

Smart Contracts for Decentralized Construction Project Bidding in Ghana: Challenges and Feasibility

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SUMMARY

The research endeavors to pinpoint the existing difficulties within Ghana's centralized construction project bidding procedure and evaluate the practicality, efficiency, and user-friendliness of the suggested smart contract solution for mitigating these issues.

The traditional bidding procedure in construction projects can be susceptible to fraud and collusion among participants. Collusive tactics employed by bidders to secure contracts include offering illegal financial incentives and manipulating the bidding process. Bribed individuals may disclose or alter proposal information, and tendering organizations may unfairly favor certain bidders. This can result in bid manipulation, unfairness, a lack of bid confidentiality, and tampering with information during the bidding process, undermining the competitive nature of the construction industry.

To ensure fairness throughout the entire process and enhance transparency, a secure, irreversible, traceable, and transparent system is increasingly important. (Wang et al., 2012; Tamirat, 2020). Electronic tendering technologies have been introduced to foster competitive bidding and expedite the tendering process. E-tendering serves as an online counterpart to traditional methods, streamlining administrative tasks and potentially reducing costs. These platforms simplify bid and technical information comparisons. However, a major drawback is their reliance on a centralized third-party database and authorized organization for oversight, making them vulnerable to issues like fraud, collusion, corruption, and manipulation. (Chan et al., 2022; Hassija et al., 2020)

Blockchain technology has recently introduced a decentralized approach to managing and storing data, offering a secure and transparent platform. Research suggests that blockchain technology and smart contracts can be used to establish a secure and open tendering

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system

The significance of this research lies in its potential to transform the construction industry by leveraging blockchain technology and smart contracts. The proposed smart contract solutions have the potential to streamline the bidding process, minimize disputes, enhance transparency, and improve overall efficiency.

The results indicate that there are numerous challenges in centralized construction project bidding processes, including issues related to trust, document management, time, accessibility, political influence, competition, fairness, financial aspects, interference, and coordination. 36 respondents representing 44% believed the centralized construction project bidding process was inefficient.

The majority of respondents, 74.1%, expressed a positive belief that smart contracts can effectively address the challenges identified. A substantial portion believes that smart contracts are feasible for construction project bidding, and a significant number are either neutral or very optimistic about the potential of this technology.

Addressing these challenges is crucial for enhancing the efficiency, transparency, and fairness of the bidding process and ensuring that it remains accessible to a wide range of participants. This analysis provides valuable insights for stakeholders in the construction industry and those involved in the bidding process.