Master thesis

Blockchain - construction product specifications for integration to BIM

Modern construction is characterized by the increasing use of prefabricated and factory created construction products. Such elements include assemblages, connection elements, layered materials of the building shell, doors and windows, parts of the technical building equipment. Their use is covered by the Construction Products regulation of the European Union which prescribes a harmonised technical performance evaluation of the products, in order to enable free cross-border trade. At the same time, the performance characteristics of each product, which are published in accordance to the European legislation, enable the supplier, designer, builder, or end user to have a reliable information of the product. Moreover, the CPR requires a product characterisation in regard to various features, such as the load capacity, the fire resistivity, the health risks, the durability and the environmental impact of the product.

Simultaneously, Building Information Models (BIM) form the basis for digital planning and construction, as well as building data structuring and accessibility. They offer data platforms in the construction industry, which include the generation and management of digital representations of physical and functional characteristics of a building, its components, and their interfaces. As such, an appropriate description of the data required to represent fastening products as digital objects is of paramount importance. However, the industry lacks knowledge and moreover consensus of what is the most appropriate amount, form, and indexing of data for the digital representation of these products. Different properties are required from each discipline involved, e.g. structural engineers, architects, building planners, contractors, owners, and product manufacturers. This thesis shall explore the requirements for each discipline, and it will suggest what are the optimal blockchain formats and content for construction products, on the example of fastenings.

Candidates for this work are expected to understand English and German and it is beneficial to have a basic understanding of blockchain technologies and databases.

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