P-021

DEVELOPMENT OF MOBILE FIELD SURVEY TOOL FOR SPATIAL ARTICULATION

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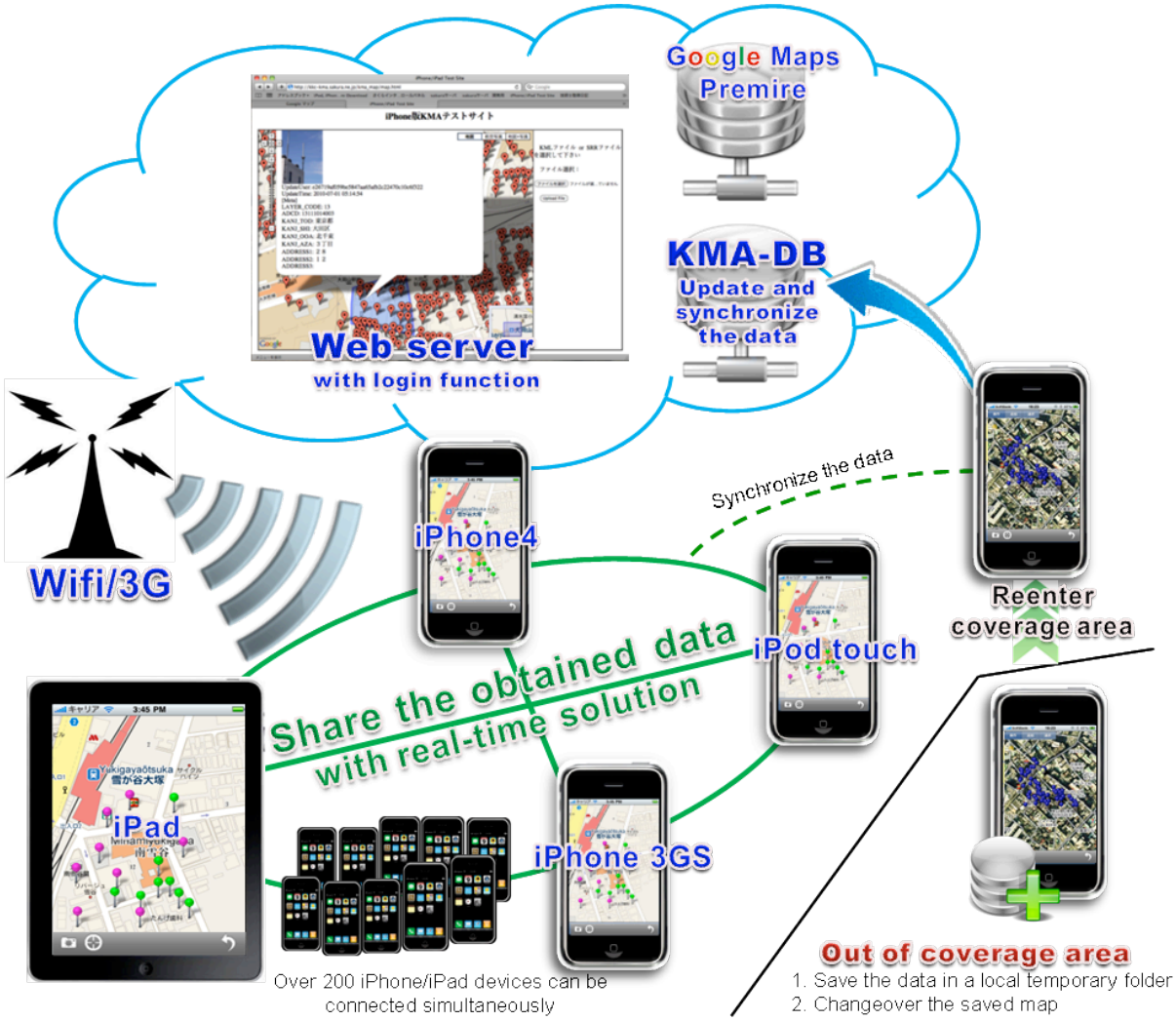
The number of people using Internet-based maps is increasing every year. In addition, mobile devices such as Apple's iPhone or iPad and Google's Android are being increasingly used. These changes have facilitated the use of Internet-based map services in the real world using mobile devices. It may not be an exaggeration to say that the use of the Internet and mobile devices has changed the manner in which we view maps. However, these online mapping services do not allow consumers to input or share data. Currently, Google provides a premier service called as Google Maps API Premier. This service can be used with internal closed networks of an organization, and custom applications can be developed according to client requirements by using this service. Further, we have been developing a field survey tool called the Kokusai Mapping Assistant (KMA) for more than ten years on PDA terminals. However, the KMA was a stand-alone service, and the user had to prepare background data before he/she could obtain the geotagging data for a real field.

Therefore, the main purpose of this study is to design an input/edit tool for spatial articulation that can be used with cutting-edge mobile devices and to develop procedures to use the newly developed input tool. In particular, we focus on the concept of input without generalization in the field survey. This input action itself can be considered a part of sensor web network as mobile devices with KMA application are connecting to server. Thus, the KMA database evolves every day as a knowledge-based database.

The characteristics of the developed system are as follows. The system facilitates easy sharing of input/edit data among different investigators working on the same project. As it is an online system, the user is able to add/edit feature data and the associated attribute data in the field. As a result, the KMA server system reflects the change and instantaneously shares the information with other users. The use of a KMA iPhone/iPad application for a field survey is more effective in obtaining accurate information and can improve the efficiency of data acquisition in the real world. The investigator can just concentrate on acquiring the data. Moreover, a GIS user can use the KMA database directly through his/her GIS software because most GIS software are compatible with relational databases such as MySQL (which is used in this study). Therefore, the user can access the KMA database in the form of a GIS layer without having to execute an export process. In addition, if the user is outside the 3G/Wi-Fi coverage area, the KMA device recognizes the situation and saves the data in a local folder. Then, when the user reenters the 3G/Wi-Fi coverage area, the KMA device synchronizes the unsaved data. The KMA device can be used not only for updating maps but also for detecting antennae on buildings, tracing water supply and sewage lines, measuring available public green space, and marketing activities.

Our future plan is to devise a method to maintain server reliability and to modify the mechanism of map loading so as to reduce the loading time. Further, an English version of the KMA device is also being developed. We expect that in the future, users from Japan as well as foreign countries will use this device.


Google Maps
Premire
KMA-DB
Update and
synchronize
the data
Web server
with login function
Wifi/3G
iPhone4
Synchronize the data
iPod touch
Reenter
coverage area
Share the obtained data
with real-time solution
iPad
iPhone 3GS
Out of coverage area
1. Save the data in a local temporary folder
2. Changeover the saved map
Over 200 iPhone/iPad devices can be
connected simultaneously