

BIM integration for cost management included inflation and market volatility

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Abstract. Cost overruns in construction projects are often driven by inflation and volatile material prices, which are inadequately captured by traditional estimation methods. This study introduces a dynamic, BIM-integrated automated cost estimation framework that incorporates real-time material pricing and official economic indicators to enhance financial planning and mitigate risk. A case study involving 316 residential buildings in Egypt revealed a 24.65% cost overrun, primarily due to significant increases in material prices, particularly for steel and cement. By continuously updating cost data and aligning it with national inflation indices, the proposed framework enhances estimation accuracy, supports proactive decision-making, and enables adaptive budget control throughout the project lifecycle. The findings emphasize the value of integrating real-time economic data into digital construction workflows.

Keywords. Automated Cost Estimation, Inflation Impact on Construction, Dynamic Pricing, and Real-time Cost Tracking.

