How to automatically extract 2D deliverables from BIM?

Yije Kim[1], Sangyoon Chin[2]*

[1] *Department of Convergence Engineering for Future City, Sungkyunkwan University, Suwon 16419, Republic of Korea,* Email: dlwpek@skku.edu
[2] *School of Civil, Architectural Engineering & Landscape Architecture, Sungkyunkwan University, Suwon 16419, Republic of Korea,* Email: schin@skku.edu

Abstract

Although the construction industry is changing from a 2D-based to a 3D BIM-based management process, 2D drawings are still used as standards for permits and construction. For this reason, 2D deliverables extracted from 3D BIM are one of the essential achievements of BIM projects. However, due to technical and institutional problems that exist in practice, the process of extracting 2D deliverables from BIM requires additional work beyond generating 3D BIM models. In addition, the consistency of data between 3D BIM models and 2D deliverables is low, which is a major factor hindering work productivity in practice. To solve this problem, it is necessary to build BIM data that meets information requirements (IRs) for extracting 2D deliverables to minimize the amount of work of users and maximize the utilization of BIM data. However, despite this, the additional work that occurs in the BIM process for drawing creation is still a burden on BIM users.

To solve this problem, the purpose of this study is to increase the productivity of the BIM process by automating the process of extracting 2D deliverables from BIM and securing data consistency between the BIM model and 2D deliverables. For this, an expert interview was conducted, and the requirements for automation of the process of extracting 2D deliverables from BIM were analyzed. Based on the requirements, the types of drawings and drawing expression elements that require automation of drawing generation in the design development stage were derived. Finally, the method for developing automation technology targeting elements that require automation was classified and analyzed, and the process for automatically extracting BIM-based 2D deliverables through templates and rule-based automation modules were derived. At this time, the automation module was developed as an add-on to Revit software, a representative BIM authoring tool, and 120 rule-based automation rulesets, and the combinations of these rulesets were used to automatically generate 2D deliverables from BIM. Through this, it was possible to automatically create about 80% of drawing expression elements, and it was possible to simplify the user's work process compared to the existing work. Through the automation process proposed in this study, it is expected that the productivity of extracting 2D deliverables from BIM will increase, thereby increasing the practical value of BIM utilization.