

BIModel creation for Social Housing projects in view of cost planning

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Objectives

This research aimed to study the modeling process, in BIM authoring software, of a Social Housing (SH) project oriented towards cost planning, and sought to understand the modeling aspects necessary for the correct extraction of quantities, associated with spaces and construction elements, in the project development.

Material and methods

The modeling, using the chosen BIM software (Archicad 27), was based on tutorials from previous works on this subject, such as SILVA (2022) and KITAJIMA (2022), or related topics, such as SALMAZO (2020) and COSTA (2021). The focus was not limited to parametric modeling itself, but also on the information inserted in the model relevant to cost planning and other BIM uses. The modeling process made use of visualization and/or basic quantity extraction software (linear, surface, and volumetric dimensions) from the models after their export in neutral IFC (Industry Foundation Classes) format. One of these software tools is PQTO, developed by the research supervisor. The other is Solibri, commonly used in the professional field. The first aimed to highlight errors during the modeling process (Figure 1), while the second aimed to verify the data relevant for cost design exercises. An important aspect of the work was the use of tables from the information classification system by ABNT (2021A, 2021B,

2021C) in defining construction components, elements, and spaces.

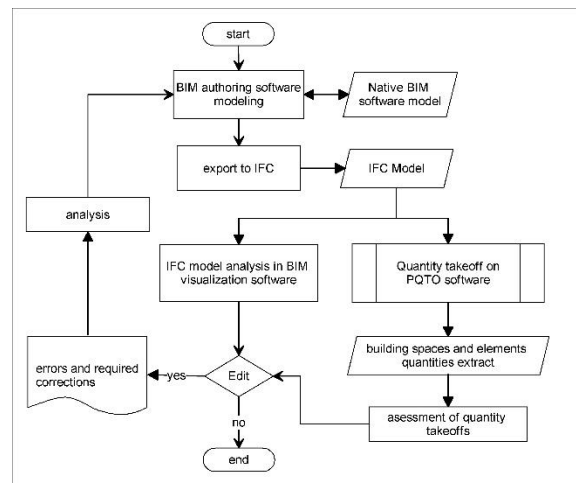


Figure 1: Modelling procedure summary.
Source: Prof. Dr. Marcelo Eduardo Giacaglia.

Results

In addition to the final research report, which includes a discussion on BIM modeling, the result comprises four models: a typical floor of an apartment building (Figure 2) and a house (Figure 3), both from CDHU (Companhia de Desenvolvimento Habitacional Urbano), each in two versions. The models were developed for use in cost planning exercises, replacing two-dimensional drawings.

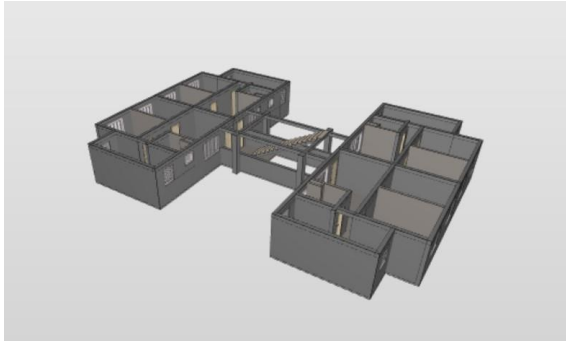


Figure 1: 3D model of a typical floor from CDHU.
Source: author.



Figure 2: 3D model of a CDHU house.
Source: author

Conclusions

It is concluded that the 3D modeling process in BIM, with a focus on cost planning, is extremely important for the construction management process. Careful and detailed modeling can result in very precise budgets, allowing for the analysis of the relationships between space gains and additional construction costs. Such comparisons aim to improve the quality of projects, especially those for social housing (SH).

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