A review of fields of use of blockchain technology in daily life

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Abstract: Blockchain is a distributed system in which all transactions are shared and recorded by the participants in the system (e.g. blockchain network). Blockchain is a form of data storing method. It is a system in which the data intended to be stored is established through structures named as "blocks," with each block related to the next by stamping and / or sealing. Particularly in the last few years, blockchain technology which is only now starting to be researched in Turkey and around the world, has many uses beyond only cryptocurrency. For researchers who are unfamiliar with the system, it will be helpful to begin with, concrete instances in order to better understand what blockchain technology is. Examining actual instances of blockchain technology application is the primary objective of this study. In this context, the study looked at the domains in which blockchain technology is applied through providing specific examples. The study concluded that the following domains have experienced the practical implementation and application of blockchain technology: supply chain, education, health, finance, digital identification, land registry, human resources management, customer recognition-commerce, e-voting, transportation, political participation and digital content industry.

Keywords: digitalization, blockchain, public services, public administration, Bitcoin

Introduction

The 21st century is characterised by rapid advances in technology and digitalisation. The advancements in information and communication technology, in particular, has accelerated and increased the speed and impact of globalisation. The process continues to develop so rapidly that any person living in the most remote corner of the globe has easy access to the information s/he requires at any time. Digitalisation has had an impact on a wide range of industries, including health,

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education, communication, and commerce. Especially, the internet has brought about a 'new world' through which people may meet almost all of their needs.

Digitalization is a transformative force that affects all institutions and organizations, from the public sector to the private sector. Concepts like speed, efficiency, cost effectiveness, performance, use of modern technologies, and assuring the maximum level of satisfaction for the service industry have become essential to institutions, particularly with Industry 4.0 (Soylu 2018). The conceptual framework of digitalisation must be employed if Industry 4.0 is to achieve its intended objectives. Both time and money are saved when digital technologies are used in the public and private sectors to produce goods and services. Organisations and institutions that implement digital technologies into their operations have a major competitive edge.

Blockchain technology is another aspect of digitalisation. The popularity of blockchain technology and its widespread practical application date back to 2009 with Bitcoin. The use of Bitcoin marks a watershed moment for blockchain technology. Taking a brief look at the developmental stages of Bitcoin, everything occurred following the 2008 global economic crisis. In an article released under the pseudonym Satoshi Nakamoto, the author suggested that a new electronic currency might emerge without the involvement of a third party (i.e. decentralised), blaming the crisis' detrimental impacts entirely on centralised financial arrangements. Satoshi Nakamoto made the case for the integration of virtual currencies into the financial system in his 2008 paper. For this reason, blockchain technology has been used to develop a peer-to-peer, public, open-source shopping system. The primary objective of the system is to eradicate the banks, financial intermediaries, and other centralised entities. The incapacity of any country or entity to exert control over the system is referred to as "decentralisation" here. In this context, on January 4, 2009, Satoshi Nakamoto transferred 50 bitcoins to build the first blockchain block. This block was named genesis block. The blocks that are generated subsequently added to the genesis block and to one another in order for the system to be operational. The way the system operates is as follows: Every block has a unique code as well as the code of the block that came before it. Block transfers, together with the person who made them, are documented. As a result, every block is connected to the next. Thus, modifying a block requires modifying the related

blocks as well. This is almost impossible. The functioning of a central bank is not necessary for Bitcoin, in contrast to conventional printed money. That is to say that it does not rely on any centralized structure. Bitcoin is generated using data from the cryptographic data and is sculpted by codes and backdoors. Bitcoin, which is made out of open-source code using blockchain technology, can be viewed and verified by anyone. Users of Bitcoin are provided with both public and private keys. Only the owner may view the data in the private key, but everybody can access the data in the public key. Bitcoin is a decentralised, transparent, blockchain-based payment method that instantaneously confirms transfers and has no double-spending issues (Durmuş and Polat 2018; Erarslan 2020; Segendorf 2014; Vranken 2017). To be brief, Bitcoin uses the blockchain technology to operate in this manner. With the introduction of Bitcoin in 2009, a turning point for blockchain took place, and efforts have been made since then to apply blockchain technology in various industries.

The discussion regarding the potential applications of blockchain technology has been triggered by its popularity together with Bitcoin. The uses of blockchain technology are numerous and go beyond Bitcoin. There are a lot of applications for blockchain technology, as concluded by this study. According to the study, blockchain technology has been used and applied in a number of industries, including supply chains, education, healthcare, finance, digital identification, land registration, human resources management, customer recognition -trade, transportation, electronic voting, political participation, and the digital content sector. The defence industry, software, notary services, fundraising, cloud data and cloud computing, software and coding, foreign trade, aviation, search engines, anti-corruption, social assistance and records, taxation, auditing, cyber security, and intelligence were also found to be among the industries that will soon make use of the blockchain technology.

Methodology

In general, the study was designed to apply the framework of qualitative research techniques. Different theoretical frameworks and a wide range of disciplines are included in qualitative research methods. For this reason, it is difficult to give a broad definition of qualitative research methods. It is feasible to employ the method of qualitative research as an umbrella term because it covers multiple disciplines. Social researchers are particularly interested in qualitative research

methods, which may include document analysis, traditional/narrative review, cultural analysis, content analysis, descriptive approach, semi-structured interview, and others. The definition of the qualitative research method has also become more complicated due to the inclusion of numerous sub-methods. Nonetheless, if a broad definition is to be provided: "The research process in which qualitative data methods such as observation, interview, and document analysis (audio, content, etc.) are applied in order to present perceptions and events in an integrated manner with rational data in a natural setting containing accurate data" (Yıldırım and Şimşek 2006, 39). There are various sub-methods within the qualitative research method. Document analysis and standard traditional/narrative review methods are some of such methods. The "document analysis" method, a sub-category of qualitative method, was applied to compile the data collected throughout the study. "A methodical approach to the examination and evaluation of all documents, including printed and electronic materials" is what document analysis is (Kıral 2020, 173). Document analysis is the process of thoroughly examining relevant documents to determine the information that will be used to achieve the intended objectives. The documents collected through document analysis were put together using traditional/narrative review methods. Traditional/narrative review refers to "the studies that synthesise the findings, conclusions, and assessments of two or more published works on a specific topic. These are studies in which data collected from various methods and sources is synthesized by experts in the relevant field, without being limited to a single method" (Karaçam 2013, 27). Within this framework, books, articles, and websites on this particular topic were first identified. The documents obtained were analysed using the document analysis method. Following the document analysis, the data were systematised using the standard compilation process, and the study was thus concluded.

Examples for the use of blockchain technology in daily life

Supply chain, finance (digital currency), digital identification, land registry system, human resources management, customer identification system (Know Your Customer (KYC), transportation, digital voting, political participation, digital content management, entertainment, and distribution are among the industries where blockchain technology is actively used as so determined during the surveys conducted in the course of the operational process.

The supply chain industry was the first to use blockchain technology. Walmart, a Canadian company, is the one that actively uses the blockchain-based supply chain management system and benefits much from it. Walmart has experienced fraud and irregularities in commercial data, deviations in shipping company bills, and concerns with payment procedures, especially in the food supply chain process. Walmart has started taking the required steps to avoid these problems. Every year, Walmart Canada ships more than 500,000 items. Walmart Canada transports items susceptible to climate change, including perishable goods. In the typical supply process, the attributes for each product must be documented and presented to the carrier and other stakeholders. The fact that over 200 variables impact the invoices generated throughout the supply chain management process complicates the procedure even more. Additionally, 70% of payments are contingent on an agreement between parties once the process is completed. This causes delays in payments and frustration among carriers. To tackle these challenges, Walmart Canada's Research and Development Team (R&D) undertook a study. Some points were brought to light by the data that the analysis revealed. For example, bureaucratic procedures and the way the supply chain process is structured are quite intricate. Significant issues with interdepartmental communication and cooperation were identified as well. In order to address these problems and expedite the system, the R&D unit made the decision to switch to a blockchain-based structure. Based on the findings of their investigation, Walmart Canada applied to the reputable company DLT Labs and requested that they develop a system. In January 2019, DL Freight, a blockchain network, was established as a result of the research and experimental applications. In the beginning, 69 suppliers were added to the network. The system contains all data about the system, transporters, transported commodities, and supply chain procedures. The DL Freight blockchain network is constantly updated, from the carrier's proposal to proof of delivery and payment approval. All such data is automatically entered and synchronised in real time. This process is only accessible to the parties involved in the transaction. Since its implementation, DL Freight has achieved significant success. According to Walmart Canada’s accounting department, whereas 70% of invoices were previously inaccurate, this figure has dropped to just 1% with the use of DL Freight. Additionally, because transactions are settled quickly

via blockchain, payments are no longer delayed. Employees have also welcomed this advancement (Vitasek et al. 2022).

Finance is one of the most relevant sectors where blockchain technology may be applied. Virtual currencies debuted with Bitcoin and have since grown to include a variety of digital currency projects. Examples for Blockchain-based virtual currencies include Ripple and Zcash. Ripple, a virtual currency, can deliver millions of dollars' worth of digital cash to another party in 3 to 5 seconds for 0.5 to 3 dollars. Similarly, Monero may transfer millions of dollars' worth of digital money in less than a second for $0.01-0.05 (https://xrpl.org/about/xrp 2025; https://cryptomus.com/tr 2025). As seen through these examples, money that is physically difficult and expensive to carry or transfer can be transmitted rapidly and cheaply. This provides benefit in view of cost-effectiveness and saves time.

Another field of application for blockchain technology is digital identification. With the introduction of digital identification, the citizens of any country are registered on the blockchain system. The blockchain system stores all information about citizens, including their birth dates, photographs, and ID numbers. Instead of needing to carry ID cards, citizens are provided with readable QR codes or smart ID cards. Citizens can complete transactions by scanning either their QR codes or their smart ID cards. This not only eliminates identity fraud, but also reduces the paperwork associated with citizenship issues (Akcagündüz 2021). Digital identification can be used to enforce age restrictions, for instance, by preventing individuals under 18 from accessing nightclub or settings where alcohol is served. A person must pull out the ID card and hand it over to the personnel in order to access such a place. The officer checks every piece of information on the ID and obtains important personal data about the person in question. What must be verified here, though, is if the individual is younger than eighteen. Blockchain technology and smart contracts can be used to establish a system that allows people to consent to disclose only their age information in order to carry out that sort of verification (Usta and Doğantekin 2017). Similarly, identity recognition systems that cannot be changed by individuals can be developed utilising blockchain technology and smart contracts to avoid identity fraud (Akcagündüz 2021). One of the most evident examples of blockchain-based digital identification has been put into practice in the Swiss city of Zug. The technology, referred to as uPort, was built on the Ethereum blockchain, and it provides people with a blockchain-based identity for use in e-

government services. In this scheme, citizens who register for the system are first asked for their address. They receive a distinct and unchangeable digital (cryptographic) address in uPort after supplying the required data and undergoing the required verifications. Through cell phones, the address is connected to a digital wallet via the user's smartphone. Therefore, residents can quickly complete a variety of tasks, including surveys, voting, filing tax returns, paying parking fees, borrowing books, or renting bicycles, if they receive a digital wallet, address, and register using the blockchain (Bozdoğanoğlu 2023).

Blockchain technology is also used in the land register system. Another country that makes use of a blockchain-based land register system is Georgia. The blockchain-based National Public Registry (NAPR) was established in Georgia. This government office generates a digital certificate for land titles using blockchain technology. NAPR aims the elimination of property ownership disputes and corruption in the land register system. NAPR makes use of the blockchain-based Exonum system to handle land-related operations, such as buying, selling, and registering property. Over 100,000 land records have been added to the blockchain since April 2016. Using its own blockchain, Exonum can handle up to 5,000 records per second between blocks. With the use of the Exonum protocol, NAPR is being expanded to offer more services, including notary services, mortgages, rents, and demolitions. Public trust in the NAPR system has increased as a result of the system's structure, which depends entirely on stakeholder approval, and the nearly insurmountable task of changing the blocks where transactions are recorded (Bozdoğanoğlu 2023).

Blockchain technology is also used in human resources management. BEOWULF is a blockchain-based startup that applies this technology to HR processes. The company in question has efficiently rendered services to OPSWAT, a cybersecurity firm based in the United States, Asian Life Insurance Group (AIA), and Vietnam University of Science. Biploma is one of the applications the company has developed. Biploma allows for the blockchain-based execution of several transactions, including identification, diploma and education certificate verification. Fake diplomas and educational certificates, which are frequently y used in job applications, can be avoided through Biploma. Hongbank University, Baria Vungtau University, and many more universities actively use Biploma (biploma.com 2024). BeSure Network is yet another practical example of a blockchain-based human resources app. BeSure Network registers people and

organizations engaged in industries including construction and furniture manufacturers through the blockchain network. All qualifications, diplomas, and reference scores from prior employers are added for both craftsmen and businesses throughout this registration process. This precludes untrained artisans and businesses from using fraudulent documentation. The most qualified people or businesses are selected for workplace and job safety thanks to the dependability offered by beSure Network (besureusa.com 2024).

Commerce is another application area for blockchain technology. Customer focus is especially important in business. Businesses who use blockchain-based 'Know Your Customer (KYC)' systems have a competitive advantage. Businesses (particularly in the service industry) carry out separate surveys for specific niche clients. The businesses attach particular importance on the customer segment referred to as "special" with high income. Information on such a customer's profile, preferences, behaviours, attitudes, likes and dislikes etc. is essential for sustaining customer retention strategies targeted at this segment. For example, if a customer with this profile routinely shops at Branch A of a store, Branch A and its personnel will engage in a variety of activities to satisfy the client because they are aware of the customer's unique features and preferences. Thus, this approach ensures customer satisfaction in the most efficient, cost-effective, and timely manner, while also helping prevent potential losses for the customer (Usta and Doğantekin 2017). Kyc-chain is the most practical example that has been developed and put into practice in this respect. KYC-chain is a blockchain network, which provides services for customer lifecycle, behaviour preferences, and ID verification. Kyc-chain integrates its corporate and individual clients' shopping habits, traits, and customer lifecycle into the blockchain network. For every customer, it generates a unique password (self-key). When clients visit or stop by a store in another country or city, their information can be communicated to store personnel via the blockchain system thanks to a blockchain-based application that can be downloaded onto smartphones. Thus, customer satisfaction reaches to the peak level. Names, addresses, phone numbers, and dates of birth are among the details that are stored on the blockchain when kyc is generated. Each individual or business customer's identification is verified using such data, particularly if they plan to conduct financial operations. In addition, money laundering is curbed through the kyc-chain customer identification system. Suspicious activity can be tracked for consumer transactions using the

Anti-Money Laundering (AML) system. AML shields clients from financial crimes and assists them in complying with the legal requirements. This also prevents tax evasion. AML makes it very simple to combat fraud, account hacking, financing of terrorism, and other detrimental events that are frequently observed in the digital environment. Singapore is now the country making use of this system. With the blockchain network it developed, the Monetary Authority of Singapore (MAS) has backed this system by mandating banks and business enterprises to use kyc. Yet again, Hong Kong, Japan, and Australia are all using the kyc-chain blockchain system to make kyc necessary in the battle against money laundering (kyc-chain 2024).

The transportation industry also makes use of blockchain technology. Another example is the blockchain-based taxi app RideX. The Ethereum Blockchain network is used by the application RideX. Drivers use the RideX blockchain to offer prices in this application. After registering with the system using the KYC application, customers compare the available prices and make a taxi call. RideX allows users to pay with cryptocurrency (Somes 2019).

Blockchain technology is also being applied to electronic voting. Blockchain-based electronic voting systems have been established in many countries worldwide. For example, from February 4–11, 2017, the Spanish political party Podemos used an electronic voting system called Agora Voting, developed with blockchain technology, to hold a vote for its 155,000 members on party-related issues. Agora Voting is an open-source, secure, and end-to-end verifiable voting system that makes use of blockchain technology. Agora Voting was developed as part of the DCENT (Decentralised Citizens Engagement Technologies) initiative supported by the European Commission. The objective of this project is to promote democratic participation by developing a voting system that is trustworthy, transparent, fast, and efficient. It is an election environment that is transparent, trustworthy, and flexible provided by Agora Voting and it is encrypted by a web browser and kept private, even from the election authorities (Opendemocracy 2017; Intelligent Cities 2021).

Followmyvote is another application that applies blockchain technology to produce an electronic voting system. Numerous U.S. states have adopted the blockchain-based Followmyvote system. “The Truth shall set you free” is the tagline of Followmyvote, an initiative that works to foster efficient communication between people. Followmyvote wants to make involvement in the digital world safe,

fast, and efficient. With a focus on international political elections and referendums, Followmyvote aims to establish a blockchain-based, standardised, accurate, honest, trustworthy, and internationally recognised voting system. (Followmyvote 2021).

Russia is another country, which employs a voting system based on blockchain technology. The company Waves developed a blockchain-based voting system, which Russia has implemented in the Kurskaya and Yaroslavskaya oblasts as a demonstration project. Blockchain-based electronic voting system developed by Waves has a number of attributes. Auditability, privacy, consistency, verifiability, efficiency, and user-friendliness are some of these attributes. Only those who have been pre-authorized can access the system because of its accountability feature None other than those defined in the system previously can access it. Voters are safely registered in the system using smart contracts once they have undergone the required verification processes. Cryptographic algorithms secure voting results, while adding blocks to the chain assures data immutability. Verifiability is provided by both a central authority and stakeholders. Smart contracts also facilitate verification. The system is incredibly simple in view of its use and application. As a result, the system might be defined as user-friendly. Thanks to the blockchain technology, vote results are not centralised. Data is compiled in a decentralised manner, allowing all stakeholders to have a control over it. This feature shows the system's consistency. The blockchain-based voting system developed by Waves is considerably advanced in terms of efficiency and speed. Waves' system is capable of processing almost 1,000 blockchain data points per second (Wavesenterprise 2021). As can be seen, one of the most advanced versions of blockchain-based electronic voting systems is the "Waves Enterprise Network" which was developed by Waves and implemented in Russia. Russia plans to enhance the system further so that it may be used for electronic voting across the country. Agora Voting, Followmyvote, and Waves Enterprise are blockchain-based electronic voting systems that have mostly been used in small-scale units with local populations. In their pilot applications, all three platforms have had notable success. There exist several other examples for blockchain-based voting systems (Akcagündüz 2022).

Blockchain technology is also being used by political parties and political engagement. Blockchain technology is being used to organise some political parties, and these parties are taking different paths. For instance, the Russian Development Party (Partiia Rosta) has upgraded

to a new blockchain application. The Waves blockchain platform has been used by the said party to issue a coin. Upcoin, which started out with 10 million units, is meant to be used by members of political parties in social activities, meetings, and other events. According to Waves platform founder Sasha Ivanov, this is the world's first effort of its type. According to Ivanov Upcoin will eventually be used for all social, cultural, and related events,. Every community member who registers on the Waves-created blockchain network receives a wallet. Extra bonuses are awarded to members that transact on this network. The Upcoin network can also be used for payments, crowdfunding, and voting (Sezgin and Yertüm 2023; Waves Tech 2017). Another striking example is the Flux Party, which was established in Australia through blockchain technology. A blockchain-based mobile application has been developed by Flux Party and made available to its members. This application will allow elected parliament members to poll their voters on their favoured vote and ask them questions prior to a parliamentary vote. For example, MPs can cast their votes in parliament according to the results of a poll on whether Bill A should pass or fail that was carried out using a smartphone app built on blockchain technology (Sezgin and Yertüm 2023). As can be seen, blockchain technology has become prevalent throughout political parties and participation in politics, and remarkable instances are starting to appear.

Blockchain technology is also used in the management, distribution, and entertaining of digital content. The blockchain-based SingularDTV project might be cited as an example in this respect. Transforming the entertainment sector into a decentralised structure is the primary objective / vision of this effort. Through the use of blockchain technology, the SingularDTV project seeks to provide consumers with decentralised access to games, artwork, books, movies, videos, and other media. How will this be accomplished, then? First of all, the artist—the person who produces a play, artwork, book, film, video, etc.—is viewed as an equal partner and stakeholder in this project. A director might shoot a movie, for instance. He has no doubt that the movie will draw interest. However, he has no capital. In this case, the public is informed about the project by the director. It is said that anyone who contributed to fund the movie will receive some profit share if it is a success thanks to blockchain technology and smart contracts. This is executed through blockchain technologies and smart contracts. The profit share that each contributor to fundraising for the

film will get in the event that the film goes on sale is specified by smart contracts. In this manner, cryptocurrency collected through blockchain is used to raise money from those who support the movie. Smart contracts specify the amount of the profit to be shared for a contributor to the movie's financing will receive in the event that the film is sold. In this way, funding is generated from people who believe in the film using cryptocurrencies collected through the blockchain. The amount of funds raised and who donated how much can transparently be seen. The film generates a certain amount of revenue when it is watched online for a specific cost. The blockchain is then used to distribute the profits to investors. In return for SingularDTV tokens (SNGLS Coin), users can access films, music, books, and other artistic creations within the ecosystem of the SingularDTV .Any user who wants to watch a movie on the SingularDTV service buys SingularDTV tokens against a price . After that, they can use this token to watch the film of their choices. According to the smart contracts, artists receive higher payments the more times the film is watched. In addition, artists make use of the SingularDTV blockchain network to help facilitate shopping and negotiate with clients on a variety of subjects (Tapscott and Tapscott 2019).

Blockchain technology is also being used in the field of health care. Government records are of paramount significance to citizens in the healthcare industry. Significant problems might emerge if these data end up in the hands of malevolent people. An occurrence that happened in the United States in 2015 can serve as an example of this circumstance. About 10 million people's health information was obtained without authorization by a hacker in the US and later sold for $1 million (Babaoğlu and Karasoy 2022). Similarly, counterfeit drugs are a widespread problem in the healthcare industry. A study performed by Jamil and colleagues (2019) is particularly significant. According to Jamil and his colleagues, counterfeit drugs account for up to 30% of the market in developing countries. According to the same study, which used World Health Organisation statistics, nearly 30% of all pharmaceuticals sold in Africa, Asia, and Latin America are counterfeit. According to these statistics, one out of every 10 medications sold worldwide is counterfeit. 361,000 children die each year as a result of using counterfeit drugs. 30 billion dollars are spent on counterfeit drugs every year (Cnnturk.com 2017; Jamil, Hang, Kim and Kim 2019; Carda and Kısa 2023). To prevent medicine counterfeiting, Jamil and his colleagues suggested a technology called

"Hyperledger Fabric," which has a blockchain-based architecture. The Hyperledger Foundation developed the Hyperledger Fabric blockchain network, which is built on smart contracts and open-source technology. It is evident from reviewing the Hyperledger Fabric website that blockchain-based healthcare services are being provided within the framework of many the examples from various countries. The Aruba Health App is one example. Indicio.tech worked with the Aruba Health Department to develop this app, using Hyperledger Fabric blockchain technology. Those who wish to travel to the island of Aruba need to employ this method to complete the necessary health exams and upload them to the app. Following the completion of the necessary medical examinations, each visitor receives a distinct digital traveller ID and it is uploaded to the system. Access to lodging facilities, dining establishments, and entertainment venues can all be facilitated by the blockchain-based ID that contains health records. People can use QR codes to confirm their identity and gain access to the places of their choice. Furthermore, if people uploaded all of their health/medical history, blood type, medications, and chronic diseases to the system by QR code when visiting a hospital, doctors will have easy access to this data. As an example, during the pandemic, the Aruba government has also employed blockchain-based digital identity information to prevent tourists from leaving their hotel rooms until they have a negative PCR (coronavirus test) result (Aruba Health App., 2021). Another instance of a blockchain-based health application is the "MediLinker" program (Bautista et al. 2023), which was developed by a team from multiple academic disciplines at the University of Texas in the United States. Hyperledger Fabric has been actively working to combat the circulation of counterfeit drugs by developing a blockchain-based system that aligns with the Drug Supply Chain Security Act (DSCSA) and serves the needs of licensed pharmacists in the United States. These efforts have given way to the generation of a dedicated application called XATP. This platform allows all stakeholders in the pharmaceutical supply chain to be authenticated through secure digital identities. The system is designed to facilitate safe and transparent information exchange throughout pharmaceutical transactions. Each company records the drugs that it manufactures on the blockchain-based XATP. XATP-supported barcode readers make it simple to verify the authenticity of the drugs by scanning the barcodes printed on them. Members of LedgerDomain and Hyperledger, as well as other stakeholders from the pharmaceutical and healthcare industries,

worked together to develop XATP. By confirming distributor ID's on the blockchain and assisting with verification requests, XATP provides a “Verification Routing Service”. By scanning the 2D barcode on any medicinal products in the United States, pharmacists are able to receive all the information they need regarding recalled, counterfeit, and expired or low-stock drugs (hyperledger.org 2021).

Conclusion

The research conducted by the study highlighted how blockchain-based projects have been expanding constantly at a rapid pace. Security, speed, and cost are the three factors that are most important in ensuring the development of blockchain-based projects. Security is the most noteworthy feature of blockchain technology. A blockchain is generated by connecting blocks with cryptographic codes that range from 17 to 41 digits. When blocks are linked together, the codes embedded within them are interconnected as well. For example, an 82-digit blockchain structure is generated when a block with a 41-digit password is put next to another block (41*2=82). In this manner, an unbreakable encryption system is created when blocks are joined to one another. The primary reason for for selecting the blockchain system is this particular case. A further benefit of blockchain technology is its speedy composition. For example, Ripple, a blockchain-based currency initiative, can transfer $1 million in 3 to 5 seconds. As highlighted by this example, blockchain technology significantly accelerates data transport. In addition to speed, blockchain provides significant cost advantages. Using the Ripple blockchain-based currency project as an example, the cost of transferring one million dollars ranges between 0.5 and 3 dollars. Blockchain-based cryptocurrency projects keep up their research and development to make transactions quicker and less costly. Automated Teller Machines (ATMs) for digital or cryptocurrency have recently been installed in several countries, including Turkey. The use of such ATMs is increasing. Once more, blockchain-based payment systems that may be used with smartphones appear to be drastically reducing the necessity of actual currency for shopping purposes in the near future.

Blockchain-based supply chain systems have been demonstrated to bring substantial benefits in terms of swift employee wage payments, preventing the transportation of counterfeit goods, and resolving problems encountered in the transfer of perishable goods during the

work process when looking at specific application examples. Blockchain technology has also contributed to the development of digital identification, opening up a significant application for it. Digital identification made it simple to determine who had COVID-19, particularly during the pandemic. All transactions (such as shopping and lodging) are carried out using digital IDs in countries that have made the switch to digital identification. This makes it simple to identify people who are infected with COVID-19 and to place limitations on their travel. No matter where they go, healthcare professionals have immediate access to the digital identities of people whose medical data has been uploaded to the system if they feel uncomfortable. Once more, the implementation of the blockchain-based moveable property registration system can avoid document forgeries (counterfeit documentation) as well as the loss of data resulting from natural disasters. There have been major advantages to using blockchain technology in the human resources process (document verification). By identifying phoney degrees and educational certificates during the hiring process, for instance, the issues that institutions might have encountered have been avoided.

Blockchain technology is on track to become an important milestone in terms of political participation and transformation of the political parties. The way to direct democracy appears to have been paved with blockchain-based voting technologies which provide a secure, fast, and transparent voting procedure. Likewise, political parties structured through blockchain-based communication networks contributed to digitalise the traditional political party organisational structure. Blockchain technology has had an impact on the pharmaceutical industry. The scope of the global counterfeit drug trade and its detrimental effects, especially on the mortality of infants, have been examined based on the data provided in the study. Blockchain-based solutions make it simple to address this issue and its detrimental effects. Finally, customer recognition and transportation both apply blockchain technology. Taxi apps that are simple to use, secure, and make use of blockchain technology are becoming increasingly prevalent worldwide in the urban transportation industry. Trade and relationship with customers have been significantly enhanced with the blockchain-based customer identification/KYC system.

The study also found out that numerous investigations into the applicability of blockchain-based systems in various industries have been carried out. The United States, China, the United Arab Emirates,

Estonia, and others have all invested significant amounts to support these studies. Nevertheless, it has been noted that these studies have not yet been put into practice and are still in the theoretical study or pilot application stage. The defence industry, notarial services, fundraising, cloud data and cloud computing, software and coding, foreign trade, aviation, search engines, anti-corruption, assistance programs and documentation, taxation, auditing, cyber security, and intelligence have all been identified as domains where blockchain technology will be used in the near future. To put it briefly, blockchain technology can be applied to practically every aspect of life. It seems that it is to be employed in every aspect of life in the near future.

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