

# ENACTMENT OF SUSTAINABLE TECHNOVATIONS ON HEALTHCARE SECTORS

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## ABSTRACT

This article discusses the use of innovative technologies and their potential to assist pan-India surveillance systems, including health initiatives. The key goal is to review prior studies on innovative technology and its use for existing healthcare sectors and identify association strength among the selected variables using Vos Viewer software.

Information gathered from research on randomized controlled trials, cross-sectional studies, review studies and systematic review studies, meta-analysis, sample, and case series. This article discusses the use of innovative technologies and their potential to assist pan-India surveillance systems, including health initiatives to community-based healthcare.

This paper discusses the current usage of Artificial Intelligence, Blockchain, and the Internet of Things (IoT) on health and developments.

The findings of the study state the complexities and opportunities of the mentioned technologies on the pan-India health surveillance system and indicates that data management, safety and security regulation gaps need to resolve before enforcing monitoring practices.

This paper presents an analysis of recent instances of using IoT technologies centred on remote surveillance and indicate a need for an advanced computing architecture for future integrated with pilot and tracking operations.

## KEYWORDS

Artificial intelligence; Blockchain; health sector; innovative technologies; Internet of things

## INTRODUCTION

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Information management, networking technology and technical advances streamlined and improved health and environmental data collection. [1] For instance, the growing cloud storage computing power now currently allows the continuous collection of data via lightweight sensors. However, the information gathered has not always been properly used. Nevertheless, affordable data storage and the increasing technical computing capacity helps to build comprehensive health and environmental datasets of untapped potential. [2] [3]

Many investigations and research have recommended the idea of including emerging technology in the scope of climate change and the establishment of pan-Indian surveillance and monitoring practices linked to environmental protection and health system effects. [4] These practices may profit from a variety of emerging innovations, such as "*Internet of Things*," "*cloud computing*," "*Artificial Intelligence*," "*Blockchain*," "*Machine Learning*," "*Deep Learning*." These groundbreaking innovations commonly utilized in many fields concerned with Comprehensive statistics including "influenza control and air quality monitoring" and demonstrate significant potential to facilitate the introduction of the pan-Indian surveillance mechanism. [5] [6] [7]

As our climate changes quickly and affects human health and welfare, the new health system needs necessitate

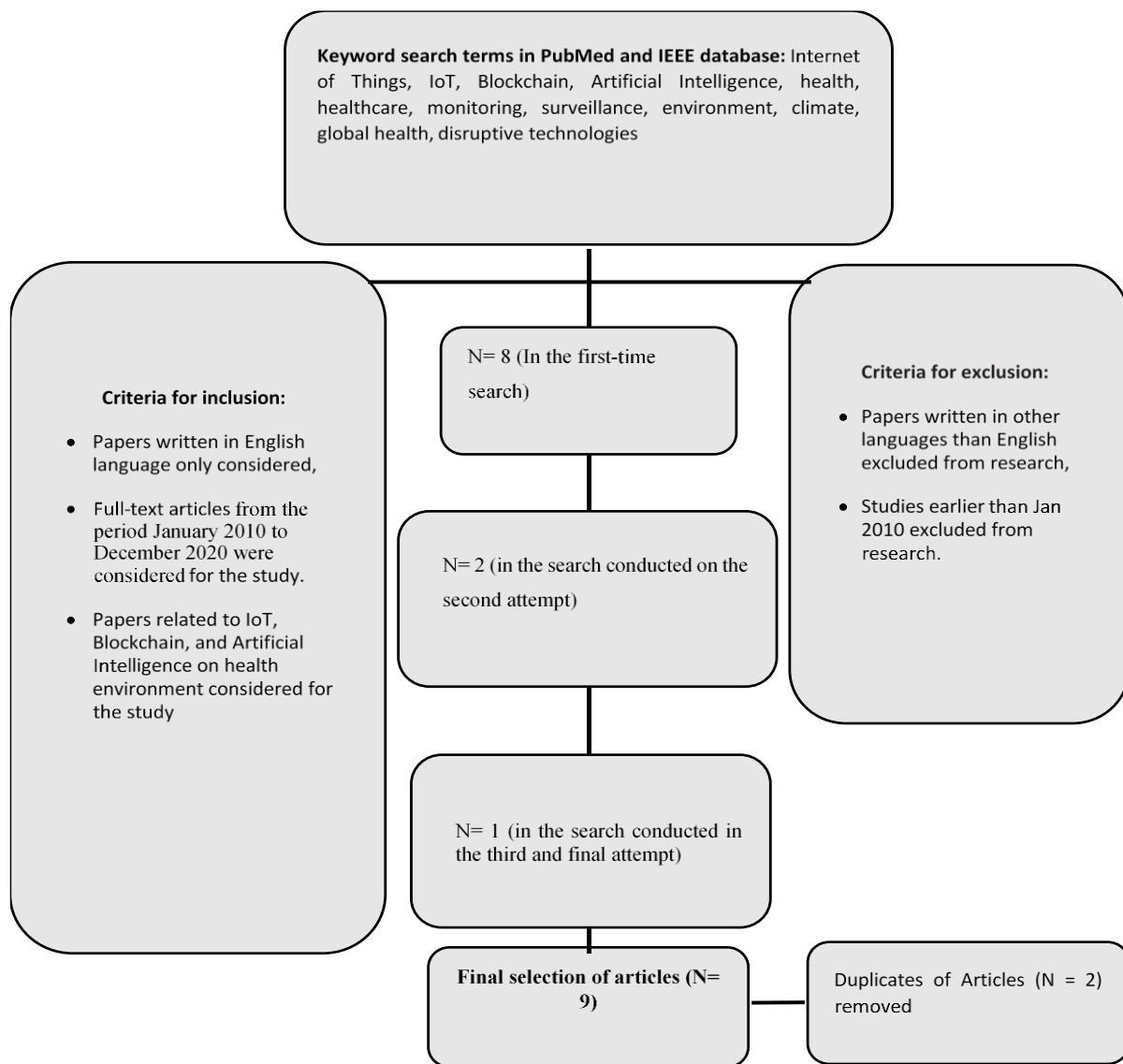
adaptation and this paper tries to find the gap that is significantly correlated [8]. This paper discusses emerging attempts to address some of the problems using innovative technology. The study provides a review of prior literature and its implementation in the Indian health monitoring framework and a discussion of possible issues needed to incorporate the proposed Pan-Indian Monitoring System components. [9] The research aims to provide several descriptions of the present and potential implementations of these technologies in the healthcare sector.

## RESEARCH DESIGN

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The present study carried out using descriptive analysis, which practices a conventional literature review. Brainstorming session was performed during the talks to facilitate the usage scenarios concerning "Artificial Intelligence, Blockchain, and Internet of Things" cases. The researchers created a flowchart (mentioned in Figure 1) to show their procedures for selecting papers and to recommend the necessity of creative scope and creation of tracking and surveillance activities by combining the technologies and components of Artificial Intelligence, Blockchain, and Internet of Things. Although this was not a formal analysis of scoping, the present research adopted guidelines [10]. Since our goal is to be more precise. In this methodological context, six steps for the systematic review are suggested (as mentioned in table 1).

FIGURE 1- FLOWCHART REPRESENTATION OF SELECTION OF ARTICLES FOR PRESENT RESEARCH



RESEARCH METHODS	
<b>Research Question</b>	In this study, we aimed at explaining "How disruptive technology based on Artificial Intelligence, Blockchain, and Internet of Things will help boost environmental and health research? "
<b>Articles searching</b>	Articles extracted from Scholarly databases, namely, PubMed and IEEE.
<b>Study design</b>	Information gathered from research on randomized controlled trials, cross-sectional studies, review studies and systematic review studies, meta-analysis, sample, and case series.
<b>Sources of Data collection</b>	The data collection process carried out by studying previous research carried out at different levels concerning the usage of multiple disruptive technologies in health and the climate.
<b>Variables Assessed</b>	Several classes of indicators are gathered after a final literature analysis of the articles. Factor includes: "Internet of Things", "IoT", "Blockchain", "Artificial Intelligence", "Health", "Healthcare", "monitoring", "surveillance", "environment", "climate", "health".
<b>The compilation, Results, and monitoring</b>	We address the current innovations and problems in disruptive technology to incorporate and interpret environmental and health data.

## RESULT

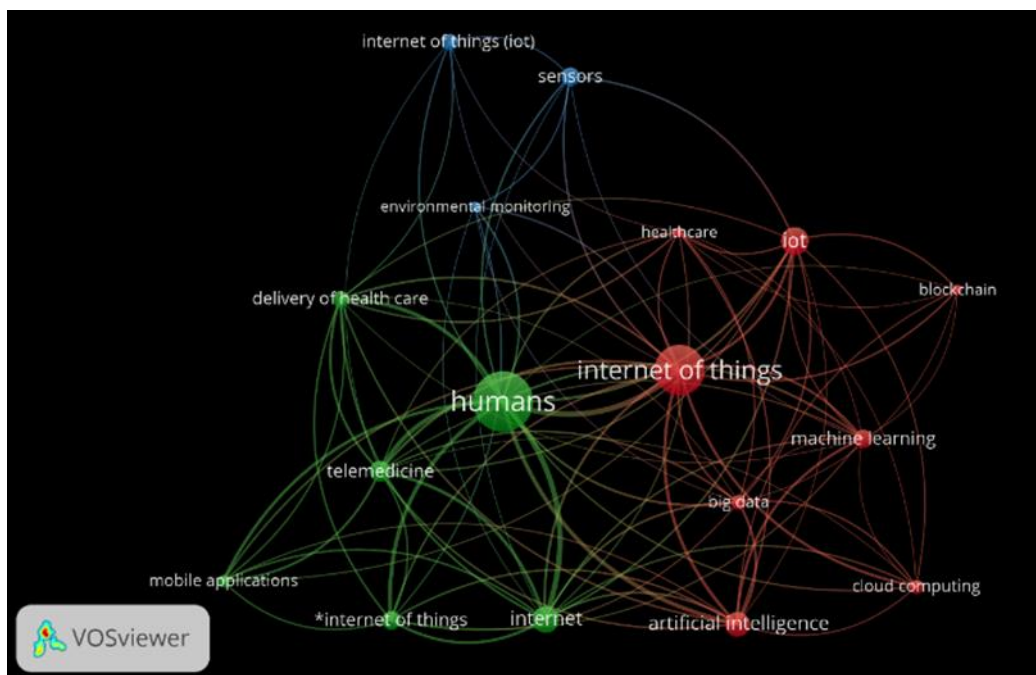
The intensive review of many academic papers and government studies on innovations, including “Internet of Things, Blockchain, and Artificial Intelligence”, can create the tremendous potential to promote health and environmental information [11]. The present study attempted to determine the association strength among the variables studied by the researchers of the selected articles through the Vos Viewer software version 1.6.15. First,

the mapping is done for the most occurred keywords used by the various researchers in different articles (Figure 2) and a broader view of network visualization of most occurred keywords in the selected articles also showed in figure 3. Then the formation of clustering was identified through the mapping of most occurred keywords present in the prior studies. The formation of clustering depicted the presence of 3 clusters—the description of the formed cluster through Vos viewer mentioned in table 2.

FIGURE 2- MAPPING OF MOST OCCURRED KEYWORDS IN THE SELECTED ARTICLES



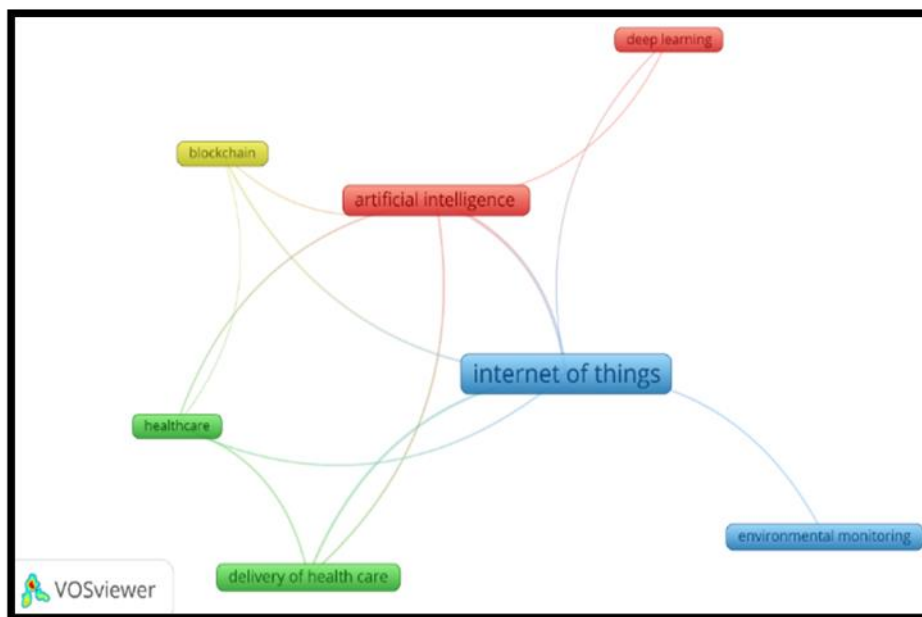
FIGURE 3- NETWORK VISUALIZATION OF MAPPING OF MOST OCCURRED KEYWORDS IN THE SELECTED ARTICLES



**TABLE 2- DESCRIPTION OF CLUSTERS FORMED THROUGH VOS VIEWER SOFTWARE**

S.NO.	NUMBER OF CLUSTERS	DESCRIPTION OF CLUSTER
1.	<b>Cluster 1 (8 items)</b>	Artificial Intelligence Big data Blockchain Cloud computing Healthcare Internet of things IoT Machine learning
2.	<b>Cluster 2 (6 items)</b>	Internet of things Delivery of healthcare Humans Internet Mobile applications Telemedicine
3.	<b>Cluster 3 (3 items)</b>	Environmental monitoring Internet of things Sensors

**FIGURE 4- NETWORK VISUALIZATION OF MAPPING OF MOST INFLUENTIAL KEYWORDS**



After forming clusters from most occurred keywords, the study further identified the presence of mapping of most influential keywords formed in Vos Viewer software (figure 4).

The network visualization depicted association strength among the most influential keywords extracted from the

selected articles. Keywords, namely, "artificial intelligence," "deep learning," "internet of things," "blockchain," "environmental monitoring," and "healthcare," and "delivery of health care," showed strong association strength and indicated the relationship among the most influential keywords.

The study made a comprehensive analysis of each innovative technology and assessed their enactment in the health and environment domain as discussed below:

## 1. INTERNET OF THINGS

The IoT is an evolving heterogeneous idea of networking that aims to influence the modern environment today significantly. IoT's central vision is to combine a vast range of intelligent artifacts towards interconnected and interconnecting networks, rendering the Internet much more all-embracing. [12] [13] It is a modern model in which every system communicates in a seamless world, irrespective of its scale, calculation capital, and network connectivity.

### 1.1. Internet of Things in Health

The World Health Organization describes surveillance in public protection as "the ongoing compilation, systematic review and assessment of health-related data required for the preparation, execution, and assessment of public health procedure." [14] Monitoring is critical when developing and enforcing public health agencies' preventive and control measures. [15] [16]

Public health monitoring has some ongoing issues that must overcome. These challenges may be technological or non-technical in conjunction with data usage and access. [17] The shortage of technology, competent human capital, and sufficient finance are the key obstacles to public health monitoring. Non-technical problems cover ethics, safety, and protection considerations, but it is deemed essential to gain informed consent to the implementation of healthcare research. [18]

## 2. BLOCKCHAIN

### 2.1. Blockchain in Healthcare

Healthcare is a diverse industry comprising various players, including patients, physicians, hospitals/clinics, researchers, insurance providers, and pharmaceutical firms. The sector is progressively digital, creating prospects for development in precision medicine, improved health systems, and quality treatment.

Since providers are the main data administrators and their networks are prone to data exchange and interoperability problems with other providers, patients lose their prior clinical history and therefore hinder a comprehensive health perception.

## 3. ARTIFICIAL INTELLIGENCE

### 3.1. Artificial Intelligence in Health

Both the central and state governments are critical in environmental and public health monitoring. Central and state governments, especially environmental regulators, face problems. For example, the limitations on financial and human capital, which may restrict the extent of surveillance activities. The use of technologies, namely, Big Data Analytics, Artificial Intelligence, Internet of Things, Machine Learning can assist in prompt and effective execution of vital activities, such as the management of water contaminants to preserve water ecosystems and drinking water safety. [19] [20] [21]

TABLE 3- COMPREHENSIVE REVIEW OF ARTICLES RELEVANT TO THE CURRENT STUDY

TECHNOLOGY	STUDY AREA	RESEARCH OBJECTIVE	CHALLENGES	OPPORTUNITIES	REFERENCE
Internet of Things	Health	A review of the current research, regulatory, technical, and analytical landscape was the objective of this study in the field of oncology research and treatment for patients provided health data (PGHD).	Electronic integration of patient reporting results and biometrical evidence, review of broad and diverse biometric data sets, and future clinical process overhaul would be among the challenges.	Within the framework of big data and artificial intelligence in medicine, computational possibilities for patient-generated health data are envisaged	[22]

Internet of Things	Health	Identifying and mapping the latest IoT advances in medicine and functional IoT in medicine, the active medical regions, and IoT places.	The healthcare sector is a vast and dynamic entity of active participation by multiple stakeholders, including patients, health care professionals, and insurance agencies. However, IoT currently does not engage in specific medical fields.	IoT apps usually built to save money and allow patients to be inspired at home. This eventually leads to wellness promotion and increased human well-being.	[23]
Blockchain	Health	To assess the blockchain adoption within the food supply chain, thus ensuring the wellness of human beings.	Five future obstacles, including a lack of better understanding of blockchain, infrastructure challenges, raw data management, problems are bringing all stakeholders into it, and regulatory limitations.	The Internet of Things (IoT) may be utilised to enhance food traceability, transparency of knowledge, and recovery quality through Blockchain.	[24]
Artificial Intelligence	Health	Artificial intelligence's role in the research and preparedness of COVID-19 (Coronavirus) prevention and combat is critical.	Medical organizations desperately require artificial intelligence systems to treat coronaviruses and allow them to receive accurate suggestions in real-time to prevent their spread.	Artificial intelligence works conveniently for the emulation of intellect shown by humans. Additionally, it may be important in understanding and creating a COVID-19 vaccine.	[25]
Artificial Intelligence	Health	To investigate artificial intelligence as an advancement in digital healthcare and point out future risks and opportunities.	Technologies in artificial intelligence and different threats involved with their application. It is necessary to understand this before implementing technologies, given the path dependence usually seen in innovation diffusion patterns.	Artificial intelligence can transform healthcare by improving clinical procedures and enhancing workflows. Artificial Intelligence has three main attributes as an innovation: "it is self-referential, programmable and able to achieve marked generativity."	[26]

## DISCUSSION

Many of the literature have studied echoed comments about the need for clarity before a data-sharing infrastructure is effectively implemented since uncertainty in managing private data creates a loss of faith. Several problems for the enactment of health monitoring technologies have appeared in previous studies by different researchers. The fundamental problems were interoperability, data exchange and data administration, and safety, confidence, and protection.

As data gathered from several outlets, various parties need to be interested in developing data sharing policies. This heterogeneity renders data possession and data processing impossible to evaluate.

In health applications, IoT devices' usage impacts privacy even further since the sharing of sensitive details in these technologies is not yet precisely controlled. Problems such as equity often create concern that only mid- to high-income citizens profit from adopting a scheme using high-end IoT tools to boost regular lives. This problem is related closely to the need for improved responsibility including consistency of data ownership and administration.

## CONCLUSION

To scope and improve reporting and monitoring programs on environmental effects on health and health networks, the present study recommends multidisciplinary partners, including government, public researchers, different sectors, suppliers of services, or innovators. The current study indicates that data management, safety, and security regulation gaps need to resolve before effective monitoring practices enforced. The public, particularly young people more aware and easily adapt to technical and technological régime. However, There's always an issue of trust and a need for digital literacy education and growth.

Although innovations including "IoT", "Blockchain", and "Artificial Intelligence" have enormous potential to encourage convergence of health and environmental data, still, disadvantages and complexities remain in using these technologies in health monitoring, which should tackle as a priority. The concentrated attempts to review various academic papers and government reports and the

recommendations for control and operations by the technical infrastructure provide interesting details for potential research.

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