Research on Estimation Price Creation Methodology for RC Structures in BIM

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1. BACKGROUND TO THE STUDY

The Japanese construction industry faces the problem of rising material and labour costs in a short period of time. To overcome this problem, it is important to accurately estimate construction costs at the early design stage[1]. The use of Building Information Modeling (BIM) is an effective way to efficiently estimate construction costs at the early design stage. To achieve this, a method of generating unit cost data associated with BIM objects is required.

2. RESEARCH OBJECTIVE

This research objective to devise a methodology for accurately predicting construction costs using early-stage, low Level of Development (LOD) BIM data. It specifically focuses on the creation of 'composite unit costs' that can be associated with BIM components, offering a novel approach to cost estimation.

3. RESEACH METHOD

By analysing the actual construction cost estimate invoice and the design drawings and BIM data for a reinforced concrete superstructure, the factors that cause variations in the quantity of rebar and concrete for each building element are analysed. The patterns for generating composite unit costs that reflect these characteristics are then examined and their effectiveness is verified.

4. RESULTS AND DISCUSSION

When applying synthetic unit costs to BIM objects, the construction cost estimates were found to be roughly 30% higher than those from the actual project. The 'structural floor' element was identified as having the most significant impact on this discrepancy. The cost of constructing a structural floor can vary greatly based on the chosen construction technique. The study also examined other factors to pinpoint areas for enhancement, aiming to refine the reliability of early-phase construction cost predictions through BIM.

REFERENCES

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