A PLAN OF APPLYING BIM FOR IMPROVING INFORMATION COMPATIBILITY AT INITIAL PHASE OF BUILDING PROJECT

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ABSTRACT: Construction process is divided into pre-design and planning, design, construction, management. Pre-design stage is very important considering the influence on other subsequent works. Recently, it is being increased that the importance of information management and decision-making support at the pre-design stage, and related researches are being conducted. As part of this trend, the purpose of this study was to develop the interoperability of decision-making support system at the pre-design stage. It is tested that interoperability to detailed design of the existing system. As a result, shape information of the building was compatible exactly, but property information was not compatible. Through future studies about improving these problems and interlocking between this system and modeling tools, it will be supported decision-making of various project participants.

***Keywords**: Interoperability, BIM, Pre-design Stage, VA-Cityplanner*

1. INTRODUCTION

BIM (Building Information Modeling) is an advanced solution that manages all information of supplies and facilities comprehensively throughout the life cycle of a building, including planning, design, construction, maintenance, etc. It is in the spotlight with its expected contribution to the innovation of construction industry process since all information can be managed in three dimensions on the computer.

To expand the application of BIM to public facilities area, Public Procurement Service obliged turnkey projects for above 50 billion won to apply BIM from 2012. By 2015 the subject will be expanded to construction works for above 50 billion won, and in 2016 BIM application is to be expanded to all construction projects for public facilities.

Private builders have also established BIM department in recent years in pursuit of improved productivity and quality by acquiring related technology and applying it to actual sites.

Like this, BIM has become an indispensable element for the architectural field of future for both government and private sectors. However, it is true that BIM application still has problems to work out in the course of settling down. Staffs in charge say that conversion to BIM process rather involves increased work and complicated procedures. Thus, this study has the purpose of proposing a plan to improve information compatibility between business proprietors at an early phase of BIM application process in architectural project.

For research, information compatibility performance of VA-Cityplanner, a decision-making support system in incipient phase of architecture, was analyzed. Compatibility into design modeling tool and environment performance evaluation system, etc. was tested on the subject of model generated from this system. Based on the result, plan of using this system for initial phase of building project was proposed.

2. LITERATURE REVIEW

2.1 VR-based decision-making support system for architectural planning phase

VR-based decision-making support system for architectural planning phase supports decision making of ordering body and designer by proposing various alternatives through simulating the information needed for planning phase of an architectural project in the virtual space of computer.

This system was designed with four major functions of project programming, schematic design, report & analysis, and connection to construction document phase.

In project programming phase, it generates a new building project and inputs needed information such as requirements from ordering body. Based on this, it composes spaces by layer and proposes diverse alternatives in schematic design phase. In report and analysis phase, it extracts quantitative data for each alternative and all related data was designed for connection to construction document phase.

2.2 DXF

DXF (Drawing eXchange Format) has been widely used as external format for exchanging CAD data, especially in the field of engineering and figure. DXF can be stored in both Ascii and Binary forms with strong points of efficient expression of figures and easy creation of data. DXF file functionally consists of four sections – a section to define header variables, table section that defines table information, block section that defines block, and entity section that has actual information of drawing elements.

3. Analysis of the system information compatibility

3.1 Information compatibility with design phase

Object model generated in VA-cityplanner was extracted with dxf file to be imported in Revit and AutoCAD, which are modeling tools in design phase. The result is as follows.

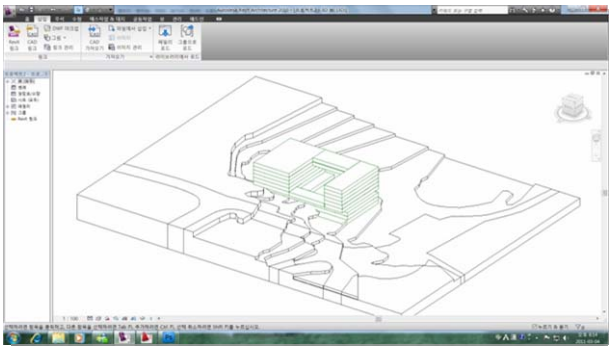

Fig 1: Imported image in Revit

3.2 Information compatibility with environmental performance evaluation system

Test was conducted to know whether the model generated in this system can be used for other specialized fields. The following is the result of importing dxf file in Ecotect, which is generally used as an instrument to evaluate environmental performance.

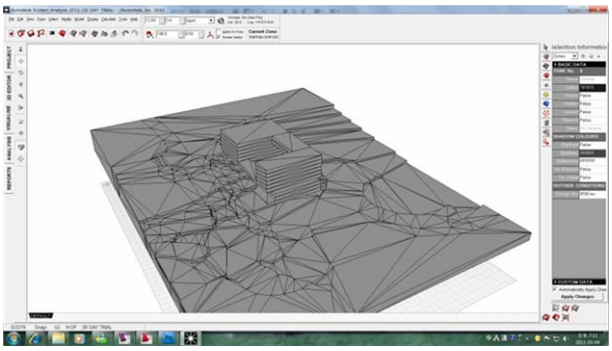

Fig 2: Imported image in Ecotect

As a result of importing dxf file from each program above, Revit turned out to be good at compatibility of object information. However, mass in VA-Cityplanner cannot be recognized in Revit as such, it needs recognizing as a family suited for Revit. For Ecotect, dxf file recognition was good as seen above. For Rhino and Microstation, too, recognition was relatively good though it included part to make up in future. On the other hand, for AutoCAD, it was found impossible to recognize dxf file, simply causing error massage.

4. CONCLUSION

In this study, test was conducted on the information compatibility performance of VA-Cityplanner developed for supporting decision-making in initial phase of architecture. As the result, it allows relatively good compatibility with programs such as Revit, Rhino, Ecotect, etc. but not with AutoCAd. Based on this result, it is considered necessary to have a test on programs much used in practical business and to develop such function of Add-in in Revit for improving information compatibility.

Through further study, it is considered possible to realize cooperative work, which could be called the core of BIM process, and settle BIM process properly in the country.

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