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RESEARCH ARTICLE **OPEN ACCESS**

A COMPREHENSIVE STUDY OF SECURITY DATA FOR HEALTHCARE SYSTEM USING CLOUD OF THINGS BASED WIRELESS BODY AREA NETWORK

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ABSTRACT

The current search trend is entering the Cloud of Things. CoT aims to provide integrated and ubiquitous IoT services with IoT functions. However, realistic and time-consuming smart services require CoT architecture, which is energy efficient. This article explores architecture, sites and CoT implementation in the healthcare sector. It reviews the need for further efforts to achieve an energy-efficient CoT framework in the healthcare sector, taking into account energy efficiency, delay and quality of service. Researchers from academia and industry have begun exploring applications of blockchain technologies for healthcare. These applications include smart contracts, fraud detection, and authentication. In addition, as highlighted in this research report, there are many health care applications that have not been addressed by research into block chain experiments. In the health sector in particular progressively associated with data and correspondence innovation administrations One of the main administrations is far off patient observing, which permits medical care suppliers to follow, analyze and allude patients without remaining in the emergency clinic .The benefit of reducing sensing technologies is the ability to wirelessly transfer normal data to remote servers or install it on the patient's body. One of these technologies is called Wireless Body Area Network (WBAN).This survey explores clinical diagnosis, legal compliance, fraud prevention, and improving patient care.

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INTRODUCTION

The exponential growth in the ICT (Information and Communication Technologies) decide to service providers in different areas, including fitness and environmental. The use of these technologies can improve the appearance of successfully provided services and reduce costs (1). In fact; out-patients improve the health, quality of life of careers, allowing us to live in freedom. Given the rapid development of chronic disease, especially in developing countries where the use of ICT is essential for early detection and prevention process help to reduce the cost of healthcare.

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For example, Undergraduate public health is used to monitor a specific area or small town, sort and IoT in the space around the network. This means the danger of chronic diseases can be effectively controlled under the right set (2, 3). In general, cloud-based IoT and monitoring the health system has four main components: (1) data collection, which uses biometric sensors to the speech parameters of the patients. (2) Wireless Body Area Network (WBAN), which allows physicians to communicate between physicians and servers communicate through the cloud (4, 5). (3) The medical cloud server that is guilty of consistent data storage, processing analysis and complex and (4) a clinical medical station that allows medical personnel to approach a distant server in the cloud. The latest thing is the joining of the cloud and Internet of Things (IoT). This combination is called as cloud of things (CoT). The standard level and application preferences will provide ubiquitous internet and ubiquitous computing (7).

Therefore, the elements generated by storage and processing are better than the ideas of the large increase in data size. When the cost increases, things can offer IoT (business) services such as API for IoT sharing applications (8). In this way, IoT applications can be promoted and consumers' goals for creating intelligent integrated services evolve. Depending on the comforts of everyday life (e.g. Healthcare) that require an energy efficient architectural sensor, prolong life and what works well (9). Advances in wireless communication technology have changed all aspects of our daily lives. It is inevitable that the health sector will experience the effects of the Internet of Things (IoT) Electronic safety monitoring, a large fitness, the calorie computing, online consulting, health care, the removal of a variety of communications technologies, and now most of all by means of more accurate diagnosis. The WBAN is perceived as a top possibility for a standout amongst other correspondence advances that applications can use to screen human wellbeing and post-handling information (10, 11). Given the key features of a large-scale transmission of sensory information between participating nodes, it can be defined as one of the means necessary for communication machine as in healthcare sector (12).

Machine to machine communication (M2M) covers a wide range of communications industries, including the automotive, healthcare, vitality, reliability, surveillance, smart metering and transfer. Machine to machine communication for the implementation of wellness program is expected to be an important part of the market in the future. Individuals with persistent infections, for example, stroke and coronary illness distinguish extreme actual work and screen the change, so they don't have to remain in the medical clinic (13). Due to the health developments in the stay in hospital is greatly reduced. Sustains the health care system is already a electronic procedures such as the health of the communications media. In addition, health services are becoming mobile, mobile Healthcare (mHealth)(14). WBAN emerging technology which is a relatively new lore and Tele focuses on health. The WBAN, health-related physical sensor is placed near the patient and in some particular situation. Finally, in connection with sensors Zigbee mainstream technologies such as wireless, Wi-Fi and Bluetooth, thus forming the WBAN (15). WLAN as a developer, WiMAX, LTE, LTE - A, and can be wheeled between the mass media gateways. The rest of the work is divided into: Section 2 and related activities and the like. 2.1 section discussion of the effect. Section 3 concludes with suggestions for future research.

Cloud of Things: The Internet of Things is an integral part of the future of the Internet, attracting the attention of academics and industry due to its provision of amazing services in a wide variety of applications. IoT fuses various consistent devices and substance to establish an indigenous habitat in which acknowledgment, preparing, and correspondence are naturally actualized without human intercession. However, the volume of data generated by devices in the current workflow is an obstacle to quality of service (QOS) of IoT systems due to the limited performance and storage resources of IoT devices. Simultaneously, distributed computing offers benefits that require limitless capacity and registering power, and IoT client areas offer powerful and productive administrations. Specifically, the incorporation of distributed computing with IoT prepares for another model like Cody, which can possibly improve worldwide smelters. Likewise, CoT can change existing assistance conveyance models with existing

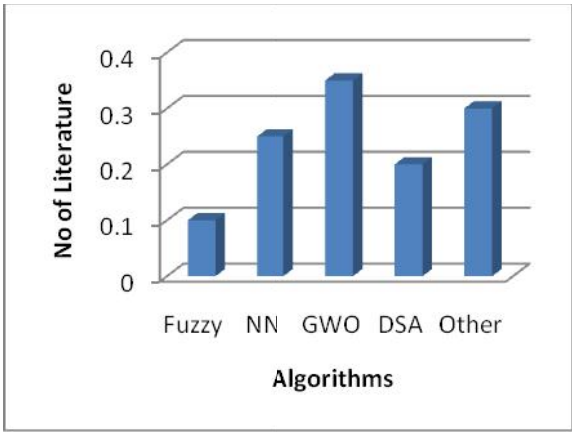

Fig. 1. Survey related to Algorithms

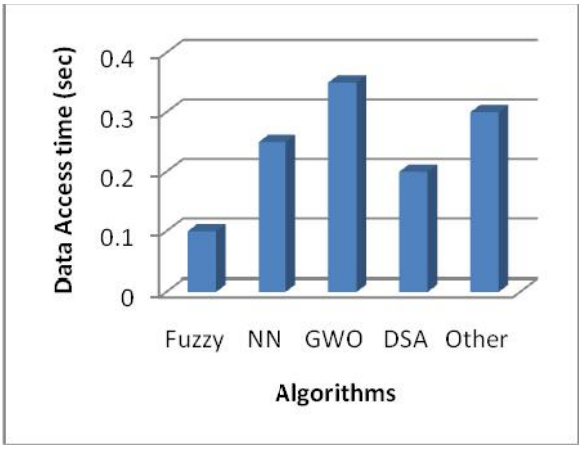

Fig.2. Survey based on a Data access time

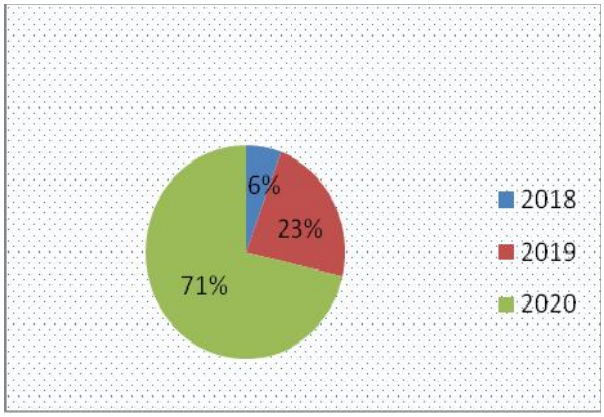

Fig. 3. Survey based on Literature papers

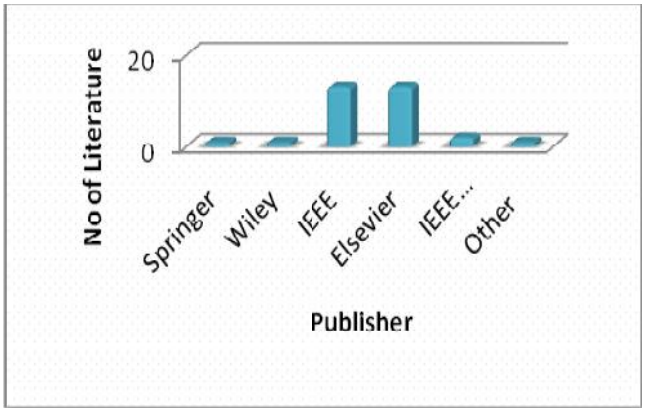

Fig. 4. Survey based on Publisher

Table 1. overall analysis of survey

Authors	Proposed Systems	Algorithms	Objective	Limitations	Journal Name
Shamshad*et al.* [16]	Blockchain-based privacy preserving and secureEHR sharing system	Fuzzy	Advanced diagnosis and effective treatments in TMIS.	The eHealth system has been reduced as the doctor cannot access the electronic patient files.	Journal of Information Security and Applications
Benil,*et al.* [17]	Two advancements are consolidated together for putting away and dealing with the electronic clinical records in the cloud climate	Halfway Private Key Generation, Set Secret-Value	Medical data protection, a new program (EC-ACS)	Introduced to keep medical records safe, but can be misused.	Computer Networks
Zhang,*et al.*[18]	JPBC library and the experimental evaluation	Probabilistic polynomial time algorithm	Efficient ambiguity for identity-based encrypted signatures on WBANs	This may be due to the fact that GT's operations take a long time and there are not enough instructions on the mobile phone processor.	IEEE Systems Journal
Rupa, *et al.*[19]	Block chain technology designed for that purpose that depends on contracts among theproviders and data consumers/uses	Ethash algorithm	Reduce counterfeiting in medical sources.	Fraud in the issuance and verification of medical certificates has long existed in health centers	Intelligent Computing and Control Systems (ICICCS). IEEE
Islam*et al*. [20]	A blockchain-based secure healthcare schemeis proposed system	Digital signature algorithm	Safety power consumption and processing time for safety execution	Medical emergencies	Computers & Electrical Engineering
Liu, *et al.*[21]	A robust authentication scheme with dynamic password for WBANs	Custom password computation algorithm	To resist the attack on the disclosure of personal information.	The communication channel is wireless with WBAN.	Computer Networks
Abiodun, *et al.*[22]	Cloud-based wireless body zone networks utilizing information the executives for better medical care	Data segregation algorithm	Patients with ongoing diseases and the old advantage significantly from a firmly observed wellbeing framework.	Conditions for changing channels time limit for user mobility and security restrictions.	IEEE Consumer Electronics Magazine
Al Omar,*et al*.[23]	A blockchain-based Encryption, Decryption healthcare scheme.	Checking of Issuer and Sender, Transaction of Data, Block-id Generation	A patient-centric data management system for the healthcare industry that uses blockchain technology as a repository to protect privacy.	Management problem of key acquisition / loss or key distribution mechanisms	Future generation computer systems.
Latha, *et al.*[24]	Remote Body Area Network Based Telemedicine through Cloud	Transaction of Data	Wireless body network, telemedicine and practice for public patients are heard	Introduced to protect medical records, but could be misused.	Procedia Computer Science
Wei, *et al.*[25]	Medical Internet based health monitoring Enables Architecture and Technologies, Applications	Adaptive cooperative communication	Effectively address Effective path recovery solutions for blocked paths in the IOMT-based Lifeguard Health Monitoring System by improving Lifeguard mobility.	This increases the difficulty of resource allocation and routing strategy.	IEEE Access
Jabeen*et al.*[26]	Cloud-Based Wireless Body Area Networks used by Managing Data for Better Health Care	Genetically based encryption algorithm	To save data in an incomprehensible form.	High security risk, computing effort	IEEE Access

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Wang, *et al*.[27]	Encrypted data storage in the GuardHealth	User Data EncryptionAlgorithm	"ESHCMA: One-time password in the body's wireless network.	Therefore, medical errors and patient safety cannot be withdrawn.	Journal of Parallel and Distributed Computing
Bandopadhaya, *et al*.[28]	Health monitoring based on internet of medical things by Architecture, Enabling Technologies, and Applications	Polynomial linear regression	A sensor-based communication architecture (or sensor designations) for future IoT-based healthcare systems is proposed.	Compared to existing algorithms, it offers little security with a long key length.	Sustainable Computing: Informatics and Systems
Tripathi,*et al.*[29]	Two-tier blockchain systems in the S2HS. For needs based job and resource management.	Data analytic techniques	"Operating process", "service-oriented architecture" and "service-oriented infrastructure"	Extend the review period in an emergency.	In Healthcare
Bilandi, *et al.*[30]	Energy effectiveness is viewed as a premier test to build the lifetime of a network.	Grey Wolf Optimization	Body-zone remote networks are made to gather and communicate human wellbeing data utilizing sensors on the human body.	Security concerns	Beni-Suef University Journal of Basic and Applied Sciences
Islam*et al*. [31]	A smart healthcare system in IoT Environment in proposed system	Digital signature algorithm	Decrease your heart rate, body temperature, room humidity, and CO value	The global health problem has caused a stir	SN Computer Science
Hamalainen*et al*. [32]	European smart body area network (BAN)is proposed system	SmartBAN approach	ETSI TC Smart BAN offers solutions for managing heterogeneity and interoperability for BANs	Security concerns	IEEE Access
Albesher. [33]	IoT in Health-care is proposed system	ANN technique	Better battery life, larger memory size and faster processing speeds.	Children's mental health problems	International Journal of Computer Science and Network Security
Zahoor*et al*. [34]	Proposed BAN system is proposed system	Advanced Edge Clustering (AEC)	Improved energy productivity, preparing time, and capacity necessities for handling	Other resources such as storage, processing, and bandwidth are not taken into account	Scalable Computing: Practice and Experience
Cicioglu*et al*. [35]	Healthcare architecture is proposed system	Software-defined network (SDN) approach	Power consumption, speed, successful transfer speed, and delay settings	The most important issues in WBN architecture are diversity, scalability, and energy efficiency.	Etri Journal
Mahmoud*et al*. [36]	Mobile health monitoring systems is the patient‘s self-management is proposed system	Machine-learning algorithm	Reduce the number of regular hospital visits	Power consumption and in number of patients which connect to one sink	Int. J. Comput. Appl

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Samal *et al*. [37]	Proposed ER-MAC protocol modifies is proposed system	Slot granting in PD MAC protocol	Providing energy efficiency and emergency data	A Preventive Emergency (ETS) time slot is also created To transfer emergency data during CFP, but this protoco	International Conference on Computing, Communication and Networking Technologies
G Lopes *et al*. [38]	Mobile-health (m-health) and Telecare Medicine Information Systems (TMIS).	Symmetric algorithm	Reduce security concerns	Obvious security issues Interests of key exchange on public channels	Sensors
Qadri *et al*. [39]	Ambient Assisted Living Systems with IoT is proposed system	Artificial Neural Networks (ANN)	Reduce latency, improve data security and interoperability	To alleviate serious problems related to latency, power consumption, bandwidth usage and scalability	IEEE Communications Surveys & Tutorials
Borujeni *et al*. [40]	Proposed smart healthcare service provision architecture.	Maximum Reward Algorithm	Scalability, network latency and real-time response	Scalability, fault tolerance, and attainability of remote health services	Journal of biomedical informatics
Yánez *et al*. [41]	Context-aware data allocation mechanism is proposed system	Fuzzy logic controller	Improve network utilization, latency, blockchain storage and reduce power consumption	Inconsistency, incompleteness, inaccuracy and / or indeterminacy of the data	IEEE Internet of Things Journal
Mehmood *et al*. [42]	Trust-based communication scheme is proposed system	Trust-Based ERCS	Increase service delivery rate, reliability and confidence with reduced average lead time	Security issues	IEEE Access
Ahmed *et al*. [43]	Proposed optimized energy congestion control system	Temperature sensing routing algorithm	Consumption Power consumption, service life, efficiency, temperature control, overload, delay, successful transmission rate	SDN based WBAN, energy efficiency problems	IEEE Access
Wang *et al*. [44]	Multi-node 3D based on RSSI The motion monitoring auxiliary algorithm is the specified system	Multi-node 3D movement checking and situating calculation	Average installation error, installation speed and average power consumption	The 3D node tracking algorithm has high complexity and high node power consumption.	Computer Communications
Zhao *et al*. [45]	A public auditing scheme with identity privacy conservation is proposed system	Signing algorithm	Verification effectiveness and signature effectiveness	Security problems	IEEE Access
Hasan *et al*. [46]	WBAN based software (SDN) based system (SDWBAN) recommended	Beacon Dissemination Process	Determine high efficiency and low latency for emergency traffic.	Ensure proper delivery of critical information due to lack of administrative control and priority support for emergency data	Future Generation Computer Systems
Wang, et *al*. [47]	Privacy-aware Efficient Fine-meshed Data access control in the Internet from Fog Computing Based on Medical Things	Access-Control Determination (ACD) Algorithm	The approach could provide a high level of privacy in less time	Emergency medical problems	IEEE Access.
Wang *et al*. [48]	Smart healthcare system based on Blockchain consortium	Graph Neural Network (GNN)	Anomaly detection	Assessing Confidence Without Sensitive Information ”In Smart Health Networks	Journal of Parallel and Distributed Computing
Kumar *et al*. [49]	Anonymous authentication and basic contract system (IBAAKA) proposed	Setup, registrationand authentication algorithm	Minimization of lower processing costs and comparable communication costs	Important session security issues	IEEE Systems Journal
Elhoseny et al. [50]	A hybrid model of the Internet of Things and cloud computing for management Big data in healthcare apps	GA, PSO and PPSO	Runtime optimizes the storage of large data that patients need and provides a live data recovery system for such applications	Tested against the most advanced method to evaluate its effectiveness.	Future generation computer systems.

authoritative exertion, exertion, high framework execution, and administration accessibility. Offer an overall thought utilizing IoT network design administrations, distributed computing, examination and applications. Around there, IoT apparatuses are utilized to find and gather information from nearby conditions. Because of restricted registering assets, signed in IoT gadgets move information to the information cloud for information procurement. Distributed computing offers a powerful information handling capacity.

Literature Survey: The Internet of Things is an integral part of the future of the Internet, attracting the attention of academics and industry due to its provision of amazing services in a wide variety of applications. IoT fuses various consistent devices and substance to establish an indigenous habitat in which acknowledgment, preparing, and correspondence are naturally actualized without human intercession. However, the volume of data generated by devices in the current workflow is an obstacle to quality of service (QOS) of IoT systems due to the limited performance and storage resources of IoT devices. Simultaneously, distributed computing offers benefits that require limitless capacity and registering power, and IoT client areas offer powerful and productive administrations. Specifically, the incorporation of distributed computing with IoT prepares for another model like Cody, which can possibly improve worldwide smelters. Likewise, CoT can change existing assistance conveyance models with existing authoritative exertion, exertion, high framework execution, and administration accessibility. Offer an overall thought utilizing IoT network design administrations, distributed computing, examination and applications. Around there, IoT apparatuses are utilized to find and gather information from nearby conditions. Because of restricted registering assets, signed in IoT gadgets move information to the information cloud for information procurement. Distributed computing offers a powerful information handling capacity.

Innovative CoT-based patients and healthcare systems can provide servicesnot only in the ICU immediately effective, but also at home and at work, which are cost-effective and improve the patient's quality of life.Blockchain for security and privacy information is a major challenge in our life and health information storage and sharing the new security policy is based on the blockchain consortium. In any case, exchange and capacity security frameworks have inadequacies, for example, high stockpiling expenses and necessities for inbound preparing demands. Imaginative CoT-based medical care frameworks can offer quick and successful types of assistance to patients in the emergency unit, likewise at home and at work. It is less expensive and improves the patient's personal satisfaction. As the security and protection of blockchain information stays a significant test, we propose another security plan for the capacity and sharing of wellbeing information dependent on the blockchain consortium. We accept that everybody except the coat and the aspects can take an interest. Each client can save their wellbeing information from IoT gadgets or emergency clinics. Albeit these plans give secure correspondence and capacity, frameworks, for example, high stockpiling expenses and high figuring power prerequisites for inquiries actually have a few downsides. Shamshad *et al*.(16) have presented an EHR to share a protocol that protectsblockchain-based privacy security and improve effective diagnosis and treatment of endpoints. The company's dual, private and blockchain mapping data structures are built using an authentication system. Blockchain is responsible for maintaining the EHRs personal directories and the EHRs Consortium directory. To ensure information security, secure search, access control, and data protection, all EHRs content must be encrypted with a keyword search.Benil, *et al* (17) have implemented a new system through the Elliptical Curve Certificate Cryptographic Signature Program (EG-ACS) curve with the minimum Egyptian full certificate encryption signature scheme (EG-ACS). In general research and auditing, use the Elliptical Curve Encryption (ECC) signature without digital signatures and medical information encryption aggregate (CAS) to create and share cloud storage data. Zhang *et al.*(18) have presented Computerized marking of storage by CAS-supplied information store (Certificate Aggregate Signature) for storage by a person from Elliptic Curve Cryptography (ECC) for information encryption. Rupa,*et al.*(19) have investigated ambiguity in the same mobile subscriptions to the encrypted WBAN particular sources and efficiently encrypt the encrypted data collected by sensors.Islam, *et al.*(20) have presented ablockchain-based Safe Health Plan utilizing an automated aeronautical vehicle in the Internet of Things.Liu,*et al.*(21) have presented the WBAs does not have a strong authentication system. Cannot talk about routine use algorithms to keep secrets and participate in the movement. This update provides that, in order to be able to withstand the attacks of our personal data WBANs very large losses. For the rest, we do not find that the traditional performance of authentication validates an analysis of the project mode for detailed evaluation.

Abiodun, *et al.* (22) have investigatedthe cause of the sick and the elderly strictly controlled fury. Widely used wireless network area of the body (WBAN) in this case. PenicilliumWBAN long-term data collected by sensors disease.Al Omar,*et al.*(23) haveIntroduces patient-centered data management system for the health sector using blockchain technology as a storage aid. Cryptographic functions to encrypt and secure the patient's name. In the process of data processing systems and analyze the cost-effectiveness of our told. Latha, *et al.*(24) have investigated Wireless body area network and telemedicine are constantly monitored for remote patients. The patient's medical records are carefully stored in the cloud. Doctors create a network that can respond to a patient's emergency. In case of emergency, the patient is treated by the nearest doctor after an on-site teleconference Ή just a conference call. Healthcare professionals can store, monitor, remotely monitor and record health information wherever telecommunications security is possible as data is stored in the cloud.Wei, *et al.*(25) have showedIoMT Health Monitoring Architecture for individuals and groups that allows supervised users to navigate at will. In addition, IoMT researchers are building large health systems, according to doctors and carriers, as well as various natural disasters. It was to ensure the implementation of our prayers, to allow research on the technology of what it is today and I will show it. Jabeen *et al.*(26) have investigatedthe Next Generation wireless body area network (WBAN) (IoT) is rapidly evolving. Today, patients can be examined with remote nanoclinic sensors. The WBAN is made up of small interconnected sensors capable of recording and transmitting existing medical data over networks for further processing. Although there is an abundance of The book reference on information security strategies, for example, advanced marks, circular bend encryption, and excellent encryption (AES) is a boundary. Wang et al. (27) have presented a proficient, secure and decentralized blockchain

framework to keep up and move information assurance. Guard Health deals with information security, confirmation, information maintenance and information move while private data is handled. Utilize the blockchain consortium and savvy agreement to safely store and offer information to forestall unapproved information sharing. A trust model is utilized to intently screen client unwaveringness utilizing the best in class Graph Neural Network (GNN) to recognize malignant hubs. Bandopadhaya et al. (28) have actualized health answers for warriors who are conveyed under unfriendly natural conditions by means of the Internet of Things (IoT) with appropriated PCs. For these warriors, the health boundaries of every individual should be checked progressively and the informational collection examined. Fitting clinical consideration ought to be acquired at the earliest opportunity. A three-levelIoT engineering is recommended that conveys PC capacities to all levels. Tripathi et al. (29) have indicated that blockchain innovation is an approach to improve the security and protection of information and its clients. With the deluge of clinical information produced by electronic health records and other ICT-based frameworks, blockchain has discovered numerous chances in healthcare. Present day advances are by and large profoundly received to change conventional health frameworks into smart health care environments. Client usefulness and usability roll out this improvement conceivable. Shrewd Healthcare Systems (SHS) addresses various difficulties and issues identified with information security, client security, straightforwardness and protection. Bilandi et al. (30) analyzed remote body zone networks that were made to get and send health data utilizing sensors in the human body. Energy productivity is viewed as the best test in expanding the existence of an organization. To improve energy productivity, hand-off hub determination is a significant component that can be utilized to demonstrate enhancement as an issue. Normally roused calculations are broadly utilized these days to take care of different streamlining issues.

Islam *et al*. (31) haspresentedan excellent IoT healthcare system that monitors the basic health characteristics of the patient and the condition of the patient room. In this framework five sensors are utilized to extricate information from the clinic climate, for example B. Pulse sensor, internal heat level sensor, room temperature sensor, CO sensor and CO2 sensor. Hamalainen et al. (32) have examined The European Intelligent Body Area Network (BAN) normalization work and guidelines have just been distributed. The objective of the ETSI TC savvy BAN is to characterize and grow new European BAN guidelines. Encourage the effective selection of bandwidth innovation by giving a normalized way to deal with convey new interoperable items to wellbeing, clinical, sports, diversion and web markets for purposes proposed for worldwide use. Albesher,(33)have developed anIoT in healthcare achievements for large communities including IoT healthcare and initiatives in various countries around the world. Examines current and imaginative wearable wellbeing advancements with IoT-empowered wellbeing applications. This precedes a full discussion of the security needs and challenges in IoT healthcare. Zahoor *et al*. (34) have represented design and modeling of BAN system with limited resources and discussion of various BAN scenarios in the context of resource constraints. Furthermore, an Advanced Edge Clustering (AEC) way to deal with asset the executives is proposed, for example B. Energy, stockpiling and handling of BAN gadgets, while basic wellbeing boundary information is gathered and strange examples are distinguished.

Cicioglu et al. (35) investigated an energy efficient routing algorithm for healthcare. Mahmoud et al. (36) have implemented a live framework for patient monitoring systems based on the wireless body area network. Remote Body Area Network (WBN), distributed computing, haze, semantic oncology and CDSS (Clinical Decision Support System) are incorporated to give a total and coordinated model. By monitoring a person with chronic illness in real time, doctors can guide patients in making the right decisions. In addition, patients can live normal lives. Samal et al. (37) introduced an energy-efficient, reliable Real-Time Access Control (ER-MAC) for QoS-based data transmission over WBAN with extended network life. This protocol is based on the IEEE 802.15.4 model, which is very popular in healthcare applications due to its low efficiency and low cost. Mutual authentication protocol for M-Health systems that supports D2D communication, ensures security, and outperforms performance and security;has been developed by G Lopes *et al* (38).With billions of devices being developed on the Internet of Things, it is important to avoid performance and security issues. Security is the basis for better in terms of the sensitivity of shared health data, especially the anonymity of patients and other entities, and the lack of bandwidth in wireless networks. Qadriand others.(39) Consider the future of online health care. The use of Artificial Intelligence (AI) has changed H-IoT systems at all levels. The fog / acne example brings computing power closer to the distribution network, thus reducing many of the challenges that can arise when processing large volumes of data. Additionally, software-defined networks (SDNs) offer system flexibility, and blockchains detect the latest applications on H-IoT systems.

Borogeni *et al*. (40) have introduction of a four-tier hierarchical architecture for the development of health systems. In the proposed model, a patient's vital signs are measured using a number of body sensors and sent to an intelligent healthcare system. Each of these layers is associated with cardiac arrest to some extent. Therefore, in the proposed model, a simple, low risk heart failure can be quickly identified before dangerous levels are reached. Yanus *et al*. (41) have Implementation of a context-sensitive mechanism for entering chain data into IoTblockchain systems. In particular, we are designing a data controller based on the vague logic of estimating the RoA (Allocation Rating) of each data request, taking into account various context parameters such as data, network and quality and determining the network share. Mehmood*et al*. (42) have Introduction of a Dependability based correspondence intend to guarantee the unwavering quality and assurance of WBAN information. A cooperative correspondence approach is utilized to guarantee validness and an encryption framework is utilized to guarantee classification. When monitoring patients remotely, the implementation of trust and confidentiality is critical as they carry critical signals to remote locations. However, the widespread use of WBAN poses serious reliability and privacy risks and limits the personalization of healthcare applications. Reliable communication solutions are often used over WBANs to solve reliability and privacy issues. Ahmed *et al*. (43) have presented an EMSMO combines the concept of avoiding congestion with energy efficiency, connection reliability and path loss for the modeling of cost functions, on the basis of which EMSMO offers an optimal path. Wang *et al*. (44) Spatial-temporal correlation application with motion data collected by multiple sensors in a wireless human LAN uses an RSSI-based algorithm to support multi-node 3D motion tracking, including

mobile device route planning. Throughout the installation process, the workflow belongs to the public node and contains the form of the information package. Zhao *et al*. (45) for the body's wireless networks, a public verification system has been introduced to protect the confidentiality of the identity based on ring signatures without certificate. In addition, it is a public audit system with identity privacy protection, which integrates a certificate-free ring signature technology for cloud-supported body zone networking. The security analysis shows that the system can fight fake attacks, which are the current attack methods. Hasan *et al*. (46)the application has implemented the Software Defined Network (SDN) based WBN (SDWN) framework to handle specific traffic. WBN coordinates SBN standards into an application order calculation and bundle stream component to effectively deal with perplexing and basic traffic in the network. Moreover, a Sector Based Distance (SBD) convention was created and used to disentangle the SDWBAN correspondence system. Wang, et al. (47) it is intended to guarantee an elevated level of information insurance without bargaining the proficiency of cloud/mist figuring (particularly in IOMT natural frameworks). The particular model is known as the Fog-Based Access Control (FACM) model. Fantastic information access control is incorporated into the usage of mist figuring with a specific methodology.

Wang *et al*. (48) Implemented by Guard Health: An efficient, secure and decentralized blockchain system for protecting and sharing data. GuardHealth handles data protection, authentication, data retention, and data transfer while maintaining the privacy of information. We use blockchain and the smart contract syndicate to achieve secure data storage and sharing that forbid data from being shared illegally. Kumar *et al*. (49) tested an identity-based IBAAKA protocol (anonymity authentication and key agreement)for WBAN in the cloud climate, accordingly accomplishing shared verification and client obscurity. In security examination, we show that the proposed IBAC plot is demonstrated to be protected under the known Diffie-Hellman computational theory and arbitrary prophet model and that it obtains the necessary security highlights Elhoseny,et al. (50). The proposed hybrid cloud and IoT architecture consists of four main components: stackholder tools,stackholder requirements (functions), cloud broker, and network administrator.To appraise the execution season of investor demands, the particular wellness work incorporates three fundamental models: it works, CPU utilization, reaction time, and stand by time.

Figure 1 shows the algorithm detection. Five types of algorithm are used here: fuzzy, neural network, optimization algorithm, and digital signature algorithm. Among the total 35 literatures, two are under the fuzzy technique, five are under the neural network technique, three are under the optimization algorithm, three are under the digital signature algorithm, and one literature is other methods. The literature based on data access time was analyzed in Figure 2. Here it shows that the data access time performed with the fuzzy technique is 0.1 seconds, the neural network (NN) is 0.25 seconds, the GWO algorithm is 0.35 seconds, the digital signature algorithm is 0.2 seconds, and the other methods take 0.3 seconds respectively. Figure 3 analyzes the years using the survey paper. Here, the year 2018 requires 2 articles, the year 2019 requires 25 articles, and the year 2020 requires 8 articles. The survey based on the publisher's chart was shown in Figure 4.

Here, one literature is under the Springer publishing house and the Wiley publishing house, thirteen publications are under IEEE and publisher Elsevier, two are under the IEEE conference publisher and a literature is under the other publisher. Mostly, IEEE editor and Elsevier were used.

Conclusion

In this article, we present a comprehensive and updated overview related to the combination of the technologies: Blockchain and CoT, which are very significant in industrial applications due to the benefits of security, data security and service support. The development of these systems was inspired by the lack of a comprehensive literary study. We first discussed the latest developments in CoT, including modules of stimuli and the ideologically integrated structure of CoT. In specific, we provided a extensive study of the deployment models in several practical contexts; we explore new CoT sites and services useful for Smart healthcare's industrial applications and application developers and researchers ranging from smart traffic to cloud services. A comprehensive literature review of CoT applications identifies major technical challenges and future directions in CoT research.

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