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Blockchain and Smart Contracts: A Systematic Review

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Keywords: blockchain; smart contracts; ethereum; bitcoin; internet of things

1 Introduction

Blockchain is one of the hottest topics in both academic and financial world. It was introduced in 2008 through Bitcoin as a peer-to-peer payment system for electronic transactions allowing two parties to send payments to one another without the intermediation of financial institutions, preventing double-spending (Nakamoto, 2008).

Lately, blockchain has been used in a broader manner (Luu, 2016), enabling the creation of smart contracts. The main concept behind smart contracts is that the contractual clauses formalizing a transaction between two parties (collateral, bonding, property rights, etc.) are enclosed in the hardware and software (therefore into property) fading the needs of a third-party (or central authority) governing these transactions.

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2 Objectives

In order to apply blockchain to transactions, it is necessary to understand how this technology works. Blockchain is nothing more that data structure, divided into blocks. Each block holds a piece of information, referenced to the preceding block in the chain, forming what is called a chain of blocks, or blockchain.

3 Methods

Blockchain technology allows a peer-to-peer network in which non-related members interact with each other, authenticating transactions. The foundations of this new system are the transparency, traceability and replicability of transactions from the source to its last instance. Smart contracts can be coded using, for instance, a programming language known as Solidity.

4 Results

Correctly coded blockchain transactions in Ethereum, for example, would help companies operating in exchange and clearing houses cut their transactional fees by entering into a reliable, corrupt free system, thanks to the blockchain mining technology behind them.

5 Conclusion

While the application of blockchain in many industries is far from being fully developed, this technology still faces certain issues that must be addressed. More investigation and further development will benefit blockchain becoming more scalable and secure, preventing misbehavior in the network. Although today it is far from being the ideal solution to challenges in a variety of sectors (energy, logistics, education, medicine), its characteristics set hopes for a greater importance in the years to come.

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