Professional Perspective

Benefits & Risks of Decentralized Dispute Resolution

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The development of blockchain-assisted technology is widely considered one of the most significant developments in the tech world, and many view blockchains as having almost limitless potential. Despite severe turbulence in the crypto ecosystem of late, tech entrepreneurs are eagerly searching for new and profitable applications of blockchain-related technologies.

One relatively new blockchain application is an emerging form of alternative dispute resolution (ADR), commonly referred to as "decentralized dispute resolution" (DDR). DDR refers to a method of resolving disputes between private parties using blockchain-assisted technology and a decentralized set of decision-makers, as opposed to a centralized decision-making authority. This innovation may assist parties in resolving disputes arising out of "smart contracts"—programs that enable self-enforcing agreements built on blockchains.

More broadly, some believe that DRR might offer an attractive substitute for typical methods of dispute resolution, including court litigation and private arbitration. Proponents of DDR believe that it may permit parties to resolve disputes more quickly, at lower costs, and with enhanced protections for the decision-making process. This article provides background on blockchain technology and on the application of distributed ledger functionality to dispute resolution, and analyzes potential advantages and challenges posed by this emerging use of decentralized systems.

Blockchains, DAOs & Smart Contracts

Blockchains

A blockchain is an online ledger that authenticates and keeps records of all transactions involving a given class of assets or activities. But rather than having a server or recording system under the possession of a single entity, the network storing those transaction records is distributed across a large number of machines and devices, each one serving as a single "node" in a physically distributed network.

One element that makes the technology particularly valuable is that it is exceptionally hard to alter the history of transactions recorded on a blockchain. Whenever a new transaction is entered into the ledger, it is linked to the previous entries, which are stored in "blocks." Altering the records of an entry in the ledger affects the records of subsequent entries all the way down the line, making attempted alterations easy to detect, and requires authentication throughout the network. The result is a chain of mutually-reinforcing blocks of entries—a "blockchain."

A blockchain can be used, for example, to record each instance of a digital asset changing hands. This can be used to keep track of the chain of ownership for a unique asset, e.g., a non-fungible token. It can also be used to track digital assets that are meant to be fungible and can be used as digital forms of currency. A blockchain can similarly be used to record voting decisions by members of a decentralized autonomous organization (DAO), who utilize a decentralized network to coordinate activity digitally, without having to rely on a central authority.

Smart Contracts

Blockchains overlap with another promising new technology—smart contracts, which are computer programs that automatically execute functions upon the occurrence of certain pre-specified conditions. Smart contracts allow parties to automate the implementation of legal agreements without relying on human actions for various functions, which can save the parties time and can eliminate some of the risks associated with trusting a human to carry out manual processes. For this reason, smart contracts are sometimes referred to as "trustless" systems.

Through smart contracts, parties can guarantee conditions-dependent performance of specific, legally required actions. These conditions and actions can include transfers of digital assets, notifications to parties or third parties, recordation of information on distributed ledgers, entries of votes on decentralized decision-making platforms, or anything else that an algorithm can be programmed to recognize and implement. Once the smart contract detects the occurrence of a predicate event, it sends commands to a network of computers to automatically perform contractually required actions, which are themselves then recorded on a blockchain.

A smart contract requires the parties to agree to a framework for determining when the terms of an agreement have been met, how those terms should be structured, and, ideally, how to resolve any associated disputes. Notwithstanding the automatic performance that smart contracts promise, these programs are not always able to recognize when those terms have been fulfilled, and are instead limited by the foresight of the humans constructing them.

This means that parties to smart contracts should agree on how to resolve inevitable disputes and uncertainties that may arise. The parties could choose to resolve disputes the conventional way—through litigation or centralized private arbitration. But, in keeping with the ethos of blockchain, they might instead choose to resolve disputes in a more decentralized manner that leverages distributed ledger technology.

For example, the parties might set up a software mechanism that would allow a dissatisfied party to enter a complaint, which would trigger a dispute resolution process without requiring a human to file a suit or seek out an arbitrator. Additionally, parties entering into traditional contracts not built on a blockchain may nonetheless wish to use a decentralized, blockchain-based solution to resolve their disputes. Enter DDR.

Potential Advantages of DDR

The advantages of DDR may vary, depending on how it is structured. One approach would treat the blockchain as just a new platform for conducting traditional forms of dispute resolution. This model would involve selecting an arbitrator—or a panel of arbitrators—providing them with the relevant evidence in a secure digital format, and entering their decision onto a blockchain. The substance of their decision might then be executed automatically, depending on whether a smart contract is implicated and, if so, how it is programmed.

Another approach would be to use blockchain technology to create a wholly new dispute resolution process—one with basic structural differences from traditional litigation and arbitration. Decentralized technology allows for a large number of users to engage in collective decision-making, as in the case of a DAO. Some believe that a system like this could enable parties to conduct an alternative dispute resolution process that more closely resembles an informal, widely distributed jury trial than an arbitration.

On this model, each party could submit its position and evidence to a large collection of voters via their blockchain wallets, and voters would then evaluate the positions and evidence and record their votes on a blockchain. Voters could then be instructed to deliberate either independently or collectively through a secure channel.

Proponents of DDR believe that it can offer a number of benefits over those of current dispute resolution options. A larger decision-making panel would enable more people to weigh in, which may counteract individual biases in the decision-making process. DDR could also provide greater security and increased anonymity for the decision-makers. It could, likewise, facilitate faster resolution of disputes, at lower costs. If, for example, each party's advocacy and evidence were required to be condensed into a two-hour virtual presentation to a wide group of decision-makers, the litigation process leading up to the presentation could be significantly streamlined.

Another possible advantage is that a decentralized process could be automated, and execution could be integrated seamlessly into a smart contract. This would require less human interaction—if any at all—to initiate or enforce a dispute resolution process and, at least in theory, could make the process more efficient and trustworthy.

These so-called "trustless" systems—i.e., systems that do not rely on trust in humans or their judgment—are enjoying considerable popularity in certain circles within the tech community. Some tech enthusiasts and "crypto-economists" view the development of decentralized systems as a sort of technological renaissance—one that will bring about a new era of autonomous, democratic, and secure economic transactions across the world. So, while litigants might value a decentralized dispute resolution system for its practical benefits, others may weigh the advantages of DDR in terms of broader, more ideological principles.

DDR's Potential Challenges

While DDR promises a number of benefits, the idea is still in its infancy, and several issues would likely need to be resolved before the technology could be implemented on a large scale. Some of these issues could be addressed fairly easily, in accordance with the parties' needs, through private ordering. For example, parties could include a provision in their agreement specifying which national, international, or state law should apply in the event of a dispute requiring DDR, mirroring the way commercial contracts include choice-of-law provisions in the event of litigation or more traditional arbitration.

Other issues pose considerable technological and behavioral hurdles that have yet to be overcome. In the case of adapting conventional forms of dispute resolution, such as arbitration, these issues are less pronounced, but it is also not clear how much value a decentralized method would add. And in the case of a new, hybrid process resembling a jury system, the unknown variables relating to the integrity of the process and its outcomes are greater.

Voter Selection

One question is how to ensure that the decision-makers are qualified and disinterested. A DDR platform could readily set the qualifications for a given dispute and select voters who meet those criteria. The voters could be handpicked by the platform—without the parties' knowledge—or randomly selected from among those who are qualified.

When dealing with disputes involving technical issues, the parties could agree to choose voters with relevant technical backgrounds. Disputes that hinge heavily on complex applications of technical regulations, for example, might call for individuals with legal backgrounds, whereas more straightforward factual issues could be entrusted to anyone fit for jury duty. One can even imagine a hybrid structure containing two or more panels, one consisting of laypeople assigned to resolve issues of fact and another featuring attorneys or retired judges assigned to resolve issues of law.

Enforcement

How could such a system ensure that the parties abide by a DDR-based decision? Parties could address this issue in more than one way. As one example, the parties could have a smart contract that is programmed to execute automatically the terms of any decision. The parties could even automate enforcement by linking a monetary award to an escrow account and having the smart contract execute a transfer of funds to the winning party once a decision has been rendered. The same could be done for legal fees, in the event the parties' agreement calls for fee-shifting.

Would parties be able to appeal decisions rendered through DDR? The parties could agree in advance on this issue. While many arbitration provisions stipulate that arbitrators' decisions are final and non-appealable, there is in principle nothing to stop parties from agreeing that they can re-litigate their dispute in court if they disapprove of a DDR outcome, or if certain conditions are met—e.g., if a DDR decision is supported by less than 60% of the voters. The parties may also want to agree in advance on whether a DDR decision will be admitted into or excluded from evidence in any subsequent proceeding.

Voter Reliability

Perhaps the most daunting challenge for DDR is finding a way to compel good behavior among voters—in other words, making sure that those participating in the decision-making process do their best to be objective and impartial. Existing platforms seek to incentivize voters to do their best by requiring them to stake cryptocurrency as collateral, making a given decision-maker's payment contingent on the quality of their decision. But since the process is decentralized, there is little to use as a basis for evaluating voter behavior aside from the outcome of their decision-making process.

One approach that seems to be favored in the nascent DDR community is to reward or punish voters on the basis of whether their vote aligns with the majority. At least one startup is particularly confident in this approach, running an ADR program on the Ethereum blockchain that selects vetted jurors at random. These jurors review the dispute and vote anonymously after a certain number of days, putting up cryptocurrency as collateral for their participation. Jurors are paid if they vote in line with the majority, but they lose some of their collateral if they vote out of step with the majority.

The theory behind this model is that, with a large enough group, any personal biases or interests will be sufficiently diluted, and the wisdom of the crowds will win out. But this incentivizes voters to vote for what they believe the majority will vote for—i.e., the most popular answer— not necessarily what they consider the right answer. That dynamic can result in voters making choices that they consider the wrong answer in the interest of avoiding being punished for going against the majority.

For example, suppose that a decentralized panel of 10 voters is choosing between option A and option B, and that six voters believe option A is the right answer. If two of them believe, for any reason at all, that the majority is likely to vote for option B, that gives them an incentive to vote for option B instead of option A. In a scenario like this, it only takes two voters who are afraid of going against the majority to tip the scales in favor of an outcome they otherwise would not vote for.

One improvement on this proposed method would be to aggregate the participants' voting history over multiple decisions. In other words, instead of rewarding or punishing voters based on whether they align with the majority in each specific case, a DDR platform could tie participants' rates of compensation to a general quality rating based on their respective performance. This quality rating could be designed to take into account any number of statistical measures, such as how frequently or how sharply a given voter deviates from the majority over a large number of cases. Doing so might provide a more accurate measurement of voters' reliability, though it would not completely eliminate the majoritarian aspects of this approach.

Security

The DDR process would provide voters with nominal anonymity, but some might worry that its decentralized nature would allow parties to tamper with voters' decision-making. It is widely accepted that a legitimate dispute resolution process must prevent decision-makers from being influenced by anything other than the facts and the law. This means shielding them from bribery, threats, or other undue influence—and preventing collusion.

But a decentralized model may lack a built-in system of rules or enforcement mechanisms to prevent interested parties or their proxies from contacting voters—to the extent voters can be identified. The security and anonymity that blockchains can provide would ideally protect voters' identities, but the last year alone has shaken many people's confidence that blockchains are as unhackable as their creators believe.

Besides, keeping voters anonymous would only address one side of the problem. There might also be no built-in mechanism—aside from ethical rules applicable only to counsel and not to parties themselves—to prevent voters from contacting parties in ways that could compromise the integrity of the process. That risk exists already for traditional jury trials, but the more voters there are, the higher the risk.

Trustless Technology

Even a full-fledged DDR model does not eliminate trust in humans entirely. For example, numerous contractual terms and doctrines—e.g., "best efforts," "force majeure," and "good faith and fair dealing"—embed a level of judgment and discretion. A DDR system charged with resolving a dispute over such issues will necessarily entrust that judgment and discretion to humans—albeit a broad group as opposed to a centralized authority.

More generally, as in traditional litigation and arbitration, the decisions rendered through a DDR model are only as reliable as the evidentiary inputs that feed into the model. As a result, to the extent such inputs are untrustworthy—e.g., a smart contract is dependent on LIBOR, but LIBOR itself is being manipulated—a DDR model is likewise vulnerable to unintended outcomes. In fact, a DDR model heavily dependent on smart contract inputs may be even more vulnerable to manipulation than traditional litigation or arbitration, given that smart contracts by definition lack human judgment that might otherwise identify and reject such manipulation.

Conclusion

Some of the issues raised by DDR are not fundamentally new. In principle, they could be resolved by specific language in the parties' agreements, similar to traditional ADR provisions. However, there are some more challenging issues—particularly around reliably ensuring optimal decision-making—that likely require further development of technological and behavioral safeguards in order to deliver a trustworthy DDR process.

The quality and effectiveness of those safeguards will likely determine whether, and to what extent, more people turn to DDR for dispute resolution. DDR and other blockchain applications are often touted as being trustless—eliminating the need to rely on human actors who might not be trustworthy. But in order for people to be willing to remove the element of human trust, the system they are choosing to rely on instead must be at least as trustworthy as the human actors being replaced. DDR does not eliminate the role of humans entirely; since it requires judgment and discretion, DDR merely shifts the decision-making process to a more diffuse group of individuals.

As with all technologies, the advantages of DDR are likely to come with tradeoffs. These may simply be the price of choosing a decentralized system. Parties considering whether to use DDR would be well advised to reflect on their goals and levels of risk tolerance, to consider how high the stakes are for them, and to weigh the risks of DDR against the likely gains in efficiency. Likewise, parties inclined to participate in a DDR model should engage counsel familiar with DDR principles, features, and potential pitfalls.