Title: **Comparing Task Performance of BIM and CAD in Completing Construction Project Activities: A Lab Experiment Approach**

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Abstract: Combined usage of computer-aided design (CAD) and building information modeling (BIM) in the same construction project can result in unwarranted issues. Stakeholders might combine CAD and BIM due to a lack of awareness of the benefits of implementing BIM exclusively. A lateral comparison between the impact of CAD and BIM on different project activities can provide stakeholders with the necessary awareness. Therefore, this study aimed to compare the task performance of BIM and CAD in completing different construction project activities in a controlled environment. To achieve that, this study used an experimental lab research approach. The study participants were industry professionals with experience in using CAD and/or BIM to produce different project outputs. The outputs were analyzed to identify shifts in task performance among the participants, including mean and median analysis and ANOVA. The results, encompassing duration, completeness, and accuracy, highlight BIM's superiority over CAD. Extrapolating these results to overall task performance, BIM exhibits approximately two times better performance than CAD. The study reveals that BIM's integrated and dynamic modeling approach contributes to its superior performance, enhancing accuracy, completeness, and efficiency in construction project activities. As a result, the study emphasizes the importance of using BIM exclusively. Nevertheless, this is the first study that laterally compares the performance of BIM and CAD in completing different construction project activities in a controlled environment.

Key words: Building Information Modeling (BIM); Computer-Aided Design (CAD); Construction Project Performance; Task Performance Comparison.

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