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BANKING USING BLOCKCHAIN TECHNOLOGY

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Abstract : today, banks are affected by economic and digital transformation, financial innovations and development of internet. Blockchain technology with cryptocurrency is underlying technology with promising application in the banking sector. Therefore, Aim of this paper is to do a research with the impact of Blockchain platform in the banking industry. To understand this technology, this research is to analyze technology functions with the model and anatomy of Blockchain architecture. Many researches for Blockchain technology are carried out consensus algorithms and four of them are discussed on this paper. How banking industry deal with this platform with advantages and limitations are mainly discussed in this paper.

I. INTRODUCTION

today, banks are continuously exploring new ways to do transactions faster for enhanced consumer services by way of assuring transparency to clients and regulators at the same time as making sure price efficiency[5]. Blockchain is an critical era with promising software eventualities in banking industry in recent times. it may transform banking enterprise and make process more democratic, obvious at ease and green. Blockchain is a era that combine several technologies like disbursed facts storage, consensus mechanism, point-to-point transmission and encryption algorithms. A Blockchain act as decentralized ledger that continues tune of transactions between two events effectively. even though those events have simultaneous get admission to to replace digital ledger consistent and gadget clearly not possible to hack.

Blockchain will affect for cease of money through bitcoin and other cryptocurrencies in Banking industry. extra than 90 significant banks concerned in Blockchain globally and 80% of banks predicted to provoke Blockchain with allotted ledger era[1]. So maximum of the banks on its manner to set up blockchain use cases to create huge revolution in banking zone by giving indicators of stop of traditional banking. This paper mentioned as follows. section I gives an advent about how blockchain going to revolutionize the banking industry. segment II give an explanation for Blockchain architecture, model of Blockchain, how Blockchain works with consensus algorithm. section III discusses performance and use cases in banking enterprise. segment IV speak how effect of blockchain on FinTech and Cryptocurrency. section V affords details about obstacles and destiny improvements of Blockchain gadget. segment VI provide a discussion on what are the demanding situations we must confronted while Blockchain adopt in Sri Lanka and what are the solutions to conquer that challenges. phase VII gives conclusion about this text, Blockchain revolution in banking industry.

II. BLOCKCHAIN ARCHITECTURE

Why is it called Blockchain? – Well, this is because it stores the transaction data in blocks, that are linked together to form a chain. As the number of transactions grows, so does the size of the blockchain. To get a clearer understanding of this glorious invention, let us discuss its architecture. The architectural components have been generalized and then modified by various companies, leading to different blockchain projects like Bitcoin, Ethereum, Hyperledger etc. In this report, to keep things simpler, we shall discuss the bitcoin blockchain architecture. The structure is shown in the image below (Fig 1)

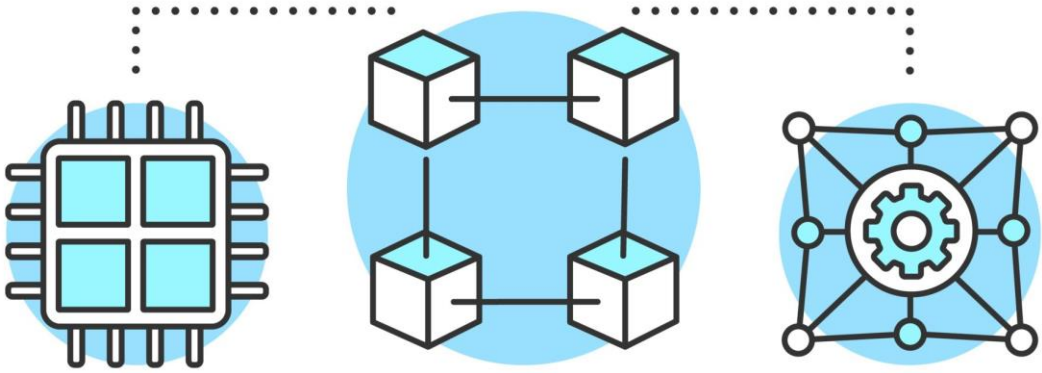

Fig 1

Below is a list of the architectural components:

- Transaction
- Block
- P2P Network
- Consensus Algorithm

2.1 Transaction

Transactions are the smallest building blocks of a blockchain system. They normally consist of a recipient address, a sender address, and a value. It is similar to a standard credit card statement. The owner transfers the value by digitally signing the hash produced by adding the previous transaction and the public key of the receiver.

The transaction is then publically announced to the network and all the nodes independently hold their own copy of the blockchain, and the current known "state" is calculated by processing each transaction in order as it appears in the blockchain. Transactions are bundled and delivered to each node in the form of a block. As new transactions are distributed throughout the network, they are independently verified and "processed" by each node. Each transaction is time-stamped and collected in a block.

2.2 Block

Block contains the information as a block header and transactions. Blocks are data structures whose purpose is to bundles sets of transactions and are replicated to all nodes in the network. Blocks in blockchain are created by miners. Mining is the process to create a valid block that will be accepted by the rest of the network. Nodes take pending transactions, verify that they are cryptographically accurate, and package them into blocks to be stored on the blockchain. Block header is the metadata that helps in verifying the validity of a block. The contents of a block metadata is shown in the image below (Fig 2)

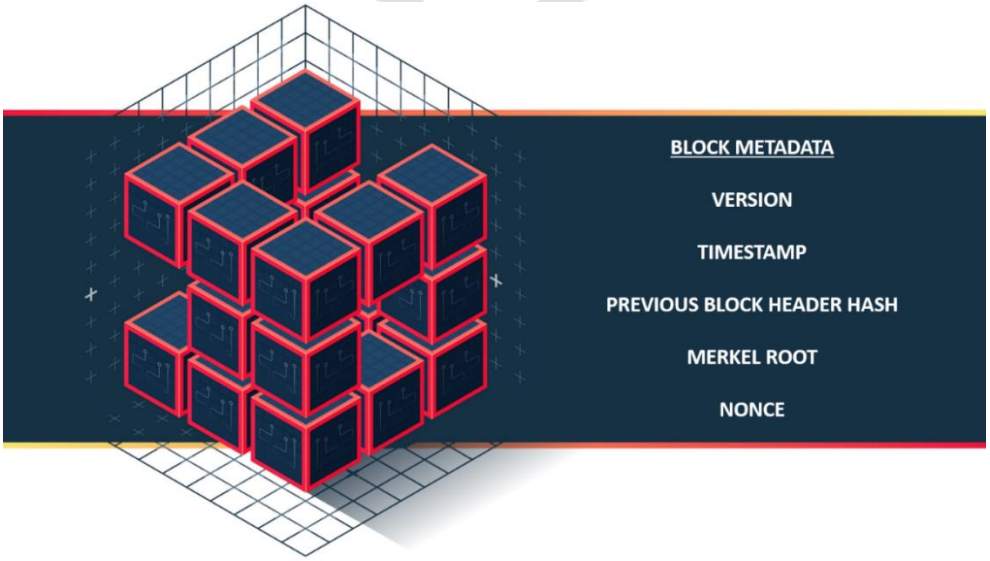

Fig 2

The rest of a block contains transactions. It can be any number of transactions bundled in a block depending on the choice of a miner.

Types of Blocks

1. Most blocks simply extend the current main blockchain which is also the longest chain in the network. These blocks are called “main branch blocks”.
2. Some blocks reference a parent block that is not at the longest blockchain. These blocks are called “side branch blocks”.
3. Some blocks reference a parent block that is not known to the node processing the block. These are called “orphan blocks”.

Side branch blocks might not currently a part of the main branch, but if more blocks are mined that reference them as a parent, there is the possibility that a particular side branch will be restructured into the main branch. This brings in the concept of forking.

2.3 P2P Network

The blockchain is a peer to peer (P2P) network working on the IP protocol. A P2P network is a flat topology with no centralized node. All nodes equally provide and can consume services while collaborating via a consensus algorithm. Peers contribute to the computing power and storage that is required for the upkeep of the network. P2P networks are generally more secure because they do not have a single point of attack or failure as in case of a centralized network. A blockchain network can be a permission-based network as well as a permissionless network. A permissionless network is also known as public blockchain because anyone can join the network, while a permission-based blockchain is called a consortium blockchain. A permission-based blockchain or private blockchain requires pre-verification of the participants within the network and these parties are usually known to each other. In a typical blockchain architecture, every individual node in a network maintains a local copy of blockchain. The decentralisation of blockchain architecture is the sole credit of the P2P network that it is built on.

Consensus Algorithm

The way all these copies of a single ledger is synchronized is due to a consensus algorithm. The consensus mechanism ensures that whatever local copy every individual party has, they are consistent with each other and is the most updated one. The copy that every individual node have are identical or similar to each other. It could be arguably stated that the consensus algorithm forms the core of every blockchain architecture. Some of the consensus algorithms are discussed below:

2.4 Proof-of-Work(POW)

Fig 3

It involves solving a computational challenging puzzle in order to create new blocks in the blockchain network. It basically involves guessing the string that produces a 256-bit hash, produced by the popular hashing algorithm SHA256. The fact that hashing algorithms are irreversible stands as the fundamental pillar of such an approach to consensus achievement. Since someone has to go through a million guesses to verify the hash, the process gets its name ‘proof-of-work’ (Fig 3).

2.5 Proof of Stake(POS)

Fig 4

In this, nodes are known as validators. They validate the transactions to earn transaction fees. The nodes are randomly selected to validate the blocks and the probability of this random selection depends on the amount of the stake that a particular node has (Fig 4).

III. USE OF BLOCKCHAIN IN BANK INDUSTRY

With an initial purpose of a mechanism behind cryptocurrencies, today the blockchain technology has stepped far beyond just powering the bitcoin or ether transactions. Blockchain is a powerful and secure technology that is getting into almost every industry, from banking and medicine to the government sector. According to Forbes, blockchain brings the following benefits:

- Blockchain records and validates each and every transaction.
- Blockchain does not require third-party authorization.
- Blockchain is decentralized.

The most popular domain of blockchain use is the banking sector because security is of utmost importance for the financial domain. So in this article, we are going to talk about how blockchain can revolutionize banking.

We will share with you several use cases of blockchain technology finance, highlight the pros and cons of each of them, and illustrate them by some real-life examples.

3.1 Payments, Especially Cross-Border Payments

Payments are the first and foremost use case of any banking and/or financial system. When it comes to blockchain finance, both central and commercial banks all over the world are now tapping into this new technology in terms of payment processing and potential issuing of their own digital currencies. This trend also embraces the cross-border payments, which have been powered mostly by Swift or Western Union until now.

Pros: Cross-border payments are faster and less expensive with bank blockchain than with traditional systems. For example, remittance costs within the blockchain are 2-3% of the total amount, as compared with 5-20% withheld by other third parties. Besides, as we have already mentioned, blockchain does not require a third-party authorization, thus significantly speeding up the cross-border payment process.

Cons: If the cross-border payment is made in cryptocurrencies, it can impose certain security-related risks. For example, if you transfer cryptocurrency funds from one country to another by applying blockchain technology financial services or wallets and one of the service providers goes bankrupt or suffers a hacker attack, the funds will be lost and no central authority such as a bank can reimburse such loss. Besides, there can be problems with cryptocurrency exchange into local currency at the destination because of fluctuating exchange rates.

Usage Examples: In 2016, Westpac, one of Australia's largest banks, partnered with Ripple, an enterprise blockchain solution for global payments, to implement a low-cost cross-border payment system based on blockchain technology. In 2015, CBA, another large Australian bank, was planning to partner with Ripple in order to develop a ledger system on blockchain for payments settlements between its subsidiaries. In 2016, the US Federal Reserve was working with IBM to implement a blockchain-based digital payment system. And these are not the only examples of banks using blockchain – other well-known banks tapping into the blockchain are Deutsche Bank, Barclays Bank, BNP Paribas, etc.

3.2 Stock Exchange and Share Trading

Buying and selling stocks and shares has always involved a lot of third parties, such as brokers and the stock exchange itself. Here is how trading works:

- The buyer or seller initiates the trade.
- A broker sends a transaction to a stock exchange.
- The transaction is matched with another party (the counterparty).

- The transaction is sent to Central Counterparty Clearing House for risks evaluation.
- The buyer's or seller's representatives work with the Central Securities Depository (CSD) to record the transfer.
- The transaction is sent to the Registrar or Transfer Agent of Initial Trade to update their list of shareholders.

As you see, the traditional stock exchange process involves lots of stages and bureaucracy and can take up to 3 days. However, the decentralized nature of blockchain technology in banking can remove all those unnecessary intermediaries and enable trading to be run on computers all over the world. No more dedicated servers united into an interconnected network.

Pros: Trading transactions in blockchain reduce the redundancy of information and thus improve performance. As a result, smaller transactions between groups of traders can be quickly handled outside the blockchain, and only the final transactions are recorded to the blockchain, without any intermediary steps.

Cons: Trading with blockchain can impose risks such as "private keys" – variables that are used for digital signatures that can be potentially stolen or lost. Those keys prove the ownership of specific assets, thus allowing the hackers to change the ownership. However, there is a way out – multi-signature transactions that can be integrated into the asset trading applications running on blockchain technology. Signatures of all parties before agreeing upon a transaction can prevent the keys from being stolen and the ownership from being changed.

Usage Examples: In 2015, Nasdaq, the world's second-largest stock exchange company, was planning to use blockchain for their Private Market Platform. They were going to implement a colored coin concept that could help to distinguish the coins used for trading from other coins. Besides, together with Citigroup, Nasdaq invested into the Chain blockchain ledger to power a shared and trusted distributed database that records all transactions and ownership changes in real-time.

3.3 Trade Finance

Blockchain additionally performs an important function inside the alternate finance zone – monetary sports which might be related to commerce and international trade (no longer inventory change trading). Even in these days's disruptive global of generation, many alternate finance sports still involve lots of office work, inclusive of payments of lading, invoices, letters of credit score, and many others. Of path, many order management systems allow to perform all this office work on-line, however still, it consumes plenty of time.

Pros: Blockchain-based totally change finance can streamline the complete trading technique with the aid of casting off time-consuming office work and forms. for instance, inside a conventional trade finance system, all members need to keep their personal database for all transaction-associated files. every of these databases must be continuously reconciled in opposition to each other, and a unmarried errors in one report may be duplicated to copies of the document. Blockchain removes such need for numerous copies of the same document and can integrate all necessary statistics in a single virtual file, that is updated in actual-time and can be accessed by means of all community individuals.

Cons: Authorities sanctions, along with exchange embargoes, can impact the usage of blockchain technologies in trade finance. for instance, the blockchain-primarily based software program could not be sold to or certified for use by using sanctions targets without an OFAC or BIS license. besides, it's far not possible to transfer the alternate transaction records in blockchain layout to events who do not use the platform.

Usage Examples: In 2016, Ornua, an Irish manufacturer of dairy merchandise, partnered with Barclays to complete the arena's first blockchain and banking change transaction. In 2017, IBM and Maersk collaborated to paintings on the first move-border, blockchain-based totally supply chain answer.

3.4 Digital Identity Verification

Online financial transactions are impossible without identity verification. However, this verification requires a lot of steps to be taken, such as:

- Face-to-face checking (can be also via a video call such as Skype).
- Authentication: The bank client needs to prove their identity every time they log in to the service.
- Authorization: A proof of the client's intentions is needed.

All of these steps need to be taken for each new service provider. However, blockchain makes it possible to securely re-use identity verification for other services.

Pros: With blockchain in fintech, users can choose how they identify themselves and with whom they agree to share their identity. They still need to register their identity on the blockchain, but they do not need to repeat the registration for each service provider if those providers are also powered by blockchain.

Cons: Standards for identity verification on the blockchain are still being developed. After the information is recorded on the blockchain, all parties in the network can access it, so the users should limit any private information that they do not want to disclose.

Usage Examples: Cambridge Blockchain and Tradle are examples of fintech startups that are using blockchain to disrupt banking and working on blockchain-based customer identification systems.

Tradle uses blockchain to store proofs of data verifications and give total ownership and control of data to the owner. This means the customer manages the sharing with banks directly, thus the customer becomes the utility. Tradle's approach enables the owner to share their data across lines of business, with any institution and across any border without breaching any data locality laws, or regulations such as GDPR.

Another example is ID2020, a project aimed at creating digital identities for people who have no paper IDs. The project is supported by Accenture, Microsoft, and the Rockefeller Foundation.

3.5 Syndicated Lending

Syndicated lending refers to providing loans to individuals by a group of lenders, typically banks (a syndicate). Due to several participants involved, the traditional processing of such syndicated loans by banks can take up to 19 days. Banks that process syndicated loans face the following challenges:

- Know Your Customer (KYC) – client identity verification.
- Bank Secrecy Act (BSA) and Anti-Money Laundering (AML) – legal actions aimed at prevention, detecting, and reporting of money laundering activities.

Blockchain financial services can supercharge this process and make it more transparent. With blockchain's decentralized ledger, banks within a syndicate can distribute tasks related to local compliance, KYC or BSA/AML and link them to a single customer block.

Pros: The use of financial blockchain for syndicated loan processing can bring the syndicate members a range of benefits in terms of compliance. If one of the banks using blockchain in a syndicate has completed the compliance procedures, all other banks do not have to do it once again. As a result, each participating bank can benefit from blockchain technology in banking by exchanging information through blockchain. This lowers the cost of meeting regulatory requirements for syndicated lending and significantly saves time.

Cons: Blockchain is unable to solve all problems on a syndicated lending market. In addition, it may be hard to implement blockchain for syndicated loans, because it should be done for each bank in a syndicate. However, nowadays banks tend to join into blockchain syndicates to make this process easier.

Usage Examples: In 2016, Credit Suisse, Symbiont, R3, and Ipreo successfully finished an initial stage of a project related to the use of blockchain technology on the syndicated loan market. In April 2018, seven international banks, specifically BNP Paribas, BNY Mellon, HSBC, ING, Natixis, and State Street, have united to support Fusion LenderComm by Finastra, a blockchain platform for syndicated loans.

3.6 Accounting, Bookkeeping, and Audit

Probably no other sphere that involves as much paperwork as accounting, and it is digitalized relatively slowly. The reason behind that may be in strict regulatory requirements regarding data validity and integrity. Therefore, accounting is another domain that can be transformed with the power of blockchain technology finance, from simplifying the compliance to streamlining the traditional double-entry bookkeeping. Instead of keeping separate records based on transaction receipts, companies can write their transactions directly into a joint register, with the entries distributed and cryptographically protected. As a result, the records are more transparent, and any attempts of forging are almost impossible. Think of it as an "electronic notary" verifying the transactions. In addition, blockchain's smart contracts can be used to automatically pay invoices.

Pros: Standardization with the help of blockchain would allow auditors to automatically verify the most important data behind financial statements and thus decrease the costs and save time. Blockchain makes it possible to easily prove the integrity of electronic files. One of the approaches is to build a hash string of a file representing the digital fingerprint of that file and then create a timestamp for it by writing it into the blockchain. To prove the integrity of files, an auditor can generate the fingerprint again and compare it with the one that is stored in the blockchain. Identical fingerprints prove that the file has not been changed. As a result, audits can be conducted in real-time and not last for days or weeks.

Cons: Some experts suppose that blockchain may not be suitable for each and every case in bookkeeping and may be used only for specific areas, such as interbank transfers.

Usage Examples: In 2018 PricewaterhouseCoopers announced the launch of the first blockchain auditing service that will allow checking how the companies are using fintech blockchain.

3.7 Credit Reports for Businesses and Individuals

Blockchain finance can also help individuals and small businesses to quickly get loans based on their credit history. It may take a long time for lenders to review the borrower's credit history. Traditional business credit reports provided by third-party credit bureaus are not available for small business owners. Besides, paying companies to access their sensitive data sounds strange and

insecure. However, blockchain can provide tools that will allow borrowers to make their credit reports more accurate, transparent, and securely shareable. Here's how it works with blockchain:

- The data owner places their transaction history into the blockchain and secures it with a private key.
- The encrypted transaction is stored outside the blockchain.
- The hashed encrypted transaction is stored inside the blockchain with timestamps and metadata.
- The data buyer submits the criteria for credit history.
- The smart contracts identify and verify the potential data based on the data owner control criteria.
- The blockchain engine filters the data and returns the results.

Pros: Blockchain-based credit reports reduce the costs and complexities pertaining to data verification. Besides, the data ownership is returned to individuals because it is no longer held in a central repository.

Cons: According to New York Times, some experts express a concern that blockchain's immutability, i.e. inability to revert changes, can fail to comply with the new data privacy regulations and violate human rights to become forgotten. Besides, US regulations such as the United States Fair Credit Reporting Act, the Gramm-Leach-Bliley Act, and the Securities and Exchange Commission's Regulation S-P prohibit such immutability of personal financial data.

Usage Examples: Credit Dream is a Brazilian mobile blockchain platform that connects lenders and borrowers in any country for affordable and verified loans. Lumeno.us is a New York-based startup that provides blockchain technology financial services so that business owners can securely share their data to get a loan, find trusted partners, or manage a portfolio or network.

3.8 Hedge Funds

A hedge fund is an investment partnership consisting of a fund manager and a group of investors (limited partners). However, hedge fund participants are traders rather than ordinary investors. The purpose of a hedge fund is to maximize investor returns and minimize risks. According to Autonomous NEXT, the number of hedge funds that trade cryptocurrencies has doubled between October 2017 and February 2018. However, one should distinguish between the traditional crypto hedge funds and decentralized crypto hedge funds.

Pros: Decentralized crypto hedge funds provide an open platform allowing many more crypto investors and strategists to participate, whereas traditional crypto hedge funds are controlled by fund managers within a single entity, Forbes reports.

Cons: Individual investors are afraid of the risks resulting from borrowing crypto coins by short-sellers.

Usage Examples: Examples of decentralized crypto hedge funds are Alphabit Fund, Blocktower Capital, CoinShares, Crypto Asset Fund, and many others.

3.9 Crowdfunding (ICOs)

Crowdfunding involves raising funds by asking a large number of people each for a small amount of money, typically online. This industry is a perfect fit for blockchain technology finance. Initial Coin Offerings (ICOs), financial instruments that help to kickstart young cryptocurrencies, are the most known example of blockchain-based crowdfunding. ICO tokens are similar to shares of a company, though usually without equity exchange. Instead, the investors purchase tokens either for existing cryptocurrency, such as bitcoins, or for physical currency, such as US dollars. Later, in case of success, they can sell these tokens on cryptocurrency markets. Like in crowdfunding, funds are raised to implement a concept at the stage when the company has no product.

Pros: ICOs have a range of advantages, such as the ability to sell the tokens internationally over the Internet, liquidity premium of the tokens, and decentralization of funding with the ability to raise funds from anywhere. Besides, ICOs ensure transparent use of funds, high ROI, and high reward assets that are not related to stock markets and the economy. Finally, ICO coins may be subdivided or consolidated and have the same anonymity as ordinary crypto coins.

Cons: Unfortunately, the ICOs lack regulation and legislation, thus being quite risky. Therefore, investors are becoming more and more concerned with this problem, feeling insecure and unprotected. However, in June 2017 Yao Qian, head of Digital Currency Research Institute at PBoC, mentioned that the Central Bank of China intended to regulate the ICO market soon, as The Coin Telegraph reports. Besides, in July 2017 the Cryptocoins News website announced that Deloitte CIS and blockchain startup Waves have joined their efforts in an attempt to regulate the ICO market in Eastern Europe. According to Cryptocoins News, both companies are going to develop "legal mechanisms for regulating ICO projects in the Eastern European Region." These mechanisms will possibly include legal services as well as ICO services and custom blockchain solutions.

Usage Examples: The first ICO was for Mastercoin back in 2013. But the most successful and investor-friendly ICO project is Ethereum, a decentralized smart contracts platform, and programming, with ethers as coin tokens. In 2014, when Ethereum was announced, its ICO raised $18 million in bitcoins. Now ether is the world's second popular cryptocurrency after Bitcoin. If you are eager to learn more about Ethereum cryptocurrency, check out this comprehensive guide.

3.10 Peer to Peer (P2P) Transfers

With P2P transfers, customers can transfer funds from their bank account or credit card to another person's account via the Internet or mobile phone. The market is full of P2P transfer applications, but all of them have certain limitations. For example, the ability to transfer money only within one geographical region, or, on the contrary, the inability to transfer money if both parties are located in the same country. Besides, some of the P2P services charge large commissions for their services and are not secure enough to store sensitive data. All of these issues can be solved with blockchain-based, decentralized apps for P2P transfers.

Pros: Blockchain has no geographical limitations – it exists literally everywhere, making it possible to do P2P transfers across the world. In addition, blockchain-based transactions take place in real-time, so the recipient will not have to wait for days and weeks until they get money.

Cons: P2P participants need to understand the cryptocurrency exchange rates and be aware that they may lose some funds when converting crypto coins to traditional (fiat) currencies. The more currencies are involved in the exchange operation, the more money you can lose. Besides, transfers of cryptocurrencies only are fast, but if the transaction involves fiat currencies in addition to bitcoin or ether, this may slow down the transaction.

Usage Examples: Circle is a decentralized app that allows P2P transfers not only in cryptocurrencies but also in fiat currencies. As reported by Yahoo! Finance, while running on the blockchain, Circle allows its users to deposit money to Circle from a credit or debit card, not dealing with bitcoin at all. Another example of a decentralized P2P app is Bitwala, which combines the functionality of a messenger and P2P money transfer service.

These were the fintech startups using blockchain to disrupt banking. To summarize the above-mentioned blockchain use cases in banking, financial and bank blockchain technologies have the following benefits for each use case:

- Lower costs and faster processing of transactions
- No intermediaries for transactions authorization
- Decentralization and thus, independence from central repositories
- Less paperwork and bureaucracy
- Transparency
- Data integrity
- Security

However, blockchain technology in banking and finance faces the following challenges:

- Upgrade of regulations and legislation. Current regulations and legislation do not allow the use of blockchain technology finance, such as the prohibition of personal financial data immutability that we have already mentioned in this article.
- Improved security. Cryptocurrency wallets that are used for blockchain transactions should have 100% protection against hackers.
- Standards for identity verification on blockchain still need to be developed.
- More specific use cases of banks and blockchain need to be investigated.
- There should be more transparency in exchange rates between the crypto and fiat currencies.

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IV. CONCLUSION

Blockchain is decentralized digital ledger which can not acquire hacker's objectives. therefore protection wise, it's miles very important generation to adopt in Sri Lankan economic industries like banks. This also enables to enhance the efficiency of the banking enterprise. There are lot of possibilities with Blockchain generation with immeasurable values. This affords a completely unique way to set up cryptography transactions, by allowing simplification of cash within the global. Giants inside the banking enterprise started out to go looking feasible new use cases to enlarge their services by using the use of Blockchain. This generation revolutionize the underlying sectors in credit score statistics structures, fee clearing, lending structures, virtual verification, audit retaining systems, crowdfunding, smart agreement and KYC in banking. PBFT is the high-quality consensus algorithm for payments and transactions. Banks used POW for virtual verification because it's far the fine algorithm which provide better security. PBFT or BFT by and large used for syndicated lending in banking enterprise. each PoW, Pos and DPoS are used for crowdfunding in banking sector. primarily based at the form of cryptocurrency algorithms will changed in clever contracts. If the cryptocurrency is Bitcoin for clever contracts most of the time we use POW. If the cryptocurrency is Ethereum for clever contracts most of the time we use POS. maximum of the banks used PoW for KYC. Prospect of this era into the banking enterprise will arise inside the close to future.

when using Blockchain, there are some challenges occur in. To remedy those challenges we should provide facilities to reduce preliminary cost to undertake blckchain in banking sector. device utilization complexity is high. consequently builders should lessen complexity and provide earlier information for the customers. Then we will reduce adoption and utilization problems related to blockchain technology. Blockchain ought to develop for small scale networks as properly in destiny. in line with the consensus set of rules electricity intake can be changed. consequently we ought to pick satisfactory set of rules for applicable banking provider. developers must reduce unwanted protection flows and make less difficult to apply.

This paper offers a comprehensive evaluation of blockchain revolution in banking enterprise. Blockchain is the next excellent invention after the net. therefore my opinion is blockchain is a exquisite disruptive era which revolutionized banking quarter higher way in close to future.

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