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# **PATIENT HEALTH MONITORING**

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# **IOT PATIENT HEALTH MONITORING**

## **ABSTRACT**

This innovative project addresses critical problems related to the welfare of elderly people by introducing a cutting-edge Internet of Things (IoT) gadget designed with great attention to detail to monitor the health of senior patients. The device utilises IoT technology to create an effective and uninterrupted tracking system for important health parameters, such as body temperature and pulse rate, in response to the limitations caused by the absence of real-time and remote health monitoring. The main objective of this project is to provide a comprehensive system that effectively monitors and records the health problems of older patients in their everyday surroundings. By effectively integrating a variety of sensors, the gadget expands its functionalities beyond conventional monitoring. This enables the remote monitoring of patients' health status, including their adherence to medicine and other relevant health indicators. The expected result entails the secure transfer of the gathered data to a ThingSpeak server and Microsoft Excel, paving the way for comprehensive analysis and ongoing monitoring. This strategy not only tackles current deficiencies in geriatric care but also foresees forthcoming healthcare requirements, promoting a fundamental change towards proactive, tailored, and technology-based healthcare solutions. This project aims to leverage the revolutionary potential of IoT to greatly improve the well-being of elderly people, introducing a new era of holistic and preemptive healthcare interventions.

## TABLE OF CONTENTS

### Table of Contents

CHAPTER 1 : INTRODUCTION .....	1
1.1 BACKGROUND OF STUDY .....	1
1.2 PROBLEM STATEMENT .....	2
1.3 OBJECTIVES OF RESEARCH .....	3
1.4 SCOPE OF STUDY .....	4
CHAPTER 2 : THEORETICAL BACKGROUND.....	6
2.1 THEORETICAL BACKGROUND / LITERATURE REVIEW .....	6
2.2 CIRCUIT REVIEW 1 .....	7
2.3 CIRCUIT REVIEW 3 .....	8
2.4 CIRCUIT REVIEW 3 .....	9
CHAPTER 3 : METHODOLOGY .....	10
3.1 THE METHODOLOGY PROCESS.....	10
3.2 PROJECT FLOW CHART .....	13
3.3 BLOCK DIAGRAM .....	14
3.4 CIRCUIT DIAGRAM / SCHEMATIC DIAGRAM.....	15
CHAPTER 4 : RESULTS AND DISCUSSIONS .....	20
4.1 PATIENT HEALTH MONITORING DESIGN CIRCUIT .....	20
4.2 FINAL PRODUCT DESIGN OF PATIENT HEALTH MONITORING.....	20
4.3 SOFTWARE SIMULATION RESULTS .....	20
4.4 HARDWARE RESULT .....	20
4.5 FINAL PRODUCT DESING OF PATIENT HEALTH MONITORING.....	24
4.6 INPUT AND OUTPUT RESULT DATA .....	26
4.7 TROUBLESHOOT FOR THE SIMULATION .....	27
CHAPTER 5 : CONCLUSION AND FUTURE RECOMMENDATION .....	28
5.1 CONCLUSION .....	28

# CHAPTER 1 : INTRODUCTION

## 1.1 BACKGROUND OF STUDY

The healthcare industry has consistently been at the forefront of embracing novel technologies in order to enhance patient care and optimise operational effectiveness[1]. In recent years, the Internet of Things (IoT) has gained significant attention as a highly potential technical innovation within the medical domain[2]. The term "Internet of Things" (IoT) pertains to the integration of commonplace objects with the internet, facilitating autonomous data collection and exchange processes, devoid of human involvement[3].

The field of patient health monitoring has demonstrated considerable potential with the implementation of Internet of Things (IoT) technology [4]. Conventional health monitoring systems frequently include human intervention, wherein healthcare practitioners are required to periodically assess patients[4]. The utilisation of this particular method has the potential to result in delayed responses during critical situations and exacerbate the workload of healthcare personnel. In contrast, an automated health monitoring system has the capability to offer instantaneous data, so ensuring prompt response and mitigating the likelihood of human fallibility. *Artificial Intelligence in Healthcare*. (2020). Netherlands: Elsevier Science[5].

Besides, the ESP8266 and Arduino Uno are well recognised and economically viable components within the realm of Internet of Things (IoT). The ESP8266 is an affordable Wi-Fi microprocessor that may be seamlessly incorporated with diverse sensors to acquire and transfer data via the internet. The Arduino Uno is a microcontroller board that is open-source and capable of processing data obtained from several sensors. The integration of these two elements facilitates the development of an Internet of Things (IoT)-based system for monitoring the health of patients, which not only demonstrates high efficacy but also offers cost-effectiveness [6].

This device has the capability to monitor a range of health data, including but not limited to heart rate, body temperature, and blood pressure. The acquired data has the capability to be transmitted to a centralised server or cloud-based platform, enabling healthcare practitioners to actively monitor it in real-time. Furthermore, with the incorporation of alarm systems and alerts, any deviations from the expected health status of the patient can be promptly sent to the appropriate individuals, so guaranteeing a swift and efficient response.

## **CHAPTER 2 : THEORETICAL BACKGROUND**

### **2.1 THEORETICAL BACKGROUND / LITERATURE REVIEW**

The incorporation of the Internet of Things (IoT) into the healthcare sector has brought about significant changes in the field of patient monitoring. This integration has facilitated the collecting of real-time data, enabled remote monitoring, and improved the quality of patient care. Within this dynamic and ever-changing environment, the ESP8266 WiFi module and Arduino microcontroller have emerged as essential components, providing a combination of effectiveness, dependability, and cost-effectiveness. These technologies enable the continuous monitoring of vital health data, including body temperature and pulse rate, in real-time. The ESP8266's ability to provide WiFi connectivity, along with the Arduino's adaptability, enables the development of efficient data collection and wireless transmission systems.

The emergence of the Internet of Things (IoT) in the healthcare sector is characterized by a collection of interconnected devices, such as wearable sensors and embedded systems integrated into medical equipment, which have a significant impact on the acquisition and sharing of data. The widespread availability of real-time data plays a crucial role in facilitating well-informed decision-making, effective management of chronic diseases, and improved preventative care. The integration of ESP8266 with Arduino has effectively enabled the advancement of health monitoring systems that are affordable, easy to use, and capable of expansion. Arduino's open-source nature and user-friendly interface have played a significant role in prototyping and the creation of IoT applications, hence promoting innovation and enhancing accessibility [11-12].

In the realm of patient health monitoring, it is of utmost importance to maintain continuous and real-time surveillance of body temperature and pulse rate. The utilization of the ESP8266 WiFi module and Arduino microcontroller has played a crucial role in the advancement of cost-effective, efficient, and adaptable health monitoring systems. The open-source nature and user-friendly characteristics of Arduino contribute to its widespread adoption for the purpose of prototyping and developing Internet of Things (IoT) applications [13]. Several studies have demonstrated the utilization of wearable sensors powered by ESP8266 and Arduino, which provide real-time data to healthcare providers and improve the effectiveness of emergency response[14]. Patients has the capacity to undergo necessary medical examinations at their own discretion, hence reducing the frequency of visits to healthcare