

Blockchain-based Intellectual Property Management Using Smart Contracts

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Abstract. In this paper, we present a comprehensive overview of intellectual property management applications that employ blockchain technology. An exploratory strategy with four steps (Planning Phase, Selection Phase, Exclusion and inclusion criteria, Synthesis) was used to perform this literature review. The theoretical foundation of many papers published in recent years is used as a source of theoretical and implementation research for this purpose. Later, a taxonomy is being developed to categorize these applications based on technical elements of blockchain technology, intellectual property management mechanisms such as digital rights management, encryption, fingerprinting, digital watermarking, and performance parameters. There is currently no comprehensive and systematic taxonomy for blockchain-based copyright protection systems, according to a survey of the literature. Furthermore, the number of blockchain-based content protection solutions that have been effectively established is extremely limited. To close this gap, we propose a taxonomy that incorporates both technical tools and application knowledge such as smart contracts which is a recent technology that is evolving in parallel with blockchain technology. Smart contracts, according to our literature analysis, function automatically, control, or document legally significant events and activities in accordance with the contract's requirements and can help experts construct blockchain-based multimedia copyright protection systems. The objective of this review is to analyse the applicability and feasibility of mechanisms such as smart contracts and address the fundamental aspects of blockchain that might pose security concerns in smart contracts within the field of intellectual property. Moreover, the study also explores certain technical issues and suggests future research directions.

Keywords: *intellectual property, blockchain, smart contracts, digital watermarking, fingerprinting, encryption, digital rights management*