

IOT WEARABLE DEVICE HEART RATE MONITORING

Indra Widhi Arsyadi
Universitas Atmajaya
Allenavarro@gmail.com

Abstrak (indonesia)

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Pada tubuh manusia terdapat tanda vital yang dapat mencerminkan indikasi dari kondisi kesehatan seseorang diantaranya yaitu tekanan darah, respirasi, denyut nadi, dan suhu tubuh. Pada saat kondisi pasien dalam keadaan sakit parah sehingga berada pada ruang ICU maka diperlukan suatu pemantaunya yang dapat dipantau setiap saat dan kapanpun. Sehingga keluarga pasien dapat membantu pemantau tersebut. Alat ini menggunakan sistem IoT (Internet of Things), alat ini menggunakan sensor yang digunakan yaitu untuk heart monitoring. Tujuan dari penelitian yang dilakukan adalah untuk menganalisis pentingnya IoT wearable device heart rate monitoring. Teknik pengambilan data yang digunakan pada penelitian ini adalah metode literature study, kemudian analisis data dengan descriptive dan pendekatan yang digunakan adalah kualitatif. Hasil penelitian menunjukkan bahwa IoT wearable device heart rate monitoring sangat penting digunakan karena sangat membantu dalam pemantauan pasien.

Kata kunci: *Iot; wearable device; heart rate monitoring*

Abstract

In human body there are vital signs that can reflect indications of a person's health condition including blood pressure, respiration, pulse, and body temperature. When the patient's condition is seriously ill so that he is in the ICU, monitor is need that can be monitored at any time and at any time. So that the patient's family can help the monitor. This tool uses an IoT (Internet of Things) system, this tool uses sensors that are used for heart monitoring. The purpose of this research is analyze the importance of

IoT wearable device heart rate monitoring. The data collection technique used in this research is the literature study method, then the data analysis is descriptive and the approach used is qualitative. The results show that IoT wearable device heart rate monitoring is very important to use because it is very helpful in monitoring patients.

Keywords: *Iot; wearable device; heart rate monitoring*

*Correspondent Author : Indra Widhi Arsyadi
Email : Allenavarro@gmail.com



INTRODUCTION

The development of information technology is now marked by of the Internet of Things (IoT). IoT allows users to manage and optimize electronics and electrical equipment that use the internet (Hermansyah et al., 2022). The era of digital connectivity and IoT has been applied in various fields. In Indonesia now the internet has become part of every sphere of life. IoT is a form of human interaction with communication that makes it easy to move data through a network without human interaction. IoT is growing rapidly with new devices being connected all the time.

Examination and monitoring of the patient's health condition at the hospital must be carried out periodically to anticipate various possibilities. In general, the examination and monitoring of patients carried out by medical personnel is still done manually, where doctors or health workers come to the patient's location to meet directly. This condition causes the examination to be less effective because it takes a lot of time and there are other possible risks, such as transmission (Angela et al., 2022).

The heart rate monitoring system is a system that can detect or monitor the condition of the heart rate of patients with respiratory problems. Normal adult heart rate ranges from 60 to 100 bpm, heart rate abnormalities can occur when the rate is less than 60 bpm which is known as bradycardia. In addition, heart rate abnormalities can also occur when the rate exceeds 100 bpm which is known as tachycardia (Sofiani et al., 2021). Monitoring BPM (Beats Per Minutes) is one of the most needed observation techniques in medical examinations, because the BPM Observation process itself is quite easy, namely by clamping the index hand on the photodiode and infrared sensors. The results of the detection of blood vessels on the fingers will be visible on the patient monitor. Heart rate itself is a heartbeat per unit time which is usually expressed in beats per minute (BPM)

(Abadi et al., 2016). In this study, we analyze the IoT wearable device system as heart rate monitoring that can monitor the heart rate in real-time. Because wearable devices are now at the heart of almost every discussion related to the Internet of Things (IoT) and the various capabilities that impenetrable connectivity can bring (Irwansyah & Lorinsa, 2020). Based on the description above, the researcher is interested in conducting a research entitled “IoT Wearable Device Heart Rate Monitoring”.

METHODOLOGY

This study uses a qualitative approach, namely by analyzing IoT Wearable device heart rate monitoring. By using this qualitative approach, it is hoped that it will provide comprehensive facts regarding the IoT wearable device heart rate monitoring (Moto, 2019). In addition to the approach there is also a method used in this study is a descriptive method. According to Ansori (2019) the descriptive method is carried out by describing the facts which are then followed by analysis, not only by elaborating, but by providing sufficient understanding and explanation. The data collection technique is literature study. Literature study is a study that is used to collect information and data with the help of various kinds of assistance such as books, journals, articles, and others (Mirzaqon & Purwoko, 2018). Literature study also means data collection techniques by reviewing books, literature, notes, and reports related to the problems studied (Cahyono, 2020). The data sources used are books, journals, articles, and similar things obtained through Google Scholar with the keywords IoT, wearable device, and rate monitoring.

RESULT

A. Internet of Things (IoT)

Internet of Things (IoT) is a communication network where devices and sensors are interconnected with each other or with a larger system. IoT networks collect billions of data from different devices that are used in everyday life. IoT applications in the health sector are increasing day by day, people living in rural areas cannot benefit from preventive health services due to lack of infrastructure. As a result, deaths occur very early in some areas that are far from hospitals. Along with changes in the family structure in addition to chronic heart disease, there is a high probability of a result of excessive cardiac fatigue during sleep at night. Devices that provide continuous monitoring of these patients are relatively expensive and require trained personnel to use them. To assist these patients so that they can be followed up continuously with medical devices that can be used to maintain their health, devices that can be used continuously to measure the patient's heart rate and when heart symptoms have occurred, it will send information about the patient's health condition to family member and doctors.

Thanks to IoT technology, information between various can be connected from anywhere with the internet as the connection medium. In IoT technology, smart health services can provide remote disease diagnosis, with low investment costs, low data consumption, and have high performance, devices that can collect patient heart data to be sent to the patient's family or doctor through a smartphone application (Ratna, 2020).

B. Wearable Device

Wearable devices are referred to as a combination of several technologies, such as electronics and computer technology that are packaged in such a way that they can be worn or worn. Wearable devices can be applied in various fields, such as: medical, sports, entertainment, to agriculture. In general, wearable devices have a number of advantages over non-wearable devices or sensors. These advantages such as being able to be placed dynamically, the device is turned on when the measurement time is needed, can be designed with a small size to as to minimize interference for the wearer. Wearable devices can not be separated from the role of sensor technology, computing, and communication. Wearable devices have a relatively small size, because it aims to make the device easier to use by its users (Lindiana, 2019).

C. Heart Rate Monitoring

Heart rate is the heart rate which is the number of heartbeats in one minute in units of Beats Per Minute (bpm) the pulse rate will be low, if you are not active or at rest, and be high, if you are doing high activity, such as sports. The cause is a lot of oxygen-rich blood which will help in evaluating the exercise program during exercise, it can also be applied to early evaluation of heart health. The average heart rate is largely determined by the balance between the level of activity in the sympathetic and parasympathetic nerves of the heart. Decreased sympathetic activity at some point, although both are autonomic. In principle, many combinations of sympathetic level and parasympathetic activity will produce the same result in mean heart rate (Puspasari et al., 2018).

D. Importance of IoT Wearable Device Heart Rate Monitoring

According to Dian et al. (2021) health is an important part for humans because with a healthy body we can perform various activities and think well. One of the health organs that we must take care of is the heart. The heart is an organ of the human body that has a vital function, abnormalities can have a major effect on the performance of our body. The normal human heart rate ranges from 60-100 beats per minute. It takes a tool that can calculate the number of human heart beats per minute automatically and display information about heart health.

Heart rate measurement is used by medical professionals to assist in diagnosing a patient's condition. There are several methods of measuring heart rate, such as a stethoscope, electrocardiogram (ECG), phonocardiogram (PCG), and auscultation. However, these methods are clinical, expensive and can only be performed by people who are experts in their fields.

Internet of Things (IoT) is a structure in which objects, people are provided with an exclusive identity and the ability to move data over a network without requiring two-way human-to-human source to destination or human to computer interaction. So the importance of IoT wearable device heart rate monitoring is expected to help doctors or families in monitoring and recording every patient's heart rate.

CONCLUSION

Based on the results of the study, it is shown that the importance of using IoT in medical devices, especially in heart rate monitoring. IoT wearable device heart rate monitoring is very important in helping doctors and families monitor of the condition of vital parts of patients in hospitals.

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