FRAMEWORK OF AN INTEGRATED INFORMATION SYSTEM WITH OpenBIM BASED LIBRARY FOR NEW KOREAN STYLE HOUSE

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ABSTRACT: This research introduces the roadmap of Establishment of Korean Traditional House Component Library Project (EKTHCLP) which developed an open BIM-based library system for new Korean traditional house components. In the project, the authors defined a parametric library by an XML-based approach; implemented the library to a browser and then developed a DB web contents Service which can be easily accessed by users. Using this system, users will be able to adjust the parameters to their wills and apply the Industry Foundation Classes (IFC) files generated from the browser to their projects regardless of software package selection. Because of additional information added in the IFC files, the translator for the generated IFC files from the browser to readable IFC file is under developing. The research stated a new methodology to develop an open BIM-based parametric library system for traditional house components. Specifically, the authors extended an XML schema from the mechanical engineering to represent traditional house components in a parametric way, and implemented a pilot browser based on this XML approach for the open BIM-based library establishment.

Keywords: Korean Traditional House, Han-ok, Building Information Modeling (BIM), openBIM, Foundation Classes (IFC), Library, Feature based, XML Schema

1. BACKGROUND

The Korean traditional house (woodened and assembled) is named Han-Ok that has passed through several centuries. Due to the popularity of the occidental house and expensive construction fee of Korean traditional house, the traditional house was always not preferred. However, since the eco-friendly and sustainable architectures were preferred and related construction technology of New Korean style house was developed as well as some national policy were made, the demands on Korean traditional house are increasing. Even though being improved, the traditional house is rather more difficult and expensive than we thought; therefore, an integrated information system which can be easily accessed by users is required. The research is carried out for openBIM based library development, popularity and cost decrease.

2. SUMMARY

There are five steps to implement an integrated information system for new Korean Traditional house.

First step is to analyze geometry information and methods of assembled traditional house components from case study.

Second step is to build database such as drawing sheet, documents, photo, and so on.

Third step is to make 3D BIM Library and input needed properties to components.

Fourth step is to connect a web service to distribute BIM libraries for end-users.

Fifth step is to build a design supporting system based specific BIM application.

In addition, Han-Ok Information Integrated Browser is needed to connect with openBIM based Han-Ok component libraries, Han-Ok Part DB web contents service and new Han-Ok Design supporting system.

The browser also provides several functions to show general properties and parametric information and controls parameter to simulate a resized geometry.
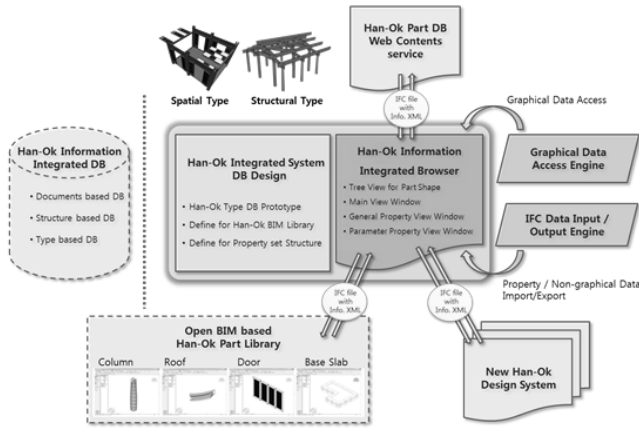

Fig. 1 FRAMEWORK OF ON INTEGRATED INFORMATION SYSTEM WITH OpenBIM BASED LIBRARY.

Developing 3D parametric libraries for traditional house components tends as a trend recently. Unlike 2D method, Building Information Modeling (BIM) technology offers an object-oriented and parametric digital representation for traditional house components. However, most researches focus on some certain BIM software packages, because parametric information cannot be exchanged among BIM applications in the current technology context, each kind of software package must have their own parametric library which causes extensive works. Macro parametric technology can control parametric knowledge based on feature such as protrusion extrude, fillet and so on. This is a interoperability test process to maintain Han-Ok's features.
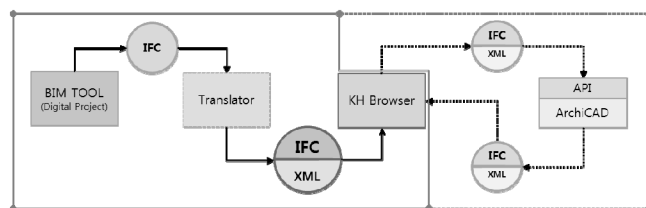

Fig. 2 PROCESS OF FEATURE BASED INTEROPERABILITY TEST AMONG BIM APPLICATIONS

REFERENCES

[1] Han, S.(2010) "Macro-parametric - An approach for the history-based parametrics", in Soonhung Han(Guest editor), Special issue: The future of CAD interoperability: History-based parametrics, Int. J. Product Lifecyle Management(IJPLM),4(4):321-325 Dec. 2010.

[2] I. Kim, "The History and Concept of BIM", Review of Architecture and Building Science, Vol. 54(1), pp. 16-21, 2010.

[3] Chuck Eastman et al, "BIM Handbook", John Wiley & Sons, Inc, New Jersey, 2008.

[4] Dana K. Smith et al, "Building Information Modeling: A Strategic Implementation Guide for Architects, Engineers, Constructors, and Real Estate Asset managers", John Wiley & Sons, Inc, New Jersey, 2009.

[5] buildingSMART International (http://www.buildingsmart.com/)