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Adoption of Blockchain in Financial Services

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ABSTRACT

This paper aims to investigate the adoption of blockchain in the banking industry. The topic was researched by utilizing previous research papers and blockchain product/ service providers. There are several use cases of the blockchain in the financial sector. However, blockchain adoption is still in its early stages.

Keywords: Blockchain, Fintech, smart contract, CBDC, payment gateway, smart asset, KYC

I. INTRODUCTION

Blockchain is one of the hottest topics in the academic and finance sectors. The technology is viewed as ground-breaking and has the potential to disrupt industries. Adopting blockchain can enable process efficiencies, build fundamentally different operating models, and help cost optimization.

From settlements to real-time payments to P2P lending, the financial industry for long has been cited as the strongest use case for blockchain. This paper reviews the current adoption of blockchain in financial services and the pros and cons of each adoption.

II. Overview of Blockchain

A blockchain is a method of structuring data in which each data block is linked to another block in chronological order. The chain of blocks is a shared, immutable ledger, and it facilitates the process of recording transactions and tracking assets in a network. Each new transaction is recorded as a block on a digital ledger after it is verified by participants (nodes). It is impossible to edit the recorded transaction data present in the digital ledger, thus making it immutable. Virtually anything can be tracked and traded on a blockchain network.

Information is critical for running a business. The faster the information is received, and the more accurate, the better a company will function. Blockchain is considered an ideal vehicle for delivering information because it provides immediate, shared, and utterly transparent information stored on an immutable digital ledger that is highly secure. A blockchain network can deliver any information from payments to accounts to production transparently. And because all participants share a single view of the digital ledger, you can see all details of a transaction end to end, making it a high confidant source of doing a transaction, storing information, and doing business in general.

1. Key Elements of Blockchain:

The blockchain consists of three key components:

- Distributed Ledger: A digital shared ledger that stores records of information/transactions. The records are immutable, and transactions are recorded only once.
- Immutable records: No one can change or tamper with a transaction after it has been recorded. If the initial recorded transaction has an error, a new transaction needs to be logged, and both will be visible in the ledger.
- Smart Contracts: These are programs stored on a blockchain that run when certain predetermined conditions are met. Smart Contracts can automate the execution of agreements without any third-party involvement or might be used to automate a workflow.

2. Private vs. Public Blockchains

Public and private blockchains are decentralized peer-to-peer networks with a consensus protocol to maintain the ledger; however, a public blockchain network is open to all, while a private network is an invitation-only affair. Bitcoin is an example of a public blockchain that anyone can join and participate in. Public blockchain requires substantial computational power and has little privacy for transactions. Because of these reasons, enterprises often consider using a private blockchain. The owning enterprise governs the network for a private blockchain, controls who participates, executes a consensus protocol, and maintains the shared digital ledger.

3. Benefits of The Blockchain

Blockchain can improve financial services in the following ways: reduced costs, greater transparency, and improved security.

a) Reduced Costs: The reduced costs stem from increased automation, such as replacing financial advisors with digital advisors.
b) Greater Transparency: The blockchain allows for greater transparency as the record of transactions is available publicly for anyone to scrutinize.
c) Improved Security: The cryptographic attribute of blockchain transactions enhances security by reducing the risk of interception arising from intermediaries.

4. Drawbacks of The Blockchain

The blockchain offers multiple benefits; however, some drawbacks to the technology.

1. Lack of Regulation: The development of regulations for blockchain technologies is non-existent in several countries. Therefore, there is uncertainty regarding how future regulations will affect the blockchain-based financial industry.
2. Cryptocurrency Scams: Several cryptocurrency scams have occurred with bitcoins and other currencies using public blockchains. They involved both outside actors (hackers) and inside actors (project owner/team).

III. Adoption of Blockchain in Financial Services

Let's look at the various adoption of blockchain in financial services.

USE CASES OF BLOCKCHAIN IN THE FINANCIAL SECTOR

1. Payment Systems

Blockchain technology offers a fast, secure, and cost-effective way of sending cross geography payments without the need for a 3rd party verification. Today a cross-geography wire transfer through traditional banks costs customers a flat fee (generally $25) and a currency conversion fee. Cryptocurrencies like bitcoin built on public blockchains can be used to send and receive money. They help cut down on the need for a trusted intermediatory (here the banks) to verify

transactions and hence all the associated costs of the 3rd party.

Pros and Cons: Blockchain provides customers with a faster, cost-effective, and secure way of sending money better than what traditional banks can offer today. However, the biggest drawback is the security of the funds. The bank guarantees payment delivery to the correct destination in the conventional transaction method. In the case of fraud, banks ensure the safety of funds. Given that blockchain is a decentralized ledger, the payment gateway users are reliant on the gateway operator to secure it. Moreover, the users risk losing their funds if the gateway is hacked.

Use Case: RippleNet is a project of blockchain-based payment settlement company Ripple. RippleNet is a bank network that sends and receives payments via Ripple's distributed financial blockchain technology. The RippleNet ecosystem consists of banks and payment providers as "members" and corporates, consumers, etc., as "users." The RippleNet members are connected through Ripple's API-based xCurrent software. "xCurrent is the first global real-time gross settlement (RTGS) system that enables banks to message, clear, and settle their transactions with increased speed, transparency and efficiency across."

2. Central Bank Digital Currency (CBDC)

A Central Bank Digital Currency is a digital representation of the official fiat currency of a country. A CBDC is the liability of the nation's monetary authority. For example, In the U.S., the Federal Reserve would be responsible for issuing a CBDC. There are two types of CBDCs: Wholesale and Retail. A wholesale CBDC is meant to be exchanged and traded between private and central banks, whereas regular consumers can use a retail CBDC.

Pros and Cons: CBDCs can help with financial inclusion by allowing people to use payment methods even if they don't have a bank account. Globally, about 1.7 billion unbanked people live in developing countries such as China and India. On the other hand, CBDCs give the country's central bank complete control over the digital currency. Moreover, there may be less privacy for users of the CBDC compared to users of decentralized digital money.

Use Case: Since 2014, the central bank of China, the People's Bank of China (PBOC), has been developing the e-CNY, the digital form of the country's sovereign currency using blockchain technology. The objective of developing the e-CNY is to "create a new form of RMB" that fulfills public demand for cash in a digital economy. Until recently, the PBOC was piloting the digital currency through lotteries in selected cities; however, now it plans to expand its rollout of the currency through partnerships with tech giants such as Tencent and Alibaba.

3. Digital Identification

A digital identification (digital I.D.) is personal information that can be authenticated digitally without ambiguity. Digital identification enables the identified person to access banking and other services. In the context of cryptocurrency exchanges, digital I.D. is seen as an anti-money laundering (AML) and Combating the Financing of Terrorism (CFT) measure. The anonymity and speed of cryptocurrency transactions provide an opportunity for the illegal use of digital assets. To ensure AML/CFT compliance, the Know Your Customer (KYC) process is part of compliance regulations worldwide. The KYC process typically involves verifying the identity of the customer. For instance, cryptocurrency exchange Binance requires users to provide a valid I.D. card, passport, utility bill, etc.

Pros and Cons: KYC enables users to restore their accounts if they lose access. KYC creates trust between buyers and sellers because both parties know that the other is ID-verified. On the other hand, some people may consider KYC an additional barrier to trading cryptocurrencies.

Use Case: SecureKey has developed the Verified.Me digital identification network in cooperation with seven large financial institutions. Verified.Me allows users to quickly verify their digital identity with personal information they have already shared with their bank or other institutions they trust. Verified.Me uses Permissioned blockchain for validation.

4. Smart Contracts

A smart contract is a digit contract present on a blockchain. Smart contracts are typically used for executing agreements without involving an intermediary. A salient feature of smart contracts is that they perform actions automatically according to predetermined conditions for execution.

Pros and Cons: Smart contracts enable speedy transactions based on predetermined conditions for contract execution. The transaction is encrypted and recorded on a ledger; therefore, making it hard for a malicious actor to alter it. A drawback of smart contracts is that there is still room for human error – the developers of the smart contract may make mistakes that hackers can exploit.

Use Case: Ethereum is the second-largest cryptocurrency by market cap and one of the most popular platforms for creating smart contracts. The dominance of Ethereum "somewhat reveals how often it is used for smart contracts and whether it is a popular blockchain for Decentralized Finance (DeFi) applications."

5. Smart Assets

A smart asset is a virtual currency token representing a physical asset, such as a house or car, or a virtual asset, such as Bitcoin or an NFT. Smart contracts back smart assets.

Pros and Cons: Smart assets enable the asset seller and buyers the opportunity to trade assets with anonymity. In the financial sector, smart assets can be used as collateral to lend money.

Use Case: New Economy Movement (NEM) is a blockchain platform that allows smart asset transactions. Two main components of NEM smart assets include Addresses and Mosaics. Addresses hold assets, and they can range from a crypto wallet to a system for trading assets. Mosaics are identical, transferable assets that represent the assets held in addresses.

6. Fraud Reduction

In blockchain applications, fraud reduction is the use of blockchain technology to prevent hackers from manipulating digital networks.

Pros and Cons: Fraud reduction can be possible partly due to the distributed and immutable nature of the blockchain and also due to the ability to create "permissioned networks." A permissioned network places restrictions on who can participate in the network.

Use Case: IBM's Fraud Reduction Intelligence Platform (FRIP) covers all aspects of FRIP except credential intelligence. The company offers industry-specific profiles and support for finance, e-commerce, health, and other sectors. Another solution IBM offers is the IBM Security Trusteer, which identifies users and devices as good or bad according to Trusteer global network.

IV. CONCLUSION

Blockchain is a relatively new concept; however, specific applications of blockchain technology are considered to disrupt the financial industry potentially. Blockchain apps, such as smart contracts, smart assets, and payment gateways take advantage of the cryptographic and decentralized attributes of the blockchain to offer an alternative to traditional banking. In the financial sector, companies such as Ripple, Ethereum, IBM, etc., are contributing to the adoption of blockchain by the financial industry. However, blockchain-based technologies

have yet to become mainstream in the financial sector in most parts of the world.

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