

Role of Wearable Devices in Medical Internet of Things: A Study on Convergence of Implementation Science, Precision Medicine

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Abstract

Wearable medical devices are playing an important role in the modern medical services. This is important for achieving a proper understanding of solutions for different medical issues that is increasing in an individual rapidly. The medical wearable devices are helping to produce a proper lifestyle management and visible growth for an individual that is important for gaining a growth. The continuous monitoring with wearable medical devices can be useful for ensuring a proper growth that are essential for gaining a proper knowledge an understanding of health for an individual. The different limitations are also developed in wearable medical

devices creating an issue for growth and different obstacles that are not helping to accrue different critical solutions of diseases. The human motion detection is helping to ensure a proper growth with different applications that are helping to produce a proper way of development.

Keywords: Wearable, medical device, lifestyle management

Introduction

In the modern era, wearable medical devices are being developed rapidly with the help of these devices. People are getting aware of different medical issues that are increasing due to lifestyle changes. Wearable IoT devices such as fitness bands, smart glasses, and smartwatches are helping to continuously observe the condition of medical health. Fitness trackers, blood pressure monitors, and biosensors are helping to ensure the exact monitoring of a person's health and develop real-time data that is beneficial for further treatment. Electronic skin patches and ECG monitoring are helping to produce data helping the personal health of people. Remote patient monitoring is a common role of development in the medical industry with different IoT devices for healthcare services. Different smart wearable medical IoT devices are invented on a daily basis such as smart bands, wristbands, and different smart jewellery. These devices are helping to ensure better development in life with the help of continuous monitoring that can get a clear idea of a person's health issues. Precision medicines are helping to produce better growth which is essential for understanding proper treatment methods for patients.

In this study, the role of different wearable devices in the medical internet of things is mentioned which is beneficial for understanding better growth that is essential for developing the growth in the study. The usefulness of wearable IoT in the medical field of things is explained and also the limitations of these devices are mentioned. The proper use of these devices and also its issues are discussed in the study.

Literature review

Importance of wearable devices in the medical internet of things

The importance of IoT is increasing in the healthcare system is increasing on a daily basis. Doctors can easily monitor the patient's heart rate, glucometer readings, calorie count, and different vital signs. These are beneficial for understanding a patient's health and safety doctors more accurately. Doctors are able to monitor and can ensure a proper treatment plan for patients along with medications with the help of data [7]. These data also are useful for different serious cases such as pandemics, accidents, and much more; better treatment can be provided for patients with the help of data. Anomalies identification and treatment of health care conditions are helping to generate data that are important to create a proper environment for the treatment of patients with proper care. Wearable pain relief devices are important for gaining proper growth in the medications that are also promoting proper maintenance of lifestyle for the people. During the pandemic time, the usefulness of wearable IoT is increasing in a rapid manner which is helping to promote the growth of treating health conditions for patients. These devices are easy to use that are beneficial for providing better development for patients with proper medical care and managing treatment. The productivity of a person can be easily increased with different wearable devices that are beneficial for creating proper data for the patient. Older patients can easily use the devices and these are helping them to understand the issues of their health and they can also maintain growth without any problems.

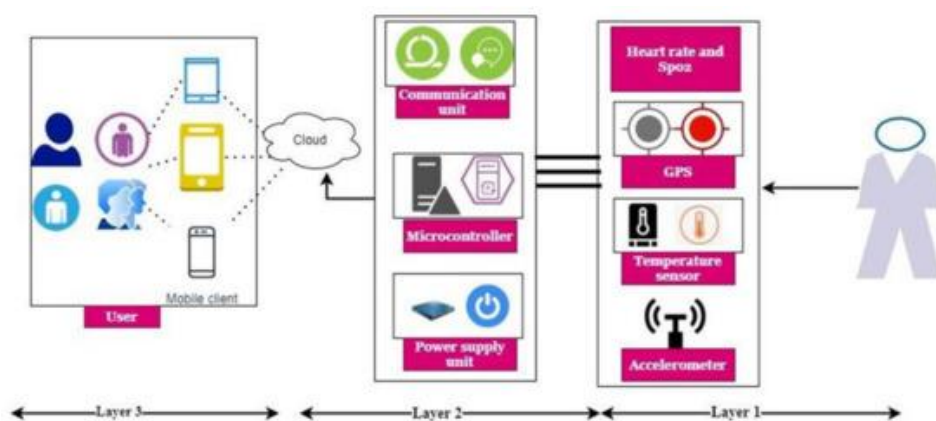


Figure 1: Use of wearable medical devices

(Source: 11)

Providing a direct connection with the body, the wearable devices are helping to produce correct data that can help a patient. The characteristics that are helping to ensure the growth of patients with different wearable medical monitoring devices for analysing and transmitting personal data in real-time. Doctors can easily observe blood sugar levels, blood pressure, heart rate for a person and oxygen levels; these are beneficial to provide quick medical advice. The wearable devices are able to monitor body temperature, body hydration, alcohol, sugar, glucose and lactose can help to identify a person's health well. Persons can easily understand and are able to monitor daily activities through mobile devices or computers. Chronic disease management, performance monitoring of an individual and navigation are helping to produce a better growth for the person. The increase in performance of athletes can be easily monitored and improved with different wearable technologies [10]. Surveillance, screening, diagnosis and many more factors of healthcare are easily uplifted with different wearable devices. The awareness is developed in a person of proper exercising, sleeping and eating habits that are helping to achieve health goals for persons. The management of cardiovascular health effectively can be possible with wearable devices for tracking and monitoring health and physical activities. A safe and effective way is possible to gain with the help of wearable devices that are essential for increasing health conditions of an individual. The self-management can easily provide for a person with real-time data that are retrieved from different wearable devices. The patient's education about maintaining a healthy lifestyle is easily assured with wearable devices in medical Iot [11]. The doctors are able to discuss the patient's conditions and remotely provide suggestions to improve health conditions based on data collected from different wearable devices. Sustainability and comfort can be developed for the individuals in the healthcare system gained from different medical technologies.

Limitations of different wearable devices in the medical internet of things

Wearable devices in the medical internet of things have developed different issues that are not helpful for patients. The security of data is creating an issue for different wearable devices technologies in healthcare. The capabilities of different wearable medical Iot are limited as it is creating a major issue for healthcare. The wearable technologies are expensive and it is not affordable for normal people. The privacy of anyone's personal data can easily be violated with different wearable devices that are creating challenges for medical wearable devices. The accuracy cannot be provided by the medical Iot in healthcare due to handling a massive amount of data. Power consumption of medical wearable devices are creating issues and it is interpreting long-term health monitoring. The chance of losing data can be developed as a possibility of safe health monitoring system can be ensured with wearable medical devices.

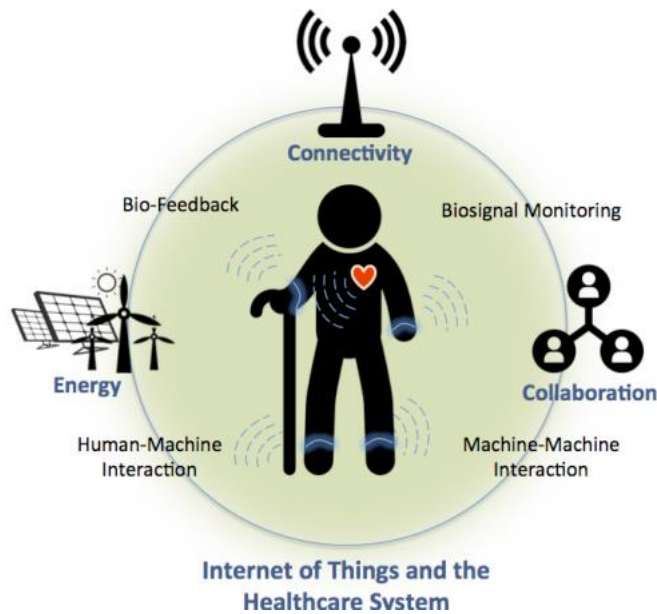


Figure 2: Internet of things in the healthcare systems
(Source: 8)

In the rural areas use of wearable medical devices are not developed due to lack of resources. The lack of awareness is also creating a major issue for growth of wearable medical devices in healthcare [8]. As per different research continuous monitoring through a wearable medical device can increase the issue of anxiety, depression in a person. Precising medicines with special care are not able to fill the gaps of coverage in the technological development. The technological issues can create different errors that are not effective to manage healthcare system and can produce wrong data. The wrong data can be affecting patients for getting a proper medical assistance and it can lead towards serious conditions in future or death. Different medical data of the patients can be leaked in the open market are creating obstacles for them as they can face different cyberattacks. Different phishing and other issues can be increased for the patients due to leaked data that are developed from wearable devices [9]. Major health issues cannot be predicted by the medical wearable devices and it is also not sufficient for encouraging the patients to get a proper health care. The minimal chance of human error can also be developed as different wearable devices can act differently it is creating issues for individuals to get the proper data.

Methodology

Methodology is an important part for gaining achievement that are also beneficial for getting appropriate results. The secondary methods are developed for completing the study. This is beneficial for understanding the proper growth that are also important for providing better results in the study. With the help of secondary data, the research is completed and gained important information that are beneficial for understanding the issues that are growing with wearable devices in the internet of things. Different books, journals, articles are able to create a major growth in the studies that are helping to ensure growth for the patients suffering with various illness such as blood pressure, heart related issues and many more [6]. This is helping the individuals to understand the different medical emergencies that are already described in different journals are providing effective and sustainable growth. The data published in the different websites, articles, journals shows that different challenges are faced by individuals regarding the wearable medical devices. The wearable medical devices are produced a unique data set that are helpful for gaining a growth in the medical sciences and created different solutions for healthcare [12]. The lack of awareness towards health of an individual can be easily developed with proper methods taken from different journals, articles and others.

After collecting data from secondary method, the proper analysis has to be done so that it is

beneficial for understanding the issues and different methods of implicating medical wearable devices in the internet of things. The understanding of issues in the lifestyle and others are developed from the collected data that are helping to produce a big data analysis method that are helping to understand volume, variety, velocity, value and veracity [5]. These are beneficial for creating a better growth in the study by transferring the data with visual analytics. The decision making can be easily developed with secondary research method as all information are already provided in the previous research. The secondary data are helping to produce a huge amount of data within a short period of time that is essential for gaining a growth in the research. With the help of medical wearable devices, the individuals are able to understand the proper growth and able to maintain a healthy lifestyle that can improve their health and ensured safety and progress. The understanding of different limitans or disadvantages of medical wearable devices can be gained with different previous articles, journals.

Discussion

The use of artificial intelligence (AI) is changing the life of individuals and also helping to ensure a proper safety. A proper pathway is also developed by the AI that is helping to produce a visible growth for individuals. Different wearable medical devices are encouraged in the modern time as it is important for maintaining a quick and understandable growth in healthcare [4]. The wearable medical devices are getting its popularity in the various field of sports and fitness and also in daily lives. A long-term health monitoring can be easily ensured with different wearable devices. An efficient and effective growth can be assured with the help of this technologies and ensured a proper growth in the daily life. The use of wearable medical devices is helping to develop an efficiency that are able to understand issues of an individual quickly and efficiently. The self-management and monitoring system can be easily developed with wearable medical devices that is also important for maintaining a proper growth in the lifestyle. The clinical decisions of an individual can also be developed with the help of different wearable devices that are also beneficial to produce a better opportunity to provide an exact medical assistance for patients or an individual. In the pandemic situation the smart wearable devices are developed as a beneficial element. The proper health management such as heart rate monitoring, blood pressure monitoring is done with medical wearable devices and can be easily done with the devices are helping to ensure medical assistance on the exact time and can save the life. Oxygen monitoring can also be done with wearable medical devices that are also essential for understanding a proper growth in the medical fields [1]. The small, light and easy wearability of different devices are helping to produce a better growth in maintaining the benefits of wearable medical devices. The power consumption of the wearable devices can be high but with the help of different advancement in technologies these issues can be reduced easily [2]. The activity management are helping to produce a major growth in the health care system that is also effective to grow a proper maintenance in lifestyle of an individual. The wearable devices are designed to collect data from a user's personal health and excesises that are helping to ensure different medical information about the person. Different continuous innovations are developed for the field of medical wearable devices that are helping to produce valuable data for an individual to understand the proper issue for maintaining a healthy lifestyle and growth [3]. The emergency health care service can be easily ensured with the help of medical wearable devices and with the help of different useful datasets treatments can be easily done. Confidentiality and managing of different data sets are developed a proper issue for the wearable medical devices that can be easily solved with different innovative development.

Conclusion

From the study it can be concluded that wearable medical devices are developed an effective way that are essential for gaining growth in the medical services. The medical wearable devices are helping to acquired different data in an easy and quick manner that are helping to ensure a proper growth for the patients to get effective assistance in the medical services. Heart attack, glucose monitoring, oxygen level monitoring, blood pressure monitoring can be easily done with the help of these devices and can get an effective result that are beneficial for achieving growth. The diseases are easily and quickly monitored and also getting some preventive measures that are beneficial to produce a maintenance of healthy lifestyle. The limitations that are developed in the study are creating some major impacts that are affecting the growth of an individual and properly maintain the healthy lifestyle. The understanding of medical care issues is helping to create a proper development in the wearable medical devices Iot. The cost of these devices is can be unaffordable for normal persons that are creating a barrier for an individual to grow in the competitive world. The modern lifestyle can be maintained by the individuals with wearable healthcare devices by getting right data about an individual's health and medical conditions. The proper monitoring through wearable medical devices is beneficial to reduce effects of health and other issues that are growing of an individual for maintaining a healthy life style. The advanced technologies are helping to ensure a proper development in the lifestyle of individuals that is important for providing medical support.

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