TECHNOLOGY IN THE HEALTHCARE SYSTEM – A MODERN APPROACH

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Article History: Received: 12.12.2022 **Revised:** 29.01.2023 **Accepted:** 15.03.2023

Abstract

Background: Everyone is concerned about their health, for which the individuals strive to be fit and healthy using numerous means such as exercise, yoga, walking and so on. AI, IoT, Telemedicine, Telehealth, and digital software are all used in today's environment. Technology has been a part of our lives for many years, so its relevance in modern-day healthcare is rising quickly.
Purpose and Methodology of the Study: Nowadays, a vast range of technologies is accessible, including medical devices and diagnostic modalities that may be used to view anatomy or identify the illness. Technology is also utilized to monitor patients' progress on their path to optimal health. Monitoring the condition of patients as they progress through their treatment plan and aiding clinicians in making better judgments based on current evidence-based procedures. Hence, it is critical to investigate technologies such as AI, IoT and the usage of telemedicine in strengthening the Indian healthcare industry, as well as the obstacles they provide through the literature survey.
Outcome of the Study: These technologies offer a huge chance of enhancing patient experience and outcomes through better care management and prevention. Despite there are several positives in employing technology and there are several hurdles to complete acceptance and its usage, such as security and privacy, big data storage, and 24 * 7 internet connectivity. The healthcare industry and technology producers can search up virulence, mutation, and illness progression preceding or anticipating technologies with effective management systems.

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DOI: 10.31838/ecb/2023.12.s2.097

1. Introduction

Every human being's primary goal is to be healthy. A person's life will be better if he or she stays healthy and fit. (Khan et al., 2020) A perfect condition of physical, mental, and social well-being is considered good health. A healthy life cycle relies on a balanced diet and frequent exercise. (Chen et al., 2018) In addition, they must observe hygienic regulations, live in a secure environment, and receive adequate sleep. Globalization and digitization have led to substantial technical breakthroughs in healthcare, including several developments in tools and apparatus. (Olaitan et al., 2017)There are several healthcare products available that can keep one in good health. To maintain a healthy body and mind, individuals utilize fitness applications. (Tahir et al., 2022)

2. Purpose of the Study

India is a developing country that is improving in terms of providing facilities and an ambiance for health care. (Sampathkumar et al., 2022) The country has several healthcare technologies, including the availability of medical facilities with modern tech, and government assistance. (Pathak et al., 2020) It is difficult for healthcare professionals to monitor the patient at regular intervals and to record the basic details of patients such as heart rate, blood pressure, oxygen level, pulse rate, and so on. (Chen & Liu, 2022)This is mostly due to a rise in the prevalence of different health issues and an increase in population. According to several research, heart disease and cancer are two of the leading causes of mortality. (Dhanarasu et al., 2019) To avoid or mitigate such difficulties, equipment such as health monitoring and the patient's medical history are crucial, thus IoT devices play a significant role in delivering services to medical practitioners. (Shekokar & Ambarkar, 2021) Other instances where previous medical records can be assessed through IoT cloud storage and also to alert them and sensor devices are used to record and transmit through internet-connected data cloud which helps health care experts to diagnose the patient in the best possible way through monitoring and real-time tracking. (Li et al., 2020) Hence, it is critical to investigate technologies such as AI, IoT and the usage of telemedicine in strengthening the Indian healthcare industry, as well as the obstacles they provide. The study is based on secondary data through the source of reputed journals.

Healthcare System in India

India is a developing nation, which represents supplying improved infrastructure and a setting for health care. (Singhal et al., 2019) Numerous issues plague the nation's healthcare system, including technical improvements when compared to existing technologies available, effective usage of technology, excessive of people, and environmental sanitation. (Parmar et al., 2021) Despite its flaws, India's medical industry still needs to be improved on many fronts. As the government pushes doctors to use electronic medical records, Artificial Intelligence (AI), Internet of Things (IoT), and other modern technologies can now extract insights from patient data to improve care. (Zhao et al., 2022) Underserved rural areas can now access medical knowledge, mobile phone-based telemedicine and teleconsultation services. The accessibility of the telecom spectrum makes this possible. (Zakaria et al., 2022) The Indian government is promoting domestic medical device production through the Make in India Project, which also enables patients to pay less for previously imported goods like stents and implants. (Ignatov et al., 2020) To overcome the challenges in the healthcare system and improve healthcare services, it is important to focus on implementing modern technologies such as AI, IoT devices, and telemedicine, as well as addressing infrastructure and resource issues within the healthcare industry. (Butpheng et al., 2020) To strengthen the Indian healthcare industry, it is crucial to leverage modern technologies such as AI, IoT devices and telemedicine services. These technologies can significantly improve healthcare services and make them accessible, especially in underserved rural areas of the country. (Mofatteh & Mofatteh, 2021) Through the implementation of these technologies and addressing infrastructural and resource-related issues in healthcare, India can ensure that its citizens have access to the best possible medical care. (Alkhattabi et al., 2021)

Need For Use of Technology in Healthcare

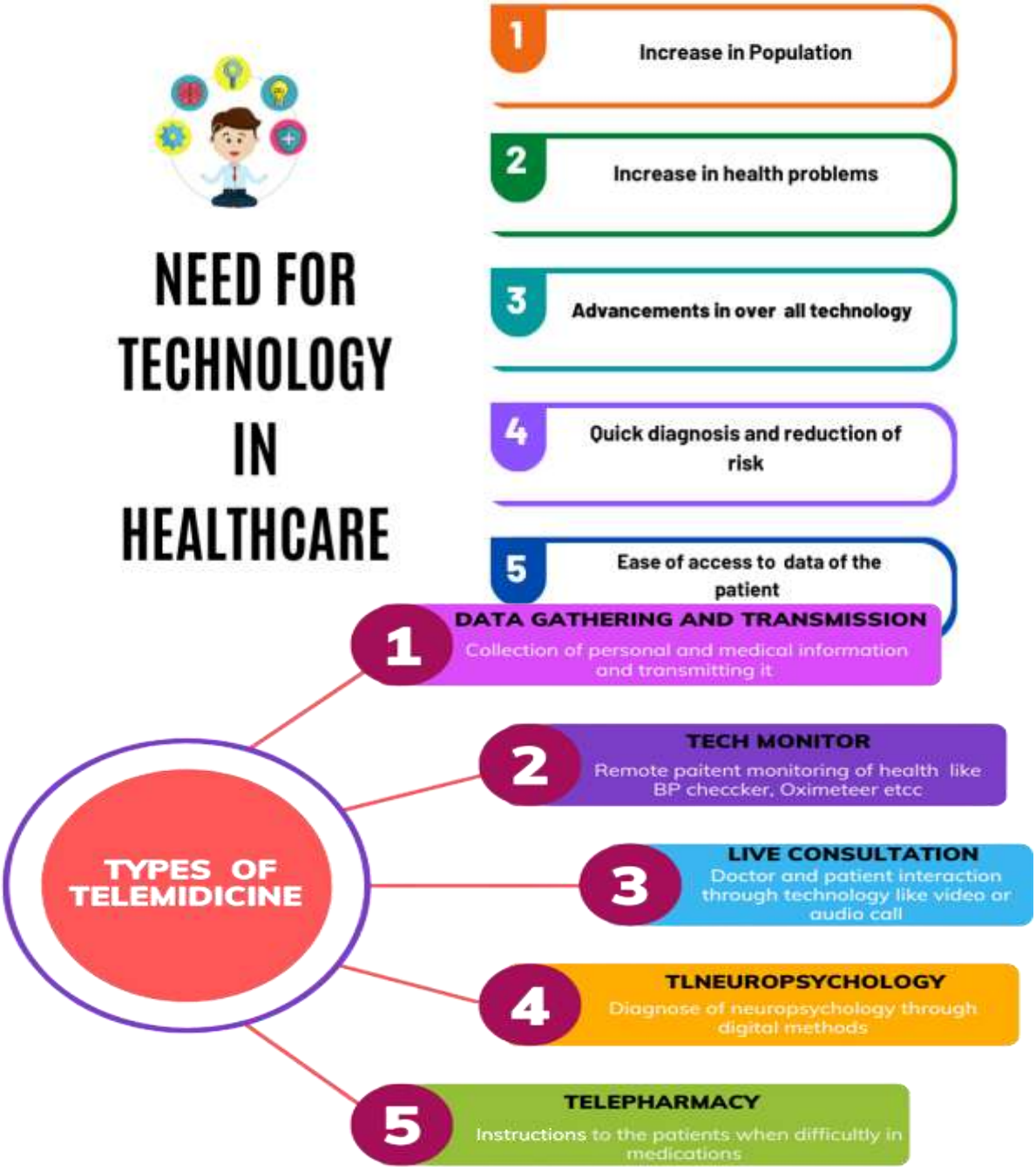
In the olden days, there were systems called Vedic medicine and many others in those years where it changed from time to time parallel to the timeline. (Rasheed & Shivashankar, 2020) There were constructions of hospitals and medication effectively during and after the period of British rule. Healthcare is more expensive than ever before because the global population is rapidly aging, and the prevalence of chronic diseases is increasing. (Baalharith et al., 2022) Furthermore, most people cannot afford basic healthcare, and a large portion will become unproductive as they age, making them more vulnerable to chronic disease. (Matthews et al., 2022) While technology cannot stop the ageing of the population or eliminate chronic diseases overnight, it may make healthcare more accessible by offering individuals with low-cost medical services.

Furthermore, technology has the potential to improve the quality of life for persons suffering from chronic conditions. (Zhang et al., 2021) For example, mobile health applications can assist patients to manage their disorders by offering

information about their symptoms and treatment alternatives.

Telemedicine

Telemedicine is the provision of medical services and the exchange of medical data over long distances. Telemedicine is defined as telemedicine because the prefix "tele" comes from the Greek word meaning "at a distance". (Flaga-Gieruszyńska et al., 2020) It, therefore, covers all aspects of medicine, such as diagnostic,

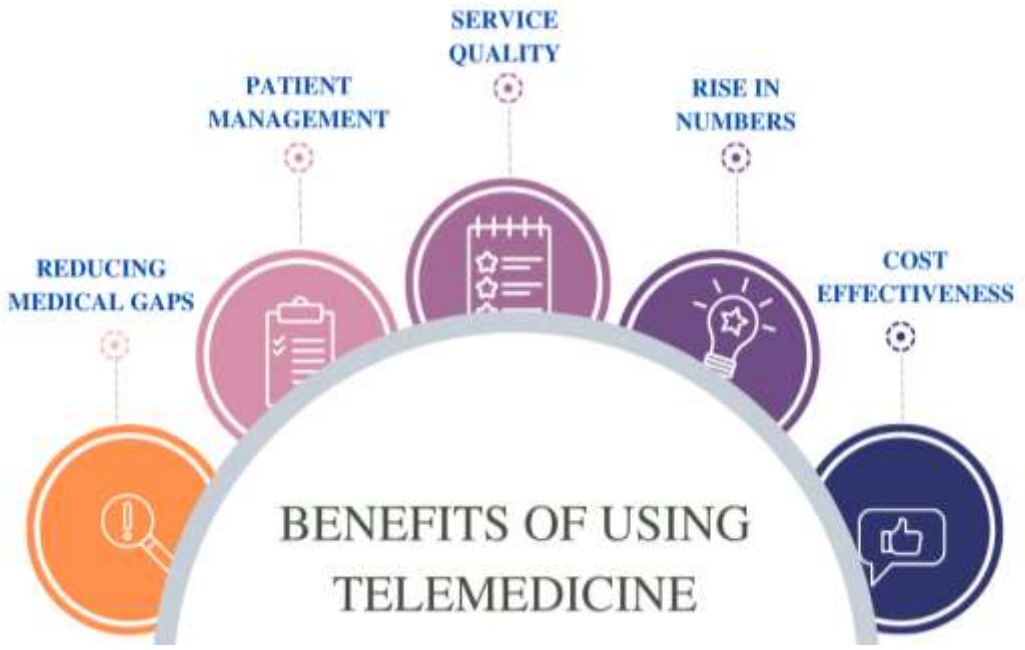


therapeutic, and preventive techniques, continuing education for patients and health professionals, research, and evaluation. (Teoh et al., 2020) However, more and more buzzwords like "e-health" and "e-health" have replaced them in the past year. Regardless of the mode of communication, the history of telemedicine is older than if it were a form of telemedicine. (Canio et al., 2021) In the mid-19th century, these service providers and health planners immediately adopted the provision of telehealth over cable. The telephone quickly assumed the role of the telegraph as it was still used for these functions until

about 50 years ago. (Costa et al., 2017) However, as early as 1910, it was recognized that telephones could be used for more than just voice communication. (Telecommunications Basics Flashcards | Quizlet, n.d) For example, EGC and EEG transmissions are among the stethoscope-amplified tones that have ever been transmitted over the telephone network.

Benefits of Using Telemedicine

The patient population is anticipated to broaden to include not just the sick, but also the newly diagnosed, the weak, the "anxious," and health-conscious consumers. It is quite challenging to incorporate change into the health services sector of a business. (Abuhashesh et al., 2021) Only when an invention prevents the way things are usually done will the soft technologies and ritualistic characteristics become apparent. Providing everyone with access to high-quality healthcare is one of humanity's major challenges in the twenty-first century. (Jung et al., 2018) There has been a commensurate rise in interest in the potential cost-benefits of telemedicine as cost containment has become more crucial to those working in the healthcare industry. The advantages that medical professionals or doctors have include some of the crucial elements like patient monitoring, medical records, real-time data, and simplicity of information access. (Peng et al., 2018) In addition, the price of the prescription will go down. IoT devices and applications are a significant piece of technology utilized in telemedicine and digital health.

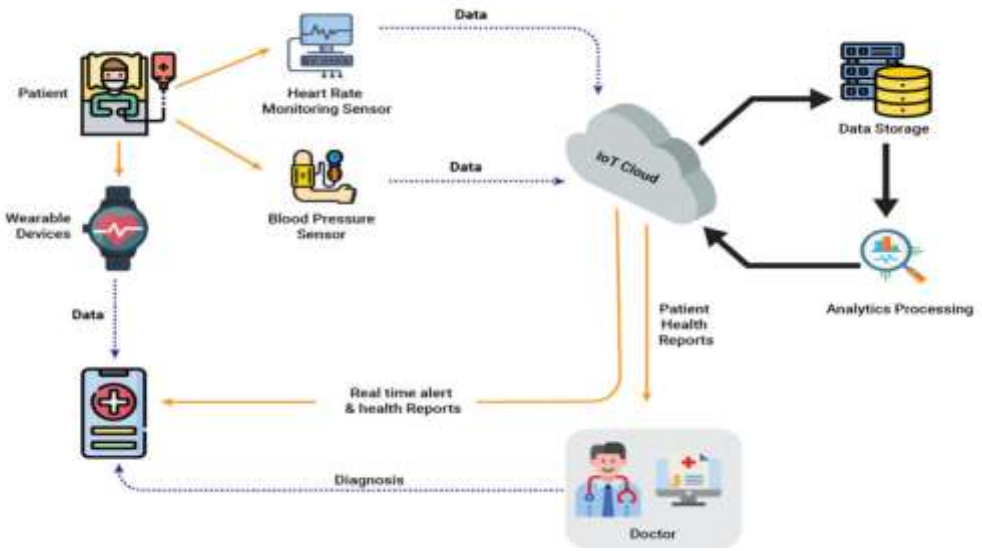


Technology and Telemedicine

Medical technology is evolving in tandem with medical science and current medical procedures. Maintaining proper health has become an important component of living a happy life. (Ryosuke et al., 2021) There is a lot of space for innovation in telemedicine, software-enabled health information systems, data analytics, virtual reality, and robotics to tackle health problems. Technology advancements are a primary driving force for advancements in healthcare and future practise. (Kadama et al., 2021) Telemedicine, genetic modification, and artificial intelligence (AI) all generate issues by altering how physicians and patients interact. On the other hand, these technologies present a tremendous opportunity to enhance patient experience and outcomes via improved care management and prevention. (Bunnell et al., 2020)These current technologies have advancements that entice individuals to utilise them. IoT, AI, VR, and AR creation and discovery.

Use of IOT in Telemedicine

The Internet of Things (IoT) refers to devices that are connected to the Internet and can be controlled or used for data transmission. (Hadzovic et al., 2021) This includes Internet-connected devices in homes, businesses, factories, farms, and cities. These devices build a network in which real-world elements, "things," are internally connected and able to "speak," transmitting data from sensors, software, and other technologies and exchanging data with other devices and systems over the Internet. (Chakraborty et al., 2019)



IoT in Healthcare. Source: How IoT is transforming the Healthcare Industry by Rahil Shrimali.

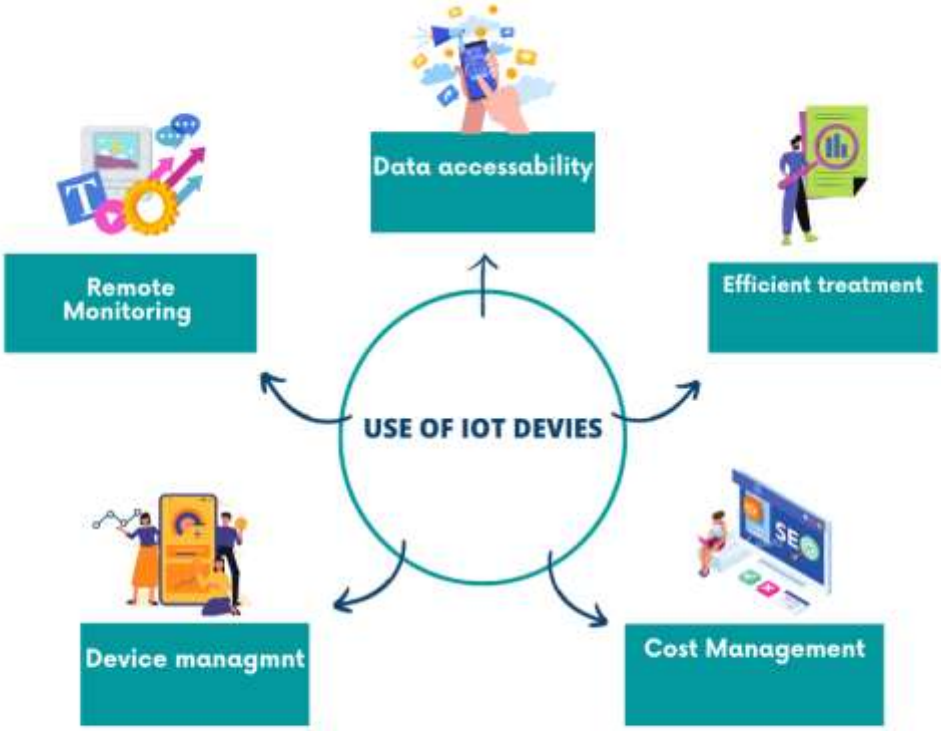
The Internet of Things is currently one of the technology fields that is expanding the quickest right now. The Internet of Things improves medical care in terms of efficiency and quality. It enhances patient care in the future while lowering expenses and raising life expectancy. (Sharma & Jangirala, 2022) Telemedicine for diagnosis and treatment has been improved with the usage of Internet of Things technologies. IoT captures data regarding patient behaviour, illness progression, and environmental variables via sensors and other connected devices like smartphones. Next, this data is sent over the internet to a clinic or hospital where a doctor may instantly analyse it. (Peng & Dai, 2019) In terms of how IoT may be utilised for good, the possibilities for development and usefulness are virtually limitless. The IoT applications and devices are also represented as the Internet of Medical Things (IoMT), the devices like a fitness bands, BP sensors, etc. IoT devices have been employed in numerous healthcare operations such as patient monitoring, in which vital information such as blood pressure, heart rate and oxygen level are collected, stored, and analysed. This enables health practitioners to better study people and comprehend their issues, allowing them to deliver therapy on this basis. (Roig et al., 2022)

3. Reviews of Literature

Farooq et al. (2015) the author's aim was to present a full overview of the IoT scenario, including a discussion of the enabling technologies and sensor network. The research provided and explored an IoT vision as well as a well-defined architecture for its adoption. The author emphasized some technologies to allow it as well as security issues. The study concluded that the different applications coming from IoT are likely to help people in their daily lives. The implementation of IoT necessitates concerted efforts to address and propose answers to its security and privacy issues.

Tarabasz (2016) Due to the IoT approach, a paper was provided with a unique perspective towards network management, based on communication and platform integration. The operation of current network regularities in an unstable environment. Secondary data resources for IoT deployment were studied and analysed by the author. The research proposed a new management paradigm, with the network being viewed as a dynamic solution. The study's results and conclusion were to offer unusual ideas and thinking such as flexible management, and a more adaptable approach, and to establish a new business window to a successful market.

Naji et al. (2022) the primary requirements for a remote monitoring system for COVID-19 patients were investigated. The opinions of health professionals on the need for wearable devices have been analysed. According to the findings of the study, wearable devices serve an important role in tracking, monitoring, and quarantine aspects, as well as facilitating their operations. The gadgets are usually used to monitor oxygen levels and body temperature; also, these devices are dependable, significant, and provide precise data. According to the study, the gadgets will be useful for the early detection and monitoring of symptoms.



Swayamsiddha and Mohanty (2020) to address the covid 19 issues, I investigated the cognitive internet of things. The research examined data from reports and literature. According to the findings of the study, the cognitive internet of things provides the following: 1) real-time tracking, 2) screening, 3) contact tracking, 4) remote monitoring, and 5) prompt diagnosis of patients. Furthermore, it is believed that it reduces the workload of the healthcare business in terms of infection prevention and control. The study indicated that CIoMT technology is optimal for therapies such as quick detection, tracking, and dynamic monitoring, as well as controlling the virus and reducing its spread.

4. Discussion and Conclusion

Despite a growth in the number of healthcare centres and healthcare professionals, they nonetheless confront significant challenges. Technology advances regularly, providing improved infrastructure as well as machinery in a wide range of industries. (Zuair et al., 2019) In recent times, internet-connected gadgets and objects have provided a variety of services to consumers and have become commonplace. The addition and integration of IoT, AI, and big data would undoubtedly boost accessibility and applicability. It is likely that in the future, with technological aid, people may receive highly valued medical advice for their ailments promptly and accurately. (Nadezhina et al., 2020) The internet of medical items and equipment, such as telemedicine and different internet-accessible applications, can be developed and utilised to preserve healthy life and provide better treatment or remedies to current problems. (Yoon et al., 2020) The integration of IoT, AI, and big data in healthcare offers vast potential for improving patient care and accessibility to medical advice.

Hence, technologies such as AI and IoT assist doctors in diagnosing patients and offering better therapy. These IoT gadgets also assist people in monitoring and maintaining their health and creating a more comfortable atmosphere. (More et al., 2020) IoT sensors and security technologies make hospitals and their facilities safer. Though there are various advantages of using technologies in health care there are certain challenges in full adoption and usage like data security, big data management, and 24 * 7 internet facility. (Fulk et al., 2022) Virulence, mutation and disease progression preceding or forecasting technology with efficient management systems can be looked up by the healthcare sector and tech makers.

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