

Implementation of the E-Catalog Mobile E-commerce Platform using 3D GIS

Information

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Abstract :

In this paper, the mobile E-commerce platform based on 3D GIS information for mobile environment is implemented. Anytime, anywhere, for all consumers can take convenient and secure E-commerce service in mobile environment, we will implement a software platform base on the mobile environment that independent of the mobile OS. Also, our platform is implemented optimized various device systems based on N-screen. And we will use a 3D electronic map for the more user visible convenience. To conclude, our E-Commerce service solution is implemented to confirm user location using 3D GIS information and to find online stores and off-line stores nearby user location. From now on mobile E-commerce system based on 3D GIS can be usable at various areas in the ubiquitous mobile environment.

Keywords-component; *E-Commerce, LBS, 3D, GIS, E-Catalog*

I. INTRODUCTION

A lot of E-Commerce services are currently used in web and mobile environments [1][2]. Among them, Ecommerce services in mobile environment have become the greatest issue with enlarging market. Web environment in general refers to services provided on PC, and such services significantly limit the movement of users. However, while there is no limitation of the movement in mobile environment, expression of contents is limited in comparison to PC. Table environment has newly appeared to resolve limitations of both, but services are still only provided online.

Within such reality, users want to instantly purchase wanted products with convenience like online market. Also, they want to buy a product that checks the one for purchasing like off-line market. So, an advanced mobile platform that possesses advantages of both online and off-line E-Commerce services is necessary.

The aim of this paper is to implement an advanced M-Commerce service that confirms user location on 3D GIS information and finds online sites and off-line stores nearby user location. The format of this paper is as follows. Technological trend of L/M-Commerce is briefly examined in Chapter 2, and Chapter 3 explains MCommerce system

based on 3D LBS. Implementation of our system is shown in Chapter 4, and Chapter 5 concludes with future research tasks based on this paper.

II. RELATED WORKS

A. M-Commerce

M-Commerce generally refers to E-Commerce in mobile environment centered on wireless network. It is basically similar to E-Commerce, but mobile communication terminals are used in mobile environment. It differs from E-Commerce in terms of contents, applications, and business models like profit opportunity. While existing E-Commerce was based on wired network connected from specific places using immobile terminals, MCommerce that makes use of wireless network with mobile communication terminals is currently leading the industry.

B. L-Commerce

LBS refers to services that provide location based information by connecting to the base station of mobile terminal or Global Positioning System (GPS) [3]. L-Commerce can be described as a field that commercially connects LBS with E-Commerce. It is not yet actively used in the market, but the concept of L-Commerce that goes beyond M-Commerce will be expanded and introduced.

C. 3D Electronic Map

3D GIS technology is rapidly spreading to diverse fields with development of mobile devices with internalized LBS (Location Based Service) function. Such concept of GIS is evolving into an integrated information system that comprehensively accommodates for application of gradually increasing user classes, rather than an expert information system used for special purpose of analyzing and managing limited information using single software. Furthermore, it is becoming available in diverse information handling platforms and environments along with development of IT. Also with popularization of various mobile devices such as smart phones, tablets, and exclusive embedded devices, the value of LBS technology is greatly increasing.

III. SYSTEM CONFIGURATION

The purpose of this system is to develop a smart convergence system that provides convenient distribution services to consumers anywhere and at any time in online and off-line mobile E-Commerce markets. Figure 1 is the overall system structure of our solution.

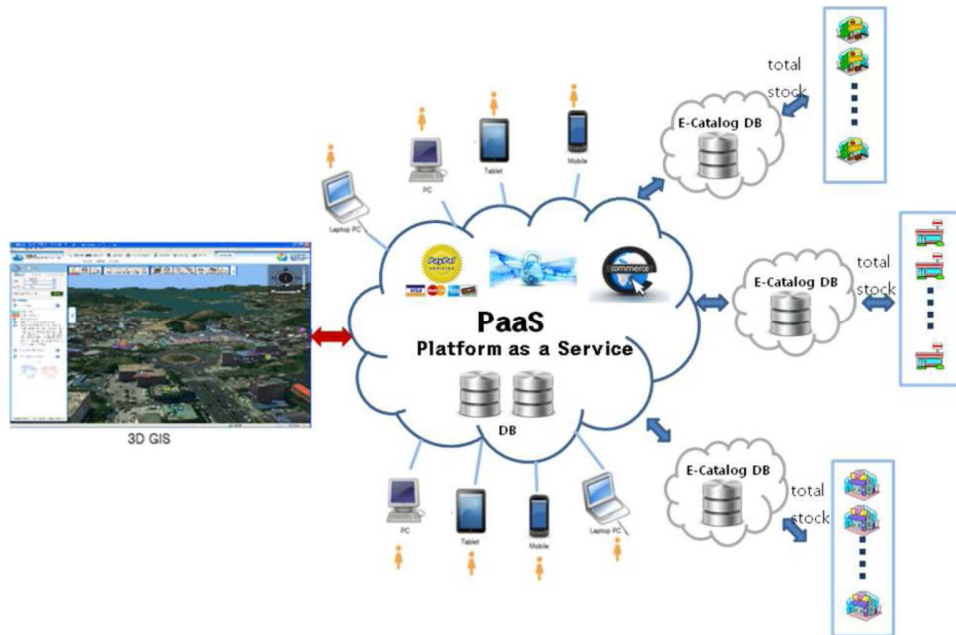


Figure 1. The system structure of the proposed solution

As shown in Figure 1, users can search wanted products on diverse devices including PC and mobile. Products in nearby off-line stores can also be searched using 3D GIS. Route information to off-line stores is provided, and shortest distance can be calculated as well. Figure 2 represents configuration and relationship of each system function.

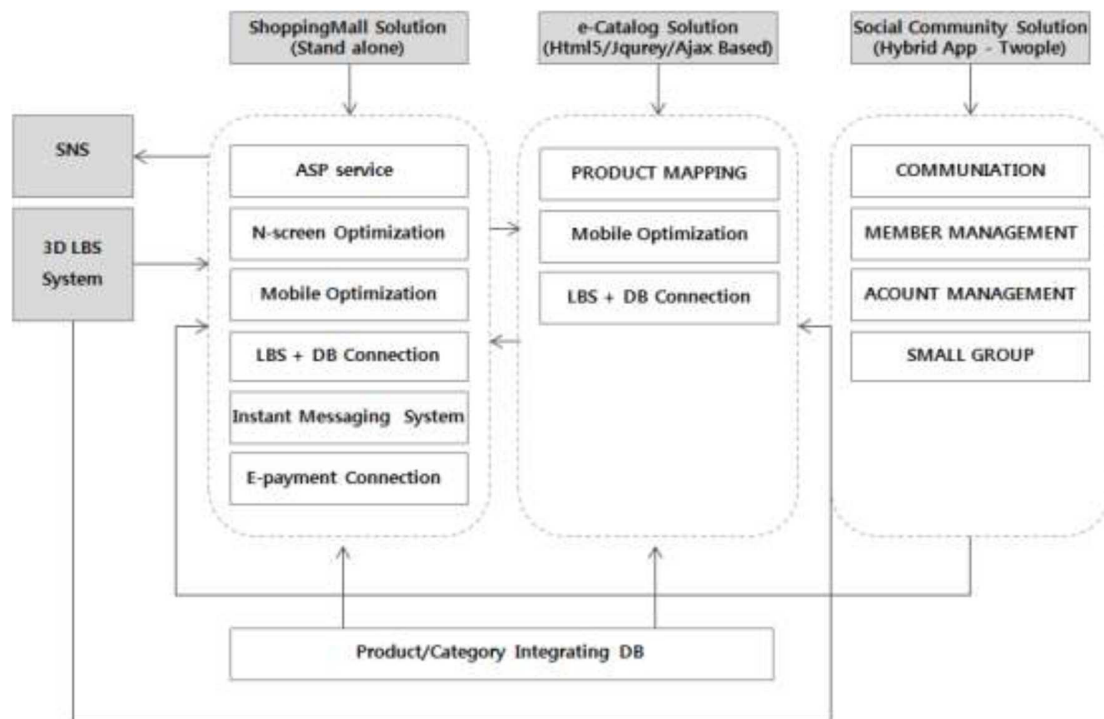


Figure 2. The block diagram for each function

Detailed functions of this system can be seen in Figure 2. This solution’s major characteristics are as follows.

- Allows direct E-Commerce in electronic catalog using an electronic catalog solution with off-line store DB.
- Allows examination of user preference on products using external SNS [4].
- Provides route guide to off-line stores using 3D LBS system.

IV. SYSTEM IMPLEMENTATION

A. 3D GIS for Mobile

To implement 3D map for mobile, 2D map data for PC is first converted to 3D. Also, 3D engine for PC is converted into mobile version. Figure 3 illustrates the development process of 3D engine for mobile.

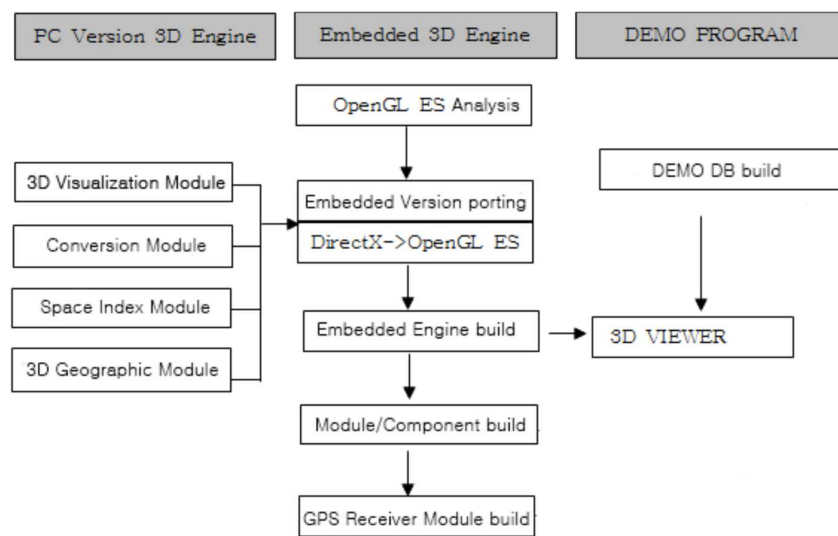


Figure 3. The mobile 3D engine development process

Figure 4 is the embedded version of OpenGL-based 3D map made according to the process above. Screen on the right shows route search with spatial search module [5][6].



Figure 4. The mobile 3D map and route search result in a smart phone

B. Connection of Electronic Catalog and E-Commerce

The E-Commerce solution based on Electronic catalog was involved as a means to construct an E-Commerce system for online and off-line stores without limitation of device. System functions related to E-Commerce such as product ordering were included, and electronic catalog data were stored on cloud server DB. Thus, client shopping mall can easily be launched at any time using the shared electronic catalog. Such electronic catalog system was developed in hybrid web app method and can provide optimal UX on any device. Figure 5 is an Ecommerce solution based on electronic catalog.

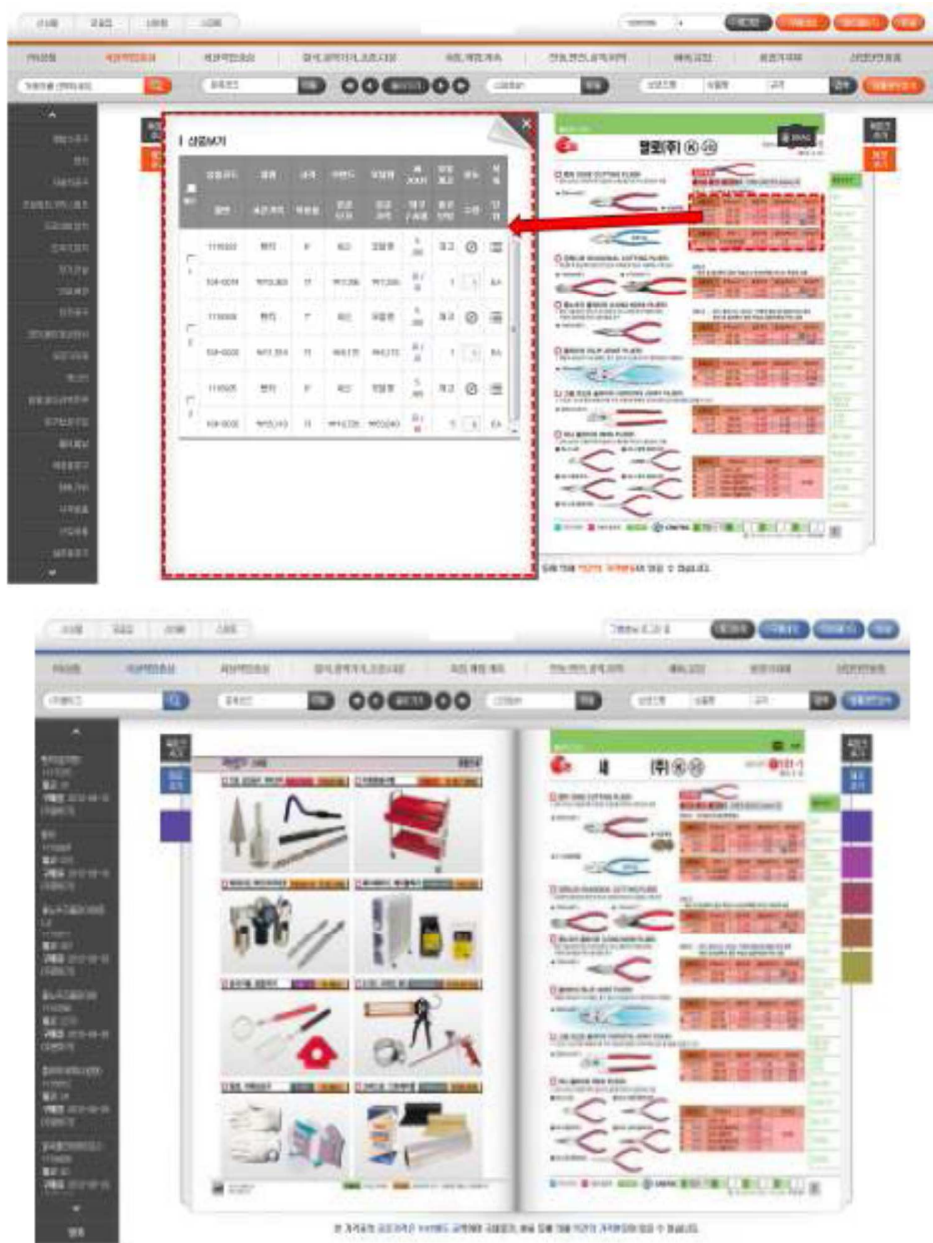


Figure 5. The E-commerce solution based on electronic catalog

As in Figure 5, when a product is selected on the right side of the electronic catalog, product name, spec and inventory status are displayed on the left side. When map item is selected, location of off-line store can be searched. Figure 6 shows a page that integrates 3D electronic map with E-Commerce solution based on electronic catalog.

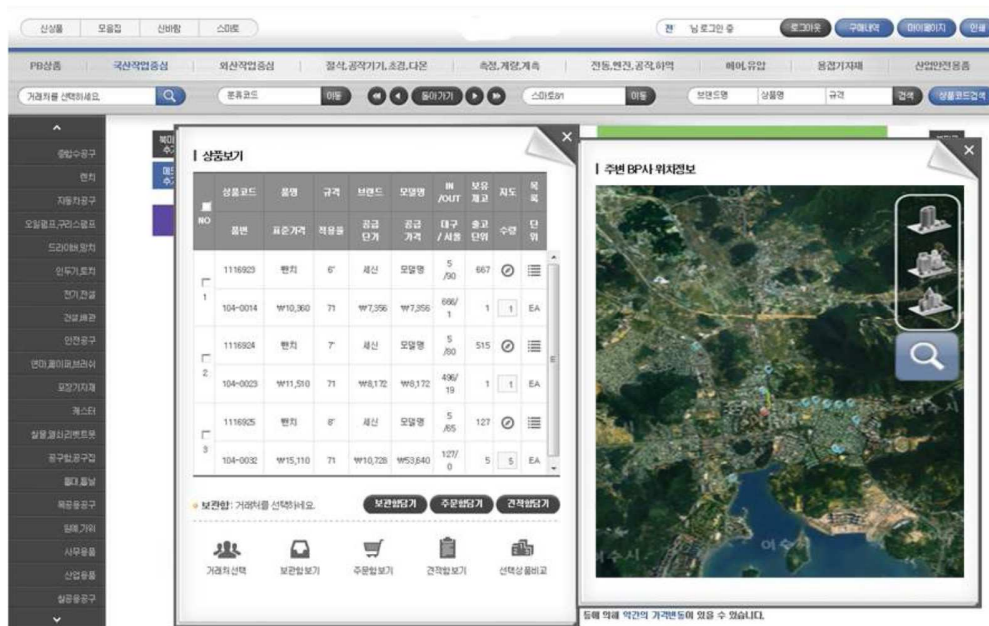


Figure 6. The Integrated solution result

Figure 7 shows the use of this system on different type devices. User convenience was maximized by providing optimum size and UI/UX for each devices.



Figure 7. The application result by each device

C. Discussion of Results

This system has advantages of convenience in purchase and selection of reliable store by E-Commerce users as it includes online / off-line stores. Moreover, it can offer an infrastructure for off-line retail stores to construct E-Commerce systems at lower cost and in shorter time. Also, lower cost is required in comparison to Ecommerce solutions in general. Figure 8 shows the cost required for manufacturing general solutions and the proposed solution.

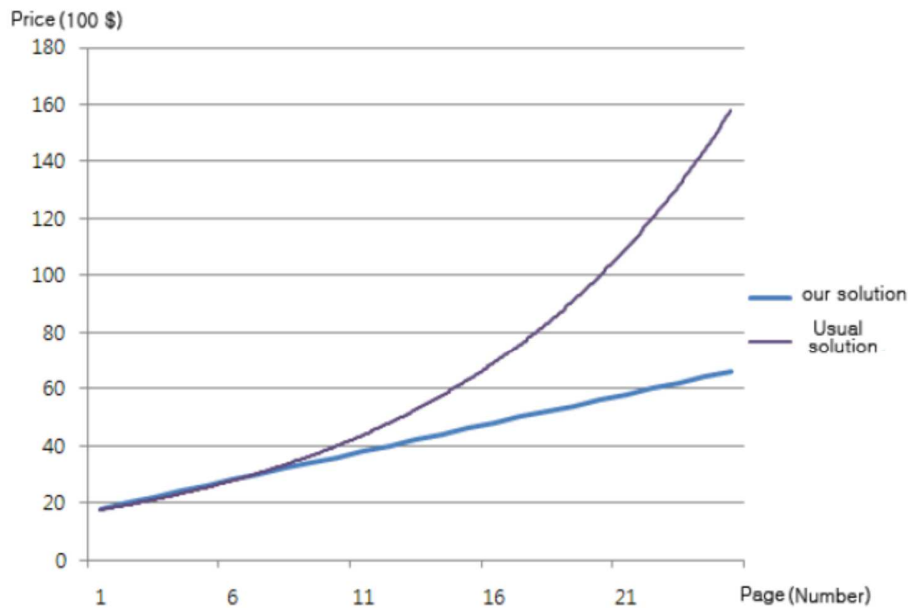


Figure 8. The price per page for each solution

Our solution can construct E-Commerce page for off-line stores in short time. As product DB is shared on the cloud server, solution can be prepared simply by selecting products sold by each store and examining inventory stock of the selected products. Figure 9 shows the time required for general solutions and the proposed solution.

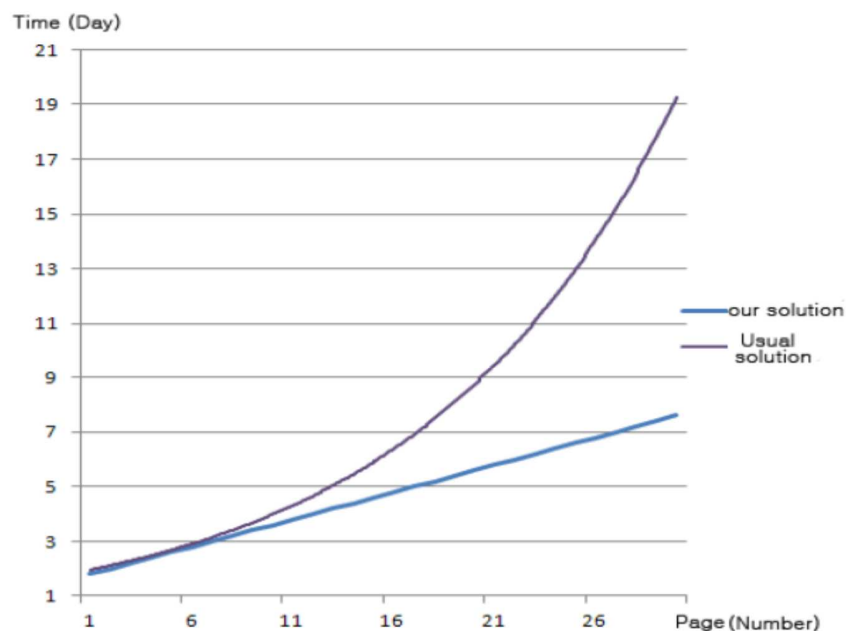


Figure 9. The time required for each solution

V. CONCLUSIONS

Recently, E-Commerce demands an integrated solution for online and off-line provided to customers on wired / wireless internet and diverse devices. Connection with GIS information is deemed essential for integration of online and off-line stores in E-Commerce, and the use of 3D electronic maps is being generalized for convenience of user recognition. In this paper, an advanced M-Commerce service solution was implemented to confirm user location using 3D GIS information and to find online stores and off-line stores nearby user location. This solution offers various conveniences in establishing E-Commerce system for off-line stores, along with convenience for consumers. E-Commerce can be applied to more diverse products and more applied solutions can be developed using the proposed solution. Future research task is to create this solution in HTML 5 environment.

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