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BIM AND COBIE INTEGRATION FOR STRUCTURES LIFE-CYCLE ANALYSIS

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ABSTRACT

The present article intends to contextualize the relevance of a linkage between BIM methodology and the COBie specification, identify the challenges and design guidelines for its implementation in structural rehabilitation projects. COBie specification encompasses several engineering projects of the constructive process, so generic files are listed for their integration into the stability engineering project and identified the type of information contained. Considerations that highlight the importance of the link between BIM methodology and the COBie specification are presented. However, cultural change that is needed within the Architecture, Engineering, Construction and Operation (AECO) sector are still a challenge.

Keywords: BIM, Building life-cycle, COBie specification, AECO sector, structures.

INTRODUCTION

In Portugal, the use of BIM (Building Information Modelling) by AECO sector stakeholders is not yet widespread. However, it is unquestionable that BIM is increasingly a reality, not only for the design and construction phases, but also for the operation phase. Its medium and long-term application will certainly be successful and efficient, since it is a methodology for sharing information and communication between all stakeholders and during all phases of the building life-cycle. In the last decades, there has been a growing interest in the implementation of BIM methodology due to the diverse benefits and resource savings of the AECO sector during the phases of the building life-cycle (Nepal et al., 2008).

The COBie specification provides guidance for the organization of the information in the operation phase (asset management) in the AECO sector (Volk et al., 2014) and deals with the definition of interoperability requirements for the exchange of data. It allows the collection and storage of project data, including equipment lists, product data, warranties, spare parts lists and preventive maintenance schedules. This information is essential to support the activity of asset management. Recently, this specification has been complemented with a responsibility matrix that assigns the types of data required for each stakeholder in the process (East, 2013), and has been incorporated into planning, design, construction, operation, maintenance and asset management activities.

RESULTS AND CONCLUSIONS

The provision of results from the development of structural design (AE-Design Phase) should be presented in a single file for each component (and location, if applicable), containing all

information related to the developed of structural engineering project. The focus of the results delivery of the project development is to provide adequate representation of the space and the structural provisions of the asset. The spatial attributes of the assets must be completed, in order to allow reports, corresponding to the level of detail found in the drawings (East, 2012). The content of the results made available in the project development should reflect the timing of activities and equipment, as presented in the corresponding design drawings. The structural engineer is responsible for correcting all deviations of content between the associated design development drawings and the information delivered (East, 2007).

The use of COBie specification, in addition to BIM, allows the identification of the information contents that must be imported / exported at each stage of the asset life cycle and thus reduce the waste of human resources, materials and associated times (Falcão Silva, 2016). The designer is required to provide the layout of the space, the list of systems, the types of equipment and their location. The builder adds equipment, model and serial number, and provides manufacturers manuals, warranty and spare parts information. Asset owners need to perform annual human resource quantification, the introduction of simplified equipment supplier lists, obtain guarantees, and inventory spare parts in their asset management and maintenance systems. The commissioning agent provides work plan data with associated tools, training, and equipment requirements.

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