

Survey on Block Chain Methodology and Agile Technology Revolutionizing Development: Integrating Blockchain Methodology with Agile Technology

¹Tooba Jalal and ²Sibghatullah Safdar

¹University of Management and Technology, Pakistan

²The Access Group and Fathom, America

Correspondence:

Tooba Jalal: toobajalal15@gmail.com

Article Link: <https://www.brainnetwork.org/index.php/jcai/article/view/11>

DOI: <https://doi.org/10.69591/jcai.1.1.2>



Citation: Jalal, T., & Sibghatullah, S. (2023). Survey on Block Chain Methodology and Agile Technology Revolutionizing Development: Integrating Blockchain Methodology with Agile Technology, *Journal of Computing and Artificial Intelligence*, 1(1), 20-51.

Conflict of Interest: Authors declared no Conflict of Interest

Acknowledgment: No administrative and technical support was taken for this research

Article History

Submitted: Mar 05, 2023

Last Revised: Apr 10, 2023

Accepted: May 29, 2023

Volume 1, Issue 1, 2023

Funding

No

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An official Publication of
Beyond Research Advancement & Innovation Network, Islamabad, Pakistan

Survey on Block Chain Methodology and Agile Technology Revolutionizing Development: Integrating Blockchain Methodology with Agile Technology

Tooba Jalal^{*1}, and Sibghatullah Safdar²

¹University of Management and Technology, Pakistan

²The Access Group and Fathom, America

Abstract

Blockchain innovations are acquiring a huge force over the most recent couple of years. Blockchains are appropriated records that empower parties who do not completely trust each other to keep a bunch of worldwide states. Blockchain, as a decentralized and circulated public record innovation in distributed organizations, has gotten impressive consideration recently. It applies a connected block structure to check and store information and applies the believed agreement component to synchronize changes in the information, which makes it conceivable to make a digital platform for putting away and sharing information. Blockchain innovation can automate installment in cryptocurrency and give admittance to a common record of information, exchanges, and logs in a decentralized and confided way. Additionally, with smart contracts, blockchain can administer communications among members with no mediator or a confided-in outsider. On the other hand, Agile techniques are progressively utilized for the improvement of programming projects. These techniques are adaptable to acknowledge future changes during the existence of programming advancement. Programming improvement and support contrast in a few significant regards. So, in this review paper we find the way in which blockchain technology in agile methodology.

Keywords: block chain, agile, innovation, significant, synchronize.

Introduction

Blockchain technology is revolutionizing the creation of adaptable information technology systems and advanced applications, integrating popular technologies like artificial intelligence, cloud computing, and big

¹Corresponding Author: toobajalal15@gmail.com

data [1]. Various industries have recently begun exploring blockchain, and its widespread adoption worldwide seems imminent. Originally linked to the bitcoin revolution, blockchain technology has garnered significant attention from both professionals and academics. It often sparks debates regarding its potential applications and business implications. Blockchain functions as a decentralized network of information technology, monitoring transactions of digital assets through distributed ledgers that are independent of intermediaries like banks and governments [2]. This setup helps to address risks associated with intermediary interference, such as cyber-attacks, compromised security, political instability, costly regulatory compliance, volatility in financial institutions, and legal disputes.

A blockchain transaction is a basic unit of an operation stored in publicly accessible documents called blocks. These blocks are executed, verified, and stored within the blockchain for validation by all participating miners. While past transactions are visible for review, they cannot be altered. The transaction process begins with sender verification to ensure transactions originate from authorized senders [3]. The blockchain consists of a series of blocks, each containing transaction data akin to a public ledger. Blocks are connected via a reference hash linked to the previous block, known as the parent block. Each block includes a transaction counter indicating the number of transactions and a list of recorded transactions. The capacity of a block to hold transactions depends on its size and the size of individual transactions [4].

There are three main types of blockchains: public, private, and consortium. Their degree of decentralization varies, with public blockchains being fully decentralized, consortium blockchains partially centralized, and private blockchains controlled by a central authority. These different types serve distinct purposes and can be assessed from various perspectives. In public blockchains, all nodes can engage in the consensus process, and users have read permissions [5]. In contrast, private and consortium blockchains can restrict access to the distributed ledger. Public blockchains offer high scalability as nodes can freely join or exit the network, making them highly adaptable.

Agile software development depends on a bunch of qualities and standards. The twelve standards are derived from agile qualities [6]. Agile

standards are an arrangement of transformative necessity, basic plan, consistent conveyance, self-putting together group, and face-to-face correspondence. Because of changing business sector interest, agile procedure deals with issues like versatility, more exertion, and cost needed in setting up equipment and programming framework, accessibility of talented assets, and capacity to construct an application from various areas

Agile methods are engaged in a quick and consistent worth conveyance for the client while keeping a high versatility to changes. Because of this, some shortcomings are not yet settled. Issues like documentation, responsibility, and adaptability have space for development [7]. Yet, this should be managed without affecting the fundamental abilities of Agile. The utilization of blockchain in this field could work with the improvement of these angles and open new viewpoints. Making the two advancements work in reality is a test that can take coordinated tasks from the executives to another measurement. Therefore, in this paper we will find the way where we can use the blockchain application that can help in the process of the agile methodologies [8].

Literature Review

The Internet of Things (IoT) is transforming various industries into smart industries driven by data. However, inherent characteristics of IoT present challenges such as decentralization and security vulnerabilities. Blockchain technology has the potential to address these challenges, leading to what is known as the Blockchain of Things (BCoT).

Blockchain is an ideal supplement to IoT with further developed interoperability, protection, security, dependability, and adaptability. Blockchain can work on the interoperability of IoT frameworks by changing and putting away IoT information into blockchains [9]. During this methodology, heterogeneous kinds of IoT information are changed over, handled, separated, compacted lastly put away in blockchains. Additionally, the interoperability likewise shows in effectively going through various sorts of divided organizations since blockchains are set up on top of the peer-to-peer network that upholds general web access [10]. IoT information can be gotten by blockchains since they are put away as blockchain transactions, which are encoded and carefully endorsed by cryptographic keys [11]. Besides, the incorporation of IoT frameworks with blockchain

innovations can assist with working on the security of IoT frameworks via updating IoT gadget firm products to cure weak penetrates in this manner further developing the framework security. Blockchain information can be distinguished and confirmed anyplace and whenever. In the meantime, every one of the verifiable transactions put away in the blockchains is detectable [12]. The changelessness of blockchains additionally guarantees the dependability of IoT information since it is almost difficult to modify or distort any exchanges put away in blockchains. Blockchain advancements can concede IoT gadgets or subsystems to cooperate naturally. Blockchain innovations have a few systems to preserve specific information security of exchange records saved in blockchains. One-time accounts are created in Bitcoin to accomplish the secrecy of clients [13].

Blockchain is praised as a big step forward in how society trades and interacts using technology. This is mainly because it lets people who don't trust each other trade money and connect without needing someone they trust in the middle. Blockchain also keeps data safe and allows for transparent processes [14]. A "block" is a way of storing a list of transactions. People on the blockchain make transactions with each other, which changes the state of the blockchain. Bitcoin is an example of a type of blockchain that anyone can join and leave freely. Unlike some other types, there's no one in charge of deciding who can join or banning dishonest people. Some blockchains, called permission blockchains, do have someone in charge who decides who can take part. To keep things private and secure, readers and writers could work in separate but connected block chains [15]. In SCM, the progression of materials and administrations needed in assembling a given item is overseen, which incorporates different halfway storage and creation cycles until the conveyance to the last mark of utilization. Commonly, numerous organizations collaborate and exchange on a worldwide scale inside a given inventory network. Because of this complexity, related expenses of dealing with the stock, process, and failure identification are especially costly [16]. A Decentralized Autonomous Organization (DAO) is an association that is arrived behind schedule through a bunch of smart contracts. Rather than conventional associations or organizations, there is no focal control or the board. Decentralized self-ruling associations are, however, an uncommon case. For certain applications, a devoted permission blockchain might be helpful for a solitary

DAO. As a rule, DAOs do not need their blockchain yet are rather more qualified to be based on top of a current blockchain with a generally existing currency [17].

It is accepted that blockchain can be applied to assorted Internet intuitive frameworks. Nonetheless, some security challenges may impede the wide use of blockchain [18].

In the space of digital currency, blockchain establishes the fundamental hidden framework, which permits the financial activity to be acted appropriately without the need for some focal elements. The blockchain framework is based on the P2P network, where each marked transaction will be communicated by the source hub to its one-bounce peers [19]. Every one of the substantial blocks and exchanges recorded on the worldwide record is permanent because of the requirement for confirmation by different hubs and discernibility of changes. One huge property of blockchain is that there is no single element controlling or overseeing the organization [20]. An exchange of blockchain contains the ID of the past exchange, the addresses of its members, exchange esteems, timestamp, and a mark of its sender. Because of the public idea of the blockchain network, it is feasible to follow the progression of transactions to remove the clients' actual characters or other extra data by data mining [21]. There are some normal burdens which include: extra delays for holding on to be blended and no insurance for the content of the transaction. Recently, blockchain has gotten significant consideration in decentralized data frameworks because of its decentralized nature and security highlight [22].

The technology world is growing fast, and it's important to understand what the main advancements offer, especially in how they handle data. In a blockchain, a transaction is like in regular databases: it's a series of actions done on certain states [23]. There are many different blockchain systems now, claiming various abilities, and both public and private sectors are trying to use them, facing many choices. Bitcoin is the most famous public blockchain, where transactions involve moving coins between addresses. Hyperledger is one of the most popular private blockchains. Security in blockchains relies on public-key cryptography, so secure key management is crucial. Losing private keys means losing access, which can have a big financial impact, especially in things like cryptocurrencies [24].

Artificial Intelligence (AI) and blockchain have emerged as two pivotal and complex technologies. AI empowers machines to emulate human thinking and decision-making processes. By combining AI and blockchain, many of their respective shortcomings can be effectively mitigated. AI algorithms rely on quality data to learn and make informed decisions, and they perform optimally when the data is sourced from reliable, secure, and credible channels. Blockchain serves as a distributed ledger, ensuring data storage and execution in a transparent and unanimous manner across all network nodes. When smart contracts are integrated with AI algorithms, the resulting decisions gain enhanced trustworthiness. This fusion of AI and blockchain technology fosters the creation of secure, immutable, and decentralized systems, which are particularly beneficial for handling highly sensitive data. These advancements promise significant improvements across diverse fields [25].

Energy systems are changing rapidly to accommodate more renewable energy sources like wind and solar power. These sources are variable and hard to predict, posing new challenges for managing power systems. Flexibility measures like efficient supply, demand response, and energy storage services are needed for safe and secure operation. Energy systems are also moving towards digitalization, with the deployment of smart meters in many countries [26].

Advances in miniaturization, hardware, and wireless communication technologies have led to remarkable progress in our society. This has resulted in more affordable electronic devices, a decrease in production costs, and a shift towards a digital world. The Internet of Things (IoT) has emerged, allowing devices to sense, interact with, and communicate over the internet [27].

Although the vital thought of blockchain is straightforward, it is anything but an incredible number of difficulties. Capacity limit and adaptability have been profoundly addressed in the blockchain. Security is not upheld in the Bitcoin convention by the plan. A critical element of Bitcoin is its straightforwardness. In the blockchain, every exchange can be checked, inspected, and followed from the frameworks [28].

Absolute first exchange. This is to be sure an inconceivable new degree of straightforwardness that without a doubt assists with building trust. To

expand security, information in the blockchain can be encrypted. The issue of security in private blockchains can be handled unexpectedly since they should give verification and approval systems. The smart code is put away on the blockchain, and each agreement is recognized by unique location, and for clients to work with it, they simply send a transaction to this location. The right execution of the agreement is authorized by the blockchain consensus protocol. Ethereum stands out as the most prominent platform for smart contracts. It's a blockchain with a powerful programming language that allows for the creation of smart contracts and decentralized applications [29]. The Internet of Things (IoT) is revolutionizing manual processes, integrating them into the digital era and generating vast amounts of data. This data is driving the development of smart applications, improving governance, and enhancing quality of life by digitizing services in cities. Cloud computing advancements in recent years have enabled the IoT to analyze and process data in real-time, and blockchain functionality can further enhance IoT capabilities, promoting the advancement of existing IoT technologies. However, there are still numerous research challenges and open issues that need to be addressed to fully leverage these two technologies together [30].

In blockchain jargon, a nonce is a unique number utilized once in a single transaction to modify the output of a function. Since the output of hashing algorithms is unpredictable from input values, discovering an appropriate nonce requires trial and error. Miners employ brute force to find the nonce by testing various nonce values until a suitable result is achieved. While multiple miners may participate in verifying transactions and creating a block, only the first to solve the puzzle emerges as the winner [31].

One notable application of blockchain in the energy sector is in microgrids. A microgrid is a localized network of electric power sources and loads managed to enhance energy production and consumption efficiency and reliability. Blockchain technology can facilitate energy trading through smart contracts on a broader scale, tackling challenges in fragmented market systems like interoperability, trust, and transparency [32].

Blockchain can also offer solutions to various issues faced by traditional databases, such as in voting systems, providing security and privacy for

sensitive personal data through the use of generated addresses instead of real identities [33].

A store network regularly meets business capacities and public limits with a broad organization of exchanging accomplices. These collaborations increment the weakness of the store network and can prompt its interruption. One of the initial steps that trigger store network exercises is contract arrangement. In that capacity, authoritative questions coming about because of misrepresentation, misconception, and execution disappointments can annihilate the store network association as well as disturb store network exercises with delayed time for the goal. One of the conceivable thoughts that were advanced as of late is to frame a smart contract. In a brilliant agreement, an agreement can be changed over to PC codes and afterward put away and duplicated on the PC framework and managed by the organization of PCs that run the blockchain. Specifically, smart contracts can help you trade cash, property, offers, or anything of significant worth in a straightforward. Cybercrime has been on the ascent for as long as a decade. The developing danger of cybercrime can disable production network exercises in the extended production network organization. Despite endless endeavors (e.g., antivirus) to manage such a risk, the threat of cybercrime has never been lessened. In a blockchain, each hub needs to measure and approve each transaction, so the blockchain by its inclination requires tremendous figuring force and high transfer speed web association, which isn't difficult to work with the current innovation. If such a test powers the blockchain to concentrate its approval cycle, it might overcome its unique reason [34].

A blockchain provides a secure method of storing data by organizing information into blocks and arranging them in a specific sequence, encrypting them to prevent alteration or tampering. In essence, blockchain technology utilizes block-shaped data structures to validate and store data. It employs distributed node consensus algorithms for data creation and updates, and encryption ensures secure data transmission and access. Unlike traditional systems, blockchain networks operate without a central authority, instead being decentralized and consisting of six layers: data, network, consensus, contract, service, and application. Data collection, validation, and manipulation mainly occur within the data and network layers [35].

Each block in the blockchain records and stores all transactions, with data automatically shared and distributed between nodes without third-party intervention. Since blockchain operates in a decentralized system, data transfer between nodes does not require mutual trust among participants, relying on peer-to-peer network protocols. Through blockchain, all participants can share and query data in nodes in a decentralized manner, ensuring secure and reliable data recording and transfer. Every transaction within the distributed system is transparent and trustworthy. Although blockchain technology has made some strides in the medical field, its full potential has yet to be realized [36].

For example, it is utilized in an individual wellbeing data set and data sharing focus, in a smart clinical help stage, and in a profound examination of the difficulties looked at by blockchain innovation in the clinical field. The decentralized design of the blockchain safely gathers the put-away information and empowers clinical information to be updated continuously on each organization hub. The blockchain is certainly not a straightforward blend of at least one advancement, however the mix of different advances. These methodologies are built in new constructions to make better approaches to record, store, and communicate information. Like blockchain innovation, distributed computing is a help and a result of coordinating PC innovation and organizational innovation. The interoperation of the blockchain and distributed computing gives framework backing to the utilization of blockchain innovation and decreases the time and work expenses of platform deployment. Blockchain as assistance is the stage that embraces distributed computing to carry out blockchain-based applications to various businesses and administrations [37].

Blockchain has been an area of intriguing exploration for some time, offering benefits that various industries have leveraged. The healthcare sector, in particular, stands to gain immensely from blockchain technology due to its emphasis on safety, privacy, confidentiality, and decentralization. However, Electronic Health Record (EHR) systems face challenges regarding data security, integrity, and management. One potential solution to these issues is the adoption of blockchain technology, which promises to provide a secure, tamper-proof platform for storing medical records and other healthcare-related information [38].

EHR systems have been implemented in numerous hospitals worldwide due to the benefits they offer, primarily improvements in security and cost-effectiveness. They are considered a crucial part of the healthcare sector, providing extensive functionality. With technological advancements in healthcare making the security of patients' medical data a top priority, blockchain presents certain advantages such as security, confidentiality, and data integrity without the need for third-party intervention, making it a sensible choice for storing patients' medical records [39].

Several experts have also acknowledged that incorporating blockchain technology in healthcare would be a viable solution. However, storing data on the blockchain raises two main issues: privacy and scalability. Data stored on the blockchain is visible to everyone on the chain, making it vulnerable, which is not an ideal outcome. Additionally, the workings of blockchain technology are understood by few people, and the technology is still in its early stages and continuously evolving. As there is no defined standard for blockchain technology yet, its implementation in the healthcare sector would also require additional time and effort, including approval from international authorities overseeing the standardization process of any technology [40].

Blockchain is one of the present new trendy expressions. Numerous individuals consider this innovation troublesome. Its expected attracts on the likelihood to empower reliable transactions between people in a conniving climate with no focal gathering. This trademark difficulty the situation of the present mediators. Since the innovation is somewhat new and applications are for the most part facilitated by new companies, information about blockchain is very heterogeneous. It is commonly amassed in the monetary business, specialized business, and the scholarly community. The subsequent obstacle to comprehending blockchain is the math behind the innovation since it depends on numerical cryptography to set up the trust [41].

Much of the current focus on blockchain revolves around its potential to revolutionize the financial services industry significantly. As a result, blockchain is expected to challenge existing business models and provide opportunities for new value creation. Blockchain technologies offer numerous possibilities for developing new businesses and pose direct

threats of disruption to traditional incumbents. Organizations operating under traditional business models, which involve acting as intermediaries between two parties in transactions, should consider how blockchain technologies may impact their incentives, competitiveness, and operations [42].

Organizations utilizing blockchain can target existing customer segments in a market, similar to segments served by conventional firms. One unique aspect of blockchain is its ability to access a target market that was previously unreachable, thus creating new customer segments for a business. One consequence of using blockchain is the improvement of collaboration, as middlemen may become disintermediated. Blockchain technology can enhance customer value by providing access to products or services that were previously unavailable or required significant time or money to obtain. It can also facilitate faster or cheaper transactions compared to traditional settings, thereby reducing transaction costs and time for parties involved, potentially through the use of smart contracts [43].

Blockchain technologies compel firms to reconsider the key assets that comprise their business model. One aspect involves the opportunity to make assets more liquid, allowing firms to move away from traditional ownership and access resources only when needed. Another significant aspect is how blockchain technologies can impact assets and activities when customers provide many of the key resources and processes, using blockchain technologies to facilitate resource exchange. Despite the potential of blockchain technology, widespread adoption has yet to be achieved, with few projects transitioning from a pilot stage to full implementation [14].

The overall idea of blockchain is inseparable from transactional information and is translatable to various security executions. Blockchain turns out to be progressively significant when joining hardware and software utilities to frame a comprehensive data framework. Issues can emerge however when just certain gatherings have the approval to draw in with a bunch of information, for example, the exacting restrictions set up regarding medical care records and other recognizable data and ensured health data. There are a lot of occasions where blockchain innovation and the structure and architecture neglect to give the ideal security, versatility, and different advantages usually examined in corresponding with

blockchain. A few cases recommended that blockchain was not genuinely as adaptable as recently suspected, evaluating certain central points of interest and proposing arrangements. Blockchain designs and their executions inside data frameworks are proposed implies by which to lessen the overhead expenses, regardless of whether those be time, exertion, or accounts, related with fittingly dealing with these arrangements of information. information system serves a major job in present-day culture. Investigations of information systems generally examine and talk about the interaction by which the actual framework is executed and sent to guarantee that all-important gatherings associated with the framework can obtain their ideal data successfully. information systems are for the most part applied in various controls, and all their elaborate applications contrast [12]. Ways to deal with information systems require the comprehension of the basic business work process just as human conduct to guarantee the most effective open platform is set up and used for the movement of data to proper gatherings. Considering the universal and noticeable utilization of information systems all through various spaces, attempting to further develop them and guarantee that they work at top execution utilizing the most productive and promptly accessible innovation is critical. an information system can be carried out in staggeringly different and extraordinary manners, each having its advantages and disadvantages. The choice to join blockchain innovations into information systems empowers gatherings to exploit the unimaginable assortment of employments that blockchain involves. Blockchain, being a particularly broadly useful way to deal with controlling information, considers it to be used inside quite a few frameworks for a wide assortment of purposes, given that the execution utilizing it has some level of comprehension or development concerning its utilization. Blockchain has been carried out in a wide exhibit of utilities. Essentially, because of the different number of use cases information system promptly and consistently control, blockchain has appeared in a similarly wide and various number and type of uses and spaces. Blockchain executions diminish the danger of a basic disappointment affecting a whole framework [20].

Since its inception, blockchain technology has demonstrated promising application potential, from its initial use in cryptocurrencies to the current implementation of smart contracts across various fields. Despite some

research on the security and privacy issues of blockchain, there lacks a comprehensive assessment of blockchain system security [6].

In current blockchain systems, four significant consensus mechanisms are prevalent: Proof of Work (PoW), Proof of Stake (PoS), Practical Byzantine Fault Tolerance (PBFT), and Delegated Proof of Stake (DPoS). The PoW mechanism utilizes puzzle-solving to validate data credibility, requiring nodes to solve computationally difficult yet easily verifiable problems when creating blocks. Once solved, the PoW puzzle is broadcasted to other nodes to achieve consensus. Block construction may vary widely across different blockchain systems [9].

The PoS mechanism employs proof of ownership to validate data credibility. In PoS-based blockchains, users are required to stake a certain amount of cryptocurrency during block or transaction creation. This mechanism significantly reduces computation, thereby increasing the throughput of the entire blockchain system. Different blockchain systems may utilize various block synchronization methods [3].

Blockchain technology has evolved through two stages of development: blockchain 1.0 and blockchain 2.0. In the blockchain 1.0 stage, blockchain technology is primarily utilized for cryptocurrencies. Compared to traditional currency, cryptocurrencies offer several advantages, including irreversible transfer and payment operations, decentralized structure without central administration, and speedy transaction completion. Blockchain relies on distributed consensus mechanisms to establish mutual trust.

However, challenges such as double-spending still persist, where a user spends the same cryptocurrency multiple times for transactions. While blockchain systems take measures to ensure transaction security, the consensus mechanism's effectiveness in preventing double-spending remains a challenge.

Additionally, each block in the blockchain contains a timestamp, and some smart contracts rely on timestamps set by miners. However, discrepancies in system time may affect the execution of smart contracts, leading to potential issues such as dead code, where certain operations in a smart contract are never executed despite being deployed on the blockchain.

Cloud computing has the potential to revolutionize the way technology is managed and deployed, particularly in emerging fields like blockchain. However, due to the novelty and complexity of blockchain technology, expertise in this area is scarce and highly sought after. Many developers struggle to effectively deploy, maintain, and monitor their blockchain applications, leading to concerns about reliability and security.

Blockchain-as-a-service (BaaS) addresses these challenges by combining cloud computing and blockchain, allowing users to leverage cloud-based solutions for creating, hosting, and managing their blockchain applications, smart contracts, and functionalities. BaaS providers handle all the necessary tasks to ensure the infrastructure remains agile, operational, and easily accessible. This integration of blockchain into cloud computing platforms enables developers to quickly set up blockchain environments without worrying about the underlying complexity.

However, current BaaS platforms still face limitations, particularly regarding support for various types of blockchains and the ability of smart contracts to access external data. NutBaaS, for example, enables smart contracts to call external data interfaces through HTTP or HTTPS, providing developers with greater flexibility. Additionally, NutBaaS focuses on comprehensive functional monitoring of the blockchain system, supporting various underlying systems, including consortium blockchains.

Over the past decade, blockchain technology has rapidly evolved, attracting significant interest from both research communities and industries. Initially developed for the Internet finance sector as a decentralized ledger system, blockchain is now seen as a powerful framework for decentralized data processing and self-organization in open-access networks. However, as the demand for high-quality blockchain-based services grows, designing robust blockchain protocols poses significant challenges, particularly in ensuring data integrity and authenticity across different levels of the blockchain hierarchy.

Blockchain technology has found applications in various sectors, including finance, banking, government, and healthcare. Research in this area primarily focuses on developing efficient, secure, and scalable consensus algorithms. While public blockchain algorithms offer scalability, permissioned blockchain algorithms prioritize efficiency and security.

Moreover, blockchain technology is increasingly being adopted in the Internet of Things (IoT) to address security and provenance tracking challenges, with specific platforms designed for decentralized IoT operations. Additionally, blockchain solutions have been applied to address various issues in healthcare.

There are various attributes needed to stakeholders in a corporate association for the endurance of the specialist co-ops. Blockchain alludes to a conveyed framework, information construction, or organization of blocks that are requested as a rundown. Straightforwardness and trust are set up in the blockchains that are fundamental parts that constrain various associations to carry out blockchain in their foundation. Among numerous endeavors blockchain applications are being used in finance, health, voting frameworks, and ensuring a common foundation. Quite possibly the main part of utilizing permissioned blockchain framework is that it offers high accessibility as opposed to single point disappointment. All transactions recorded in the framework stay in the framework as all hubs download each transaction or block and it very well may be recovered when needed from different hubs. A permissioned blockchain is not the same as permissionless because of the utilization of the access control layer. It limits clients as far as admittance to the agreement system and hence empowers just the proposed members to join the organization. Various stages are explicitly intended for IoT networks due to their explicit qualities. IoT chain is another stage for IoT devices to fill in as a decentralized organization. IoT chain has not been available to general society for advancement. IOTA is another stage that utilizes DAG (Directed Acyclic Graph) explicitly intended for IoT. Blockchains can address IoT's security and unwavering quality issues. It can follow billions of associated devices and can be utilized to deal with transactions and correspondence between devices. The Integration of blockchain into the Internet-of-Things is certifiably not a clever thought, it has open a somewhat fresher and more extensive space for innovative work in the field of IoT applications. The greater part of the restrictions of IoT can be settled utilizing blockchain advances. IoT gadgets are imparting straightforwardly without the inclusion of the blockchain. In the IoT framework, the absence of trust between devices is a basic issue as the actual hubs can't execute the unpredictable trust calculations. IoT foundation depends on the brought together design, which makes it hard for the IoT

biological system to be adaptable [24].

With the widespread expansion of Information and Communication Technology (ICT) over the past few decades, various smart applications have seen significant use in sectors such as healthcare, supply chain management, tourism, energy management, and more. However, security and privacy remain major concerns due to the use of the open channel, the Internet, for data transfer in all these applications. Despite numerous security solutions and standards proposed over the years to enhance the security levels of these smart applications, existing solutions are either based on centralized architectures (which have weak links) or incur high computation and communication costs. Moreover, most current security solutions focus only on a few aspects and fail to address scalability, efficiency, data storage, network latency, suitability, immutability, and traceability.

To address these issues, blockchain technology can be a viable solution. Blockchain reduces the risk of weak links and network attacks by using distributed network nodes. It can handle various security attacks by eliminating the need for centralized authority to perform various operations. Energy is essential for life on Earth, serving as the foundation of our existence. Distributed Energy Systems (DES) present a significant concept in the energy sector, overcoming the challenges of centralized energy grid systems and maximizing the use of renewable sources for distributed energy generation. Nowadays, many emerging technologies can digitally convert energy. By leveraging such technologies, we can closely monitor DESs located in remote areas. DESs are intelligent systems that offer a wide range of services across various platforms.

The setting of wells in groups with an inconsistent number of thereof is an arising idea of well pad advancement which requires investigation even from a hypothetical point of view. The idea has its potential in working on the financial effectiveness of perhaps the most capital concentrated cycles in the upstream area of the oil industry—the good pad boring. To advocate and fortify this productivity upgrading potential, this work coordinates the grouping of an inconsistent number of wells into current venture the board techniques (agile), which has not been done previously. Crushing wells on a solitary pad is advantageous however makes issues with good crashes and

well impedance. When penetrating in nearness to the previously delivering wells, subsurface well impacts are kept away from by utilizing a wellhead checking framework. One of the most exceedingly awful kinds of impedance that ought to never be permitted to happen is the crack hit. Multi-well cushion boring is consequently a grounded and generally utilized innovation, yet it appears to be that there is a generous void in the present-day data field and writing regarding the matter of well cushion setups with an inconsistent number of wells. Over protracted time of well pad improvement, these vulnerabilities are diminished as more exact data gets accessible with new wells being done, tried, and put to creation. It is in this way alluring to keep necessities and well pad configuration to be slowly arising. The cycle of well pad advancement is customized with the end goal that it fits into agile task the board and agile item improvement. Agile project management focuses on the general administration of the task which is carried out as a bunch of short sprints. There are procedures from which some key ideas can be acquired and applied to well pad boring to execute versatile good pad advancement practically speaking. Improvement of a pad inside the structure of introduced ideas expands finesse in overseeing vulnerabilities, particularly of topographical nature just as vulnerabilities of functional beginning. This benefit comes about inferable from changes made when updates come up and up to the second until adjustments are conceivable. Distinctive good pad setups have diverse financial exhibitions as they require various lengths of the landfilling relying upon well bunching plan and distances among wells and gatherings of wells.²⁶

This consolidation of agile and cloud computing may give framework improvement and robotization advantages to agile experts. Agile standards further clarify and improve the significance of agility in programming advancement. Agile software engineering depends on regular conveyance, the solid working connection between client engineers, specialized greatness, and obliging change in any phase of advancement. Agile software engineering has different techniques. Scrum is characterized as an adaptable, comprehensive item advancement system where designers function as a unit to arrive at a shared objective. The cloud computing quality characteristics and the administrations have a significant part to help, impact and speed up Agile software engineering. Quality characteristics are additionally isolated into sub-factors. From an agile

advancement point of view, adaptability is normal for overseeing and controlling an enormous group. Cloud computing furnishes all assets with any foundation size immediately. Agile software engineering has advantages of cloud computing, for example, zero beginning speculation for programming improvement framework, no additional expense for support of equipment and ideal usage of assets locally and on the cloud, quicker an ideal opportunity to showcase, simple set-up, and organization of uses. In Agile software engineering, the absence of correspondence and coordinated effort decreases the permeability and straightforwardness of the undertaking. The agile Scrum approach expects to keep everything apparent to the individuals. Straightforwardness might be inside and outside the undertaking group. Straightforwardness in Agile software engineering is accomplished by playing out the exercises. If a deformity is identified in the venture, the group fixes the bug and conveys it relying upon the need in the backlog list. This load of exercises is cultivated with the assistance of tooling given by cloud computing. In cloud computing, the large issue is interoperability; there are no widespread norms or interfaces characterized for joint effort among various cloud stages. Each cloud supplier has its administrations.

The choice of cloud administration is another test. The product engineer's local area feels awkward in another stage, for example, cloud computing climate. The unease is because of the absence of direction for cloud computing standard design. One test of cloud computing is to keep a climate for various partners of the association [27].

Agile software development has gotten ordinary in programming advancement organizations because of the various advantages it gives. In any case, leading Agile tasks is requesting in Small and Medium Enterprises (SMEs), since activities start and end rapidly, yet need to satisfy clients' quality necessities. Industry reviews show that practically all associations utilize Agile strategies somewhat, and over a portion of them have Agile as their standard way to deal with programming advancement. Estimating programming measures with the utilization of cycle measurements empowers levelheaded and quantitative assessment of programming measures, which can prompt nonstop improvement and learning. Programming measures are intrinsically intricate and immaterial, which makes their estimation more troublesome than their item counterparts. The

three key ideas that they use in their day-by-day practices to screen advances are Task, Bug, and Effort. The main benefit of the interaction measurements saw is the emphasis simultaneously and group viability.

Agile strategies acquired distinction because of the reality of delivering excellent programming frameworks. Upkeep exertion is practically the greater part of the all-out exertion put resources into any product framework during its life expectancy. An all-around examined issue inside the local area of specialists and designers is how to utilize agile approaches for keeping up with the created programming because the agile programming advancement life cycle doesn't have the explicitly arranged mechanism for maintenance. Most programming projects are expanding on the existing code base and interfaces for certain occasions of the association and as a rule hard to change a lot of the cycle without a moment's delay. This factor inspires us to present the iterative strategy for the support to embrace changes in emphasis. Software support is a fundamental period of the existing pattern of programming. Maintenance exertion is practically more noteworthy than half of the all-out exertion put resources into any product framework during its life expectancy. Maintenance groups don't have a particular fruition date for support projects and contain just assignments to be performed. These undertakings can cover and proceed to a boundless time until the framework is supplanted in the decrease stage. Improvement projects ordinarily handle the single example of the product framework during the specific time frame, yet support is more confounded by thinking about discrete adaptations of a product framework and by connecting with the client. The achievement of software development measures is estimated by a fruitful finish of scope for a predetermined time frame utilizing assessed cost. Programming improvement and maintenance are unique, and we can't utilize the very system for maintenance with the product that is characterized for the advancement of programming. Agile approaches share some normal attributes remembering advancement for cycles, little groups, including the client, direct correspondence, less documentation, test-driven turn of events, aggregate possession, quality item. Presenting agile techniques for maintenance gave positive outcomes by accelerating the cycle of support and expanding the correspondence between maintenance groups [31].

As the most key foundation in the current Internet, the Border Gateway

Protocol (BGP) upholds the availability of various Autonomous Systems (ASs) and afterward, the reachability can be accomplished from any organization on the Internet. The blockchain is a chain construction of associated blocks. It is a distributed framework dependent on the shared (P2P) network without the central control hub. Clients participate in a mysterious structure, and there is no requirement for local shared trust between every hub. The trust instrument is set up through exchange confirmation and agreement on the organization. The core innovation of blockchain fundamentally incorporates a few angles. With blockchain advancements, we may re-develop the BGP to fix some precarious issues brought about by its striving control plane. The BGPCChain is planned primarily for the accompanying two capacities: QoS-based blockchain and Resource confirmation. QoS-based blockchain is a public chain and there are two sorts of members: End-clients and Routers. Resource confirmation blockchain is a consortium blockchain. BGPCChain is made of two isolated blockchains for various capacities.

Agile approaches are established in versatile planning, early conveyance, and constant improvement, all to have the option to react to change rapidly and without any problem. The cycles dependent on these standards are products and coordinated in a few stages. Some of them assume human actors' key jobs, some others, like a check of acknowledgment rules or test confirmation don't require any human choice or impression and appear to be appropriate for being automated through other programmed devices or means. Agile methodologies permit engineers to accomplish a generally excellent tradeoff between viable coordination and interaction agility. Coordinated systems, like Scrum, depend on a steady improvement model. Various methodologies can be applied in the various techniques. The undertaking improvement is isolated in User Stories (US) execution. The execution stream might be in Sprints or ceaseless. At the point when the comparing US is effectively carried out by the engineer who focused on it, the test should pass [[18](#)].

These days, one of the primary patterns of IT innovation is the alleged Blockchain applications. The Blockchain is an innovation initially concocted to run the Bitcoin cryptographic money in a decentralized and secure manner. The Blockchain can be utilized additionally as a decentralized PC, running Smart Contracts and projects that can be utilized

as the reason for robotized authoritative requirements. The attention to the probability of the innovation, and the likelihood to implement contracts disposing of go-betweens made a gigantic interest in Blockchain applications. The sensation of numerous programmers about such gigantic interest in Blockchain advances and, specifically, on the numerous product projects quickly conceived and immediately created around the different Blockchain executions or applications, is that of unruled and rushed software development. The initial step to developing a product framework utilizing computer programming rehearses is to have an unmistakable development cycle, and configuration practices and documentations valuable to the reason. Computer programming practices focused on Blockchain-Oriented Software (BOS) improvement is as yet at their outset. A Blockchain framework is normally made of a Blockchain, and of programming communicating with it through transactions, regularly giving the UIs to clients, and conceivably worker exercises to store extra data, and to execute business rationale outside the Blockchain. Such a framework is regularly called a dApp (decentralized application). The product related to the transactions, and running on the Blockchain, is normally called Smart Contract (SC). The principle normal for the SCs is that they run in an isolated climate. The program results should be similar to whatever hub they run in, in this way, they can't get to the outer world; they can just access and send messages to the Blockchain itself. A BOS framework is ordinarily made out of a conventional programming framework and the SCs running on the Blockchain. Agile is iterative and steady with short sprints and is fit to convey rapidly and to convey frequently – which is extremely valued with regards to dApp advancement. The key Agile practices utilized are prerequisite elicitation utilizing User Stories (US). dApps have exceptionally severe security necessities, and a more proper methodology for certain parts of the advancement could be valuable. Some critical elements in the SC plan that should be completely planned are lasting information, Security examples, Interactions, and documentation in the code [33].

Blockchain programming development is getting increasingly more significant for any advanced programming engineer and IT startup. Regardless, blockchain programming creation absences of a trained, coordinated, and develop advancement measure, as exhibited by the

numerous and famous disappointments and cheats that happened lately. DApps commonly run on a blockchain, the innovation initially acquainted with deal with the Bitcoin currency. Blockchain programming runs in an organization of shared hubs, so it is normally decentralized, repetitive and straightforward. A blockchain is a sort of DL innovation (DLT), however not all DLT depends on a blockchain because a DL can utilize other cryptographic ways to deal with hold permanent transactions history. It is notable that, to foster a dependable and viable programming framework, one necessity to follow an explicit development interaction, and utilize SE practices. A further affirmation about the requirement for explicit SE in Blockchain programming comes to a review, which presents the aftereffects of a study among blockchain designers. They tracked down that the pervasive assessment is that blockchain improvement is not the same as customary one, because of the severe and non-regular security and unwavering quality prerequisites, and to other extraordinary attributes of the DApp advancement area. These days, the advancements of DApps overall offer some normal attributes. Attributes of DApp advancement is that DApps commonly are not life-basic applications, however, a few among them can be strategic. However, an opportunity to showcase and the capacity to get early input from the clients and the partners are fundamental, because regularly the requirements of the DApp at first are just ambiguously characterized and are liable to change. This load of highlights makes DApp advancement an optimal contender for the utilization of Agile Methods (AMs). Indeed, AMs are appropriate for little, self-coordinating groups, conceivably co-found, dealing with projects whose requirements can change. AMs are viewed as ready to convey rapidly and regularly, depending on the situation by DApp projects. Scrum doesn't recommend software development practices, however, is centered around the cycle. The proposed ABCDE strategy depends on Scrum, and is explicitly centered around the product improvement measure, and not on explicit plan or programming rehearses. Other than Scrum measure, other agile practices are appropriate to DApp improvement [34].

The present period of globalization and computerized change has delivered numerous advanced innovations that have affected current cultures, blockchain being one. Blockchain can be depicted as an encrypted data program utilizing a bound together web exchange log, and it is this that

has been planned in a decentralized manner to dispose of the requirement for a delegate framework to follow information trade. This likewise hosts eliminated the requirement for third gathering or middle person intercession, and it is as indicated by innovation that the biggest circulated and open advanced record takes into account the exchange of the beginning of property starting with one gathering then onto the next all the while, without the requirement for a broker. Over 10 years have slipped by since the primary information on nations and organizations utilizing Blockchain as an underwriter through a dependable and secure data set, and, although Blockchain addresses the new time of our current and future specialized lives, it is as yet developing and needs additional time to build user certainty. The advancement of nations depends on the arrangement of various administrations to their residents, including those inside the clinical, logical, and monetary areas and it is Blockchain that has worked with the exchange of assets between various nations simply and quickly. Blockchain has additionally enormously added to the battle against corruption in the entirety of its networks—especially that of financial corruption—through the finish of 'smart agreements', which control the development of advanced financial resources between the gatherings worried in various nations. To accomplish more intelligent, practical, and achievable outcomes, this inductive and unmistakable methodology will be trailed by extrapolating the different realities and occasions about it on the nearby and worldwide fields. Blockchain and savvy contracts have been broadly acknowledged as progressive, and have been executed on all levels. that there are at present a few troubles and difficulties being looked at because of the customary techniques for finishing up agreements [37].

Blockchain innovation is an information design of the Decentralized Ledger Technology (DLT) family that produces trust and guarantees information trustworthiness without the need of a confided in the third party. A blockchain partakes in the hubs of a distributed organization and every hub stores a duplicate of it. The information recorded inside the blockchain is gotten through transactions. On account of the energy exertion of organization hubs, each blockchain activity has an expense. An Initial Coin Offering (ICO) is an imaginative method to raise assets and dispatch a startup. The utilization of ICO is a worldwide wonder that includes numerous countries and a few business classifications. ICOs are the recent

fad in the cryptographic forms of the money field. The innovation to make another digital currency is modest: in a brief time, frame and without enormous ventures any organization can introduce itself to the market. The accomplishment of an ICO is generally founded on three key components: unwavering quality of colleagues, assessment of the undertaking and its white paper, and remarks from different financial backers. The basic parts of an ICO additionally can in part or match the average essential parts of a startup firm, which works in states of extreme weakness and faces numerous difficulties. The market of ICOs is very unstable and complex. ICO groups and financial backers should give specific consideration to the speed of changes and to the innovative dangers that portray its development. the Agile and Lean Startup techniques can be viable and corresponding. Agile techniques drive software improvement, though the Lean Startup approach is more arranged towards the turn of events and the executives of the business and the item. Blockchain innovation is a development that prompted a high dynamism in a few business regions. It led to the meaning of another part of computer programming called Blockchain-Oriented Software Engineering. The primary issue of an ICO is the ability of financial backers to make a qualification between an authentic raising support movement and a trick [40].

Blockchain innovation is one of the most recent and popular advances in the computerized world. Most associations, particularly monetary foundations noticed and felt the progressions that were made in digital currency markets. As blockchain is the facilitated climate and the foundation of the digital forms of money they accept they ought to embrace a portion of their offered types of assistance on this innovation. Numerous substances in the district are intrigued to be pioneers on offering types of assistance on later and generally trusted and acknowledged innovations like blockchain. Scientists and intrigued staff anticipated that blockchain innovation will be competent to limit the necessity of numerous members in numerous organizations. Business cycles should be reengineered on the firm. Likewise, it is relied upon to lessen the required time and assets to finish an exchange. Overseeing projects on blockchain innovation will be unique with overseeing different ventures as these sorts of undertaking will require the capacity to change and a ton of arrangements for startling. As blockchain is still thought to be a mysterious innovation that needed to be

found and may require a few changes to be applied, agile manifesto and ideas fitted the way that blockchain frameworks ought to be overseen. Agile used to make quality programming which leads to consumer loyalty that will be thankful for sensitive advancements. Scrum approach where project owner assembles the business necessity and the cross-functional group with experienced scrum expert could be gainful to the venture as the item will be conveyed gradually inside short cycle with numerous test meetings and end-user cooperation. Agile is the best project management technique to oversee blockchain projects. Master project administrators perceived the Scrum technique as the most reasonable venture procedure for these kinds of tasks [23].

The consistently changing innovation in a profoundly serious climate applies tension to the software improvement measure. Requirement Engineering (RE) is of central significance in this cycle, notwithstanding in the period of digital changes, it has been accounted for that necessities engineers are not appropriately supporting to the improvement of advanced arrangements. One of the primary exercises of RE is the management of requirements. Blockchain innovation can disturb conventional plans of action in numerous spaces. Blockchain empowered new types of distributed software, which present numerous difficulties like the requirement for new expert jobs, security, and dependability, the need for particular displaying dialects, and for explicit measurements [26].

Analysis

By reading all this literature we find out that the Blockchain (BC) innovation has shown wide abilities to be viewed as problematic in various regions and areas. BC has been introduced as a troublesome innovation in a wide scope of areas and business regions. Carrying its attributes to the administration of agile tasks, the use of BC in the Scrum interaction could contribute to evolving requirements, the correspondence of each change, complete record of the multitude of improvements, and Clear acknowledgment rules. Blockchain will predominantly carry the accompanying qualities to the Kanban interaction, for example, Direct understanding between the proprietor of the undertaking and the engineer, when the acknowledgment conditions present in the SC are satisfied. The Kanban technique centers around the work with the most noteworthy need

that must be completed. At the point when a task is finished, the designer extricates the following most noteworthy need thing from the pending stack once more. The utilization of blockchain innovation can affect, remembering that one of the incredible difficulties today is to scale agile techniques to dispersed conditions to accomplish better and more proficient items or administrations. Agile structures depend on direct correspondence and solidarity, and this is hard to accomplish in conveyed conditions. Without straightforwardness, agile techniques can't carry tasks to progress. Issues like social contrasts, the board of arrangements and necessities, or issues of trust and transparency can be tended to and settled through the BC stage.

Conclusion

The development of software is an unpredictable undertaking that incorporates application and execution layers with useful and non-functional viewpoints. The endeavors to scale agile programming advancement rehearses are not completely ready to resolve issues like trustworthiness, which is a critical non-practical part of the software development measure. In any case, if we consider most software disappointments where parts may fizzle and there is defective data on which a segment has failed, that may weaken the activity yet don't disable the productivity line. Normally, software development associations depend on a focal control or authority, for example, task or advancement director for the creation of the executives. Blockchain is a straightforward distributed digital record innovation that is functional as a decentralized framework. There is no conceivable weak spot situation that may cut down the entire development. Recently, specialists have shown an expanded interest in applying blockchain in the development of software and propose another region for computer programming research. A blockchain execution should profit from the highlights that blockchain offers. There have been a predetermined number of explorations including smart contracts that have announced the significance of resolving the issues presented by a potential application that ought to operationalize on the blockchain networks. When software professionals lose trust with their colleagues, they are searching for a workaround on the functioning programming measure or now and again demand intercession from outsiders. A blockchain-based programming improvement model guides specialists to address decentralized trust issues

in programming advancement.

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