Cloud-Based Real-Time Collaboration (CRTC) in Construction Planning Phase: Adoption, Performance, and Success Factors Explored

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The construction industry is confronted with persistent challenges in the enhancement of project planning and collaboration to enhance efficiency and performance. Nevertheless, recent technological advancements have introduced cloud-based real-time collaboration (CRTC) tools as promising solutions for streamlining project planning processes. The objectives of this research are (1) to investigate the current adoption rate and tools of CRTC in the construction industry within the project planning phase, (2) to identify the performance rate of construction projects that adopted CRTC, and (3) to analyse the critical success factors that contribute to the adoption of CRTC in the construction industry. The quantitative method was employed, utilising a structured questionnaire survey to gather data from 120 respondents who represent various construction industry players. The research findings highlighted that the current adoption rate is "moderately familiar" with CRTC in the construction industry, and the performance rate of construction projects is "significantly better" when CRTC is adopted. Five (5) key factors impact the successful adoption of CRTC tools into construction project planning processes: (1) top management support; (2) budget and cost; (3) data security and privacy; (4) compatibility; and (5) perceived industry pressure. By comprehending and identifying these factors, construction stakeholders can develop targeted strategies to effectively expedite the adoption of CRTC tools. Furthermore, this research contributes to the expanding body of knowledge on digital transformation within the construction industry and provides valuable insights for decision-makers, project teams, and technology providers. The research was aligned with the Construction 4.0 Strategic Plan (2021–2025), Malaysian Digital Economic Blueprint, and Sustainable Development Goals (SDGs) No. 9. Additionally, the outcomes of this research have the potential to cultivate a collaborative environment within the construction industry, resulting in improved project planning and execution, reduced project delays, and enhanced overall project outcomes.

Keywords: cloud-based real-time; collaboration; project planning, SDG No. 9, construction 4.0