

Smart Contracts and Blockchain Technology in The Financial Industry

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Abstract:

Blockchain technology is believed to be the latest advancement in industries as well as financial transactions in the banking sector, where trust is of prime importance. Blockchain technology is a coded security system and decentralized which provides the ability for platforms and new digital services to be created through this emerging technology.

The purpose of this paper is to help in providing a better understanding of the implementation of blockchain technology and Smart Contracts in the banking and financial industry. The main aim is to study the possible contribution of blockchain technology in banking industry along with its strength, weaknesses, opportunities and threats. this article discusses how can blockchain technology make far-reaching changes in the banking industry? The study is primarily based upon the secondary data. For this extant literature related to the topic from different databases, websites and other available sources were collected. To answer the research questions, a literature review was conducted. The articles were selected from evidence-based scientific databases such as Emerald, Sage Premier, ScienceDirect, Springer Open, and Google

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Scholar. we searched relevant literature using specific keywords, e.g., “Blockchain Technology,” “the banking industry,” “SWOT analysis,” “Financial Industry”. seventeen scholarly articles were selected by using exclusion and inclusion criteria and screening the relevant articles.

Keywords: Blockchain Technology; banking industry; SWOT analysis; Financial Industry.

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I. INTRODUCTION:

Over the years, the use of emergent digital innovative technologies, through telebanking, online and mobile banking and fintech, has contributed towards offering new experiences. In this regard, convenience, availability, speed, efficiency, effectiveness and transparency of banking and financial processes have enabled the sector to tackle some of the common challenges associated with facilitating transactions across various sectors (Peters and Panyi, 2016). The emergence of blockchain technology has been heralded as the next revolution that will transform the shape and size of the banking and finance industry and the way business transactions are conducted (Ceremeno, 2016). Blockchain technology is focused on having an open, universally accessible decentralized ledger for establishing trust in an unsecured environment without relying on a third party. The ledger contains the shared and agreed-upon state of the blockchain, including a list of all past transactions that are immutable. Moreover, it can also be utilized along with other technologies, such as encryption, business rules and identity management, in order to make such technology fit for the challenges at hand (van Engelenburg et al., 2018).

Blockchain technology offers the opportunity to help in enhancing issues surrounding transparency, trust and privacy for relevant stakeholders. Nonetheless, as much as blockchain has brought opportunities for organizations, it is pivotal to realize that there will be several challenges and complexities across technical, regulatory and adoption-related areas. Recent events such as digital currency theft and cybersecurity breaches have demonstrated the high-level of risks related to the use of blockchain technologies in banking and finance.

1. Statement of problem:

blockchain has also the potential to disrupt the banking sector by exploiting it across various financial services. As such, it includes facilitating global money remittance, smart contracts, automated banking ledgers and digital assets. It can transform a considerable number of existing traditional banking services through improving transaction security and expediting transfers at a lower cost. and from this perspective, the research problem can be formulated as follows:

- How can blockchain technology make far-reaching changes in the banking industry?

2. Research questions:

This article focuses to answer the following questions:

- What is the meaning of the blockchain technology and how it works?
- What are the main characteristics and benefits of the blockchain technology?
- How the bank industry turned to blockchain technology?
- What are the determining factors of SWOT Blockchain technology for the Banking Industry?

3. Research hypothesis:

- blockchain technology revolutionize the banking and financial industry.

4. Research objectives:

This paper focus to:

- contribute to facilitating the successful adoption and application of the blockchain technology in the banking industry.

- outline blockchain's concept, benefits as well as challenges of the technology in the context of banking and finance sector.

5. Methodology:

The study is primarily based upon the secondary data. For this extant literature related to the topic from different databases, websites and other available sources were collected. A systematic review of the collected literature was done in detail.

II. LITERATURE REVIEW

1. BLOCKCHAIN CONCEPT:

The blockchain concept can be defined as “shared, distributed ledger that facilitates the process of recording transactions and tracking assets in a business network. An asset can be tangible a house, a car, cash, land or intangible like intellectual property, such as patents, copyrights, or branding.” (Gupta,2017). This ledger information operates with encrypted data to implement identification, authentication, and authorization of access to information. Integrity and trust on data, which is in the information systems, is the main objective of blockchain technology. Blockchain is a technological tool to comply with data integrity, in terms of its completeness, correctness, and free of contradiction, in distributed software systems. Distributed software systems are a number of independent computers that cooperate with each other in numerous informational transactions, without having a centralised computer to control or monitor those transactions. In a centralized system, only one computer can control all the information occurred in a specific context or network. In our everyday life economy, we know that transactions should not be on only one computer to prevent fraud risk, but rather in

multiple computers. For this reason, companies use decentralised information systems. Within this decentralised system, ownership of information must be authenticated, the ownership proof has three elements: (1) the identification of the owner, (2) the identification of the object being owned, and (3) mapping the owner with the correspondent object. This object and the mapping to its owner is maintained in a ledger, corresponding to a proof of ownership. Next figure represents the ownership concepts used to certify and proof property.

Blockchain means different things to different background people (Gupta,2017). For some authors blockchain is defined as a data structure, for others is an algorithm, for others can be defined as a suite of technology, and even for others blockchain can be a group of systems that communicate peer-to-peer within a common application area (Drescher ,2017). Drescher (2017) defines blockchain as a distributed ledgers system, which uses an algorithm for computers to communicate with each other with cryptographic and security technologies to achieve and maintain data integrity.

In October 2008, Satoshi Nakamoto published a paper where he introduced the concept of a decentralised trustless peer-to-peer digital currency called Bitcoin, the first cryptocurrency, that was not issued and backed by a central authority, but by automated consensus among networked users (Nakamoto,2008). The backbone of Bitcoin is the blockchain technology, a distributed ledger which contains the details for every record processed since the very first one. The validity and authenticity of each transaction are protected by digital signatures resorting to cryptography, thus the denomination cryptocurrency. To understand better, it is necessary to comprehend how the cryptography on the bitcoin blockchain works. Digital signatures are produced by

using hash functions and encrypted resorting to a private key. This key is used to authenticate and authorize transactions in the bitcoin network, confirming the ownership of the bitcoins in each address, which identifies senders and receivers of transactions. The public key is used in the creation of bitcoin addresses by a digital application known as wallet (Martins,2018). From a user perspective, in a transaction, the sender must know the address of the receiver and inputs merely the desired amount to transfer.

1.2. HOW BLOCKCHAIN WORKS:

Here are five basic principles underlying the technology.

1.2.1 Distributed Database:

Each party on a blockchain has access to the entire database and its complete history. No single party controls the data or the information. Every party can verify the records of its transaction partners directly, without an intermediary.

1.2.2 Peer-to-Peer Transmission:

Communication occurs directly between peers instead of through a central node. Each node stores and forwards information to all other nodes.

1.2.3 Transparency with Pseudosymmetry:

Every transaction and its associated value are visible to anyone with access to the system. Each node, or user, on a blockchain has a unique 30-plus-character alphanumeric address that identifies it. Users can choose to remain anonymous or provide proof of their identity to others.

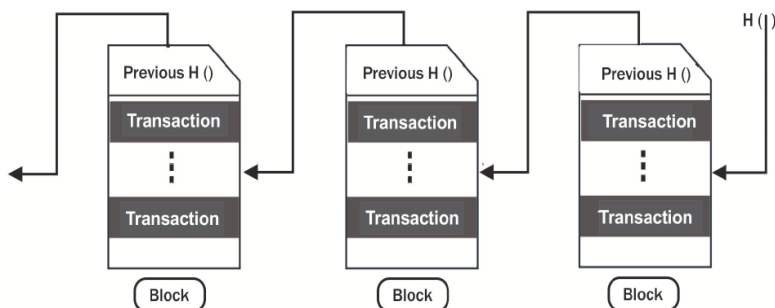
1.2.4 Irreversibility of Records:

Once a transaction is entered in the database and the accounts are updated, the records cannot be altered, because they're linked to every transaction record that came before them (hence the term "chain"). Various computational algorithms and approaches are deployed to ensure that the recording on the database is permanent, chronologically ordered, and available to all others on the network.

1.2.5 Computational Logic:

The digital nature of the ledger means that blockchain transactions can be tied to computational logic and in essence programmed. So, users can set up algorithms and rules that automatically trigger transactions between nodes (Tapscott,2017).

Figure 01. The formation of the blockchain



Source: (Tapscott,2017)

1.3 CHARACTERISTICS OF BLOCKCHAIN:

A blockchain is characterized by censorship resistance, immutability and global usability, and has a global network of validators called miners, who maintain it through block rewards, named crypto tokens.

the creator of Ethereum, states that decentralization assures fault tolerance, attack resistance and collusion resistance.

Also, that blockchain is decentralized on two of the three possible axes in software decentralization (Holotescu,2018):

- politically decentralized - meaning that no one controls it;
- architecturally decentralized - no infrastructural central point of failure exists;
- logically centralized - there is one commonly agreed state and the system behaves like a single computer.

Anyone has the autonomy to access a blockchain, to download a copy and play a role in maintaining the blockchain, thus that computer becoming a node. The copy will be actively updated along with every copy on every other node, edits can only be made to the blockchain with general consensus among the individuals running a node.

The process of adding a new block (containing thousands of transactions) to a blockchain, by hash verification procedures, is named mining. The new block is linked to the last one in blockchain. Each blockchain starts with the genesis block, containing its settings.

The advantages of the blockchain technology are the following (Holotescu,2018):

- self-sovereignty - users identify themselves and maintain control over the storage and management of personal data;
- trust - the technical infrastructure offers secure operations (payments or issue of certificates);
- transparency and provenance - to perform transactions in knowledge that each party has the capacity to enter into that transaction;
- immutability - records are written and stored permanently, without the possibility of modification;
- disintermediation - no need for a central controlling authority to manage transactions or keep records;

- collaboration - ability of parties to transact directly with each other without the need for third-parties.

The main drawbacks are the high consume of hardware, energy and time needed for the mining process, also the fact that the technology is complex and difficult to understand. Moreover, the plethora of development platforms in continuous release and the novelty of associated languages still keep the blockchain implementations as appanage of geeks, similar with sending e-mails using line commands at the beginning of web (Holotescu,2018).

Thus more friendly GUIs and tools are needed in order blockchain to enter in mainstream. blockchain needs to overcome its usability problem in order to impact on the everyday lives of people. The usability and understanding issues make blockchain be the one least heard about, as concluded by the “Trust in Technology” study.

Greenspan (2015) listed specific conditions to be met in order to implement a decentralized solution, thus avoiding “pointless blockchain projects”: needing shared databases with multiple writers, having interactions between transactions, operating with an absence of trust, and without the need of a trusted intermediary; for the other cases a regular database (Oracle, SQL Server, MySQL, Postgres or NoSQL) should be used (Holotescu,2018).

Some aspects to be considered when designing blockchain products are (Atchley, 2018):

- engaging target users in interviews, surveys and usability testing, designing for trust: transparent product’s information architecture, which is critical to acquisition, retention and building trust;
- visual consistency: clear visual style, familiar terms, flow and functions for product interface;

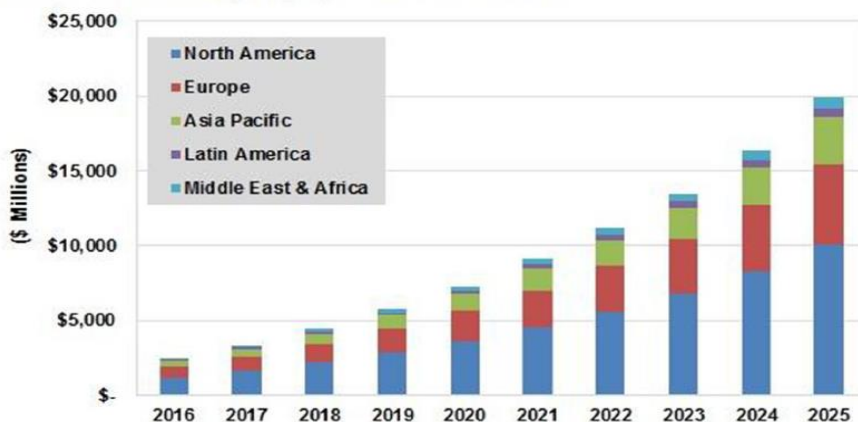
- constant and consistent feedback, active guidance to users because of the long duration of validation and confirmation transactions on a blockchain network (Holotescu,2018).

1.4 BENEFITS FROM BLOCKCHAIN:

Blockchain, as discussed in the above section by virtue of its design and architecture, offers some inherent benefits which the industry has been looking for quite some time now. The distributed nature of Blockchain brings in a lot of transparency in processing and thereby reduces the need for manual verification and authorization. The key features of the Blockchain include following (Shah & Jani ,2018):

Figure 02. blockchain revenue by region, world market :2016-2025

Blockchain Revenue by Region, World Markets: 2016-2025



Source: (Niranjanamurthy et al,2019).

1.4.1 Near real time: Blockchain enables the near real-time settlement of recorded transactions, removing friction, and reducing risk.

1.4.2 No intermediary: Blockchain technology is based on cryptographic proof instead of trust, allowing any two parties to transact directly with each other without the need for a trusted third party.

1.4.3 Distributed ledger: The peer-to-peer distributed network records a public history of transactions. The blockchain is distributed and highly available. The blockchain does not typically preserve the identities of the parties or the transaction data, only the proof of the transaction existence.

1.4.4 Irreversibility & Immutability: The blockchain contains a certain and verifiable record of every single transaction ever made. This prevents past blocks from being altered and in turn stops double spending, fraud, abuse, and manipulation of transactions.

1.4.5 Smart Contracts: Stored procedures executed in a Blockchain to process pre-defined business steps and execute a commercially/legally enforceable transaction without involvement of an intermediary.

1.5 ADVANTAGES OF BLOCKCHAIN TECHNOLOGY:

• Disintermediation and trustless trade:

Two social affairs can make an exchange without the oversight or intermediation of an outcast, solidly decreasing or despite massacrings counterparty possibility.

• Empowered clients:

Customers are accountable of every one of their information and trades.

• High quality information:

Blockchain information is finished, reliable, convenient, exact, and generally accessible.

- **Process respectability:**

Clients can assume that exchanges will be executed precisely as the convention summons expelling the requirement for a trusted outsider.

- **Transparency and changelessness:**

Any sort of transactions whether modify or reversal can be shown to customers as all the transactions are permanent, which means they can't be adjusted or erased.

- **Faster Transactions:**

Interbank Transactions can possibly take days for clearing the cheques and demand drafts, particularly outside of working hours. With the use of Blockchain all interbank transactions are carried out within short span of time. Customers can use E-Banking, M-Banking and UPI etc for any sort of transactions even at home.

- **Lower exchange costs:**

By taking out outsider middle people and overhead expenses for trading resources, blockchains can possibly extraordinarily diminish exchange charges (Akram,2017).

2. TURNING OF BANKS TOWARDS BLOCKCHAIN TECHNOLOGY:

Bitcoins aren't fiat monetary forms i.e. they are not sponsored by national banks and in this manner exceptionally unregulated and hazardous. Peterson and Krug (2015) They are hard to track and are not generally worthy. In any case, Blockchain is a sub-structure that can be isolated from bitcoins and can be put under numerous other super-structures like B2B, G2G and G2B exchanges along these lines diminishing the exchange and upkeep costs introduce in customary framework, in the present framework each keeping money substance keeps up a center saving money arrangement entryway (CBS gateway) as an incorporated advanced record that is exceptionally helpless against digital

assaults and henceforth socio-political emergency in light of monetary emergency. In addition, the cross-country exchanges can turn out to be all the quicker and more modest and the reserve funds would then be able to be spent on social welfare or digital security (Akram,2017).

Figure03. blockchain for banking



Source: (Akram,2017)

2.1 BLOCKCHAIN OPPORTUNITIES IN BANKING:

2.1.1 A better way to know your customer (KYC):

Verifying the authenticity of consumer identities is a frequent and important task for banks owing to anti-money laundering regulations. Given the ever-increasing problems of terrorism, KYC is a crucial aspect related to the prevention of the criminal use of banking funds and services in the form of money laundering and terrorism. However, KYC also represents a significant cost for banks with Thomson Reuters (2016) estimating that financial institutions spend between 60 million and 500 million USD per annum to

keep up with KYC. Therefore, the current KYC processes are not only expensive but also inefficient and feed towards poor customer experience for banks (Walker, 2018). In addition, 4th EU Money Laundering Directive requires consumer data to be monitored and constantly updated whilst the General Data Protection Regulation (GDPR) requires strict internal controls pertaining to consumer security (Walker, 2018). As such, blockchain technology, if implemented correctly for KYC can be extremely useful. This is because, the use of blockchain technology can do away with the need for filling out endless KYC questionnaires when opening a bank account.

As Lang (2017) states, blockchain can enable banks to share customer information across their company securely and thereby simplify the administrative process by reducing unnecessary duplication of information and requests. Blockchain helps cut down on duplication as it can allow the independent verification of one client by one bank to be accessed by other banks (Marr, 2017). As Luu (2017) asserts, efforts to KYC are more important today than ever before as decentralization of cryptocurrencies opens it up to the risk of money laundering and terrorism financing.

2.1.2 Improved transaction speeds:

You thought digital payments were fast? The use of blockchain technology can enable banks to speed up the time to settlement through the certainty it provides by enabling individuals and corporations to transact directly and view the same ledger of transactions updated through consensus and made immutable through cryptography. In fact, Tapscott and Tapscott (2016) note that settlement times can be cut down to minutes or seconds via blockchain technology whilst Ho (2016) alerts us of the possibility of processing bank transaction 24/7.

2.1.3 Enhanced security:

Security is of paramount importance to the banking industry. As Tapscott and Tapscott (2017) stated, 45% of financial intermediaries are experiencing economic crimes in comparison to the 20% and 27% for the professional services and technology sectors. Therefore, applying blockchain for an extra sense of security is a critical component of the future digital banking model (Maiya, 2017). Blockchain can offer enhanced security for banking data as historical information cannot be altered and the new information which is added in real-time is essentially shared by multiple entities and thus making it difficult to manipulate the data. As Patel (2018) points out, any alterations to data within a block can be tracked and monitored to prevent fraud and misuse and more importantly blockchain technology allows for real-time communication and updating on potential scams (Patel, 2018). Blockchain can also achieve simultaneous security and privacy by enabling confidentiality through 'public key infrastructure' and by maintaining the size of a ledger.

2.1.4 Cost reductions:

Economics will always play an influential role in the adoption of technology, and it's no different when it comes to blockchain technology. The banking sector will have to consider a cost/benefit analysis to determine the feasibility of implementing blockchain. First and foremost, the enhanced trust made possible by blockchain can reduce friction that comprises all kinds of direct and indirect costs and efforts due to the lack of trust, and bring certainty via transaction logic instantiated as code. MacDonald, Allen, and Potts (2016) summarized that the permission-less and nonterritorial features of blockchain can significantly reduce the institutional exit costs. In addition, settlement periods

resulting from traditional banking processes cost the financial industry between 65 and 80 billion USD per annum and blockchain has the potential to reduce or even eliminate settlement times. Further cost reductions are made possible by doing away with the need for intermediaries and their associated charges when completing bank transactions in a world where global enterprises could pay up to 25USD for an international transaction. The ability to share information openly across banks via the blockchain system would also significantly reduce administrative costs for compliance departments.

2.1.5 Smart contracts:

There is evidence of the banking sector already exploiting smart contracts. For example, Gatteschi, Lamberti, Demartini, Pranteda, and Santamaría (2018) have systematically analyzed the implementations of blockchain-based smart contracts in insurance and finance. Furthermore, a smart contract for travel insurance and automatically issuing refunding was developed based on the Ethereum blockchain by Bertani, Butkute and Canessa (2017) whilst the Commonwealth Bank of Australia exploited smart contracts with blockchain technology to monitor and track the shipment of 17 tonnes of almonds. However, as Sarnitz and Maier (2017) argue, smart contracts could make the role of banks in contract management redundant in future. Thus, banks must look into ways in which it can exploit smart contracts and the related technology to its benefit and one such option would be to become the provider of the said facility.

2.1.6 More transactions with more transparency:

Transparency is an increasingly important consideration alongside the increase in transaction capacities. Whilst the traditional banking system is extremely secretive, blockchain

technology presents means of making the entire banking process more transparent and secure as it locks records and then enables users to access the full historical data with possibilities of giving authorized parties only access to shared transaction ledgers. Moreover, any changes made to public blockchains are publicly viewable by all parties. In fact, as Tapscott and Tapscott (2016) assert, blockchain technology can lower or even eliminate the need for trust in transactions and make auditing transparent and real-time. It is also promising for automating financial reporting and the transparent nature of blockchain allows banks and regulators to communicate in real-time and enables swift action when compliance violations take place (Hassani et al,2018).

2.2 BLOCKCHAIN CHALLENGES IN BANKING:

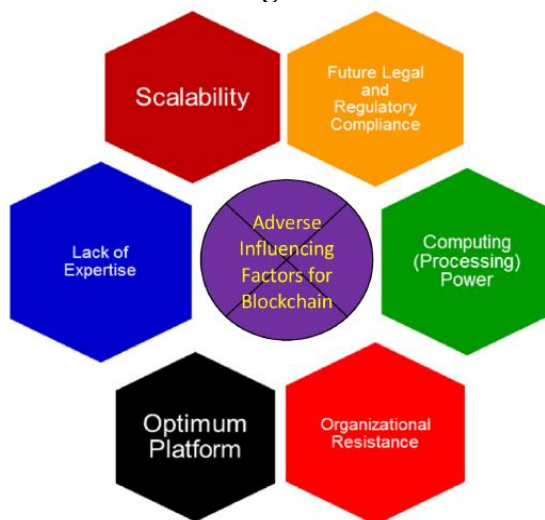
2.2.1 Costs and standardization requirements:

Developing a blockchain enabled system is a high-cost affair, and if the banking industry is to make the most of the system, then it should be standardized across banks (Walker, 2018). For example, for KYC information to be usefully shared across the banking industry, a common policy on identification and verification of consumers is mandatory (Walker, 2018). As it stands, each bitcoin transaction costs about 0.20 USD and can only store 80 bytes of data. The lack of harmonized industry standards, unless addressed, will be a major hindrance to the adoption and development of blockchain in banking. Bech and Garratt (2017) proposed the money flower taxonomy of money, where the central bank creates its own cryptocurrency. To this end, the Bank of Canada is validating the implementation of a digital currency CAD-coin for the use of interbank transfers (Iansiti & Lakhani, 2017).

2.2.2 Currency stability:

Bankers are not open to the use of bitcoin as a currency. One major concern for the adoption of blockchain payments in banking is the stability of the underlying currency, especially as the cryptocurrency market is extremely volatile. Currency stability is crucial for ensuring that neither the buyer nor the seller loses out in trade due to price fluctuations. Instead of regular cryptocurrencies, Lund (2018) suggests a 'stable coin' which is basically a digital token that will have low price volatility as a result of being pegged to some underlying fiat currency, thereby acting as a store of value, a medium of exchange and unit of accounting for blockchain payments. An example of a stable coin is Stronghold USD (Corradino, 2018) which is backed by USD deposits and is currently undergoing research and development at IBM as a credible token for blockchain payments. Another example is the digital coin called utility settlement coin backed by six of the world's largest banks with the aim of allowing financial groups to pay each other or to buy securities without waiting for traditional money transfers to be completed (Harsono, 2018).

Figure04. Potential challenges of blockchain technology



Source: (Min,2019)

2.2.3 Security:

The security element features as both an opportunity and challenge for the adoption of blockchain in banking. It is no secret that banking requires high security. Historically, banks had to only be concerned with protecting their safes and deposits in high street banks. The move to online banking saw the emergence of a new security threat from hackers around the globe, thus creating a job market for cybersecurity and increased costs for banks. In the recent past, cyber-attacks have resulted in losses of 100 million USD in the banking sector and therefore, banks are cautious with regard to letting its financial data sit outside their secure firewall (Hillsberg, 2018).

2.2.4 Legislation and regulations:

In an early review by Guo and Liang (2016), the authors addressed the significance of establishing a regulatory sandbox, so that the implementation and operation of blockchain will have a restricted scope and still maintain sufficient space for innovation. Red tapes associated with Central Bank rules and bank secrecy regulations are adversely impacting the adoption of blockchain in banking with government intervention likely to be blocked further by lobbyists battling against this disruption (Hillsberg, 2018).

2.2.5 Scalability:

It is agreed that as it stands, blockchain has very limited transaction capacity. In fact, limited scalability is one of the serious concerns underlying blockchain technology. Bitcoin was built to be decentralized and secure at the expense of scalability. This is formally referred to as the ‘scalability trilemma’ in which only two of three properties decentralization, security or scalability – can be attained (Schou-Zibell & Phair, 2018). Therefore, more research and development are required for enhancing the scalability of the blockchain technology to process more transactions than Visa for a start. Furthermore, some Central Banks like De Nederlandsche Bank is of the view that distributed ledger technology is not suitable for existing financial payment infrastructure owing to scalability restrictions for large volumes of transactions. Therefore, the scalability issues, when coupled with the energy concerns, suggest that blockchain is more suited to wholesale banking solutions than the mass market (Caplen, 2018). A13

2.3 Blockchain Adoption Factors in the Banking Industry:

WEF (2015) sees that traditional roles will have to change in light of the blockchain technological and digital advancements, governments specifically will adopt an engaged facilitator rather than a commander role. While financial systems will adopt blockchain, changing the legacy pricing and exchange rate models. The main blockchain adoption supporting factors are referred to through literature as opportunities or benefits of using the new technology. These factors are based on the business value they provide to the financial and banking sectors. The identified supporting factors by this research are (Kawasmi et al,2020):

- ✓ Enhanced data exploration:
- ✓ Regulatory compliance
- ✓ Improving the KYC process
- ✓ Improved transactions speed
- ✓ Smart contracts
- ✓ Increased transparency

3. BLOCKCHAIN AND GOVERNMENTS:

For governments, the potential for blockchain adoption is equally compelling, with a variety of use cases that could aid and protect democratic principles. Land titles in developing countries have long been an issue for citizens; a large number of registries were lost due to lack of ownership proof. In Honduras, blockchains are being used to guaran-tee that land rights are digitized, ensuring consecutive governments cannot strip land owners of what is rightfully theirs by successive dictatorships (Lemieux, 2016). In the context of voting, individual citizens' de-tails could be stored in blockchains to guarantee that voting is executed lawfully and foreign government influence could be mitigated since the potential for vote tampering would be marginal. A malicious party cannot cast a vote on behalf of another

individual because each individual has a unique private key that only he/she can access (Hughes et al,2019).

4. SWOT ANALYSIS OF BANKING BLOCKCHAIN:

SWOT analysis (or SWOTM matrix) is a short form for strengths, weaknesses, opportunities, and threats and is a structured planning method that evaluates those four elements of an association, project or commerce endeavor etc (Niranjanamurthy et al,2019).

(a) Strengths:

- 100% transparency • Able to skip the intermediary • Auditable trail • Business process efficiency and productivity • Decentralized approach • High quality and fool proof data • Higher efficiency • Lower cost • Lower risk • More secure • No reliance on third party • Robustness (no SPOF) • Speed • Transparency • Trust in trustless networks • Unharmed privacy

(b) Weaknesses:

- Access challenge • Change Management • Integration with Legacy Systems • Lack Of Standards • Low capacity and processing speed • Ownership challenge • Recent technology (not 100% developed) • Scalability • Security against cyber criminals • Storage • Technology Maturity

(c) Opportunities:

- Automations • Business Process Optimization • Elimination of trust necessity • Faster (international) payment transfers • Improved customer experience • Increased quality of products and services • Innovation in Almost Every Industry Especially Banking • Instantaneous settlements • KYC database • New Intermediaries • No reliance on rating agencies • Opportunities In IoT • Programmable control mechanisms • Smart contracts in insurance • Speedup bank processes.

(d) Threats:

• A lot of research needs to be done • Disappearance of existing bank jobs • Govt. willingness to adopt • High investments for implementations • Huge regulatory impact • Hype • Legal/regulatory and compliance • Privacy and security • Time—consuming negotiations • Uncertainty about the impact-

5. Blockchain technology and its mutli-faceted potential for financial applications:

Over the past year, Blockchain technology has become one of the focal points of many financial practitioners eager to understand how it could impact, and possibly alter, their ways of doing business. We outline below our prospective analysis of where we think blockchain technology is likely to matter most when it comes to financial applications (Collomb & sock,2016).

- 1.Payment systems.
2. Corporate finance and governance
3. Financial accounting, trade finance and supply chain management
4. Financial reporting and compliance
5. Crowdfunding and peer-to-peer (P2P) lending.

III. CONCLUSION:

Our section on Ripple emphasized the potential of blockchain technology for the harmonization of payment protocols in the global financial system. However, other important applications exist in the banking and finance industry. Although suspicion initially surrounded Bitcoin, reaching its climax with the Mt Gox scandal in 2014, it is now morphing into deep embrace with blockchain technology, being touted as the main potential driver of financial services in the twenty-first century (Shubber, 2015). Likewise, a digital revolution is on its way in the banking industry, although the consequences for major players are very uncertain. Banks are likely to be reshaped, following a period of turmoil, to better address the needs of individuals and institutions, by providing them with enhanced services.

On 24 March 2015, Nasdaq, the leading provider of trading, clearing, exchange technology, listing information and public company services, signed a deal with the New York-based start-up Noble Markets. The latter will provide Nasdaq with core trading technology to help them build a new market for crypto-currencies (Casey, 2015). Nasdaq announced its plans to leverage blockchain technology, through the Open Assets Protocol, a colored coin innovation. Nasdaq will apply blockchain technology, in order to expand the equity management capabilities of Exact Equity™, its Nasdaq Private Market platform, resulting in enhanced integrity, auditability, governance and transfer of ownership capabilities (Nasdaq.com, 2015). For Bob Greifeld, the Nasdaq CEO (Nasdaq.com, 2015), blockchain technology is not only relevant to the management of physical securities, but increasingly to immaterial assets, and should widely benefit global capital markets (Pilkington, 2016).

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