Merging traditional contracts (or law) and (smart) e-contracts – a novel approach

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Abstract

For a long time, there have been various parallel developments in the area of AI and Law, Legaltech more recently or computable law, data exchange formats, e-contracts, agreement systems and similar. Some working more on creating normative or logical systems outside of traditional law such as business logic systems, others on bringing probabilistic approaches to reasoning about law or understanding human language, and as an extension, law written in that language. A particular important development are computable contracts, either through DSLs, understanding of natural language or repurposing of other languages such as logic-based languages. In this paper, the most important competitors for writing computable contracts that translate to the environment of a blockchain's normative environment will be examined in light of their usefulness for creating and merging contracts and e-contracts, functionality and legal looks. Championing the idea that the machine does not actually have to understand anything to be useful, as long as it can comprehensively translate, all the while keeping syntax and semantics intact, making for a more closely integrated contract stack.

1 Introduction

This work compares several kinds of programming languages that are used and developed for working in conjunction with or instead of traditional legal contracts, compared specifically when deployed upon a blockchain based smart contract system or a similar normative environment. Different approaches and methods are available, from simple computer code that in effect also has legal implications but isn't a contract as such and various bridging technologies and (such as SCTs (Wong, Meng 2018)) to the newest advances in writing contracts that have an automatic and accurate electronic representation. "Legal Tech" in various forms and different comprehensions has been all the rage for a while now, and still is. (Braegelmann, Breidenbach, and Glatz 2019) There has been tremendous progress in everything from probabilistic analysis of legal cases to templating systems and contract management systems, as well as the processing of large amounts of cases in specific niches, such as with flight delay claims and similar mass markets. This also brought renewed interest in general AI & Law/computable law as well as more specifically computable contracts. This work then focuses on computable contracts as understood by Surden (Surden 2012), represented by merging a traditional, natural language legal contract with a smart contract or other e-contract systems. The paper at hand will focus on contract law and specifically a licensing contract for software evaluation. This will be implemented and compared in three different systems. The comparison is made between a direct smart contract language (Solidity) (Christian Reitwiessner 2020), Prolog (SWI-Prolog 2020) as an alternative declarative, logic-based approach and the Lexon (Diedrich 2020) Smart Legal Compiler using an NLP-like approach and a smart contract templating system. Each of the approaches will be briefly introduced where after the implementation is introduced, and finally they will be compared and evaluated based on Surden's criteria and general legal and technological considerations defined more accurately later on. After the introduction, there will be a brief 'primer' on previous and existing technologies of AI & law and specifically e-contracting. Thereafter the method and case-selection employed here will be implored in more detail, explaining how implementations were made and tested. Then, the overall case and example license will be presented, where after each implementation is introduced, first by introducing the technology itself and then the implementation that was made. In the end, an analysis is conducted, and a conclusion drawn. After specially designed programming languages, legal interchange formats and different bridging technologies either with or without smart contracts, new natural-language-like systems present a new frontier for legal programming and e-contracting, merging traditional and electronic contracts.

2 Primer on Legal Technologies

For quite some time, various technologies for some kind of digitalization of law have been developed under different headings, such as 'ai & law', 'computable law' , 'computable contracts' , 'e-contracts' or 'smart contracts' , 'contract management', 'rule systems', or even very generally 'legal tech' which has in recent years become more and more popular with the rise of startups and law firms focusing on legal innovation and digitization.

2.1 Legal Markup

On a basic level of textual representation, there are the systems that structure legal documents, with some tailored towards legislative or judicial documents and others targeting contractual documents. This is covered by Legal XML