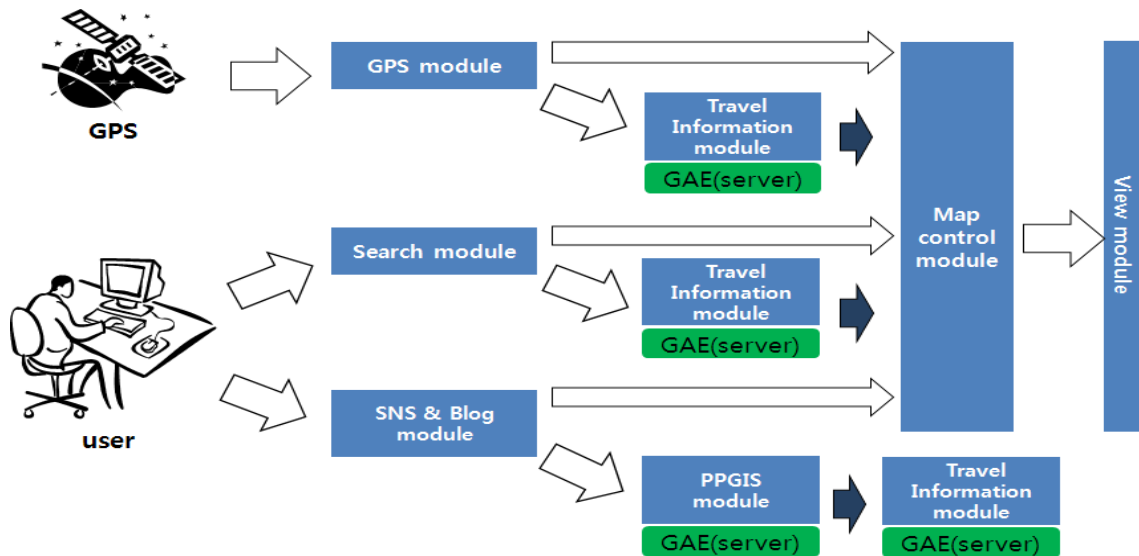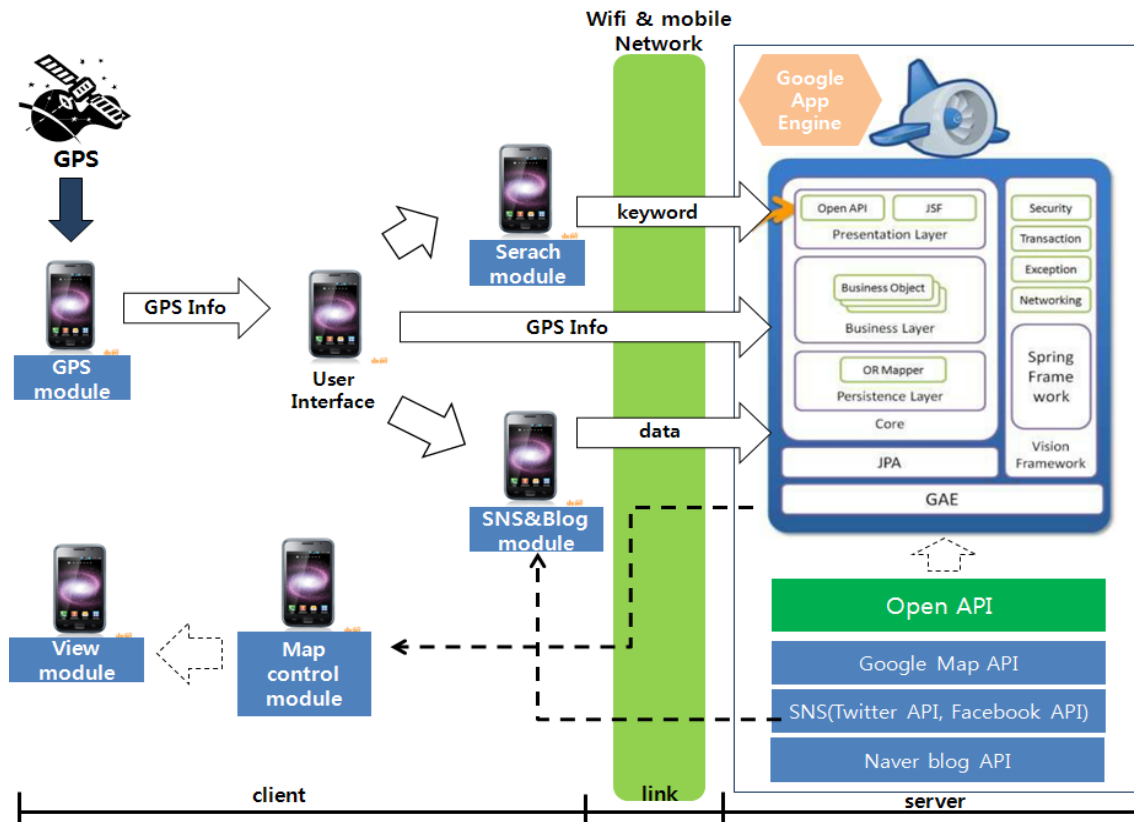

Figure 2. data flow diagram of android

Figure 3. service flow

2.2 Cloud Computing (Google App Engine) design

Prior to the popularity of Web GIS, the individual GIS server and the modules were used. It had weakness that access was limited in Web Browser or a variety OS and interworking is impossible. Then it has some limitations such as server overload, slow performance, network bottlenecks and dependencies of a particular RDB (Relational database) (Koh, 2010; Choi et al, 2005).

According to opening the Google App Engine, The environment which is restrictive in platform is converted to environment of `opening`, `public`. It is able to use Mash-up using the open API easily and effectively take advantage.

Google App Engine provides a distributed database system in ´Bigtable´. It is easy to build, easy to maintain, and easy to scale as your traffic and data storage needs grow.

In this study, the travel information DB and PPGIS module are designed in Google App Engine serving as server. The Google App Engine is composed of travel Information DB, Travel information module, PPGIS module (Figure 1).

2.3 PPGIS Module design

The participation of users became possible through Human Computer Interaction (HCI) and development of SNS by supply of smartphone (Koh, 2006).

The PPGIS module includes the following features.

· Web-based GIS is used.

· The user-friendly interface will be built.

· Provide services of participation centrally.

In this study, use Mash-up having Twitter API, Facebook API, Naver blog API.

The PPGIS module aim to serve the latest travel information and converse with other people. The PPGIS module and SNS & Blog module is located respectively in Google App Engine and Android. And two modules are designed able to interact with each other. (Figure 1)

The PPGIS collect the travel information from SNS and blog. Then, maintain latest travel information. The SNS & Blog module is role of communicate with other people.

The PPGIS module receives the data coming through the Open API. The travel information module updated travel information in travel DB. And it updated travel information in travel DB.

Figure 4 shows a mash up process. A mash up is combines contents from one or more source into an integrated experience.
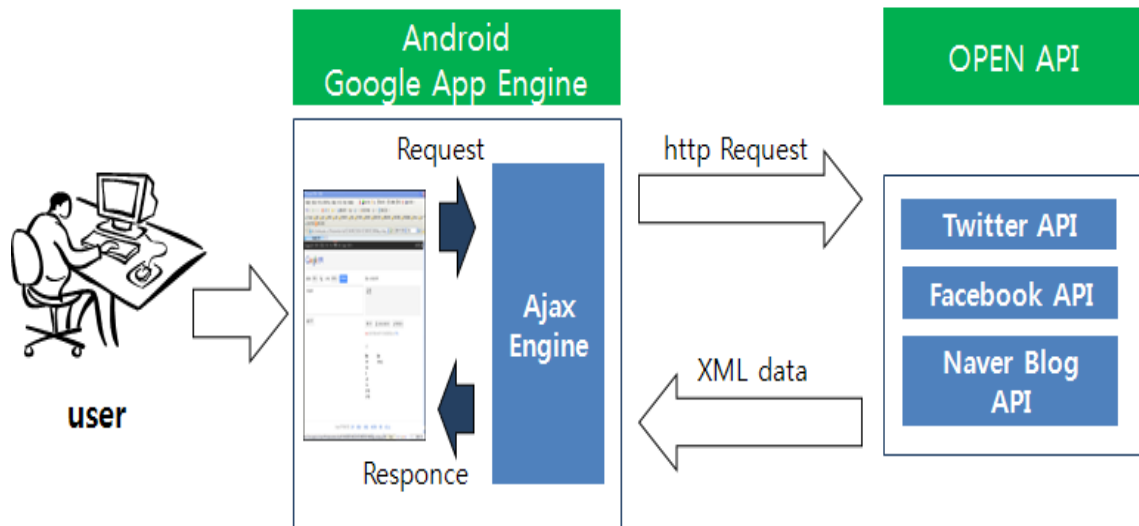

Figure 4. mash up of OpenAPI

3. Conclusion & Future work

In this study, provide the latest travel information for individual travelers through a smartphone in real time. And it designed service that share travel information with other people. Existing travel information service provided travel information in real time through smartphone. But it did not consider ways to travel of different purpose.

Using Google App Engine and PPGIS, the study is elicit user's participation 'open' and 'public' in environment.

Designed system consists of three major. (Google App Engine, Android, PPGIS) DB and the data control which is general become accomplished from Google App Engine.

In the future, implementation of information systems designed to travel is required. Then it need study to provide travel information based PPGIS on the recommend of people.

Acknowledgement

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