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Is There a Trilemma Associated with Using Blockchain to Protect Trade Secrets?

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In the past two years, there has been a handful of commentaries expressing mixed views on how blockchain technology can be applied to protecting a company's most valuable trade secrets.

This article takes a step back to evaluate whether and why (or why not) blockchain may be a good fit for realizing this objective conceptually, making reference to the inherent blockchain trilemma, correlating any complementary technological merits to business needs or legal requirements, and then ambitiously setting the stage for analyzing real-life implementations and the value-add.

Inherent Characteristics

The trilemma of blockchain, as Ethereum founder Vitalik Buterin observed, is that in the quest for *security*, *decentralization*, and *scalability*, only two of the three requirements can be achieved simultaneously. Is the compromise on the third requirement something that a cautious company can live with?

For protecting trade secrets, plainly *security* is paramount. One would not want the company's prize formula to be corrupted, lost, or overwritten. Data integrity is crucial. One way to heighten *security* is to *decentralize* the verification process.

That leaves *scalability*. The system may operate more slowly (lengthy verifications as the nodes work towards consensus) as the number of nodes increases. But would a company that had stored its trade secret on a blockchain years in the past necessarily care about the speed at which current transactions are being processed?

Other Related Properties and Merits

Another trait of a decentralized blockchain is its relative *immutability*. This is a natural consequence of having a distributed, public ledger. Permanence can be beneficial for some aspects of trade secret protection, but probably

not for keeping safe third party confidential information.

This brings us to *trust*. One way to side-stepping the bottleneck of a consensus-based model as the network grows in scale is to centralize and entrust some of the decision-making in a reputable third party provider. The tradeoff to consider is whether the central authority is corrupt (or corruptible), and if not, whether it is more likely to be hacked than a decentralized system.

The final aspect worth raising is *visibility*. Information encoded within the blocks of data are visible to anyone with access. On a public, permission less blockchain, that means everyone. Transparency allows users to police and quickly detect any tampering. Displaying one's trade secret in plain sight would normally be fatal—frustrating the legal requirement of secrecy—but data may be encrypted before it is hashed and uploaded.

Preliminary Observations, Limitations, and Vulnerabilities

While blockchain can be used to record data, it falls short of proving *ownership* of a trade secret. Even with the time stamp and the decryption key, the most a company can show is that it had *possession* at a certain time.

There is also the risk of a hash collision—where two sets of data inputs result in the same output—which is not very likely, but not impossible. The threat is that by sleight of hand, a competitor could produce a similar but different document to hold up in court that would cast doubt on whether plaintiff's copy was an exact copy of the time-stamped one whose hash signature was stored in the blockchain.

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