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How Blockchain Technology could reshape the Financial Industry

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ABSTRACT

Advances in telecommunications and information technology have had a significant impact on the financial industry over the past few years. After the Credit Crisis of 2008, the landscape of the financial sector has changed due to overall financial regulation and financial technology innovations. Moreover, Finance and technology are very closely associated in which innovations have drastically changed the framework of financing processes. One such disruptive innovation that globally changes the financial sector is blockchain technology. Therefore, this paper outlines six different financial transactions use cases that are expected to be radically transformed by the use of blockchain technology. It is also aimed to provide an overview about this technology with its main benefits and to emphasize on the applications of blockchain in different financial areas. The paper gives insight of various implementations and global perspective of blockchain in the financial industry. The study concludes that, The financial industry, which is motivated by digital innovations is one of the industry that has the potential to benefit from blockchain. It will evlve as a disruptive force in transforming financial services especially in banking, insurance, international trade, cross-border payements, supplychains and crowdfunding transactions by making them faster,secure, transparent, less expensive and more effective.

1. Introduction

Over the last two decades, financial service technologies have evolved rapidly as a result of the expansion of the Internet Recently, advances in the fields of cryptography and decentralized computer networks have resulted in the emergence of blockchain.(Fernandes & Renato Verschoore, 2020, p. 318) Blockchain technology, which is a new technique emerged in recent years, has been widespread concern from all sectors of the society, especially financial institutions and high-technology corporations. It was firstly invented by Satoshi Nakamoto in 2008, who tried to design a decentralized electronic cash transaction system in order to solve the problem of double payment and improve the security of information verification. The main advantage of Blockchain over the existing technologies is that it enables the two parties to make secure transactions over internet without interference of any intermediary party. The omission of the third party can reduce the processing cost while improving the security and effciency of transactions. The financial industry, which is motivated by digital innovations, is one of the industry that has the potential to benefit from blockchain due to the reduction in the settlement period and the acceleration of payment processes. This breakthrough technology has gradually gained traction and it is now being explored far beyond the scope of bitcoin projects. Even traditional big players in the financial industry are looking for ways to benefit from blockchain.

Problematic: The technological revolution of digital and online computing combined with the information revolution paved the way for the emergence of innovations to reshape existing financial industry. Therefore the problematic of

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this research paper is : **How could blockchain technology reshape the financial indusry?**

Hypothesis: to solve this problem we have made the following main hypothesis: Applying blockchain technology will positively improve the financial industry by making financial transactions more secure, faster, transparent, and eliminate intermediaries.

Importance of the study is to identify the applications and contributions of blockchain technology in finance in general. Also to identify such areas where the technology can make a larger impact in payment and financing systems.

Methodology

This study uses the method of systematic literature review, which presents a conceptual study of potential of Blockchain Technology in revolutionizing the existing financial business applications . It also seek deep into the research articles and case studies conducted on the blockchain technology to understand its application in various financial industry. This approach has a methodological objective such as the verification of our hypothesis, sothat we can answer our questions and provide elements of solutions that will lead to recommendations. In order to achieve this objective, many references that were closely related to the topic were briefly examined, such as :

- **Holotiuk,F & others** (2017) study entitled **"The Impact of Blockchain Technology on Business Models in the Payments Industry"** : This study contributed in the analysis of the impact of new technologies on business models in the payments industry using the example of blockchain technology. The results indicate that blockchain technology will affect the Business models in the payments industry by allowing new services and making some of the current services obsolete. Through this change in services, a subsequent impact on the financial structure of firms in the payments industry is realized, which generates a great potential for new BMs in the market while some existing ones become obsolete (Holotiuk, Pisani, & Moormann, 2017).
- **Soonduck Yoo** (2017) study entitled **"Blockchain based financial case analysis and its implications"** : this paper investigates the use of blockchains in the financial sector. This study aims to examine how blockchains are applied to the financial sector and how to respond to the Korean conditions. It also the movements of the financial sector and related services using the blockchain in the current market. The study concludes that the areas where blockchains are most actively applied in the financial sector are expanding into settlement, remittance, securities and smart contracts. Also, in Korea, the domestic financial institutions also need joint action by financial institutions through a blockchain consortium to apply blockchain technology to the financial sector (Yoo, Blockchain based financial case analysis and its implications, 2017).
- **Abhishek Gupta, Stuti Gupta** (2018) study entitled **"Blockchain Technology Application in Indian Banking Sector "** : This study aims to provide the overview of blockchain technology with its benefits and emphasizing on the applications of the technology in the Indian Banking Sector. The paper gives the insight of various challenges and global perspective of blockchain technology in Banking Industry. The study concludes that, Blockchain will evolve as a disruptive force in transforming Indian Banking Sector by making banking transactions more secure, faster, transparent, and cost effective (Gupta & Stuti, Blockchain technology application in indian banking sector, 2018).

Study sections : The structure of this paper is organised as follows.

- ❖ Blockchain Technology: Theoretical Background
- ❖ The Implementation of Blockchain Technlogy in the Financial Industry

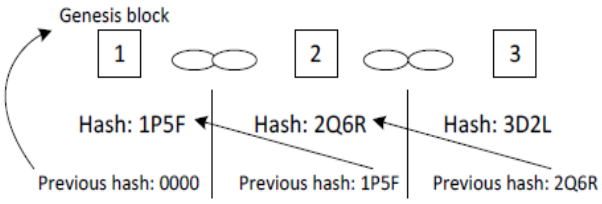
2. Blockchain Tchnology: Theoretical background

2.1. Concept of Blockchain

Blockchain technology can be explained as a distributed database of records or public ledger of all transactions or digital events that have been executed and shared among participating parties. Each transaction in the public ledger is verified by the consensus(validation) of a majority of the participants in the system. Once entered, information can never be erased . The notion behind Blockchain as a digital, distributed, and decentralized data structure is the development of transaction blocks that store digital transactions without the need for a central authority. Information concerning new transactions is appended to the chain after it has been encrypted and confirmed by the majority of the participating agents. Each block is then timestamped and cryptographically linked to the former blocks as a demonstration for the sequence of recorded transactions.(Lashkareh & Musilek, 2016, p. 03) As shown in Figure 1,

the hash of block 1 includes transaction details of that block, other information such as timestamps and importantly, the hash of the previous block (**Hashing refers to the transformation and generation of input data of any length into a string of a fixed size, which is performed by a specific algorithm)** . This hash is then included in the hash of block 2. This interlinking of hashes occurs across all the blocks in the entire chain. The interlinking of hashes across the entire length of the Blockchain makes it infeasible for the data inside the blocks to be tampered with. One of the properties of an ideal cryptographic hash function is that even the smallest of changes in the input, such as changing one letter or the addition or removal of a space result in completely different hashes. (Kim & Chandra Deka, 2020, p. 133)

Figure 1: Blockchain Structure



Source: Kim, S., & Chandra Deka, G. (2020). *Advanced Applications of Blockchain* Blockchain structure *Technology.* Singapore: Springer Nature. P.03

The distributed system is made up of many single nodes (users) working together. Each node is indirectly connected, and no single node is directly connected to all other nodes. By contrast, in a centralized system, all nodes are directly connected to a single central node. Distributed systems are preferred to centralized systems because of their faster calculation, reduced maintenance costs, greater stability, and easier upgrades. (Ko, Jaeram, & Doojin, Blockchain Technology and Manufacturing Industry: Real-Time Transparency and Cost Savings, 2018, p. 03) Blockchain has a unique features which are discussed below: (Dattani & Sheth, p. 01)

a)Distributed ledger : Distributed systems are a computing paradigm whereby two or more nodes work with each other in a coordinated fashion to achieve a common outcome. The end users see it as a single coherent logical platform. The term node here refers to an individual player in the system that are capable of sending and receiving messages to and from each another.

b)Information immutability : A central property for the participants' trust in the blockchain is the immutability of the data records. The information that is once stored in the system cannot be corrupted or hacked. Recorded data cannot be manipulated or modified after being accepted by the blockchain network. For an attacker who wants to change the data (i.e. transaction details) of a particular block, he/ she has to unlock every block (change the block back to the beginning) that has been appended above the target block to be able to access the latter which is nearly improbable.

c)Decentralisation : The fundamental basis of blockchain is that there is no single central authority in control. A group of nodes looks after the system. It puts users in a position to access and store their assets on the web without intervention of any governing authority.

d)Tokenization : It is the process of digitally representing an existing real asset on a distributed ledger. While the tokens exist on the blockchain and act as a store of value by representing the rights of the underlying assets, the real assets continue to exist in the "off-chain" world and are placed in custody to ensure that the tokens are constantly backed by these assets.

e)Smart contract : a smart contract is piece of a program executed in blockchain system that uses consensus protocol to run a sequence of events. In case of blockchain smart contracts refer to scripts residing on the blockchain, which has the ability to execute them. Smart contracts are effectively programmes which are loaded into, and sit alongside traditional transactions within a blockchain, that can automatically execute predefinable code when called (for example, automatically executing the terms of a contract when trigger events occur). The important thing about smart contracts is they reside in a decentralised system accessible to anyone, that doesn't require any intermediary party. (Deloitte, 2016, p. 27)

2.2. Type of Blockchain

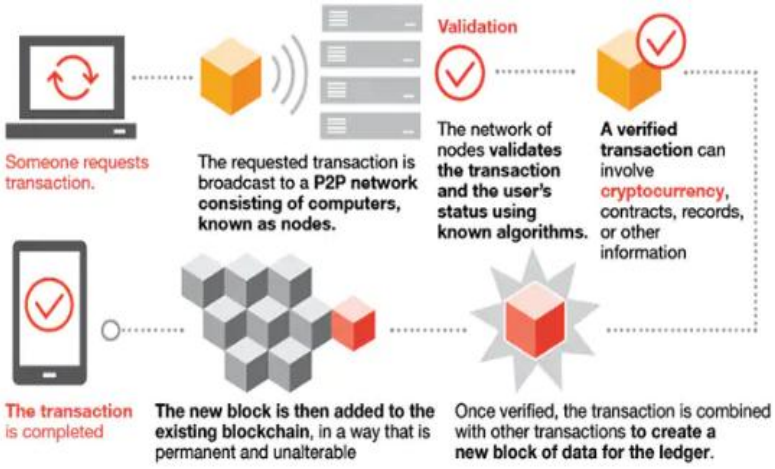
blockchain is a new type of database that enables multiple parties to share the database and to be able to modify that in a safe and secure way even if they don't trust each other (Hileman & Rauchs, 2017, p. 13). There are three main types of blockchain nowadays in the working domain, that are listed as follows :(Dattani & Sheth, p. 01)

a. Permission less blockchain : Bitcoin is the best example describing Permission less blockchain. There is no barrier as to who can use it. Anyone can run a node, mining software. Anyone can access a wallet, write data onto the transactions as long as they are following rules of the blockchain. These types of blockchain are open and transparent anyone can review it at any given point of time They are also known as public blockchains and this blockchain network power ups most of the digital currency in the market. e.g. Bitcoin and Lite coin.
b. Permissioned blockchain : They are also known as private blockchain. They act as closed ecosystem where people cannot readily join the blockchain network, see the history or issue transaction they need some sort of permission to do the mentioned task. It belongs to private individual or an organization where there is a central authority who looks after the permissions. e.g. Ripple.
c. Consortium or federated blockchain : This type of blockchain removes the power which is vested on the single individual. So here instead of giving power to a single entity it is given to a group of people or individual who form groups called consortium or federation. e.g. Quorum, Hyperledger, Ethereum and Corda.

2.3. Blockchain's Framework

A blockchain transaction between two parties starts when one of the participants signals a message to the network about the terms and conditions governing the transactions between the two stakeholders. Then, the other participant broadcasts its acceptance to the network, which by default triggers the request for the network participants to authenticate and verify the transaction. Consequently, network members automatically play the role of authenticators that validate and guard the transaction against double spending through a validation system called "proof-of-work", which represents a competition among network members to validate the transaction. At this point, when the transaction is validated, the public ledger (blockchain record) as well as the users of network will be collectively updated with the status of the recently added transaction. This mechanism helps in establishing trust between concerned stakeholders through the use of a decentralized public ledger as well as cryptographic algorithms that can guarantee approved transactions cannot be altered after being validated (Morabito, 2017, p. 23). In his original Bitcoin white paper, Satoshi Nakamoto defined an electronic coin "the Bitcoin" as "a chain of digital signatures" known as the "blockchain". The blockchain enables each coin owner to transfer an amount of currency directly to any other party connected to the same network without the need for a financial institution to mediate the exchange. (Dattani & Sheth, p. 06) We can illustrate how a blockchain works by using Bitcoin as an example, as shown in Figure(2). Bitcoin, like other blockchains, uses cryptography to validate transactions, which is why digital currencies are often referred to as "cryptocurrencies". Transactions are validated by a network of users called 'miners', who donate their computer power in exchange for the chance to gain additional bitcoins using a shared database and distributed processing. The framework of blockchain technology is illustrated in Figure 2 below.(PCW, 2021)

Figure 2: How Blockchain works



Source: https://www.pwc.com/us/en/industries/financial-services/fintech/bitcoin-blockchain-cryptocurrency.html

3. The Implementation of Blockchain Technology in the Financial Industry

The digitalization of finance and the processing of big data through distributed ledgers is at the core of current Financial technology adoption. Blockchain is a self-contained program that functions on the internet and it is stored virtually on it as a decentralized ledger.(Broby & Karkkainen, 2016) There are a diverse applications of blockchain

technology. In this section, the implementation of blockchain technology in different areas are thoroughly discussed. Furthermore, such applications have been categorized into several area, i.e. banking services, insurance, international trade**,** cross-border payments, supplychains, and crowdfunding.

3.1. Blockchain Application in Banking

Innovations in the banking sector started with the introduction of money that replaced the barter system and then the gradual replacement of banking and technology have drastically changed banking services over the period of time. One such innovation which is changing the banking sector globally is Blockchain Technology(BCT). (Gupta & Stuti, Blockchain technology application in indian banking sector, 2018, p. 01) It allows banks to enhance the products and services that they can offer their customers. By automating parts of bank's business processes (e.g. through smart contracts) and eliminating the intermediaries involved in transactions, it enables banks to provide their services and products in a faster, low-cost and secure way, thereby improving customers' experience. The first trade finance transaction made in 2018 between the two indians banks HSBC and ING supports this argument: the two banks completed the world's first commercially viable trade finance transaction in a record time of 24 hours instead of the standard period of 5–10 days, thereby providing benefits for the companies involved in the transaction in terms of speed and ease of execution. However, blockchain can also allow banks to offer a new value proposition to their customers. In particular, it can bring innovation to the banking sector by allowing banks to create products and services that were previously unavailable. Having access to a range of information recorded in the ledger, banks can exploit this information to have a better and more complete understanding of the behaviours' needs and preferences of their customers. This, in turn, enables banks to create and offer new products and services that are not necessarily associated with traditional banking products but tailored to meet the customers' individual needs. Thus, in addition to improving existing banking services and products, blockchain can help banks to offer a new value proposition to their customers by creating high-value-added products and services that can provide a big competitive edge. (Martino, 2021, p. 57) In addition, the ledger would provide a historical record of all documents shared and compliance activities undertaken for each client. This record could be used to provide evidence that a bank has acted in accordance with the requirements placed upon it should regulators ask for clarification. It would also be of particular use in identifying entities attempting to create fraudulent histories. Subject to the provisions of data protection regulation, the data within it could even be analysed by the banks to spot irregularities or foul play – directly targeting criminal activity (Deloitte, Blockchain applications in banking, 2016, p. 19). Blockchain finds applications in various areas in banking operations such as: (Patki & Vinod, 2020, p. 69)

- Secured transactions in capital markets with high efficiency
- Trade finance deals involving processing of LC (Letter of credit) and bills of lading.
- Servicing of trade and securities with stored KYC (Know Your Customer) data on real-time basis enabling transparency, reduction in credit exposures for quick, riskproof and prompt settlement.
- Supplychain Financing process with better system security and efficiency.
- Accounts monitoring to reduce non-performing assets (NPA).
- Enabling secured loan and credit bowering at a lower rate of interest.
- In blockchain trade settlement process, the verification from third parties is eliminated, leading to faster processing times, reduction in operational cost reduced and real-time transaction.

3.2. Blockchain Application in Insurance

Insurers, like banks, are intermediaries and, at first glance, there is great potential for insurers to use blockchain technology to streamline payments of premiums and claims. In addition, blockchain technologies could support the significant digital transformation underway in the industry because much of this transformation relies on data. In the case of **Claims handling,** For customers, insurance contracts are typically complex and difficult to understand because of the legal language used. In addition, when accidents or crimes happen, customers can often be faced with a complex and drawn-out claims process. From the insurer's perspective, the industry is facing ever-tighter regulation and a growing threat from fraud – whether from small-claims fraud by individuals or more serious and organised fraud spanning multiple insurers in the industry. The Insurance Fraud Bureau (IFB) is a not-for-profit body set up to tackle organised crime affecting the UK general insurance industry. In a typical motor insurance scam, for example,

drivers deliberately stage or cause an accident or even pretend to have had an accident, and claims are then made by the various criminals involved. These so-called "crash for cash" scams cost the industry around £400 million a year. Where claims are made against multiple policies held by different insurers, it becomes difficult to detect the fraud unless cross-industry data is shared. Smart contracts powered by a blockchain could provide customers and insurers with the means to manage claims in a transparent, responsive and irrefutable manner. Contracts and claims could be recorded onto a blockchain and validated by the network, ensuring only valid claims are paid. For example, the blockchain would reject multiple claims for one accident because the network would know that a claim had already been made. Smart contracts would also enforce the claims – for instance, triggering payments automatically when certain conditions are met. Adopting a common blockchain across the sector could create a step-change in value in the insurance industry: claims-handling could become more efficient and streamlined, resulting in an improved customer experience. Such an approach could also help to reduce further, if not entirely prevent, fraud if identity management was also enforced on the blockchain. Which means that criminals could no longer crash for cash or exploit the current challenges of sharing data unless their methods for obscuring identities became significantly more sophisticated. (Deloitte, Blockchain applications in insurance, 2016, pp. 20-21)

3.3. Blockchain for International Trade

Each international trade operation triggers hundreds of processes and as they are carried out, they are registered in the systems of each participant. Throughout the logistics chain, these data are replicated in the systems of each participant, where they are often reentered into a new system. In Latin America and the Caribbean, it is estimated that 75% of exporters re-enter data in their systems and then submit paper documentation to the respective trade authorities. The existence of multiple records often leads to errors, information time lags, delays and inefficiencies, and may even lead to fraud. Given that the blockchain contains a single shared and verified version of the data, proper implementation of this technology can provide the same information to all participants, eliminating the need for a centralized authority and reducing the volume of paper used (paperless trade), time, costs and the complexities of bilateral trade communications. Moreover, if the storage of information in the blockchain involves advanced cryptographic techniques in addition to encrypted electronic communication between the parties, much more secure services can be provided, allowing traceability and analysis of data dynamics. The World Economic Forum developed a study on blockchain and its potential impact on supplychains, which involved more than 60 participants from 40 different countries. This analysis identified five generic blockchain use cases and their potential impact on international trade, as shown in Table 1:

Table 2: Use cases relating to international trade and supply chains

Use case	Potential impact of blockchain
Product provenance and traceability	It would offer advantages and greater accuracy in the management of product certificates, reducing the risks of fraud and adulteration.
Streamlining of commercial operations	It would favour secure information-sharing, fostering secure and paperless trade. Traceability using this technology would favour better planning within processes
Automation and smart contracts	It would increase transaction efficiency, through faster processes and lower administrative costs. When certain contract conditions are met, contracts are executed automatically.
Trade finance	It would make trade finance easier and more transparent, especially in terms of efficiency and security of processes.
Facilitation of the detection of discriminatory measures	It would encourage the auditing of processes and thus encourage businesses to be more transparent and ethical.

Source: Caribbean, U. N. (2021). *Blockchain implementation.* Latin America and the Caribbean: ECLAC. P.06.

3.4.The Application of Blockchain Technology in Cross-Border Payments

Cross-border Payments can finish the transfer of funds in at least two countries or regions. If a domestic consumer purchases a product of foreign manufacturers, the consumer needs depend on a settlement tool and a payment system to finish cross-border payments. The most common payment tool is foreign currency, and the most common payment system is cross-border interbank payment system. For example, domestic consumers can conveniently buy imports overseas by bank payment channels, including VISA card, MASTER card, JCB card, and so on. The mainstream cross-border payments include bank telegraphic transfer, transfer by remittance company, credit card payment and third-party payment. Firstly, the bank telegraphic transfer is based on the payment network of Society for Worldwide Interbank Financial Telecommunications (SWIFT). A remitting bank at home sends a remittance message to a receiving bank abroad, and then the receiving bank abroad pays the money to the payee. This kind of payment needs to pay high fees and wait a long time. Secondly, the cross-border payment can also be finished by a remittance company, which confirms the payment transaction by authorized agencies overseas. The entire transaction process only cost very little time. Thirdly, the credit card payment bases on the bank payment and clearing system. Although the credit card payment is often used for shopping online or in a retail store, the shops need cost a great deal of money to equip hardware and software facilities. Fourthly, the third-party payment is a new payment method in recent years. If the government permits third-party payment institutions to offer their payment services to traders at home and abroad, consumers can finish a payment by a third-party payment tool, such as "Alipay" and "PayPal".

The above traditional ways of cross-border payments involve many trading parties and intermediaries, and the operational efficiency is lower. In such situations, blockchain technology can be used in cross-border payment business. In order to overcome the disadvantages of traditional ways of cross-border payments and reduce the transaction risks, blockchain technology can create a point-to-point payment, which discards a third-party financial institution and provides all-weather service. Concretely speaking, a global foreign exchange settlement system can be set up based on blockchain technology. In this settlement system, a gateway system is introduced to deal with the trust issues between parties in the transfer payment. The relationship between the gateway and the party reflects a kind of debtor-creditor relationship. For example, party A remits money to party B by blockchain. At first, the gateway, as a creditor for party A and a debtor for party B, is responsible for clearing the debtor-creditor relationship between party A and party B. In a blockchain system, the debtor-creditor relationship is stored on several servers though the distributed network technology. In the practical application, Ripple is a very popular cross-border payment network, which accepts not only all kinds of legal tenders, but also virtual currencies. Comparing with traditional ways of cross-border payments, the transaction cost of Ripple nearly equals to zero and the transaction time only takes a few seconds. Also it is possible for a trader to use any one currency, either the legal tender or the virtual currency, to realize a free trade. For example, if party A holds Bitcoin or gold, he can finish a payment by US dollars, Euros in Ripple. (Wu & Duan, 2019, p. 03)

3.5.Supplychian Finanacing Using Blockchain

A supplychain is a collection of organisations, individuals, activities, knowledge, and resources involved in getting a product or service from the supplier to the consumer. It's made to keep important products in good condition during the shipping process. Corruption, fraud, and tampering are all risks associated with centralized supply chain management systems. Blockchain is a modern distributed information system that reflects a new solution in the supply chain, where visibility and accountability of commodity flows are major challenges. There are benefits of blockchain in suppychain such as improved protection and traceability. There can be no documents lost, destroyed, or replaced. Furthermore, a blockchain-based framework removes the possibility of false identifiers being used to steal documents or products. Transactions are safer and more straightforward, resulting in increased confidence for all parties involved; there is less manual work and no paperwork delays. All the agreement conditions can be met by machine, without any human interference, thanks to smart contracts.(Dikilitaş, Onur Toka, & Sayar, 2021, p. 05) Supplychain finance is a set of technology-based business and financing processes that link the various parties in a transaction—buyer, seller, and financing institution—to lower financing costs and improve business efficiency. Supplychain finance provides short-term credit that optimizes working capital for both the buyer and the seller. (Choi, 2020, p. 02) Traditional supply chains rely on banks to support the related financing activities and services. With the emergence of blockchain technology, more and more companies in different industries have considered using it to support supplychain finance. Table 2 below illustrated the defference between traditional suppychain versus blockchain based supplychain.

Table *2*: Traditional supplychains versus blockchain-supported supply chains in SCF

	Traditional Supplychains	Blockchain-supported Supply chains
Supplychain financing	Relies on banks (or other third parties)	Uses cryptocurrency directly between the sellers and buyers
Operational cost	No additional cost per transaction but service fees are needed (to be paid to the banks)	A non-trivial blockchain cost is associated with each transaction (for establishing the hash tags and blocks)

Source: Choi, T.-M. (2020). Supply chain financing using blockchain: impacts on supply chains selling fashionable products. Annals of Operations Research , p.03.

Table 2 shows features of traditional supplychains and blockchain-supported supplychains in supplychain financing (SCF). Under the traditional supply chain, the supplychain members rely on the traditional bank for providing financing services which would incur service fees. Under the blockchain-supported supplychain, the supplychain members use cryptocurrency which means they do not need to rely on the traditional bank and hence the respective service fees are no longer needed. However, operations with blockchain are not free and costs are incurred. In short, there is no doubt that blockchain technology helps SCF and may potentially improve operational efficiency. (Choi, 2020, p. 05)

3.6. Blockchain-Based Crowdfunding

Crowdfunding relies on the contribution of a large number of individuals in order to finance the production of a particular work. Already a few crowdfunding platforms have been deployed on the blockchain, rewarding people's financial contributions to a project with actual shares of the project. Any invester in the project becomes an active shareholder, whose return on investment ultimately depends on the success or failure of that project. (Filippi., 2016, p. 02) At the core of crowdfunding are two defining aspects: first, raising small amounts of money from a large number of people (hence the term 'crowd'); second, the fundraising and transactions take place via internet. The World Bank (2013) defines crowdfunding as an internet-enabled way for businesses or other organizations to raise money in the form of either donations or investments from multiple individuals. Crowdfunding occurs where small amounts of money is obtained from a large number of individuals or organisations, to fund a project, a business or personal loan, and other needs through an online web-based platform in crowdfunding. In short, crowdfunding can be described as an internet enabled platform that is open for individuals or corporations for particular purposes, including wealth creation and social value creation. Crowdfunding offers an alternative to traditional banking, which has grown rapidly in markets driven by technology, as well as macroeconomic and regulatory factors. Crowrdfunding can be categorised into four: loan, equity, reward, and donation. While the former two involves financial returns, the latter two have no payback. Therefore, with the growing emphasis on the social roles of financial services, crowdfunding could be seen as an innovative way to improve financial inclusion. (Aishath, Arshad, & Arifin, 2018, p. 85)

Blockchain technology can change the experience of equity-based crowdfunding for investors. For instance, in centralized crowdfunding, papers such as contract or shareholder list or any kind of information are stored on a crowdfunding platform and only a few people have access to it. The features of blockchain crowdfunding technology like anti-tempring, anti fraud and decentralized ledger system will help to make information and data secure. Blockchain will be helpful in eliminating the tiring job of signing on a number of papers, postage issues, registration, authorization, and certification. Blockchain technology is transparent and can help the crowdfunding platform to gain trust and credibility among the funders and fundraisers. The credibility of the crowdfunding platform is realy important for the success of compain and platform itself. Traceabiity features of blockchain technology will help to fight against black money and money laundering. In all aspects, blockchain technology based crowdfunding can bring more discipline to this innovative and more effective form of crowfunding. (Righi, Marcos Alberti, & Singh, 2020, p. 123) Also, blockchain could mitigate the problems faced by crowdfunding and traditional banking. For instance, fundraisers could issue their own shares or perhaps smart contracts guaranteeing that pledge contributions would be returned where funding targets were not met. This allows project initiators and crowdfunding shareholders to securely register their rights at low cost. Blockchain is a decentralized and distributed ledger technology to ensure data security, transparency, and integrity, which cannot be tampered with or forged, and thus it is deemed to have great potential in

the crowdfunding industry. Table 3 summarises the differences between traditional banking and how blockchain could resolve the issues in crowdfunding. (Aishath, Arshad, & Arifin, 2018, p. 88)

Table 3: How Blockchain Could Disrupt Traditional Banking and Aids Crowdfunding

	Traditional banking	Blockchain
Efficiency bottlenecks	Complex clearing process; Large amount of manual inspection; Many intermediate links	Distributed ledger; Automated; Disintermediation
Security of fund management	A central trusted party; Complex equity transaction and transfer	Point-to-point transmission; Uniqueness of equity transaction and transfer
Cost	High cost	Low cost
Transaction lag	Centralised data management; Leads and lags	Decentralised data management; Transactions are time-stamped and can be verified in near real-time
Operation risk	Use of information asymmetric which often leads to adverse selection and moral hazards; Double payment	Use of asymmetric encryption;Transparent

Source: Aishath Muneeza, Nur Aishah Arshad, Asma' Tajul Arifin, The Application of Blockchain Technology in Crowdfunding: Towards Financial Inclusion via Technology, International Journal of Management and Applied Research, 2018, Vol. 5, No. 2, 2018.p. 88

There are plenty examples of combining blockchain technology and crowdfunding. Initial Coin Offering (ICO),Which is a type of funding using cryptocurrencies, where start-ups use blockchain protocols and cryptocurrency tokens as a means of crowdfunding their ventures. A number of crowdfunding platforms (e.g. Fundedbyme, StartEngine, WeFunder) have already accepting bitcoin. More notably, crowdfunding platforms such as Swarm and Lighthouse allow companies to create their own coins (cryptocurrency) which can be traded for other virtual currencies. (Aishath, Arshad, & Arifin, 2018, p. 90) In August 2021, the global crowdfunding market was valued at 12.27 billion U.S. dollars and was forecast to double by 2027. The size of the Chinese Alternative Lending market is remarkable - with a volume of US$251.9 billion, China accounted for 86% of the global market in 2020 (Statista, 2021). Thus, based on the above analysis, with the maturity and wide use of blockchain technology, a secure, efficient, cost-effective crowdfunding platform can be established based on the blockchain technology.

4. Conclusion

Advances in telecommunications and information technology have had a significant impact on the financial industry over the past few years. After the Credit Crisis of 2008, the landscape of the financial sector has changed due to overall financial regulation and financial technology innovation. The financial industry, which is motivated by digital innovations, is one of the industry that has the potential to benefit from blockchain.

Results : we can sammarize the results of this stady in these points below **:**

- Blockchain was first introduced as the technology behind the bitcoin cryptocurrency. It is a trustless, decentralized and secure ledger. It provides an unprecedented way to monitor and execute transactions with no need for intermediaries and to keep a tamper-proof record of these transactions.
- The nature of all records in the Blockchain is unalterable. Once a transaction record is put into the Blockchain, it cannot ever be removed. This makes it impossible to make up a transaction that never occurred, which results in a private, secure, and decentralized system.
- Cryptocurrency is the first successful application of blockchain technology and can be used as the main fuel of the global money transfer network.
- Blockchain allows banks to enhance the products and services that they can offer their customers
- Smart contracts powered by a blockchain could provide customers and insurers with the means to manage claims in a transparent, responsive and irrefutable manner

- In order to overcome the disadvantages of traditional ways of cross-border payments and reduce the transaction risks, blockchain can be seen as best solution in cross-border payment business,
- Blockchain eliminates the need for a centralized authority and reducing the volume of paper used (paperless trade), time, costs and the complexities of bilateral trade communications.
- Improved protection and traceability, no documents lost ; destroyed or replaced, removing the possibility of false identifiers being used to steal documents or products, increaseing confidence between all parties, less manual work and no paperwork delays are the main benifts of blockchain in supplychain.
- Crowdfunding is a practice of funding a project or venture by raising small amounts of money from a large number of people via internet. Blockchain technology could bring crowdfunding to another level because it does not only help in enhancing data security but also in its efficiency and affordability.

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