

Guidelines for measuring construction work with BIM and its impact on construction project management

Summary

As technology advances, productivity demands in many industries are increasing, including in AEC. AI-powered software is becoming more prevalent in this field, providing innovative approaches to project design and development across various specialities. This technology has a significant impact on several stages of construction projects, particularly in the determination of Construction Bill of Quantities (BOQ) or Quantity Take Off (QTO).

In the construction process, the designer defines the necessary quantities, understands the tasks involved, and provides reasoning for the estimated quantities. The contractor interprets these quantities and assigns unit prices based on their knowledge that each quantity corresponds to specific tasks that must be completed. It's important to note that there may be additional tasks that aren't directly reflected in the measured quantities but are still essential to the project. During the project's execution, the inspection team, well-versed in the Construction QTO rules, prepares and monitors measurement reports. Finally, project billing is carried out by applying these same rules to determine the quantities of the completed tasks.

Consistency is crucial when measuring completed construction tasks. To ensure accuracy, stakeholders must follow the rules outlined in the tender's QTO and be familiar with proper measurement techniques. With the increasing prevalence of BIM models in design, it's essential to adopt a methodology that aligns with the actual constructed object and accurately reflects its geometry without any deviations. Precision is crucial when automating the extraction of quantities from BIM models for task quantification.

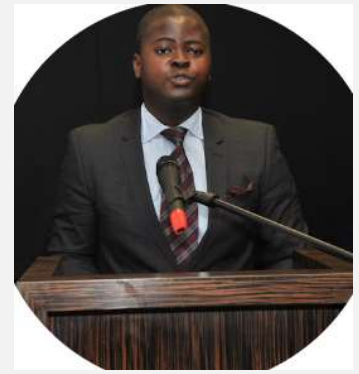
To address this challenge, this Doctoral Thesis in Civil Engineering aims to propose effective processes for quantifying construction tasks based on BIM, develop corresponding measurement rules, and automate quantity extraction from BIM models.

Keywords

Measurement rules, quantity take-off, BIM modelling, parametrization.



Model with parametric information for QTO automation similar to the real thing - REVIT software.



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