

A Blockchain Information Management Framework for Construction Safety

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ABSTRACT

A successful construction safety management process involves systematic collection, management, and distribution of a significant amount of data through various means including stakeholders' safety records, inspection procedures, risk assessment analyses, daily reports, preventive control tasks, incidents reports, and post-incident investigations. Despite the tremendous efforts and research in construction safety, still little is known about a systematic method for safety data management that provides accessibility, transparency, reliability, consistency, and traceability. This study aims to address this gap in knowledge by developing a novel information management framework for construction safety processes using Blockchain. The proposed framework utilizes Distributed Ledger Technology (DLT) to offer a new architecture of trust for reliably sharing information among all entities involved in a construction project who may not trust one another. The proposed method is designed based on a private Blockchain system that maintains a decentralized control of information through permissioned channels to provide a shared view of reliable safety data and records that are accessible, traceable, and immutable. The outcomes of this study contribute to the existing body of knowledge and current state of practice in Integrated Safety Management (ISM) systems that aim to protect construction workers and public through providing timely, reliable, and complete information to all entities involved in a project.