

A Methodological Framework for Analysing Drone Survey Adoption: Cost and Schedule Accuracy in Small- Scale Accra Construction Projects, 2019

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| Abstract

The adoption of drone technology for topographic surveying on small-scale construction projects in West Africa is an emerging practice. A structured analytical method to assess its impact on project cost and schedule accuracy, which are critical for firm viability, is lacking. This article presents a methodological framework to analyse the adoption of drone-based surveying by small-scale construction firms. Its objective is to provide a systematic approach for quantifying changes in project cost accuracy and timeline predictability following drone adoption. The framework synthesises technology adoption theory and construction project control metrics. It proposes a mixed-methods, longitudinal case study design. Data collection involves structured pre- and post-adoption project audits, semi-structured interviews with project managers, and comparative analysis of survey data against traditional methods. Key performance metrics are percentage variance in budget and schedule. As a methodology article, it presents no empirical results. The framework's application is demonstrated via a hypothetical scenario. A key procedural finding is that the method requires establishing a clear baseline of historical project performance using traditional surveying to enable valid comparison. The proposed framework provides a structured, replicable method for investigating the benefits of drone surveying in an under-researched context. It facilitates an evidence-based assessment of the

technology's impact on core project performance indicators. Researchers applying this framework should secure early access to historical project records and ensure participant firms have completed at least one project using drone surveys. Future adaptations could integrate the analysis of survey data quality and its influence on design phases. drone surveying, construction methodology, technology adoption, cost accuracy, schedule performance, small-scale construction, Ghana, project management This article contributes a novel methodological framework for empirically evaluating the effect of drone survey adoption on construction project performance within the specific context of small-scale firms in West Africa.
