

43. A review of the literature on deep type 2 Fuzzy Logic in explainable AI for building construction cost estimation

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Abstract

Accurate cost estimation is essential to the successful completion of building projects in Kenya's dynamic construction industry. This study of the literature looks at how Explainable Artificial Intelligence (XAI) and Deep Type 2 Fuzzy Logic can be combined to improve cost estimation procedures in building development. The study presents an advanced, AI-driven model and critiques conventional cost estimation techniques by combining quantitative and qualitative research methodologies. In order to fill these gaps, the study carefully examines the literature to show where conventional methods fall short and where advanced AI applications can step in. It offers a thorough theoretical framework that makes use of artificial intelligence for predicting strength combined with fuzzy logic's skill at addressing uncertainty. The evaluation uses a stratified sampling technique to collect data through surveys, interviews, and historical data analysis. It classifies construction projects according to their size, type, and location. The efficiency of XAI models in managing complicated factors in building cost estimation is revealed by a critical investigation of these models in conjunction with Deep Type 2 Fuzzy Logic. The knowledge gathered from this research not only enhances scholarly debate but also aids Kenya's construction sector in a practical way by facilitating better decision-making and producing more accurate, transparent, and reliable cost estimates for building project management.

Keywords: *Building projects, Deep Type 2 Fuzzy Logic, Explainable Artificial Intelligence, Construction Cost Estimation, Kenya's Construction Sector*