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Blockchain and its Influence on Market

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ABSTRACT

In the last decade, Blockchain has experienced a booming success. It is on everybody's lips, in particular in the banking and finance world where it finds its source. Many authors have explored the potential influence of Blockchain on the market. Blockchain brings digital technology into real time computing systems management. It has the ability to transform all aspects of the digital economy, including conducting business, shopping, enhancing education, delivering healthcare, and learning, entertainment, and staying connected with a social world. Blockchain was not in fact created for its own intents and purposes originally, it was only an aspect of Bitcoin protocol, ensuring the secure transfer of the cryptocurrency. In this paper, we are providing an introduction to Blockchain technology in a simplified style. It also discusses about how Blockchain technology can be used in the market to benefit the customers and the company to a great extent. Lately, Blockchain digital technology has evolved further to aid in conducting financial transactions. Online payments have gained large traction and card based payment methods, credit and debit cards have become dominant. Blockchain supports all these transform by creating increased speed of transaction processing and greater efficiency in real time processing. Blockchain provides a robust environment for secure data sharing in real-time. Blockchain is a type of distributed ledger system providing enhanced security in the real time digital economic process.

Keywords: — Blockchain**,** Cryptographic, Distributed Ledger Technology (DLT), Consensus Mechanism, Ripple, Ethereum.

I. INTRODUCTION

The world is continually changing, driven by technological innovations that affect the way we live and do business [1]. The history of the world economy is intimately linked to technological progress. The invention of the steam engine mechanized production, big data [2] [3], and the rise of the internet made it possible to coordinate various production stages at a distance, leading to a fragmentation of production that gave rise to global value chains [4]. The internet revolution conquered the world as key stakeholders [5] in politics, business, and civil society developed visions and brought us innovations such as email, the World Wide Web (WWW), Big Data [2], cloud computing and the first days of the Internet of Things [6]. Security concerns and the difficulty of coordinating data flows across borders and between the multiple parties involved in an international trade transaction have hampered efforts to digitalize trade [5]. A new technology, Blockchain [7], is seen by many as a possible game-changer. Blockchain are built on a series of innovations in organizing and sharing data. A Blockchain is essentially a distributed database of records, or public ledger of all transactions or digital events that have been executed and shared among participating parties [8]. Each transaction in the public ledger is verified by [9] consensus of a majority of the participants in the system. Once entered, information can never be erased. It stores data in blocks that can verify the information and are very difficult to hack [10].

Blockchain is a decentralized, distributed database that maintains a continuously growing list of secure data records [7]. It first emerged in the context of Bitcoin [11], where it serves as a decentralized, distributed digital ledger recording all Bitcoin transactions. In the traditional banking system, when money is transferred through banks, they are notified to transfer the money, the bank(s) [12] will send notification and update accounts appropriately. The relevant data is stored in a database owned by the bank, and users only have partial access to that data. Users must trust third parties. This has two implications. First, the bank has to make a profit, so in the aggregate, this means less for the other participants. In addition, if any third party or the bank itself manipulates the data or commits fraud, it might be challenging for all participants to quickly and efficiently detect this. These new technologies make it possible for a group of independent parties to work with universal data sources, automatically reconciling between all participants. In principle, any stored data record could be represented on a Blockchain, from ownership of assets to contractual obligations, credit exposures or static data. A multitude of data types can be 'hashed' encrypted and entered into the ledger to create richer datasets than today. Blockchain is a technology that could potentially drive innovation for the asset management industry, both in terms of operational effectiveness and cost reduction and exploitation of information [13]. Storing and agreeing datasets of financial obligations and ownership forms the basic core of capital markets operations. The current methods are highly complex, utilize fragmented IT and data architectures and suffer from a lack of common standards. This creates the continual need to reconcile data with massive systems and process duplication, leading to high costs and protracted time to execute tasks.

More efficient settlement of transactions and processing would occur as everyone sees the same data, and updates are quickly

circulated across the market. The cash transactions could settle in real-time since the trade is complete when the next update to the Blockchain is agreed, embedding the transfer of ownership of an asset or other agreement. This would remove the need for post-trade affirmation or confirmation and central clearing during the settlement cycle. Since all participants would now use the same underlying dataset for trade-related processes, the Blockchain reduces the scope for data errors [14], disputes and reconciliation lags, speeding up the end-to-end process. Blockchain technology can be put to use as a mechanism to safeguard trading. It has attracted the interest of stakeholders across a wide span of industries, finance [15] healthcare [16], utilities [17], real estate [18] and the public sector [19]. Another area that could be significantly impacted by the use of Blockchain technology is insurance. The automation of processes through the use of smart contracts could help reduce administrative procedures and costs, handle claims, and administer multinational insurance contracts. Blockchain is also just starting to enter the e-commerce world [8].

II. ABOUT BLOCKCHAIN

The term 'Blockchain, much used in the past couple of years, refers to different concepts, some of which are more precise than others [7], depending on the context and who uses them. The first Blockchain was that of Bitcoin using the protocol of the same name [10]. It consists of a database structured as a chain of blocks of information, where the blocks are connected to each other by cryptographic linking for the purposes of making the data stored incorruptible. The Blockchain contains transaction data, it's not a replacement for databases, messaging technology, transaction processing, or business processes [9]. The Blockchain contains verified proof of transactions. This register acts like the accounting ledger for the network, in which all valid transactions are recorded. It is distributed in the sense that every active participant of the network or node, has their own copy of it, which they can consult and, if desired, change, by solving a cryptographic puzzle. There is therefore no need for a centralised controller, and the addition of a new block of information to this ledger happens on average every ten minutes, according to a consensus protocol which allows all active members of the network to verify the validity of the proposed transactions. A Blockchain database has a network of users, each of which stores its own copy of the data, giving rise to another term for Blockchain technology distributed ledger technology (DLT). Basic elements of a DLT network are: a digital ledger, a consensus mechanism used to confirm transactions, and a network of node operators shown figure 1.

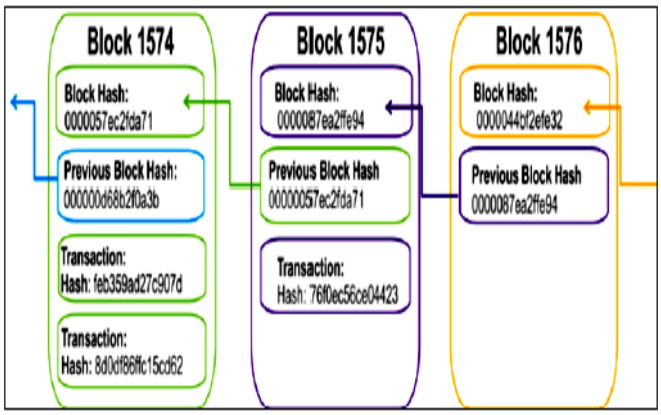

Fig. 1 The Blockchain Sores Transaction Records in a Series of Connected Blocks

There are different types of Blockchain and the type of Blockchain selected determines how actors in the network interact with each other [20]. There are permissioned and permissionless Blockchain, each with different characteristics, rules, and actors. Permissionless Blockchain are public Blockchain [7]. The best-known example is the Bitcoin Blockchain. In the permissionless Blockchain anyone interested in joining a particular permissionless Blockchain can do so by simply connecting his or her computer to the decentralised network, downloading the application, and starting to process transactions. It is not necessary to have a previous relationship with the ledger and you do not need to be approved to join [9]. The permissioned, or private, Blockchain do not require these artificial incentives because all actors in the network are known to each other [20]. New actors have to be approved by existing participants in the network, which enables more flexibility and efficiency in validating transactions [7]. Private Blockchain are generally used by organisations that like to keep a shared ledger for settlement of transactions [21], such as within the financial services industry. Private and public Blockchain are the two flavours that have been around and, for both options, the main feature is that, once a transaction is approved and on the Blockchain, it cannot be changed or edited. Some of the larger fintech are considering layering their online banking on to combinations of public and private Blockchain networks [22]. The type of Blockchain that an organisation could opt for depends on the objective of the organisation and the type of transactions that need to be stored on a Blockchain. Some transactions, such as financial transactions, should not be visible for the general public, whereas other transactions, such as ownership of goods and land titles, benefit more from a public Blockchain [23]. Regardless of the type of Blockchain, the data stored becomes immutable, verifiable, and traceable, due to four key components of Blockchain, cryptographic, consensus mechanisms, transactions, and smart contracts [8].

2.1. Cryptographic

The cryptography is a key component of any Blockchain system. Among other things, it consists of two important characteristics the digital signature and the Hash algorithm.

1) Digital Signatures:

Digital signatures are based on public key cryptography, also known as asymmetric cryptography. Asymmetric cryptography means that two keys, a public and a private key, are mathematically related to each other. This relationship means that any data encrypted by one key (public key) can be decrypted only by the other (private key), and vice versa. It is impossible to encrypt data with a public key and use another public key to decrypt that data [24]. As a outcome, you can use a key pair to identify the owner of a certain digital asset. As the public key is publically available, any data encrypted with a related private key can be decrypted only by the corresponding public key.

2) Hash Algorithms:

Each block of data on a Blockchain receives a hash ID, as a database key, calculated by a Secure Hash Algorithm. A block's hash is fixed. In other words, the hash ID allocated to the block never changes. Hash algorithms are used in a variety of components of Blockchain technology [25], one of them being the hash ID, which is a unique string of 64 numbers and letters linked to data in each block. The US National Security Agency (NSA) has designed a second generation of crypto-graphic Hash functions called secure Hash algorithms 2. It includes SHA-256, a highly efficient secure Hash algorithm in figure 2 that creates a unique hash ID for every piece of data. Hash algorithms create the exact same hash if the data is exactly the same. Altering only one bit in the data will result in a completely new hash ID [26]. The hash ID of a block that is added to a Blockchain is the starting data for the next block, and as such the blocks are chained together. The hash makes data on a Blockchain immutable and that it has not been changed over time verifiable.

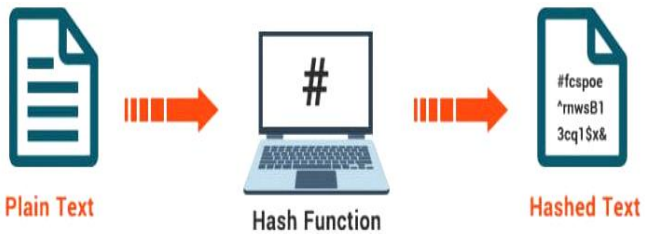

Fig. 2 The Hash Algorithm

2.2. Consensus Mechanism

The consensus algorithms ensure that connected machines are able to collaborate independently without the need to trust each other and can continue working even if some members of the network fail [27]. There are a multitude of consensus algorithms that take different approaches to authenticating and validating values and transactions on a Blockchain. Consensus is vital to Blockchains, because there is no trusted central authority. The consensus algorithms use cryptography to validate transactions and at the moment,4 the two most [28]common consensus algorithms are Proof of Work (PoW) and the Practical Byzantine Fault Tolerance (PBFT), although new consensus algorithms are being developed constantly. PoW is commonly used in permissionless Blockchains, whereas PBFT is used in permissioned Blockchains.

1) Proof of Stake:

Proof of Stake (PoS) is another common consensus algorithm that takes a different approach. Within PoS, as within PoW, validators are selected randomly, but, where validators within PoW have a larger chance of being selected if they have more computing power, within PoS the amount of money that a member holds determines the likelihood of being selected.

2) Proof of Work:

The PoW algorithm solved the requirement for a centralised authority. The technical innovation of a PoW is that it does not require membership. For this reason, a central authority is no longer required. The PoW algorithm is, therefore, used in public or permissionless Blockchains

3) Timestamp:

A consensus mechanism implements a timestamp service [29], which ensures that every block that is added to a Blockchain is time stamped to prove temporal relationships between different events. The timestamp basically confirms that a certain transaction occurred on the Blockchain at a certain time.

2.3. Transactions

A Blockchain transaction can be defined as a small unit of task that is stored in public records. These records also know as blocks. These blocks are executed, implemented and stored in Blockchain only after the validation by all persons involved in the Blockchain network. Each previous transaction can be review at any time but cannot update. A Blockchain browser is a site where every transaction included within the Blockchain can be viewed in human-readable terms.

2.4. Smart Contracts

The term 'smart contract' was first coined by Szabo [8] as 'a computerised protocol that executes the terms of a contract'. It can be seen as a traditional agreement that is automatically defined and executed by code, leaving no room for discretion. The smart contracts are analogous to scripts for processing transactions and/or decisions. Smart contracts can be seen as If This Then That statements compiled into bitcode. They are software programs that will execute certain transactions or decisions, which were agreed upon by two or more actors [10]. They are created by choosing events or preconditions, and by providing what needs to happen when those preconditions are met.

2.5. Blockchain Platforms

This section considers some of the organisations that are developing the new technology for Blockchain. The number of companies developing new tools and solutions is constantly

expanding and here we provide three examples of different types of Blockchain start-ups.

1) Ripple:

Ripple is a Blockchain start-up focused on the financial services industry. They claim that they are not using Blockchain, but rather use Distributed Ledger Technology. They have developed a Distributed Ledger Technology to enable banks around the world to send real-time international payments, without the need for a centralised authority. It is in reality a payment network to instantly transfer any type of currency across the globe. They have developed a distributed global network that hosts payment nodes to transfer value around the world.

2) IOTA:

IOTA is a completely different cryptocurrency because it does not use a Blockchain, but rather uses a Directed Acyclic Graph called Tangle. It is developed especially for Industry 4.0 where connected devices have to be able to perform micro- or nano-transactions with each other.

3) Ethereum:

Ethereum applications run on a custom built Blockchain, a shared global infrastructure that can move value around and represent the ownership of property. It is a decentralised platform to develop DApps that run through smart contracts. These smart contracts are small software programs that execute a task, a sort of If This Then That statement. They run on a custom built Blockchain and as such there is no chance of fraud, censorship, or third-party interference.

III. POSSIBILITY OF BLOCKCHAIN IN THE FINANCIAL SECTOR

Today scenario banks see and recognize the opportunities and new possibilities that Blockchain technology can create for the financial and technological centre. Therefore, the banking working group looks into new business models and the resulting value-added potential for the financial sector. In recent years, new start-ups have emerged in the field of Blockchain and cryptocurrencies. Blockchain technology offers new potential for the financial industry in terms of earnings as well as costs [30]. In terms of earnings, these are new business models and new products and services, offered by existing as well as new companies. New platforms on the Blockchain make it possible, for example, to optimize the process of raising capital as well as all other subsequent processes. In terms of costs, potential arises along the entire value-added chain from the perspective of the financial industry [31]. For examples client identification through new, Blockchain based KYC approaches, up to mortgage contracts based on smart contracts. The potential ranges from the reduction of clearing and settlement times, lower error rates, the reduction of operational risks up to improved regulatory transparency. Many of the existing processes in the financial industry can be optimized through Blockchain. In the payment sector, these include the processing of international payments, IoT payments or even P2P payments. In the investment field, these include, for example, post-trade settlement, electronic marketplaces and stock exchanges as well as liquidity management. In the financing sector, syndicated loans, trade finance and bonds can thus be optimized. It is very probable that many of today's products will be transformed through Blockchain based solutions.

IV. INFLUENCE OF BLOCKCHAIN IN THE GLOBAL MARKET

Blockchain technology is set to impact all major areas of business in the coming years, ultimately causing large-scale disruption to the global economy. By adopting Blockchain technology, advertising executives can avail of better protection, ensuring their marketing ROI doesn't suffer companies can use the system to track and manage their budget spending. This reduces the risk of being overcharged and also guarantees better performance in the long run. It would be easy to assume that machine learning technology is the antithesis to the human resources department. However, there is a lot of tech needed to effectively evaluate, hire, compensate, and even terminate employees [32]. The society for human resource management believe that Blockchain technology will soon modernize the hiring process, making it possible for HR staff to verify candidates and current staff much faster. Any concerns of third parties interfering with inaccurate data on job applicants will be a thing of the past. Furthermore, payroll will be streamlined, even for multinational corporations and companies with foreign staff. The long-term effects of this will change how people save for retirement, as more employees will seek out valuable investments in Blockchain based cryptocurrency, rather than linking everything to their home country's currency and banks. Accountancy departments must manage large-scale operations spread all over the globe, handling multiple currencies and complex tax codes. For any economy, this area demands the most precision. With Blockchain, that becomes a whole lot easier to achieve [33]. To consider the big picture, adopting this revolutionary, immutable technology means fraud is significantly minimized, if not eradicated. It also offers confidentiality and total anonymity. Blockchain can shore up this valuable part of the economy. It can record digital transactions and interactions in a secure and efficient way, offering transparency and protection to form a solid foundation that companies can rely on. This allows photographers to register licenses for their work, protecting against image theft. Another example of how Blockchain is enhancing operational efficiency is the organic agricultural company NagriTech. Focusing on developing markets in India, and Mexico, NagriTech aims to improve copy yields. It does this by helping out the farmers who normally have trouble getting credit because of an unstable economy in their country. Blockchain tackles the problems of high inflation rates and regular currency devaluation by using a cryptocurrency that facilitates better regulated financial transactions in these nations.

V. PRACTIAL USE IN BLOCKCHAIN

Unluckily, a fair amount of trades have errors, requiring manual intervention and extending the time required to settle trades. Because it does not require an exchange to verify, clear, and settle security transactions, Blockchain will save a large amount in fees and capital charges globally by moving to a shorter, and potentially customized, settlement window. Blockchain will eliminate significant fees across FX, commodities, and OTC derivatives. Blockchain technology could simplify and streamline this entire process, providing an automated trade life cycle where all parties in the transaction would have access to the exact same data about a trade [34]. The real estate market will change for sure. Home owners buying or refinancing property are subject to significant transaction costs, including title insurance, where the title search process can be labour intensive. An individual can put a property on the Blockchain so that prospective buyers can review and verify the owner of a property [35]. Banking regulation requires that banks know their customers (KYC). Identity data stored on a Blockchain facilitates the bank's verification of the identity of new customers. Storing account and payment information in a Blockchain could standardize the data required for an account, thereby improving data quality and reducing the number of falsely identified "suspicious" transactions. The Blockchain can be used to keep track of digital assets. When we purchase a used car the seller must physically deliver the car, title, and key. In the future, car titles may be public on the Blockchain and the key may be digital. All data could be verified through a Blockchain.

The general concept of a decentralized autonomous organization (DAO) is that of a virtual entity that has a certain set of members or shareholders which, perhaps with a 69 percent majority, have the right to spend the entity's funds and modify its code. The members would collectively decide how the organization should allocate its funds. Methods for allocating a DAO's funds could range from bounties and salaries to even more exotic mechanisms such as an internal currency to reward work. This essentially replicates the legal trappings of a traditional company or nonprofits but uses only cryptographic Blockchain technology for enforcement. So far much of the talk around DAOs has been around the "capitalist" model of a decentralized autonomous corporation (DAC) with dividend receiving shareholders and tradable shares. An alternative, perhaps described as a decentralized autonomous community, would have all members have an equal share in the decision making and require 69 percent of existing members to agree to add or remove a member. The requirement that one person can only have one membership would then need to be enforced collectively by the group. The gambling is a multi-billion-dollar industry and was revolutionized by the Internet. Online gambling accounts for a significant proportion of all betting. Mostly, the Internet just saw the same big gaming players move their infrastructure online. However, Blockchain technology changes all that. It is the missing piece that protected the established gambling industry. Private data is stored, shared, and analyzed without ever being fully revealed to any party. Enigma provides secure multiparty computation, empowered by the Blockchain [36]. This is as futuristic and radical as Blockchain gets and will be an important innovation as it solves some of the most difficult problems in technology today: privacy and security. These core functions, layered on top of distributed cloud technology, are a dynamic combination that transforms how data is stored and retrieved, providing industries like finance, health, and civil services the underlying trust and security to truly unlock the potential of next generation mobile applications.

VI. BLOCKCHAIN IN BUSINESS USE CASES

6.1. Know Your Customer (KYC) Use Case

Know Your Customer (KYC) is the process by which a financial institution gathers information about a customer. The main purpose of this process is to ensure that institutions' services are not misused, and this process takes place when a customer opens an account. The process varies because each financial institution is responsible for being in compliance with the requirements laid out and specified by their local regulatory body. The process typically requires the passing of documents back and forth between the customer and financial institution. There is very little automation; financial institutions dedicate a huge amount of resources to the process, but it is still very time consuming. The customer's personal information, KYC documentation, and data are encrypted and added as a block in the Blockchain [37]. The customer's block is validated using a consensus model running on the network. When the customer wants to open an account with a bank or financial institution for the first time, the FI directs them to their block and authorizes them with access. The FI can access all of the validated KYC information and move the customer along the on boarding process. The single source of KYC data that can easily be shared between financial institutions and external agencies will eventually result in much faster account opening, reduced resources, and therefore lower costs. This can all be done while maintaining the privacy of data, because the owner of the data strictly controls its access.

A. 6.2. Digital Recognition Use Case

The decentralized nature of Blockchain means that there is no centralized point of weakness for hackers to target, which may lend itself as a good use case for digital identity management. A self sovereign ID can be used to verify identity without needing an individual to produce numerous documents and paperwork each time they need their identity verified. This could be done with a single key that can be matched against an immutable ledger. The digital ID can also collect other online information about a user's identity like social security information, medical records and social media credentials and have that stored securely on the Blockchain [38]. This can allow users more control of their private data to transact more securely online but more importantly, takes away the power from companies to monetize this data and puts control back to the users. For those billions of people who are unbanked, allowing them to have a digital identity is the first step to help these people gain access to financial services in order for them to participate in the global economy.

B. 6.3. Asset Management Use Case

Typical back office trade processing and settlement methods can be awkward, risky, and time consuming. This is especially the case when manual steps are involved, such as during matching and reconciliation tasks. Every entity in the value chain keeps its own copy, or view, of the transactions that have taken place. These processes continue to get more complicated as new instruments are being developed and traded. In short, mistakes and associated costs are rising in proportion to the complexity of the tasks and involvement of resources to deal with them. The transactions can be stored in a Blockchain and made available to all parties. This would drastically simplify and streamline this entire process for all parties. It would lead to automation [38] of the trade life cycle, facilitate easier management of the data, and provide transparency as well as substantial infrastructure and resource reductions. These improvements would lead to minimal reconciliation and ultimately faster processing times.

6.4. Healthcare Use Case

In the healthcare, patient data is held across different institutions in legacy silos in various different formats and standards, making sharing of the data ill suited for the modern user's expectation for instantaneous access. Using Blockchain technology to record patient information on a distributed ledger can allow different stakeholders conditional access to a single source of truth where each interaction with a patient's health data can be recorded on a ledger as a transaction with a time stamped audit trail [39]. This makes access to a patient's health information more secure, can take out the inefficiencies with current data management practices and offers patients more control over their own health data.

6.5. Insurance Processing Use Case

The insurance claims process is complex and often drawn out and lengthy. Insurance contracts are typically difficult to understand, because over time they have evolved into a complex web of legal language in reaction to prior unfavourable outcomes. So when you need to make a claim, it takes a while for the process to complete. Insurance companies are composed of many separate department silos, such as underwriting, policy issue and administration, claims, actuarial and statistical, accounting, investment, legal, and audit. Create insurance policies using a smart contract on the Blockchain. The qualities of a smart contract would allow for much more automation. A smart contract would provide the customer and insurer with the ability to manage claims in an open in figure 3, speedy, and indisputable way. The contract is uploaded to the Blockchain and validated by the network. Similarly, claims are then uploaded to the Blockchain and applied to the smart contract. That being said, Blockchains cannot access data outside their network [40]. This data can represent external conditions such as temperature, payment, price change, or RFID presence trigger. When the correct conditions are met, a payment is automatically triggered.

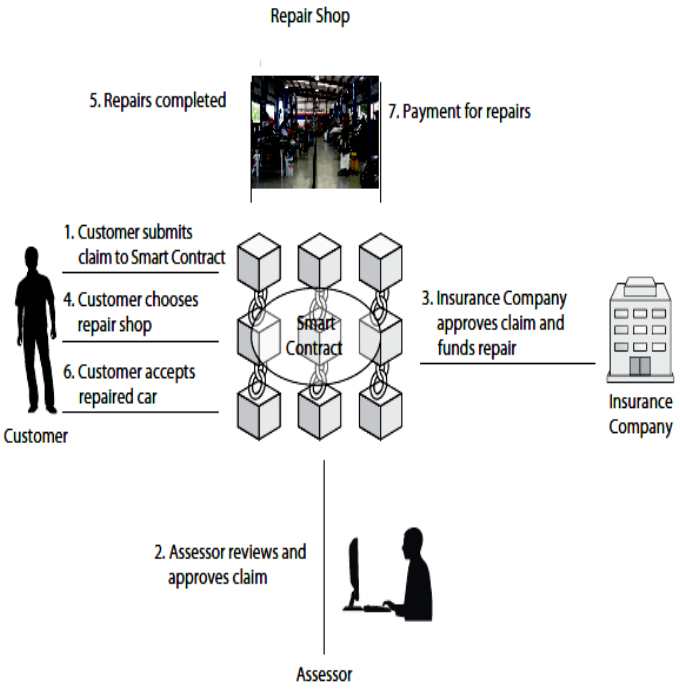

Fig. 3 The Insurance Claims Processing

6.6. Energy Market Use Case

Another evoking interest use case for Blockchain technology is the role it can play to decentralize the energy market, which is typically controlled by a few large corporations in each market. Blockchain technology enables the smart metering of electricity generated through an individual's solar panels to be recorded, traded and settled on a ledger. If electricity can be traded like any other commodity, energy prices instead of being a fixed regulated price, will respond to forces of demand and supply in a fully functioning distributed electricity market [41]. This allows individuals to be both producers and consumers of energy, which can reduce costs and improve efficiency by not having to rely on a centralized grid.

6.7. Trade Finance (Supply Chain) Use Case

Trade finance refers to financial transactions, both domestic and international, that relate to trade receivables finance and global trade. Trade finance is a core business function for all global banks, especially tier 1 bank. It still lags in its application of technology and still resorts to using very manual processes for its document centric flows. This leads to interruption in business cycles, and the lack of transparency leaves the door open to financial crime. Supply chains between many parties are complicated [42], distributed, and lack trust, therefore they are very slow and need many third parties such as banks and clearinghouses to facilitate the trust aspect and allow the commerce supply chain to flow. Blockchain will hold all of the necessary information in a smart contract, updated instantly and viewable by all members on the network. The smart contract can be used to automate the transfer of title to goods and money. This automation and network validation remove the need for third party facilities, such as letters of credit, and will help to streamline the whole process and measurably reduce

costs by eliminating the third parties and their associated fees. The open and auditable transactions available in the distributed ledger reduce or eliminate supplier fraud. The shared ledger is available to all banks, rating agencies, and suppliers participating in the chain, reducing processing and storage costs and fees. Payments between institutions in the network can potentially be made through a cryptocurrency. This will eliminate the need for higher cost third party payment networks.

VII. BLOCKCHAIN CHALLENGES

A key challenge associated with Blockchain is a lack of awareness and technical skills needed to implement the technology. A Blockchain represents a large shift away from the traditional ways of developing digital technologies. It places trust and authority in a decentralized network rather than in a classic central institution. In this section, we will explore challenges and other issues.

7.1. Regulation and Governance

Regulations have always struggled to keep up with advances in technology. Indeed, some technologies like the Bitcoin Blockchain bypass regulation completely to tackle inefficiencies in conventional intermediated payment networks. One of the other challenges of the Blockchain approach, [43] which was also one of its original motivations, is that it reduces oversight.

7.2. Usability

Blockchain technology has been met with several usability issues due to the lack of feature rich tools for third party developers. As a result of this, the technology has been unable to gain a significant presence on mobile platforms which have led to the lack of widespread usage and a number of smart contract flaws. Also, system security has not been left out which has also been negatively impacted. Until robust tools are created and developers learn to do away with hacky third party tools, the issue of the usability will continue to prevail in the industry. Also, there is a need for adequate frameworks to be created so as to enable third party organizations to step up to the challenge of providing more centralized solutions for improved multi platform availability.

7.3. Privacy

The Bitcoin Blockchain is designed to be publicly visible. All the information pertaining to a transaction is available for anyone to view. With the exception of privacy centric coins, this is the same with many of the Blockchains currently in existence. While this feature may be important in some contexts, it becomes a liability if distributed ledgers are to be used in sensitive environments. For instance, private patient data should not be available for all as is the case with proprietary business data [44]. This is also applicable to government data or financial data. For Blockchain technology to be adopted on a wide scale, the ledgers need to be altered in order to limit access to the data contained therein to only those who have the necessary clearance.

7.4. Security

While it is rather unlikely to happen to large Blockchain networks, Blockchains are vulnerable to a 53% attack. This refers to a situation where a miner or a group of miners control more than 52 percent of the mining power. In such a scenario, the miners would be able to control the confirmations of new transactions, especially those by other miners. Moreover, they would be able to reverse the transactions they confirmed and therefore double spend tokens. While the controlling miners would not be able to alter old blocks, this would severely affect the integrity of the token with the affected Blockchain and it would need to recover in the public eye. Fortunately, the probability of this attack is reduced as more people participate in the network as miners.

7.5. Costs

Blockchain technology is an effective tool for reducing costs. It reduces the fees associated with transferring value and can streamline operational processes. However, because it is a relatively new innovation, it is difficult to integrate it with legacy systems. Such a process is likely to be an expensive affair that many corporations and governments will be unwilling to undertake.

7.6. Scalability

It is difficult to talk about Blockchain development without considering how the tech is being affected by a range of scalability issues. This is one of Blockchains biggest problems that need to be addressed first hand. The lack of scalability is an inherent problem of the technology that continues to restrict its growth as it can adversely affect the speed of the application currently in use. As a matter of fact, no one is interested in making use of applications that are relatively slower than what they are used to. To this conclusion, developers shouldn't expect mass adoption of Blockchain based apps just for the sake of decentralization. With these problems [45] on the ground, developers will find it difficult to make headway in their quest to provide credible Blockchain solutions.

7.7. Integration With Systems

In order to make the move to a Blockchain based system, an organization must either completely overhaul their previous system or find a way to integrate their existing system with the Blockchain solution. However, it may be difficult for Blockchain solutions to handle all functions needed by organizations, initially making it difficult to completely eradicate legacy systems. Therefore, considerable changes must be made to the existing systems in order to facilitate a smooth transition. This process may take a significant amount of time, funds and human expertise. In some cases, it may be undoable to reconcile the two systems, and the organizations must acquire new systems that are compatible with the Blockchain solution. Many organizations are reluctant to make the move to

Blockchain solutions because of the meticulous planning, time and money that would be required in order to achieve successful companywide implementation.

7.8. Lack of Talent

An organisation design perspective is the lack of talent to build decentralised applications. Educating employees to work with Blockchain takes time however, it is not yet taught at many educational institutions. The only 52% of the world's top universities offer a Blockchain course. As is the case with all new technologies, organisations and academia need to work together to ensure the correct curriculum is introduced. There are already hundreds of Blockchain start-ups, all trying to attract the same limited talent, yet organisations are faced with a talent pool that is expanding more slowly than demand is growing. Therefore, organisations that want to embrace Blockchain technology need to have deep pockets to pay for expert salaries or rely on employees that have only just started learning this new technology.

7.9. Ecosystem

The decentralised ecosystem surrounding Blockchain and supporting distributed products and services is needed. This includes decentralised cloud, decentralised archiving, decentralised communication and decentralised domain name servers. Most of these technologies are not yet fully developed, resulting in significant risks for anyone who wants to get involved with Blockchain and develop completely decentralised and autonomous organisations.

7.10. Energy Consumption

The Bitcoin network, as well as the Ethereum network, both uses the proof-of-work mechanism to validate transactions made on the Blockchains. This mechanism requires the computation of complex mathematical problems to verify and process transactions and to secure the network [46]. These calculations require large amounts of energy to power the computers solving the problems. In addition to the energy used to run the computers, a sizable amount of energy is also required to cool down the computers. The large amount of energy required to keep the most well-known Blockchains in operation is a deterrent to many corporations that are now focusing on sustainable methods of doing business. With climate change being a major concern, such massive use of energy does not seem justifiable.

7.11. Identity

Utilization a common Blockchain system participant is able to identify every single device. Data provided and fed into the system is immutable and uniquely identifies actual data that was provided by a device [46]. Additionally, Blockchain can provide trusted distributed authentication and authorization of devices for IoT applications [47]. This would represent an improvement in the IoT field and its participants.

VIII. CONCLUSION

At present, technological innovation in market is not new, investment in technology and the pace of innovation have increased outstandingly in recent years. Among other things, technological innovation is driving social networks, Blockchain, artificial intelligence, machine learning, mobile applications, distributed ledger technology, cloud computing, and big data analytics. Using Blockchain new services and business models by established financial institutions, technology companies and new market entrants. The Blockchain can revolutionize several areas of international trade, from trade finance to customs procedures and intellectual property, are legion. Blockchain is known as distributed ledger technology because it uses encryption and distributed computing power to create a perennially updated and cryptographically secure record of transactions. Because all aspects of the transaction are distributed in real time, alternatively asynchronously, among all its participants, transactions can settle faster, and with lower expense, lower human error. In this paper, aimed to demonstrate a close-up view about Blockchain in business use case, influence of Blockchain in the global market, practical use in Blockchain, and challenge. Blockchain ledgers can be handled autonomously to exchange information between parties, much like a peer-to-peer network or collaborative software.

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