
**A REVIEW ON APPLICATION OF BLOCKCHAIN TECHNOLOGY IN
HEALTHCARE INDUSTRY TO PURSUE COVID 19 CHALLENGES**

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ABSTRACT

In 2019, the coronavirus (COVID19) will begin to spread in China, but in early 2020, the COVID19 pandemic has spread uncontrollably, affecting public health emergencies around the world. Much of our health care system is centralized, so it cannot provide critical information about patient tracking, vaccination certificate fraud, test-related data, and health care. In such contexts, innovative and cutting-edge technologies such as blockchain have initiated promising solutions to combat situations such as pandemics. By using blockchain technology, we will fight pandemics by enabling early identification of patients, ensuring medical data is requested, and maintaining a reliable medical supply chain during a pandemic. This take a look at proposes a story revolutionary technique for managing demanding situations of (COVID-19) pandemic and contagion. This take a look at proposes a Blockchain-primarily based totally framework which check out the risk of using peer-to-peer, time stamping, and decentralized garage benefits of blockchain to create a cutting-edge gadget to confirm and discover the unknown inflamed instances of COVID-19 (SARS COV-2). The framework will permit to make certain residents further as authorities to are expecting the contamination danger of virus, to offer an green gadget capable of aid governments, healthcare experts, fitness associated government and residents to require essential choices concerning contamination and contamination . this technique includes Blockchain Platform, Mobile application, closed-circuit tv those additives works collectively for detecting unknown inflamed sufferers and are expecting the contamination danger of corona virus. to create choices on vaccination and scientific supply.

Keywords: Covid-2019, Blockchain Technology

I. INTRODUCTION

At At the finishing of 12 months 2019 the Chinese town Wuhan have become the number one coronavirus (COVID-19) hotspot, this newly emerged ailment turned into first not noted as pneumonia which affecting the lungs. After a few day's docs found out that it is now no longer only a trendy pneumonia which affecting lungs however it's some thing newly occurred to the affected person other than pneumonia. Patient can't breathe without problems they require extra quantity of oxygen supply. On the other hand of sufferers getting extended day with the aid of using day. Patients extended at some point of a this type of fast manner that docs humble on it duration of time. Then researchers located that that is regularly now no longer easy pneumonia however it's upgraded model of SARS (excessive acute respiration syndrome). After it sluggish while media reviews set out WHO (global fitness organization) broadcasts that that is regularly Novel coronavirus ailment (SARS-COV-2) that spreading unexpectedly in human.. The severity of the epidemic turned into so massive that the planet Health Organization (WHO) turned into pressured to claim it as a deadly disease inside a month. Nearly the overall global is going for dealing with the conditions like implementing lockdowns in countries. That Affects the arena economy, insurance, transport, agriculture, tourism and each one the sectors. The shortage of clinical resources and hospitality potential has compelled authorities government to impose partial or whole lockdown to manipulate the unfold of the infection. With the lethal covid-19 spreading globally, each strive is being made to affirm assist for sufferers further on forestall the unfold of virus. As governments scramble to deal with those problems, technology-empowered answers can assist accommodate the global fitness associated crisis.

Applications of progressive technology like Blockchain Technology may want to have the solutions in reaction to coronavirus pandemic crisis. Blockchain era can aid to fight the COVID-19 pandemic like conditions via way of means of permitting early detection of patients, fast-monitoring drug delivery, and supplying a consensus at the ordering of the COVID-19 information. Blockchain era may be a allotted, decentralized, and immutable report of transactions which might be saved on a allotted community of nodes over geographically dispersed area. The decentralization characteristic of blockchain era affords excessive safety and robustness to the data and transactions saved at the blockchain and not using a opportunities of 1 factor of failure attack. The report of transactions and information saved at the blockchain is obvious to each member in the community that brings agree with in reliability and availability. The transparency of blockchain primarily based totally information is finished thru a decentralized consensus protocol that defines regulations for assuring the settlement of all miners on the existing repute of block chain. In "Decentralization" technique, which means that information is not saved most effective on one server however is shared amongst many participants, servers, stores. As a result, fitness files delivered to the blockchain are regularly accessed via way of means of all fascinated events like patients, doctors, governments in a completely obvious and dependable environment. This new era has been proposed to disable an amazing variety of information-pushed areas, which includes the fitness field. Additionally, blockchain era can aid properly for dependable coronavirus analytics. Collecting COVID-19 information is a critical step of ailment analytics. During the data collection, the manner to make certain the reliability of gathered information is of sensible importance to verify the pinnacle excellent of COVID-19 information analytics.

II. APPLICATIONS OF BLOCKCHAIN TECHNOLOGY FOR FIGHTING COVID-19:

1. Contact Tracing: The use of private protecting equipment (PPE) via way of means of people having disclosure to transmittable disorder like corona virus can substantially save you and manipulate the unfold of the corona virus. For instance, for the duration of the pandemic resulting from COVID-19, the usage of PPEs can result in reduce the publicity of the front line healthcare people to the inflamed individuals. Examples of PPEs which might be usually used to save you touch to inflamed individuals or surfaces consist of gloves, protection goggles, face masks, and protecting clothing. During the COVID-19 pandemic, many counties have pronounced the dearth of PPE kits in hospitals because of a loss of a relied on machine to offer suitable statistics approximately call for and deliver of PPE kit. Existing centralized primarily based totally PPE deliver chain control structures are clearly incapable to efficaciously hint the statistics provenance of the PPEs in a relied on and dependable manner. Therefore, figuring out the supply of PPEs at the side of extra info which includes the kind of certification of the PPE is challenging. Blockchain flexibility via way of means of the applicable healthcare corporations to manipulate and manipulate the deliver chain of PPE can substantially help in figuring out PPE associated frauds. It can assist in constructing a extra resilient deliver chain of PPE. Through blockchain-primarily based totally structures, the collaborating corporations can validate the authenticity of PPE and discover any signal of PPE tampering or insufficient managing for the duration of its shipping. Blockchain era unchangeable and transparently shop all movements, possession info, and changes which might be came about to the PPE in a distribution.

2. Vaccination:

To fight towards the rising COVID-19 pandemic, it is favored to increase powerful vaccines towards lethal sickness due to COVID-19 virus. to conquer the unfold of COVID-19 calls for a success immunization of human beings towards the corona virus thru the management of a energetic vaccine. this centralized-primarily

totally based vaccination control structures face numerous demanding situations reputable to the chance of being failing to efficiently steady and distribute vaccines, to any or all over the humans in nations and breaching the logistics deliver chain of vaccines for malicious. The Blockchain era can completely keep records related to diverse stages, phases, and activities of the COVID19 vaccine like development, production, certification, and allotment slots to legal agencies for immunization purpose. In hospitals, healthcare specialists can get entry to blockchain to spot, trace, and confirm vaccines records earlier than administering it. It additionally may be used for notification control purposes (real-time) thru light-weight clever contracts. Smart contracts offer possibilities to hit upon vaccine-associated frauds, guarantee 0 downtime, and removes the position of third-birthday birthday celebration offerings to examine COVID-19 vaccine logistics. III.

Research related challenges:

1. Cross-platform Communication:

Blockchain interoperability characteristic that permits various blockchain-primarily based totally structures to uninterruptedly speak with every one. It guarantees customers to see, share, and get admission to statistics throughout numerous blockchain structures with out requiring middleman assistance. Thus, the blockchain platform’s interoperability help can boom the protection and productiveness of system. It additionally permits a user-pleasant enjoy amongst multiple-customers, affords a contactless and less difficult clever agreement execution environment, presents the possibility to broaden partnerships amongst collaborating businesses, and permits clean sharing of statistics with every other. Generally, the variety in technology and variations in software program designs of present blockchain structures are the primary demanding situations to create an interoperable blockchain-primarily based totally system. The distinction in supported languages, degree of safety for information and transactions withinside the clever contracts, and encouraged settlement protocols makes it tough to advise generalized interoperability supported solutions. An interoperable platform that hosts offerings for businesses which might be combats the COVID-19 pandemic need to offer excessive security, tolerance, and speedy transaction processing

2. Data privacy and Security:

Data privateness guarantees that the medical trial of information saved at the blockchain generation platform ought to be invisible to unauthorized individuals or organizations. It assures that fitness information is most effective shared with legal organizations (authorities or authorities) and complies with the phrases and situations as described withinside the consent shape and GDPR privateness. Assuring privateness of medical trial information thru public blockchain structures including Bitcoin and Ethereum is hard as information and transactions are public; whereas, personal and consortium structures including Hyperledger cloth and Quorum are operated in a managed surroundings, thereby retaining the privateness of medical trial. While the prevailing scientific passport advent schemes have cautiously preserved the privateness of COVID-19 information, there exists positive moral problems which can have an effect on it. For example, the impact of blockchain at the surroundings including carbon emission because of large energy intake poses essential demanding situations that ought to receive sufficient attention.

3. Slow Adoption of Blockchain Technology:

COVID-19 has affected the social life, in addition to commercial enterprise rules, and health of people, countries, and groups in numerous ways. The Blockchain generation has bounded as much as cope with the affairs which can be associated with the fitness of people through providing virtual touch tracing solutions. So, the similarly studies is needed to endorse standards, governance rules, and legal guidelines for blockchain

generation to enhance its adaptability through the taking part agencies to combat in opposition to the COVID-19 pandemic like situations.

IV. Diagrams

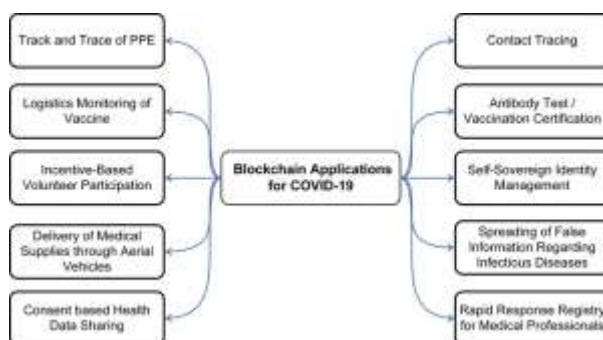


Fig. 1. Opportunities for Blockchain to combat COVID-19 pandemic.

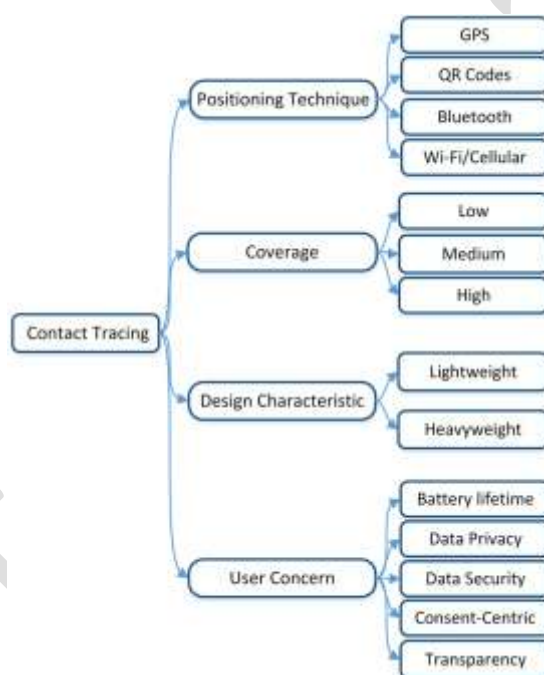


Fig. 2. Design for digital contact tracing solutions.

V. LITERATURE REVIEW

Paper Title: Blockchain and COVID-19

Pandemic: Applications and Challenges

Author Name: Raja Wasim Ahmad, Khaled Salah, Raja Jayaraman, Ibrar Yaqoob, Samer Ellahham, and Mohammed Omar In this paper they gift the high-stage layout of 3 blockchain-generation-primarily based totally structures to allow the governments and health workers to successfully take care of fitness emergencies like pandemic as a result of COVID-19. They talk the crucial ongoing blockchain-primarily based totally studies undertaking to illustrate the adoption of blockchain generation for the COVID-19 pandemic. Finally, they diagnosed and talk destiny studies demanding situations together with their key reasons and guidelines. In this paper, they mentioned in element that how the rising blockchain generation functions and blessings may be leveraged for combating towards the COVID-19 pandemic like situations. They explored that the ability blockchain generation programs are specially the healthcare emergency angle to talk about the important thing position that blockchain generation can play essential position all through the COVID-19 pandemic situation.

They diagnosed that the important thing necessities of the taking part organizations, governments to expand blockchain-primarily based totally structures for healthcare emergency offerings to fight the COVID-19 pandemic. They mentioned current blockchain-primarily based totally structures which can be advanced currently to put into effect numerous offerings associated with facts privateness assurance, far flung COVID-19 testing, seamless virtual touch tracing of affected patients, and far flung outpatient fitness monitoring. They diagnosed and supplied numerous studies demanding situations that prevent the correctly implementation of blockchain generation for healthcare, scientific professional emergency offerings all through the COVID-19 pandemic situation [1].

Paper Title: A crucial assessment of rising technology for tackling COVID-19

pandemic Author Name: Elliot Mbunge, Boluwaji Akinnuwesi, Stephen G. Fashoto, Andile S. Metfula, Petros Mashwama

In this paper they geared toward the imparting a complete assessment of technology like blockchain are tackling COVID-19 with emphasis at the functions, demanding situations, and u. s. a. of domiciliation. Their effects display that overall performance of the rising technology like blockchain isn't always but strong due to loss of sufficient COVID-19 dataset, inconsistency in some of the dataset available, mixture of the dataset due to contrasting facts, lacking facts, and noise. the safety and privateness of people's fitness facts isn't always definitely assured and warranted. Thus, in addition studies is needed to empower the prevailing technology like blockchain and there may be a effective requirement for the emergence of a robust computationally shrewd version for early scientific prognosis of COVID-19. Despite all of the severa development in the software of rising technology like blockchain in compacting COVID-19 pandemic, there may be nonetheless a demand for in addition implementation of these technology for detecting, monitoring, diagnosing screening, surveillance, mapping, tracking, and growing awareness. The size, availability and accessibility to COVID-19 facts enhance overall performance, GIS concepts, and programs. Future paintings must focus on strengthening the prevailing technology like blockchain and there may be a strong want for the emergence of a robust computationally shrewd version for early scientific prognosis of COVID-19 affected patients. in preference to the longer term paintings must specialize withinside the ethical framework and desirable use of rising technology whilst tackling COVID-19 pandemic whilst watching the safety and privateness of people's crucial facts. [2]

VI. CONCLUSION:

In this paper, we've were given furnished the state-of-art work survey on the usage of blockchain generation to fight in competition to the coronavirus (COVID-19) epidemic. we noted that how the growing blockchain generation skills and benefits will also be leveraged for combating the COVID-19 pandemic. We explored the blockchain programs from especially the healthcare emergency to talk about the vital factor function that blockchain can play all through the COVID-19 pandemic situation. We identified that key requirements of the taking element corporations to boom blockchain-based totally definitely systems for healthcare emergency services to combat the COVID-19 pandemic. We noted modern blockchain-based totally definitely systems which is probably superior presently to empower diverse services related to records privacy assurance, mobileular COVID-19 testing, contact tracing, and a long way off outpatient health monitoring. We identified and furnished severa research traumatic conditions that avert the a success implementation of blockchain programs for healthcare emergency services all through the COVID-19 pandemic.

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