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Unpacking Smart Contracts in the Legal Services: a systematic literature review

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Abstract:

This paper employs a systematic literature review to construct a theoretical framework for the design of smart contracts in the field of legal services. The analysis of 32 studies is categorized into two types: descriptive and thematic. The descriptive analysis reveals that smart contracts serve as the foundation of current knowledge in this domain. Subsequently, a cyclical conceptual model is developed, illustrating the evolutionary progression of legal smart contracts and their interplay with preceding actions. Furthermore, the thematic analysis critically examines the literature, identifying challenges and concerns related to legal service offerings. The proposed model is then briefly applied to address these issues.

Keywords: Systematic literature review, legal services, smart contracts, conceptual framework

1. Introduction

The utilization of smart contracts has permeated various sectors, including the public sector, supply chain management, and industries such as automobiles, real estate, insurance, and healthcare (Chamber of Digital Commerce, 2016; Hu et al., 2018). This increasing adoption of smart contracts has generated discussions regarding their legal implications. Projections indicate a potential growth rate of 17.4% in the forecast period of 2020-2025, with an estimated value of USD 208.3 million by 2025 (Marketsandresearch.biz, 2020). Consequently, research efforts have intensified to address the need for reducing legal uncertainties and mitigating risks associated with smart contracts (Boto, 2019). Furthermore, there is a desire to establish a jurisdiction that is perceived as blockchain-friendly, aiming to attract this rapidly expanding industry (Akilo, 2020; Ridder et al., 2017).

The impact of smart contracts stems from their ability to enhance operational efficiency (Angelo et al., 2019, p. 392) through automation, risk mitigation, standardization, and transparency. Smart contracts based on blockchain technology have facilitated automated insurance claims, corporate governance, and operational transparency in clinical trials (Ferreira, 2021). These applications have streamlined the enforcement of legal obligations (Wright & De Filippi, 2015, p. 18).

The need to operationalize legal smart contracts is exacerbated by the presence of ambiguous legal terms (Ferreira, 2021). Ferreira (2021) highlights several terms that are ill-suited for smart contracts, such as "reasonable efforts," "best endeavors," or "good faith," as well as circumstances where contractual parties may be exempt from fulfilling their obligations without incurring liability, including impossibility, force majeure, and occasionally hardship, illegality, and public policy (depending on the legal system). Utilizing smart contracts to represent implied principles of contract law and ambiguous legal expressions can be costly and highly inefficient. Consequently, a prescriptive approach becomes necessary to effectively operationalize complex smart contracts. In light of these considerations, this systematic literature review (SLR) aims to achieve the following objectives:

- Explore and comprehend the contributions of smart contracts to the field of legal services.

- Investigate the ways in which smart contracts have been developed to enhance legal service operations.
- Establish a conceptual framework for integrating smart contracts into the business of law, enabling a prescriptive level of smart contract utilization.

2. Methodology

To ensure the comprehensive consolidation of relevant literature in this systematic literature review (SLR), a multiphase analysis was conducted. It is imperative for an SLR to provide a detailed account of its search strategy to facilitate replication by other scholars (Linnenluecke et al., 2020). The completed literature review is presented below, along with the detailed framework:

Stage 1: Question formulation. This study focused on three research questions:

- What are the applications of smart contracts in the legal service sector?
- How are smart contracts operationalized in the context of legal services?

Stage 2: Locating studies. To gather an extensive and comprehensive range of literature, five keyword searches were conducted in three online databases. The selected keywords were derived from field expertise and other literature related to sports data analytics. The search phrases used were as follows: Blockchain Technology, Legal Contracts, and Smart Contract System. The databases employed for the search were Scopus, ScienceDirect, and ProQuest. These searches were supplemented with predefined inclusion and exclusion criteria. Specifically, the study included only articles written in English, peer-reviewed articles, and those published from 2017 onwards. The selection of this time frame was based on the observation that although research on smart contracts existed prior to 2014, the scope and volume of research expanded significantly from 2017 onwards. The initial searches yielded approximately 650 potentially relevant articles, along with 2081 citations.

Stage 3: Study selection and evaluation. The 650 articles were systematically coded according to their relevance to sport data operations: Green (accepted, containing relevant data operationalization practices and theories in a legal context), yellow (potential acceptance, focus on legal contracts was unclear), and red (no focus on smart contracts). Consequently, a total of 354 studies were found to be related to blockchain, while an additional 56 studies focused on legal contracts. These 56 articles were then subjected to discussion among the researchers, resulting in a final selection of 32 articles for review.

Stage 4: Analysis and synthesis. The selected studies were coded using NVivo to identify common nodes within the literature corpus. The analysis was subsequently divided into two phases: descriptive analysis and thematic analysis. The descriptive analysis aimed to review the selected studies and provide insights into the smart contracts employed for analysis, while the thematic analysis critically examined the literature.

Stage 5: Reporting and utilizing the results. The outcomes of the SLR will be presented in the results, thematic analysis, and discussion sections. The findings from the SLR will address the three main objectives stated earlier. Initially, the outcomes of the descriptive analysis will report on the key innovations in smart contract usage found in the literature. This analysis will then be problematized to provide insights into the necessity for a legal smart contracts model and to identify crucial areas for future research.

3. Findings

Smart contracts have garnered significant interest and hold immense potential, offering substantial benefits. The UK Jurisdiction Taskforce (2019, p. 3) asserts that in legal terms, crypto assets and smart contracts undoubtedly represent the future. Given the potentially disruptive and transformative nature of blockchain-based smart contracts, it is crucial to comprehend and elucidate the normative aspects of

this innovation and establish its legal foundations. The systematic literature review (SLR) undertaken in this study revealed a diverse range of legal problems and areas related to public procurement. The research encompassed various focal points, with 16 studies specifically examining legal innovations. This section will delve into these studies, highlighting key technologies and innovations, and draw inferences to aid in contextualizing legal smart contracts. The research demonstrates the advantages of legal smart contracts and their applicability in the legal sector. Ladleif and Weski (2019) advocate for smart contracts as a mechanism to reform the legal domain by automating administrative and procedural tasks while minimizing the risk of fraud and manipulation.

4. Conclusions

The SLR provides a comprehensive overview of how the legal services sector is embracing novel methods involving technology, blockchain, and smart contract innovations. While this is essential in demonstrating the potential applicability of smart contracts in legal services within ideal and specific environments, it also highlights the challenges that arise when dealing with the dynamic variables inherent in the provision of legal services. Our proposed conceptual model aims to bridge the gap between research and reality by offering insights into the implementation of smart contract ideology. The proposed model facilitates research on enhancing existing legal services and addresses the challenges encountered in the realm of smart contracts. By providing a framework for the implementation of prescriptive legal smart contracts, we enable innovation-driven transformation. It is important to note that the law will continue to adapt to blockchain capabilities incrementally rather than through revolutionary change.

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