

BIM for Asset Management: A taxonomy of non-geometric BIM data for asset management

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Abstract. Nowadays, the capabilities of collecting different sets of data from different sources (BIM, GIS, Sensors, Assets database) for asset management (AM) use have availed opportunities to provide benefits for project's owners and facility managers. Meanwhile, there has been a focus on asset management and the connection to effective documentation through BIM. However, this data integration came along with new issues and obstacles in terms of an effective process to extract, store, manage, integrate, and distribute this data to ensure interoperability. In addition to the foregoing, the issue is not only the interoperability, it is also about the decision regarding what data is relevant and what would provide value to asset owners. This paper explores the owners' needs from BIM in the operation and maintenance stage from an asset management perspective. A combination of methods consisting of literature review, face-to-face and focus group interviews was used in this study. This culminated in the development of a taxonomy that consists of 40 parameters. The developed taxonomy can help BIM professionals identify and recognise the required data to be submitted to facility managers which can be useful in AM practices.

1. Introduction

Asset Management (AM) is a sophisticated area of management with wide range of professional disciplines and activities (Spilling, 2016). Asset management is defined by ISO 55000 (2012) as "coordinated activity of an organization to realize value from assets". In other words, Asset Management is process in which a management system is bi-directionally linked to a record model to efficiently aid in the maintenance and operation of a facility and its assets. These assets, consisting of the physical building, systems, and equipment, must be maintained, upgraded, and operated efficiently to be of better value to the owner and the end users. Accordingly, asset management transforms business objectives into asset-related decisions and assists in financial decision-making, short-term and long-term planning, and generating scheduled work orders (Pocock et al, 2014). For the bi-directional link, these assets have to be available in electronic formats with proper classification and organization to simplify the access to the information. For that purpose, research efforts have been made to improve data interoperability between the different Facilities Management (FM) systems. However, the main challenge is creating and manually updating these assets data with the correct information linked to the relative documents in various databases and in various phases which is a timely process that leaves a lot of room to human errors. Building Information Modelling (BIM) model/database seems to be the ideal platform for collecting, capturing, visualizing data and information using different techniques such as standardized barcode and radio frequency identification (RFID) labels during different building phases such as planning, design, construction, and operation and maintenance phases. BIM for FM can be even described as "Better Information Management" (Thomas, 2017). BIM and Big Data technologies can achieve a good efficient database for asset management (Ibrahim et al, 2017). This good quality assets database can improve financial performance, improve asset investment decisions, manage risks and demonstrate compliance (Spilling, 2016).