

Integration of Durability Data of Construction Elements Within a BIM-Based Environment

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1 Context

The construction sector in Spain has been one of the major sources of economic growth and development. So far, in order to maximize the benefits and minimize costs, it didn't take into consideration the long-run costs, such as environment, resources, materials or durability. In this context, voices are being raised in the academic field that demand a change in the production model of the construction sector proposing solutions at different levels.

The science of life cycle cost analysis is a fundamental tool to make changes in the Spanish construction sector. As an agent of the construction sector, The Valencian Institute of Building seeks to provide technicians with tools and to help them working with life cycle cost data from the design phase.

The Valencian Institute of Building (IVE), as a public interest incorporated foundation in the construction sector subjected to private law, brings together a collective of professionals involved in the building and urban process. Its main interests, among others, lie in improving the processes linked to the edification and urban space, encouraging research and enhancing life quality, sustainability, safety, accessibility and durability standards through the smart development in the built environment.

2 Objective

The main purpose of this research is not to find out how to increase the durability of the products and systems to compile the maximum quantity of data available in order to have the ability to compare different constructive solutions durability.

The developed database is due to be included in BIM-based computer software so that architects and construction professionals can predict how much their buildings will last and how much they will have cost when ending their service life in terms of stability, safe functioning and appearance.

3 Methodology

The multiple-criteria decision-making result consisted in a database of the reference service life of the constructive materials. The content was analyzed regarding the available data from each database, some referred to the minimum and maximum number of years of service life, others only to average values. The database created allowed the extraction of a variety of relations between the analyzed elements.

In order to improve the existing Catalogue of Construction Materials and update it to nowadays needs, complementary information such as materials durability, maintenance and costs are being added to the existing catalogue so that data from several IVE tools can be integrated in BIM-based computer software.

The Valencian Institute of Building has been working on integrating construction materials data, characteristics, durability data from the latest databases and information from other IVE tools in a BIM-based environment. Therefore, users will be able to know constructive information and characteristics from the design phase.

4 Conclusions

The final input, based on the worldwide reference databases, the Catalogue of Construction Materials, the multiple-criteria decision-making to process the data collected, lies in the introduction of the research results into BIM software and its applicability to buildings as a whole. The application of the data in BIM software is on the beta-testing phase and it is expected to be released to the public by the beginning of the year 2020.

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