

A Study on LBS Technique Make for CRETA LBS Platform Service

Yongwon (Conrad) Cho
Virtual Builders Researcher Engineer, Seoul 150-796, S. Korea
Email: avenuel88@gmail.com

Sunwhie Hwang
Virtual Builders Director Manager, Seoul 121-190, S. Korea
Email: gazer94@vbuilders.co.kr

Abstract—Indoor and Outdoor spatial information technology closer to reality 3D space. So spatial information services market is growing now. A variety of information services and web-based content, to provide information services through the space. In addition, consumers make to direct spatial information service more than just a service provider. That means satisfy the needs of the consumer now. We have a lot of high quality smart devices. So, we will available to upload or share web. This study is outdoor and indoor map building based on the 3D data. And we will make to management for LBS service. We have to platform project name is 'CRETA' LBS.

Index Terms—big data, user participation, crowd mapping, CRETA platform, spatial information service, LBS

I. INTRODUCTION

CRETA LBS provides an environment that can easy entry into interior space services in various fields of business, Users can share their experience in interior spaces and get rich services.

A. Indoor Integrated Development Platform

Provides an Indoor LBS integrated development platform through Builder ->Manager ->Viewer (Fig. 1).

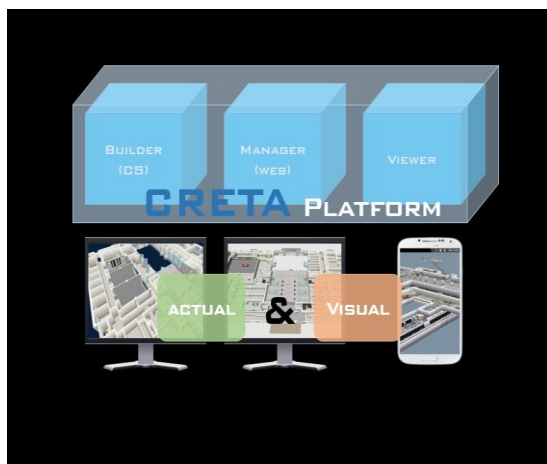


Figure 1. CRETA LBS platform (Yongwon Cho)

B. Building and Operating Database of Indoor Map

In using Contents DB, which is applicable to a wide range of business areas, such as APT, exhibition (Fig. 2).



Figure 2. CRETA LBS content publisher (Yongwon Cho)

C. Business Model of Indoor Map

Provides business proposal for business operator or developers who want to conduct Indoor LBS business (Fig. 3).



Figure 3. CRETA LBS future business partners (Yongwon Cho)

CRETA LBS can be applicable to various technologies and Mash-up. Such as private/public sector, Travel/location information, transportation/logistics control, real estate/commercial analysis. We distribute deployed resources, which can easily add or expand features that developers need to develop in accurate and up-to-date development environment. And the development environment can easily use the Indoor Map

Services and LBS in multi-device environment such as Web and Mobile, KIOSK and so on.

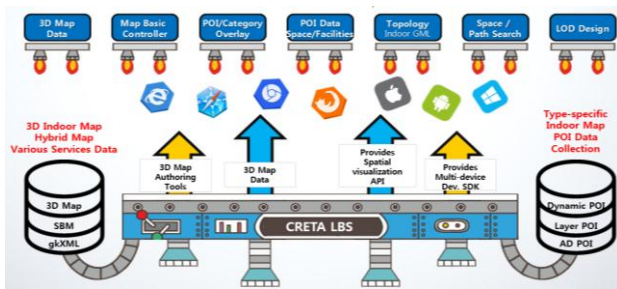


Figure 4. Service developer view point (Yongwon Cho)

New business revenue creation that was based on CRETA LBS Indoor Contents. Provide Contents DB for various business operator who want to provide Indoor Map Service, and make new business revenue creation by providing a differentiated Indoor Map service and a variety of customized products that supported development environment like API and SDK.

Provides Indoor Map Services proposal that is suitable for the business purpose by using CRETA LBS for Indoor Map Service providers who want a cheap and fast deployment (Fig. 4).

- **Specific indoor application for indoor map service providers:** Provide marketing tools that is suitable for service environment for Indoor Map Service providers. The application progressed from providing a simple location information or route guidance to be suitable for users' needs and focused on the unique features.
- **Secure effective marketing channel at low cost:** With the help of CRETA LBS than build to individual system of Interior Space Information, which is possible to develop a high quality service at low cost. 3D Indoor Map which is specialized in indoor space has a use value for companies who want to promote brands and products for sales promotion.
- **Secure a new big data marketing point by influx of sustainable users:** CRETA LBS Secure Big Data of a variety of users who was income to services and increase advertising revenue through providing value-added services. It can be utilized as objective statistical Data of multiple business model that was contained users experience in interior space.

II. LBS TECHNIQUE TRENDS

A. 3D Data Management for Big Data

Big Data and efficient processing of such data, analysis, and in order to take advantage of was the emergence, Big Data is usually data volume, variety, velocity as a combination of three factors is characterized by changes [1]. Big Data and analysis techniques for processing such data, the text mining, opinion mining, social network analysis, cluster analysis has dual images similar to

nested characteristics of the object together with the cluster analysis technique was used for outgoing [2].

B. Crowd Sourcing

When As mentioned earlier, many of Crowdsourcing development and through user participation can be consumed. Today based on the evolution of online communication technologies with the public to show the infinite possibilities [3]. Crowdsourcing is therefore beneficial to both businesses and the public to be used, a systematic procedure based on a clear sense of purpose can be satisfied through the participants should be provided with appropriate incentives [4].

C. Crowd Mapping

As said, Crowd mapping is designed and built by the team behind Ushahidi, a platform that was originally built to crowd source crisis information. As the platform has evolved, so have its uses. Crowd mapping now allows users to set up their own deployments of Ushahidi without having to install it on a web server. Since its release in 2010, prominent deployment of Crowd Mapping have documented the global 'occupy' protests and the 2011 London anti-cuts protest [5].

On 31 December 2010, the Ushahidi team announced Crowd mapping: Checkins, a geosocial add on to Crowd mapping that allows users to create a white label alternative to sites like Foursquare and Gowalla [5], [6]. Rather than filling out submission forms online, checkins allow Crowd mapping users to expedite data entry to their deployment, focus first on location and adding more detailed information later [7]. Ushahidi describes the effort as 'checkins with a purpose'.

D. User Participation

Wikipedia users to make their way directly participated map programs are gaining popularity recently. Focusing on user participation in Wikipedia map Global Positioning System (GPS)-equipped people to use a smartphone without any prior knowledge help us be able to create a map of the world. Participation typically made of an open-source map 'Waze' and Open Street Map there [8].

Israel Tal Aviv 'Waze' for the first time in 2006, began. Users are not marked on the map into a dead end when the Wise stood no way connected to the place on the map to display the next place to visit for people who can help. 'Waze' is now the driver of the 14 million people worldwide and is used to edit the map and 45,000 people living in 5,000 people in his area manager to verify the accuracy of the map is active [8].

Open Street Map is a 'Waze' was born with a similar purpose or non-profit model is more like Wikipedia. Open Street Map is like Wikipedia, which anyone can add information to connect to the home page and can be modified because it is free to use. Usage of open street map homepage and searching for the place is similar to Google Maps. However, unlike Google Maps and Open Street Map is a map, not just anyone can use without having to pay a geographic information features [8].

Recent popular location-based social network services company Foursquare have the same characteristics of the open street map to identify the user where their friends are staying open, make sure that you had to use a street map unveiled last month.

Disaster relief organizations are also ‘maps of the terrain is changed just change’ increasingly rely on participatory map. Earthquake in 2010 significantly changed the topography of the entire country rescuers in Haiti is that using the example of the open street map. Nine trillion won at the time of the Haiti relief efforts using real-time information to modify the map where the terrain is changed when it arrived and prayed to inform the open street map.

Jonathan Bennett, open street map users “that there is no other way to create a map from the open street map is not inferior to the rate of progress,” he said [8].

E. LBS

Location Based Services (LBS) is a wireless Internet user, user-specific information according to the changing location of the points to provide wireless content services. Location Services (LCS) may be referred. The main advantage of the LBS wireless mobile Internet users in multiple locations, but directly enter the address or area classification, and that you do not have GPS positioning technology make it possible to easily access the wireless Internet access technology is one of the major factors [9].

- **Here are some examples of location-based services are:** ATM, restaurant, close to the location of services and facilities to look up information. Save your gas station location information and notification services, such as traffic congestion warning. Find a friend’s location.

LBS market has gradually expanded the number of services being offered internationally. Representatively ‘Waze, iBeacons’ a close, the system proposed in this study can itself developed LBS ‘CRETA’.

III. CRETA LBS PLATFORM

LBS Solution can implemented Location-based services, which can be utilized in a variety of business fields that was conducted in three procedures: “Builder>Manager>Viewer”.

CRETA Builder is a component-based 3D space authoring software, which was created on the basis of professional 3D buildings modeler technical. Design services like POI Management, LOD design, Routing simulator, etc. in 3D Manager, and operate services like wetting permissions, project management, editing, etc. in Web POC. Viewer service provides specialized high quality of the indoor maps API and SDK that was based on various 3D interior map.

CRETA LBS support to the business requirements of the customers. Provide quickly and easily differentiated solutions through a variety of indoor map mash-up like spatial information, topology, templates, POI design, API offers.

- **Authoring specialized indoor LBS 3D map data:** anyone can easily author 3D map by

drawing on pre-processing 2D CAD drawings or image automatically converting. Implement specialized indoor location-based services by authoring/editing function Indoor GML-based topology. Easily create 3D interior space by placing component and authoring the map like writing a sketch. Provide a rich components and texture library to authoring a variety of indoor space. Provide templates and style guides to authoring indoor space that was suitable for the purpose. Export function for SHP files for survey map of a variety of indoor positioning technology (Fig. 5).



Figure 5. Authoring specialized indoor LBS 3D map data (Virtual Builders)

- **Simple and easy to design spatial information:** The effective POI management through batch/individual POI information. Design to indoor location-based services that was suitable for service purposes in flexible POI input method. POI can be conveniently designed through category management of service domain. POI information check and visibility setting via LOD manage menu. Provides function for indoor simulated driving and POI provide information for providing service of routing simulator. Visibility 3D space-based information through Unity3D Viewer that was optimized at web.

IV. CONCLUSIONS

- **Provides a variety of features and customizable API:** Provides basic controls and additional controls of map. Provides API of a variety of visualization mode and layer transfer services. Provides POI on/off and center move, duplicate and visualization, visualization of placement-related API. Three kinds of timing mode API include top view, bird eye view, walking view. Provides optimum/theme for the source/destination/destinations path and real-time visualization/simulation driving directions visualization API. Provides 3D indoor maps data download and update API. Provides distance unit settings that support global services API (Fig. 6).



Figure 6. Provides a variety of features and customizable API

CRETA LBS provides efficient development environment by promoting indoor space standardizing. Which being promoted name of an international standard is Indoor GML and used in combination with a variety of existing geometric model like phase-IFC, City GML, KML, ISDM. City GML was most commonly used as international standard in the existing data model in 3D, but can't express the various aspects of the Level 4 interior space. Interior Space Data Model (Indoor Spatial Data Model: ODM) be developed to remedy these shortcomings and express the various aspects of interior space (Fig. 7).

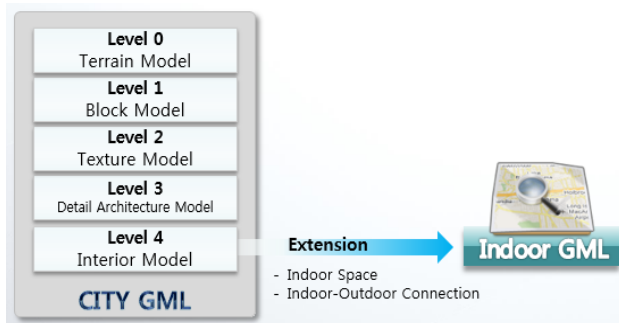


Figure 7. City GML extension (OGC)

V. SYSTEM SOLUTION STRUCTURE

A. 3D Modeling Builder (CRETA Builder)

Apart from other architectural modeling tools, CRETA Builder based on architectural components is optimized for how easy people convert physical space into 3D modeling data to provide the architectural services, especially, indoor services such as facility, space, surveillance, lighting and energy management. Not only does it make anyone use 3D model easily and comfortably, it also enables to integrate with any other software and systems (Fig. 8).

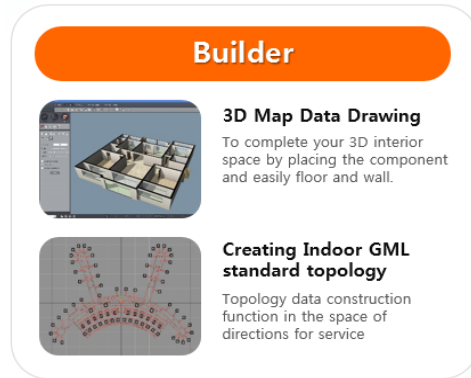


Figure 8. CRETA builder (Yongwon Cho)

B. Building Tools POI and Management

Enter for POI information to trial level was developed. Indoor and outdoor POI integrated network was applied to the implementation of the platform.

Range of web service on the indoor information about indoor name and POI information was aimed at visualizing (Fig. 9).

The basic 3D visualization features.

Range of mobile service Android OS based services was a priority.

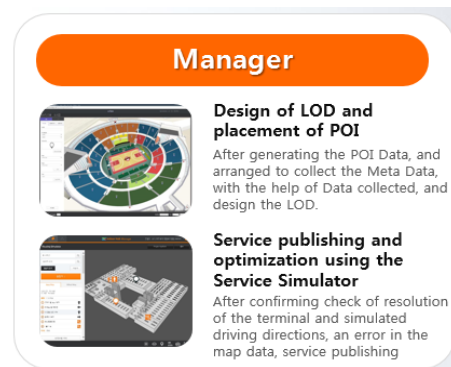


Figure 9. Building information management (Yongwon Cho)

C. 3D Modeling Viewer (CRETA Vue)

CRETA Vue is built on Unity web 3D player. (Fig. 10) CRETA Vue features are loading to only. SBM data, processing to GKXML version and renewal API. (Now on CRETA Vue ver. 1.6) And then, CRETA Vue is service about web and mobile (Fig. 11). Because through a variety of equipment, plan area and to provide information developed systems (Complex, Building, Floor).



Figure 10. CRETA vue (Yongwon Cho)



Figure 11. CRETA LBS platform indoor map level (Yongwon Cho)

VI. SIMULATION RESULT

We purposed that provide to LBS service for CRETA LBS platform. So, this CRETA LBS Platform service is focus to for the people. Make to 3D modeling is first. But, this suggest is shows very difficult. Because of show to exact location to viewer service is engineer's effort. So, we had problem solved and now on we show CRETA LBS Platform services (Fig. 12, Fig. 13, and Fig. 14).

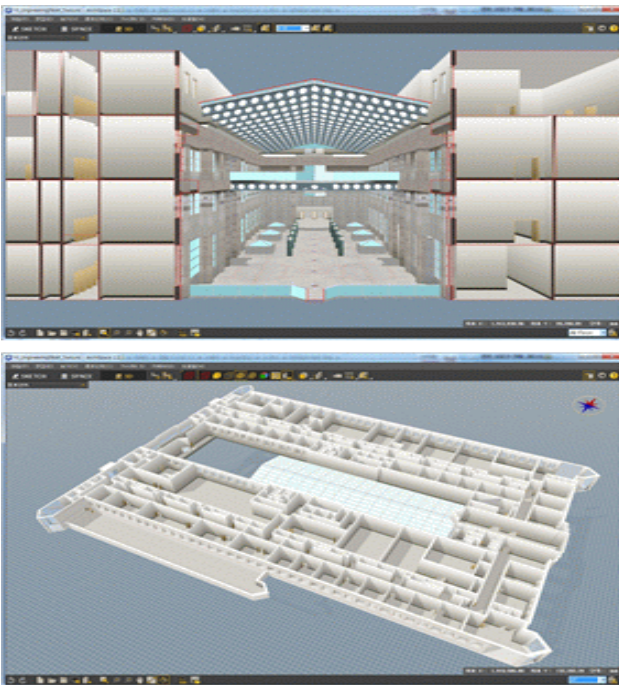


Figure 12. Yonsei university (Korea) modeling (Yongwon Cho)

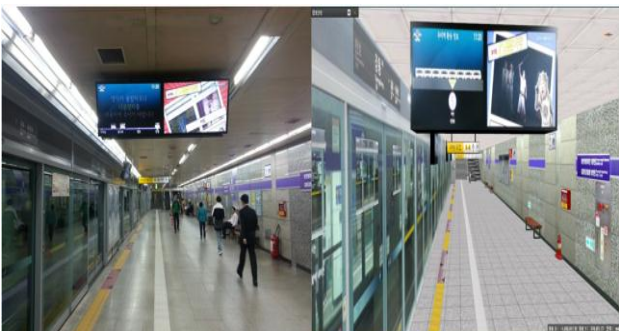


Figure 13. Seoul indoor map (left: real, right: 3D build) (Virtual Builders)



Figure 14. Indoor LBS mobile service (for SK telecom, Korea)

VII. CONCLUSIONS

CRETA Platform trial run trial services information system operating at the same time as the improvements are intended to collect and reflect.

There are many future plans indoor LBS platform. But we have do this. This CRETA LBS Platform service.

Finally, CRETA LBS Platform based 3D spatial information consists of space authoring (CRETA Builder), space operation (CRETA Manager) and space visualization (CRETA Vue). It carries out more space values and new space experiences with realistic 3D technology. Our professional solutions at business, service and technology raise your values up through new perspective of space, challenge and integration with technology (Fig. 15).



Figure 15. Scalability for CRETA other solution (to future)

ACKNOWLEDGMENT

This research was supported by a grant (11 High-tech G11) from Architecture and Urban Development Research Program funded by Ministry of Land, Infrastructure and Transport of Korean government.

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Yongwon (Conrad) Cho was born on 3rd August, 1988, Seoul, Republic of Korea and completed his B.Sc. degree in Civil Engineering from Suwon University of Engineering, Suwon, Republic of Korea in February 2012. He also completed his Master degree in Department of Fusion Technology from Konkuk Graduate University, Seoul, Republic of Korea in February 2014. At present he is working as Virtual Builders Corporation, Digital space lab. After

graduation he research in indoor & outdoor spatial information service. He always feels to do innovative Research work that is reflected by a good number of his publications in international journals and conferences. His fields of interest are: Spatial Information, Image

Matching, Indoor & Outdoor integrated service, User Participation and GIS. He was development to 'CRETA platform', 'CRETA Builder' and 'CRETA vue' tools. (IACSIT member, IEEE member and SCIEI member) *The corresponding author. Email: avenuel88@gmail.com



Sunwhie Hwang was born on 27 July, 1975, Seoul, Republic of Korea and completed his master degree in Architecture form Kukmin Graduate University, Seoul, Republic of Korea in February 2003. Previous he was working in the 'MARUHAN' corporation. And he was working about interior design and research. At present he is working as Virtual Builders Corporation, Digital space lab. Conducted a number of research and development in the country (Republic of Korea), currently a

'Korea virtual training systems industry forum' to be members. He was research about 'U-GIS development' (from Korea government research). Recently, progress study of spatial information with city of Seoul. And an understanding of CityGML & IndoorGML, information about the indoor spatial information, know the exact technology and information. His fields of interest are: Spatial Information, Platform, LBS, GIS, BIM and IoT. Email: gazer94@vbuilders.co.kr