11-2019

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Citation

OOI, Vincent. Contracts formed by software: When things go wrong. (2019).
Available at: https://ink.library.smu.edu.sg/sol_research/2962

Contracts Formed by Software: When Things Go Wrong

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OBLB Keywords: Agency Law, Artificial intelligence, Contract law, Law and technology, Mistake

The use of software in contract formation is likely to become increasingly pervasive in light of the digital economy. Consequently, software can also be expected to exhibit greater autonomy and take on increasingly complex transactions and contract negotiations. It is important that a legally coherent, fair, certain and economically justified approach be taken to regulate such contracts.

A 'contracting problem' arises when software is used to autonomously enter into contracts without human input. The formation of a valid contract requires, inter alia, an agreement between two or more parties, where each party exhibits an objective intention to be legally bound (the 'Objective Theory of Contract'). As software develops to become more sophisticated, in some cases, it may act autonomously in forming contracts, requiring little to no human input. The contracting parties may well be unaware of the specific terms of each contract formed by the software they are using. Under the Objective Theory of Contract, no objective intention to be bound can be inferred and thus, theoretically, no binding contract will be created (the 'contracting problem').

A 'contracting problem' does not inevitably arise just because software is used in contract formation. In my recent paper, 'Contracts Formed by Software: An Approach from the Law of Mistake', I draw a distinction between 'passive' contract forming mechanisms, which merely relay the representations of the human actors controlling them, and 'active' contract forming mechanisms, which make autonomous decisions such as whether to contract, and under what terms to do so. The use of 'passive' contract forming mechanisms is completely in line with the objective theory of contract, given that each party exhibits, through the communication device, an objective intention to be legally bound to each specific term of a contract.

In comparison to 'passive' contract forming mechanisms, 'active' contract forming mechanisms are a recent development, relying, inter alia, on artificial intelligence and machine learning to aid or even almost entirely replace a human user in the process of contract formation. Instead of merely relaying the user's representation in a 'passive' manner, new technologies are actually able to autonomously decide the terms and conditions of the electronic contracts and execute those contracts. The role of the human operator is limited to stipulating the rules or objectives that guide the electronic agents in the process of contracting. The human operator does not directly participate in the process of contracting or in the determination of the final contract. In certain situations, we might not even be able to predict the result generated by the software, which might be because the software is used to analyse copious amounts of data before making a decision.

Such 'active' contract forming mechanisms do not fit neatly within the Objective Theory of Contract. Conceptual questions may be raised, such as whether there can be a meeting of the minds if neither party knew terms of the particular contract entered by their software at the time of the transaction. In the absence of any such consensus ad idem, one might even question as to whether an agreement can ever validly be reached when such mechanisms are used.

My paper looks at these issues largely in the context of English Law, though the issues would undoubtedly be relevant across Common Law systems (and, at a more abstract level, to Civil Law systems as well). It considers three leading solutions to the contracting problem. These solutions can also be described as rules of attribution, since they determine how and under what circumstances the acts of software will be attributed to its user. There are both theoretical and practical considerations. The process of contract formation is not always a smooth one and unintended consequences may sometimes ensue. Contract law determines the allocation of risk in this process and has to maintain an optimal allocation even as developments in software raise new dimensions to contract formation.

I suggest that the 'mere tools theory', which views software as 'mere tools' of communication, is too harsh as it binds users to any software malfunction. The agency approach, which treats software as electronic agents, capable of contracting on behalf of their users, is untenable as it ascribes unrealistic characteristics to software. I suggest that the optimal solution is to extend the objective theory of contract, which would allow parties to agree in advance to accept any contract entered into by the software they have chosen that is within pre-set parameters. This is a logical development of the law of contract, which has on numerous occasions adapted to reflect changing commercial realities, often those brought about by technological development.

In order to achieve an optimal allocation of contractual risks that may arise in the process of contract formation, where software produces an unintended consequence, this should be seen as a mistake. The law of mistake will allow a party to rely on the representation made by the software of his counterparty unless the former objectively has reason to believe that the latter (or the latter's software) has made a material error in the process of contract formation. In this way, contractual certainty is preserved, while the 'mistaken' party is not unduly taken advantage of.