Planning and Developing Facility Management-enabled BIM for a Research Facility: A Case Study

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Most institutions engaged with new facilities are grappling to deal with the massive information potentially available from using Building Information Modeling (BIM) on projects. How to effectively plan the development of BIM for its later utilization during project handover and Facilities Management (FM) is the question. In the current practice of developing BIM for FM use, building information at different stages needs to be collected repeatedly, and the BIM models delivered to facility personnel usually contain extensive information that typically does not map to the information required to execute FM tasks. Therefore, avoiding redundant work and realizing the value of BIM as an integrated data center require a clear definition of what information should be made readily available for FM operations and a standard process of capturing them during the design and construction phases.
BIM application in FM varies depending on the organizational mission and the requirements of the facilities infrastructure supporting it, and the informational needs of different organizations are quite diverse (Teicholz, 2013). Through presenting a real world case study, this research provides insights into the process developed by a major American university to develop BIM for further deployment during the facilities management phase. The building studied is a 200,000 S.F., five-story research facility with laboratories for chemical, cell therapy, and systems biology. This project started in the summer of 2012 and was completed in September 2015. The total cost is $113 million.

The key objectives of the paper are to discuss 1) the required information in BIM needed for FM, 2) the strategies for capturing such data; and 3) the challenges faced during the BIM-enabled handover and corresponding proposed solutions. In this research, the FM-enabled BIM data requirement and creation process explored are in the context of a university's comprehensive research facility, and the major objectives of adopting FM-enabled BIM are to support facility personnel in space analysis, retrofitting and preventive maintenance.

This paper concludes that successful implementation of FM-enabled BIM can be achieved with 1) a clear definition of what FM-enabled BIM constitutes, 2) a well-established practical process of collecting the data needed throughout the project development phase, and 3) a well-executed interoperability plan for transferring data from BIM models into facility management systems, such as Computerized Facility Management System (CMMS). The paper demonstrates how a BIM-enabled method of developing, sharing, and turning over project data in this project is different from the traditional process. In the BIM-enabled process, the BIM model should be continuously critiqued and scrutinized by different parties from the architecture, engineering, construction, and FM disciplines. Through the process, essential facility information is captured, maintained, and shared digitally. At the handover phase, important project information is readily available to auto-input into the relevant facilities management system. In addition, maintenance personnel have access to the geometrical BIM model containing the systems information consist of equipment location, accessibility, and maintainability.

Keywords: Building Information Modeling (BIM), Facilities Management (FM), FM-enabled BIM, COBie

Reference

Teicholz, P. (Ed.). (2013). *BIM for Facility Managers*. John Wiley & Sons.