The Internet of Things for Healthcare: Applications, Selected Cases and Challenges

Anagandula Swarupa[1], G. Narsimhulu[2]

[1]Assistant Professor, ECE Department, St. Martin's Engineering College, Hyderabad
Email: *swarupanarsi2009[at]gmail.com*

[2]Assistant Professor, ECE Department, Vignana Bharathi Institute of Technology, Hyderabad
Email: *narsiroopa[at]gmail.com*

Abstract: ***The role of the Internet of Things (IoT) in healthcare is no longer a futuristic concept—it's already redefining how we understand, deliver, and manage medical care. This article navigates through the evolving landscape of IoT technologies, tracing their roots from early RFID applications to their growing presence in personalized medicine, remote monitoring, and clinical decision - making. It is evident that IoT isn't just about data collection; it's about real - time, actionable insights that connect patients and providers in meaningful ways. From wearable health trackers that anticipate diabetic crises to AI - enhanced platforms that streamline diagnostic workflows, the integration of IoT in medicine is shaping a more responsive and individualized system of care. That said, the road ahead isn't without its speed bumps. Technical limitations, economic hurdles, and ethical dilemmas—especially around data privacy and consent—raise tough questions about the scalability and inclusivity of these technologies. Still, this chapter offers a compelling overview of use - cases ranging from cancer care to mental health support, subtly urging stakeholders to invest in sustainable, human - centered design strategies. The discussion underscores that while IoT won't replace physicians, it will undoubtedly enhance their reach, precision, and efficiency. In the end, the smart use of IoT, especially when merged with AI, holds the potential to transform healthcare from reactive to predictive—ushering in a new era where timely information could mean the difference between crisis and control.***

Keywords: IoT in healthcare, personalized medicine, wearable health devices, data privacy challenges, AI - assisted diagnostics

1. Introduction

The Internet of Things (IoT) is a term that has numerous uses, technologies, standards, and programs. At its core, it is a network of things that are connected to the Internet. These things include IoT devices and physical objects equipped with IoT. Things and data are the starting point and the essence of what IoT means and allows doing. IoT devices and assets are equipped with electronic components and software to receive, sort, and share data.

The author of the term "Internet of Things" is Kevin Ashton. In the late 1990s, he studied radio frequency identification (RFID), a technology that allows small items of radio frequency tags to be attached to various subjects, containing information and readable at a distance [1]. Being a small sticker or a special label in a plastic case, it allows, for example, to track the movement of goods, improving the supply management system, and even prevent theft. Such RFID tags have become widely used in the trade industry. Moreover, Kevin Ashton explaining the basic idea of his invention used the term "Internet of Things". He once suggested that every single thing, in the real physical world, in IoT would have a digital counterpart as its virtual representation Today, the area of application of RFID technology is becoming more widespread. This technology is widely used for the automation of industrial processes, especially where there is a complex production of cars, appliances (refrigerators and washing machines). Specific libraries, such as the Vatican Library, which has over two million copies of books in its stock, have implemented RFID to speed up inventory and search for books, automate their delivery, and help combat theft. Over 700 of the largest libraries in the world are using or implementing this technology [2, 3]. RFID tags are also included in new passports in many countries around the world. Such documents are called biometric, e - passports, which contain a chip with the same information as the printed version. Increasingly, this technology is "taking root" in medicine. For example, in maternity hospitals, RFID wristbands are used to identify the baby with the mother. In conventional hospitals, they are used to tracking the movement of patients who need ongoing supervision. A new concept of a wireless sensor network was introduced, which track and control objects by connecting the tracker to the heart rate monitor [4]. Today, these devices interact with the Global Positioning System (GPS) devices, smartphones, social networks, cloud computing, and big data analytics to support the modern concept of IoT.

The direction of IoT developed actively since the 2000s when the number of devices connected to the Internet rapidly increased. The massive amount of big data used on the IoT is a concern for its users' privacy. The General Data Protection Regulation (GDPR) was developed and implemented, the primary purpose of which is the protection of users' rights. In their work, Alexia Kounoudes and co - authors studied the problems of applying GDPR requirements in IoT. The authors conducted a systematic literary analysis to better examine the problem of user privacy [5].

When working with the IoT, the group of twenty (G20) Artificial Intelligence (AI) Guidelines of the Organization for Economic Cooperation and Development and the General Principles for Human G20, and the Coordination Plan and Ethical Recommendations on AI Reliability developed by the European Commission, should be taken into account too. In particular, five interrelated principles should adhere to human centered values and justice; sustainable development and prosperity; transparency and clarity; reliability, protection, and security; responsibility [6–8].

IoT requires a dedicated environment for uninterrupted, and therefore quality, work that includes directly different "smart" devices equipped with sensors, network access, and information transfer, and platforms for managing the network, devices, and applications. In the absence of at least one of these components, this system will not work. In order to fully harness the potential of the IoT, close cooperation is needed between businesses, mobile and Internet operators, governments, and even ordinary users.

This chapter aims to examine the basis of IoT in the health system, highlighting applying IoT technologies for the newly evolving personalized health. It discusses the latest and sophisticated IoT - derived techniques and popular examples of health. Moreover, this study focuses on the technical, ethical, and financial constraints in developing a better medical system that can early discover and diagnose illnesses. Healthcare providers could make good use of such innovative health systems, supplying the right data about the right patients at the right time and consequently, promptly and efficiently managing medical conditions. In this chapter, we discuss the role and some applications of IoT technologies in health and then show some selected medical cases highlighting an IoT - driven healthcare system followed by the prospective challenges of applying it in the health sector.

2. IoT and Healthcare

Healthcare is one of the noblest areas of IoT application. Through IoT, doctors can help people through the Internet. Portable IoT - based health monitoring devices can significantly reduce the distance between the patient and the doctor. IoT allows you to approach each patient individually, analyse their health status, and calculate their individual treatment method. With portable sensors, doctors can remotely monitor patients' health and respond in real time. However, real - time metrics require an uninterrupted Internet connection. Although IoT in healthcare is developing quickly, still not in full use in some medical industries [9]. The development of adequate Internet applications for traditional medicine still has some difficulties. With a significant increase in the number of medical researches, the IoT will probably lead to attracting more of them in the coming years.

Modern medical professionals are faced with the need for collecting a large amount of big data and their analysis and interpretation to make informed and personalized decisions. All that takes considerable effort and time. New technologies of the IoT can speed up and facilitate this process. In connection with the mass introduction of electronic registration of health, a growing amount of digitized medical data is seen. Fully viewing and assessment of all this information takes a lot of time. Furthermore, training the medical staff of the technology based on AI, that is very associated with the IoT, is needed as well [10].

Through coordinated actions of such digital technologies as the IoT and AI, doctors can better tailor treatment to patients' needs. With these technologies, it is possible to handle a much greater volume of information to store and analyse it in order to closely follow the progress of a particular disease or process. Skill - fully combining practical personal experience with the possibilities of new methods of diagnosis, collection, and analysis will lead to positive changes in healthcare management [11]. Figure 1 introduces the concept of IoT in healthcare.

Eventually, the IoT introduces network - enabled technologies, involving wear - able and portable devices that can trigger, detect, synergize, and connect with other comparable media across the Internet. The IoT is deeply reshaping data production, use, and distribution. Average subjects frequently use these systems to follow their diet consumption, sleep, vital signs, exercise, and other physical states, whereas IoT technologies periodically gather and work on ecological data, which affects an individual's health. Eventually, this interoperability has introduced a start for novel production of medical alternatives.

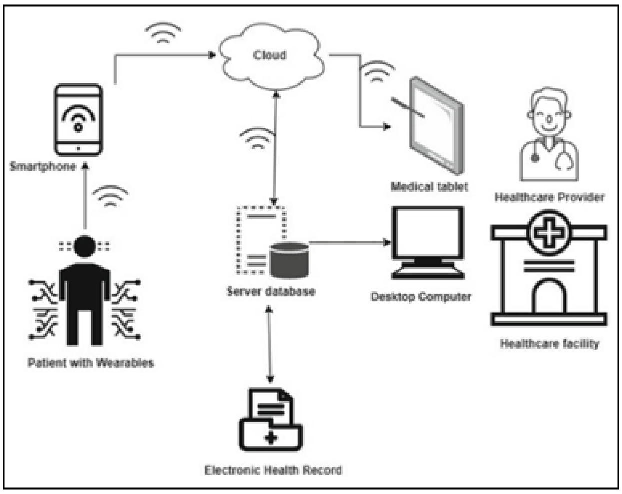

Figure 1: The Concept of IoT in healthcare

3. Applications of IoT in Healthcare

IoT in healthcare can have a substantial contribution to research, clinical practice, and patient's management. In a broader sense, it also has various applications related to the insurance and industrial sector [12–15]. In all the aforementioned contexts, the contribution of IoT is based on four principles. The first principle is the collection of data, which is supported by interconnected devices such as sensors, monitors, detectors, equators, and cameras. The second principle is data conversion. This stated, it is imperative to mention that the input of sensors and other related devices is in analog form and it should become digital to undergo further processing. The third principle comprises data storage, which in most cases is achieved by a cloud - based system. The fourth principle is data processing through advanced analytics modalities, which eventually provides the users with information necessary for decision - making [15– 17]. The aforementioned principles already exist in most aspects of healthcare, from hand - written patient records to interconnected laboratories' databases. What makes them unique in the IoT context is the fact that the flow of data is continuous, and the impact of IoT - based decisions can be instant.

With patients, IoT infrastructure consists mostly of wearable devices. Wearables may include oxygen saturation, blood pressure, pulse/heart rate, glucose level monitors depending on the history of the patient, and the parameters that should be monitored. These devices can ensure personalized attention in case of an acute condition or a gradual deterioration. They can also work as reminders if connected to physical exercise and calorie count software or appointment and referrals systems [13, 18, 19]. As far as physicians are concerned, IoT offers a real - time connection to their patients, to their colleagues, to their clinic or laboratory. A cardiologist can be notified about an arrhythmia affecting one of his patients, and a diabetologist can be informed about hypoglycaemia threatening one of his patients. In both cases, patients can have immediate medical guidance and support. Physicians can assess patients' adherence. It is not only a matter of outcome (e. g., blood pressure) increase in case patients neglect their treatment it can also be a matter of device monitoring. This stated, pillboxes could be monitored counting how many times they were opened on a daily basis. Evidence suggests that IoT devices' datasets can assist physicians to identify the best treatment process and management strategy for their patients. This is a meaningful contribution to personalized healthcare. These big data on a larger scale could be the base of future treatment to outcome studies [20, 21].

Larger - scale Hospitals and Research Centres work as an incubator for IoT applications. This happens because of the great load and variability of data that need to be processed there, the responsibility these institutions bear as well as because of the funding they receive. In addition, to monitoring inpatients' and outpatients' health which has been previously addressed, hospitals and laboratories can use IoT to safeguard equipment such as wheelchairs, defibrillators, nebulizers, and oxygen pumps. Moreover, research facilities can monitor the course of experimental work, the deployment of equipment, and the availability of resources in a constant and time - consuming manner [22, 23]. Eventually, communication and sensor devices are growing into multidimensional information technology solutions in several instances. The growing IoT techniques have aided researchers and clinicians to structure novel healthcare solutions. The IoT - related health research is profound for its vital significance, involving effective prophylactic care and services at an elevated quality and less cost. The IoT is steadily securing basis as a novel research subject in several business and scholarly sectors, particularly in medicine. Impressively, for the dramatic dissemination of smartphones and wearable devices, the IoT - derived techniques are shifting health from a traditional hub cantered system to further personalized healthcare systems.

Recently, e - health is being used to provide individualized medical services to meet people's healthcare demands. IoT is profound progress in the era of big data that endorses several timely technical software to optimize services. Nowadays, the medical system is using IoT data analytics as a consumer data source to find more data, determine diseases early, and decide upon vital conditions for better life quality. Eventually, the swiftly expanding demand for the timely improved health system. IoT gadgets can accumulate and distribute data instantly with other platforms on the cloud, facilitating a vast quantity of data to be collected, warehoused, and examined. The IoT devices would be functional in computerizing business or distant tracking of the local surroundings. IoT applications in health are promising for their ability to enhance access to care, reduce cost, and crucially boosting patients' quality of life. Healthcare industry, as well as insurance systems, can also enhance their work through IoT applications. Data storage, product evaluation, patients' evaluation, and faster compensation services could be based on IoT.

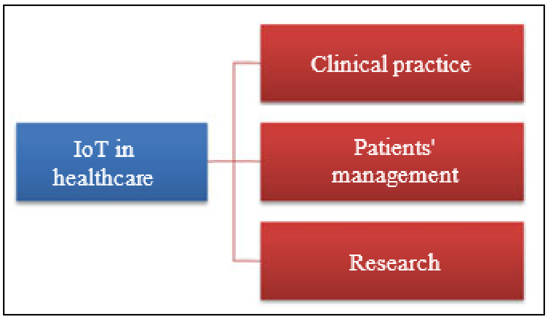

Figure 2: Shows the key area of applying IoT in health care.

However, such applications can face considerable legal obstacles because of data protection policy and because of the interference of financial interests in handling such information as well [13, 24].

4. Selected Cases of Using IoT in Healthcare

Now, mobile applications and wearable devices provide monitoring symptoms, medical education, fitness, and cooperative managing of illnesses and coherent care. Analytics software applications could increase interpreting data significantly and minimize the needed time to reassemble the produced data. Perspectives from studying big data would lead to the electronic evolution in the medical discipline, business procedures, and time deciding. Since the worldwide aging population rises, it would be vital to raising understanding and interpreting of data about health and well - being, minimize chronic and diet - derived diseases, and enhance mental abilities, boost mental health and lifestyles. Although it is impossible to list all the IoT health - care applications, we will provide an overview of the renowned ones. Going through the scientific literature as well as some commercial resources, it becomes obvious that IoT is expected to play soon a prominent role in cancer care, patient - driven self - assessment procedures, drug delivery and adherence monitoring, exaggerations of acute conditions management and mental health. Cancer care (CC) wearables have already been tested in clinical practice. In 2018, a Randomized Clinical Trial was presented in the Annual Meeting of the American Society of Clinical Oncology. The study focused on patients with head and neck cancer who were monitored via a Bluetooth - enabled weight scale and blood pressure cuff, together with a symptom - tracking app that was sending regular and emergency updates to patients' physicians. About 400 patients were involved in the study, and the patients who used this IoT - based system experienced milder symptoms in comparison with the control group, which was assessed physically on a weekly basis [20, 21, 25].

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Diabetes is a model disease for assessing self - monitoring and adherence to treatment in various contexts including oral pharmacotherapy, injected insulin, blood glucose measurement, and blood pressure monitoring among others. IoT - based continuous glucose monitoring can be implemented on a wealth of existing devices. Although continuous monitoring and immediate intervention are mostly needed by type 1 Diabetes Mellitus (T1D) patients, accumulating evidence suggests that more punctual or even constant monitoring could prevent complications in patients with T2D [26, 27]. Smart insulin pens are relevant tools to assess the treatment adherence of patients with Diabetes Mellitus (DM). Although the existing devices focus on insulin injections, similar devices could also be used for pillboxes. Nowadays, such wearables are connected with smartphone apps and assessed by physicians regularly. Incorporating these modalities in an IoT context, physicians could be notified for patients neglecting treatment sooner and act accordingly [28, 29]. Closed - loop (automated) insulin administration systems have been long - awaited in T1D care. Potential regulatory and management flaws have hindered the introduction of such devices in clinical practice. Several advocacy activities from physicians and patients' networks have already been observed taking into account that IoT can contribute significantly to tackling such obstacles. Although several steps need to be taken, an automated and IoT secured closed - loop system can be very important with regard to T1D patients who are at risk of diabetic ketoacidosis [30, 31].

Rather than DM, asthma is a chronic condition with a pattern of exaggerations that offers a fertile field for IoT - based healthcare. It represents a significant burden for hundreds of millions of people all over the globe. The majority of the patients are young and active seeking a stable quality of life. IoT wearables assessing saturation or warning about the presence of common allergens are important in the early detection and management of an upcoming exacerbation. In the same frame, IoT - based inhalers could provide the patients' physicians with reliable information about the adherence and the ability of the patient to handle the device properly [14, 32].

Asthma has a chronic aspect, of course, and so do mental health disorders. Apart from the aforementioned monitoring options, IoT can enhance patient support services. In combination with AI modalities, IoT can provide supportive chatbots for a wide variety of purposes from suicidal thoughts' detection to regular cognitive rehabilitation treatment in patients with dementia or mild cognitive impairment [16]. In this section, we have presented selected cases of IoT implementation in healthcare such as cancer care, patient - driven self - assessment procedures, drug delivery and adherence monitoring, asthma exaggerations management, and supportive care of degenerative mental health conditions as shown in Fig.3. Such modalities state the potential of IoT in transforming clinical practice, patient management, and research if further and hopefully adopted.

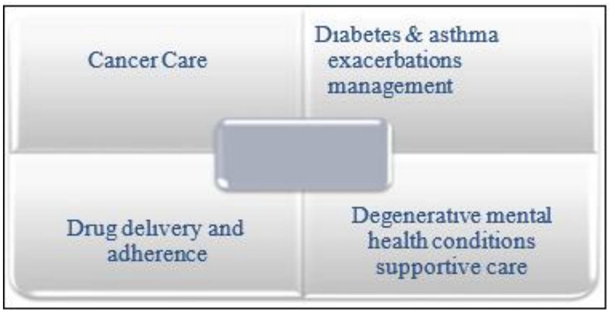

Figure 3: Selected cases of IoT implementation in healthcare

5. Challenges of IoT in Healthcare

IoT is expected to bring a revolution in healthcare. However, there is no revolution without strife and conflicts. In fact, it is the conflict in the technical and moral level that shapes the way innovation is incorporated. The challenges of IoT in health care can be classified as technical, cost - related, and ethical as shown in Fig.4 [28, 33, 34].

5.1 Technical Challenges

Technical considerations arise from the fact that IoT is still not a part of everyday life. In most countries, the fifth - generation wireless technology (5G) and subsequently IoT services are not available. Not only patients but also the vast majority of healthcare practitioners and researchers are not well acquainted with what IoT comprises and what can IoT do in everyday life let away from health care. This stated 5G can be considered as the first technical challenge that IoT implementation in healthcare faces [21, 35]. Implementing 5G requires the instalment of multiple antennas, which is costly, time - consuming, and has been associated with a health hazard. Although there is not sufficient evidence for this claim, further research out to be conducted to establish the safety of large - scale use of 5G technology. Tackling the international repercussions of 5G, persuading the policymakers and changing (with their help) the public opinion can consume equal or even more time than safety studies. The prospective benefits from the use of IoT in healthcare can be an important argument in favour of 5G instalment [16, 23].

The next technical challenge lies with the integration of data. Multiple sources of data mean multiple devices. In the healthcare sector, there is a variety of wearables and data collecting devices that cannot be easily modified to a unified pattern of data collection for technical and financial reasons. Even now, manufacturers have not achieved a consensus with regard to communication protocols and standards [21, 36]. Patients with the same disease can use different wearables addressing the disease itself or the vital signs of the person in general. Patients with diabetes, for example, may use different glucose and vital signs monitoring systems as well as a different closed - loop insulin pump. Altogether, this accounts for at least three different sorts of data from the very same patient. Even though these data will eventually be processed, this will require more time that can be a problem when it comes to acute conditions management, and it is also been a problem when multiplied by a vast number of individuals [13, 37].

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5.2 Financial Challenges

As far as the financial aspects of the topic are concerned, we intend to elaborate on prospective cost - efficacy challenges. From a financial point of view, IoT belongs to the sphere of remote health applications. According to the International Data Corporation (IDC), the current budget for remote health monitoring in Europe is €10.41 billion, and it grew to over €12.4 billion. Such a budget might appear favourable with regard to the establishment of IoT health care. However, the complexities of implementing IoT have already discouraged many prospective investors. Sources of financial instability include the involvement of third - party service providers to ensure the quality of IoT and the associated connectivity infrastructure. Empirical observations suggest that both state and private healthcare providers would be unwilling to fund the establishment of an IoT healthcare network without evidence and experience from other healthcare systems/countries [38, 39]. To be more precise, the IoT healthcare market size was estimated to worth $60 billion back in 2014. It is expected to have reached a net worth value of $136 billion by 2021 [40]. It is noteworthy that the Compound Annual Growth Rate (CAGR) of IoT in healthcare is expected to reach or even exceed 12.5% over the forecast period. Whether this upwards shift will be sustained depends on the capacity of outsourced providers and healthcare providers to reach and maintain an adequate level of understanding and cooperation [41].

If implemented, IoT has the potential to reduce the financial burden of healthcare. Healthcare - related costs are traditionally divided into direct and indirect costs. The former account for expenses of healthcare providers, whereas the latter consists of expenses of the healthcare recipients including absence from professional activity, uncompensated treatment costs, and engagement of family members or other carers in their treatment. Given that IoT healthcare services have not been deployed in any major healthcare system yet, there is scarce evidence concerning its cost - effectiveness.

[12, 42]. Economists have already highlighted aspects of IoT leading to a cost - effective model of development in healthcare. Proactive asset management, inventory management, strict quality control, product packaging optimization, and supply chain management have been recognized as prerequisites of IoT financial success in health care. However, to date, these concepts seem industry rather than health care centered. Their adaptation to clinical practice will require close collaboration and deep understanding between economists, healthcare managers, and clinicians [15, 16].

5.3 Ethical Challenges

The ethical controversy of IoT in healthcare stems from the data management and care paradigm. The main debatable aspects, as far as the management of sensitive health - related data is concerned, are informational privacy, data sharing, and autonomy, data ownership, and consent, and unknown value issues. In the paradigm of care, the isolation and dehumanization of doctor–patient communication, the decontextualization of health and well - being, and the risk of non - professional care are alerting in terms of ethics [36, 43]. Repercussions from the field of ethics may influence policymaking related to IoT in healthcare. Any relative legislation should inherently abide by universal and regional standards such as the Universal Declaration of Human Rights and the General Data Protection Regulation (GDPR) in the EU, respectively. In this frame, it is also expecting that policymaking is a potential source of ethical obstacles to the implementation of IoT in health care [18]. Although the GDPR applies solely to the European Union, it can considerably influence IoT in healthcare - related research.

Examining some real - life scenarios in an IoT for healthcare context is essential to understand the ethical burden. Sensors following individuals in work and home will become a part of everyday life and may even be forgotten by their users. However, the same sensors fading in the background will monitor any moment of their users' personal life, including the normal deviations of pulse in a fight or in a happy occasion. Sound detecting and analyzing sensors may also "overhear" private conversations of the user. Even if the users consent to this for the sake of their well - being, this monitoring may violate the privacy of their family members, friends, and colleagues [12, 28].

Researchers have already come up with solutions promising a selective memory of IoT connected sensors. To our knowledge, drawing red lines between what is personal and confidential and what is clinically important is quite a difficult task. Everyday fights in family level or silenced conversations regarding debatable actions of the user may hide signs of occult hypertension or arrhythmia. Having a trained clinician or data scientist to discern what is important in case the sensors cannot achieve a selection consists a violation of privacy per se [14, 44].

At the same time, relying on data collected alone and selected by sensors to reach potentially risky decisions bears a considerable ethical burden [45]. What if an increase in anticoagulation dosage led by an IoT - mediated monitoring system results in extensive gastrointestinal bleeding? It could be argued that studying the use of sensors will provide the necessary evidence - based guidelines. Nonetheless, this cannot put in jeopardy the well - being and the life of patients who would not endure this risk otherwise.

Cybersecurity is an aspect of IoT healthcare services that ought not to be neglected as well. Data storage and procession requires cloud - mediated services [36]. Even if all the ethical considerations related to the healthcare and outsource services that will have access to these data are resolved, hacking remains a considerable hazard. Insurance companies, HR departments leading to unequal treatment of potential employees, can violate biometric data as well as medical history. In the same context, any other entity or individual could pose monetary or other claims in order not to decipher sensible information [35, 46].

6. Discussion

IoT technology helps to ensure the adoption and implementation of decisions in proper time based on the collection and processing of an enormous amount of data. Moreover, to handle such enormous amounts of information, which is dynamically changing, people have developed AI technology.

The process of a wide application of IoT is one of the fundamental benefits of the technological revolution. IoT will become among the largest innovations of humanity. The popularity of IoT is a response to the rapid growth in the past two centuries. It is known that making important decisions requires considering all the extensive amounts of information about several subjects and objects tangent to the processes in respect of which a decision is made. Basically, the decision should be taken in a mode as close to real time. Because of certain physiological and cognitive limitations, people are not always able in such circumstances to make quick and informed decisions. Consequently, IoT and AI technologies are relevant. The rational use of these technologies can bring many benefits to the medical sector.

The modern healthcare industry is a field where IoT becomes more prevalent. IoT directly affects people's lives and shows the importance of medicine as a sphere of activity in modern society. The medical systems are one of the most promising key areas that consume large numeric data. The significant flow of information and its transformation to a specific end product and its consumption is impossible using interactive information and innovative technologies. According to scientific studies, most of the leaders of the health sector believe that IoT will lead to a revolution in medicine in the next few years. This will involve mainly the following three areas: remote health monitoring of patients, prevention of exacerbations of chronic diseases, and the collection of information. Health is the fastest - growing segment of the IoT. According to forecasts of scientists, the number of connected medical devices in the next 10 years will increase by 10 times. Several analytics predict that the number of individual wearable sensors for medical direction in the next two years will rise to 92.1 million units. In 2016, their number was only 2.4 million. At the same time, a variety of devices and smart systems are not intended to substitute doctors and nurses, it facilitates and optimizes their work. Doctors can help people remotely using Internet technologies, which is especially important in the period of deterioration of the epidemiological regime. Therefore, IoT allows finding the approach to each patient separately, to perform the condition of his health and calculate individual treatment.

Furthermore, IoT can facilitate the practice in medical care because of: automation of data collection in medical institutions, optimization of medical personnel, providing more accurate diagnosis of diseases, monitoring the patient's condition and course of the disease in real time, respectively. In addition, IoT can improve the effectiveness of prediction and prevention of diseases. It is possible that with a reasonable and coherent application of AI and the IoT, the number of errors in medical practice needs to be significantly reduced, which will help save more patients.

The emergence and widespread use of AI in various spheres of human activities have caused in this time many debates. There are certain barriers and risks to the technology development of IoT. The main systemic barriers include a lack of understanding of the values of IoT. Therefore, there is an absence or imperfect state of its development strategy. Also, significant barriers and risks include political; technological; legal regulation; education and motivation; financial and economic; security; privacy; compatibility of technologies and standardization. These barriers require further investigation to determine the program of measures for overcoming them because they are the source of a range of threats during using IoT.

7. Conclusions

Modern technologies are swiftly getting valuable in the health domain, involving devices that routinely observe health biometrics or monitor timely health - related data. Using Internet technologies and the large accessibility to smartphones, healthcare providers and patients are using mobile apps to manage health. Combining IoT techniques with big data is crucial in such a health arena. In the healthcare field, IoT is revolutionizing the creation of effective healthcare delivery, creating a platform for communication between different health segments, providing digital support at every turn, and facilitating the rapid transformation of modern medicine to the demands of time. Healthcare providers could use such innovative health systems, supplying the right data about the right patients at the tight time. Consequently, a promptly and efficiently medical decision - making can be conducted. However, the emergence and widespread use of AI in various spheres of human activities have caused in this time many debates. There are certain barriers and risks to the technology development of IoT. The main systemic barriers include a lack of understanding of the values of IoT and, therefore, the absence or imperfect state of its development strategy. These barriers require further investigation to determine the program of measures for overcoming them. This chapter has provided innovative insights regarding the role and some applications of IoT technologies in health. It also showed selected medical cases highlighting an IoT - driven healthcare system and the prospective challenges of applying it in the health sector. Finally, more research on AI and IoT or in any way associated with the various aspects of their development, implementation, and use is encouraged as the way for future healthcare.

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