A

Project Report

On

HEALTH MONITORING SYSTEM

Submitted to

RAJIV GANDHI UNIVERSITY OF KNOWLEDGE TECHNOLOGIES, KADAPA

in partial fulfilment of the requirements for the award of the Degree of

BACHELOR OF TECHNOLOGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

Submitted by

S.NANDINI	R170551
S.GOWSIYATAJ	R170640

Under the Guidance of

Mr. ABDUL MUNAF

Assistant Professor

Department Of Electronics and Communication Engineering

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

RGUKT, RK VALLEY
(RGUKT KADAPA is approved by UGC, AICTE, established in 2008, provide Education opportunities for rural people)
Vempalli, Kadapa-516330

2019-2023

CERTIFICATE

This is to certify that the project report entitled "HEALTH MONITORING SYSTEM" a bonafide record of the project work done and submitted by

S.GOWSIYATAJ	**R170640**
S.NANDINI	**R170551**

for the partial fulfilment of the requirements for the award of B.Tech Degree in **ELECTRONICS AND COMMUNICATION ENGINEERING,** RGUKT , Kadapa.

PROJECT GUIDE	**Head of the Department**
Mrs. ABDUL MUNAF	B. Madhan Mohan
Assistant Professor	Assistant Professor,
	Head of Department of ECE

External Viva-Voice Exam Held on _____

INTERNAL EXAMINER *EXTERNAL EXAMINER*

DECLARATION

We here by declare that the project report entitled **"HEALTH MONITORING SYSTEM"** submitted to the Department of **ELECTRONICS AND COMMUNICATION ENGINNERING** in partial fulfillment of requirements for the award of the degree of **BACHELOR OF TECHNOLOGY.** This project is the result of our own effort and that it has not been submitted to any other university or institution for the award of any degree or diploma other than specied above.

S.GOWSIYA TAJ R170640

S.NANDINI R170551

ACKNOWLEDGEMENT

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We would like to express our gratefulness and sincere thanks to **Prof. B.MADHAN MOHAN,** Head of the Department of **ELECTRONICS AND COMMUNICATION ENGINEERING,** for the kind help and engouragement during the course of our study and in the successful completion of the project work.

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S.GOWSIYA TAJ **R170640**
S.NANDINI **R170551**
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ABSTRACT

IOT enabled technologies enable the possibility of developing novel and noninvasive clincial support systems.In particular COVID-19 patients ,high bllod pressure patients ,diabetics patients,etc.,in a rural area do not have instant access to health or emergency clinics for testing.The system we developed will measure a patient's body temperature ,heatbeat and oxygen saturation(spO2) levels in the blood and send data to a mobile application using application using Bluetooth.The main objective is to increase affordability for regular people.Besides sustainability in the context of finance ,patients will have easy access to personal healthcare.This presents an IOT-based system that will simplify the utilization of an otherwise complicated medical device at a minimum cost while sitting at home.

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CHAPTER 1

INTRODUCTION

Health is more important for every human being.Especially for aged persons regular checkup of their heart beat rate and respiratory rate definitely helps to find out their health condition.The number of doctors is not exactly the same as in urban areas.Medical equipment is not readily available in rural areas ,except for government medical centers.Generally we have some devices available in the present market which gives heart beat rate and respiratory rate.Those devices will work only while we are using them.It is difficult for us to move here and there while using those type of devices our device rectifies that problem.A sensor in the health monitering system will collect information about the patient’s health condition.It is smaller in size,faster and more affordable.(is system can be used to measure the oxygen saturation level,heart rate,and temperature of the human body and display the results on a web platform.

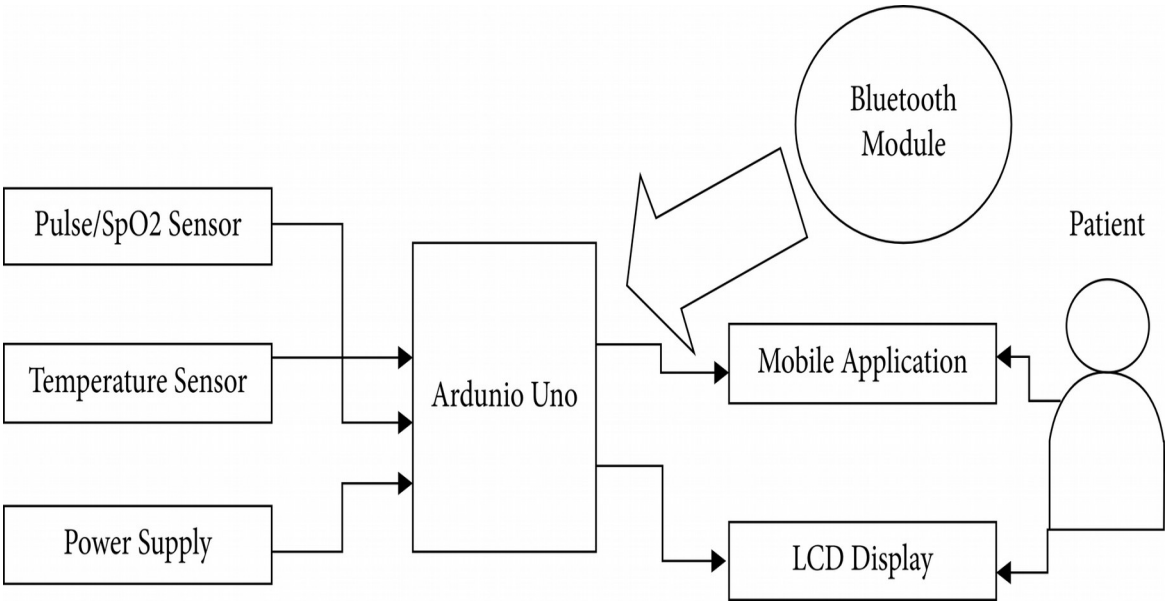
CHAPTER 2. LITERATURE SURVEY

2.1CURRENT STATUS IN THE MARKET:

Oximeters are present in the market.We have updated the structure of those type of devices in order to give the output while we are moving from one place to another place.Previous devices will give that the information while we are in a stationary position.But the device will give that information at any time while we are in a stationary position or we are moving from place to place.

CHAPTER 3. METHODOLOGY

3.1 BLOCK DIAGRAM OF THE SYSTEM



CHAPTER 4. EXPERIMENTAL ANLYSIS

4.1 HARDWARE DESIGN

Components	Description
Arduino Uno	An open-source microcontroller based on the 8 bit ATmega238p microchip. It will work as an interface between the sensor and the mobile application described in this paper. This consists of additional components that help the microcontroller, such as a crystal oscillator, serial contact, voltage controller, etc. The Arduino Uno has 14 pins, including 6 pins for analog input, a link to the universal serial bus (USB), an ICSP header, and a reset button. The Arduino Uno provides an ICSP case.
Max 30100	The MAX30100 is a pulse oximetry and heart rate monitor sensor that can be powered by 1.8 V or 3.3 V power supply. A host microcontroller uses the I2C interface to communicate. The MAX30100 pulse oximetry subsystem consists of the ALC, a 16 bit sigma-delta ADC, and a patented disconnected time filter. It is ultra-low-powered, making it suitable for systems operating on batteries.
LM35	The LM35 is an integrated circuit temperature sensor with a temperature-dependent output voltage. It's a compact, low-cost IC that can determine temperature anywhere between -55 and 150 degrees Celsius. It can easily be interfaced with any ADC or development platform, like an Arduino microcontroller. It can be linked.
Bluetooth module HC-05	The HC-05 is a module that can provide wireless functionality. We are using this module to set up communication between the Arduino and the mobile application. The HC-05 module can easily be coupled with microcontrollers because it uses the serial port protocol (SPP). Power the module simply by using +5V and connecting the module's rx pin to the tx and the tx module pin to the MCU rx, as shown below.
LCD display	A 16 X 2 LCD display with I2C can show 16 characters in 2 lines. This means that you will only have four pins for the LCD display: VCC, GND, and SDA, as well as SCL.
Jumper wires	Without the requirement for soldering, flexible wire with connections on each end can be connected to other jumper wires or a pin header.
Bread board	It's a construction base.

4.2COST OF COMPONENTS

Component	Model	Quantity	Price/Unit (BDTK)	Price (BDTK)
Pulse oximeter and pulse rate sensor	MAX30100	1	300	300
Body temperature sensor	LM35	1	70	70
LCD display	16 x 2 I2C	1	273	273
Microcontroller	Arduino uno	1	430	430
Bluetooth module	HC-05	1	30	90
Jumper wires		20 x 3	280	280
Bread board		1	85	85
Total cost				1443

4.3. Introduction

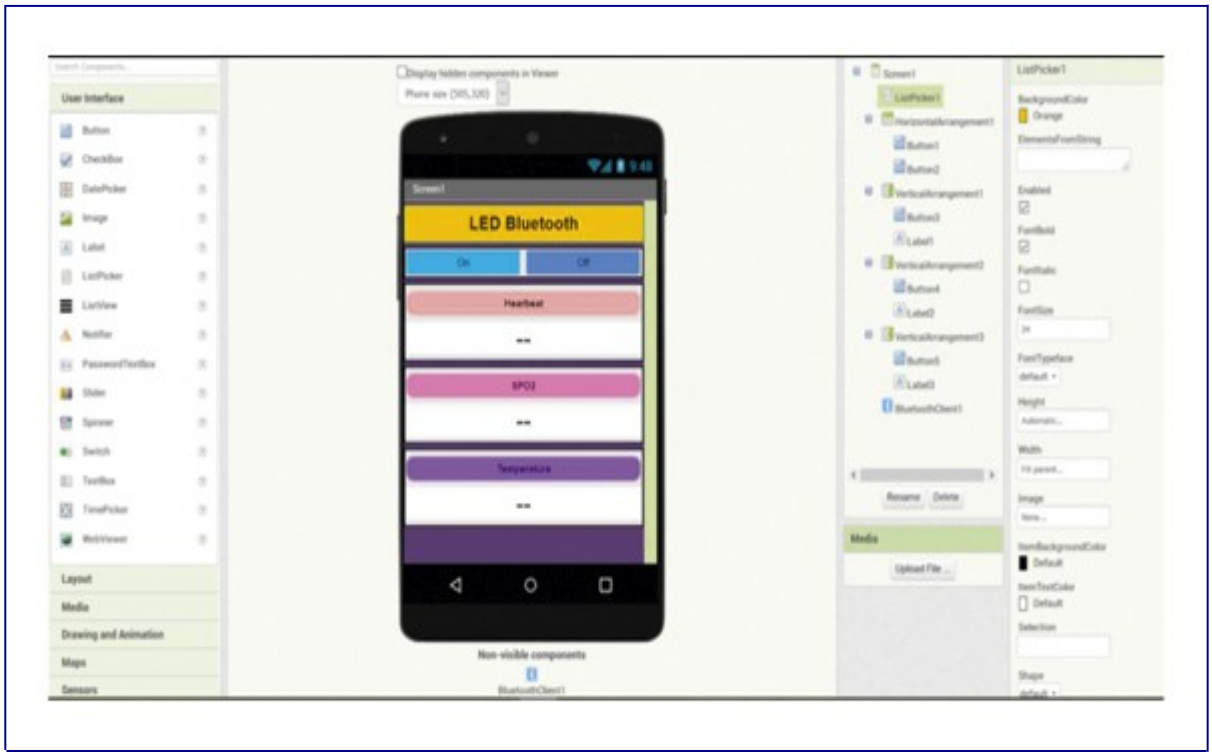
The system’s goal is to build a health monitoring system that can quickly measure a variety of health factors. In this part, the techniques and materials used in the system are detailed. The system’s block diagram is presented in the first subsection. In this part, the techniques and materials used in the system are detailed. The system’s block diagram is presented in the first subsection.

4.4 Block Diagram

The system’s structure is depicted in Figure 1. Here, patients will measure their pulse rate and SpO2 using the max30100 sensor and body temperature using the Lm35 sensor, and patients can see measurement data in the mobile app and LCD display. The data will be shown in the mobile app with the help of a Bluetooth module that will receive data from the Arduino and save it in the cloud. From there, the data will be transferred into the mobile application, and the patients can view the measurement of the health parameters. After measuring the physiological vital data of the human body, it will be sent to the Arduino UNO, which will process the analog data into digital. After that, the data via Bluetooth module will appear on the mobile application. Measured data from the human body can be seen on the LCD display as well.

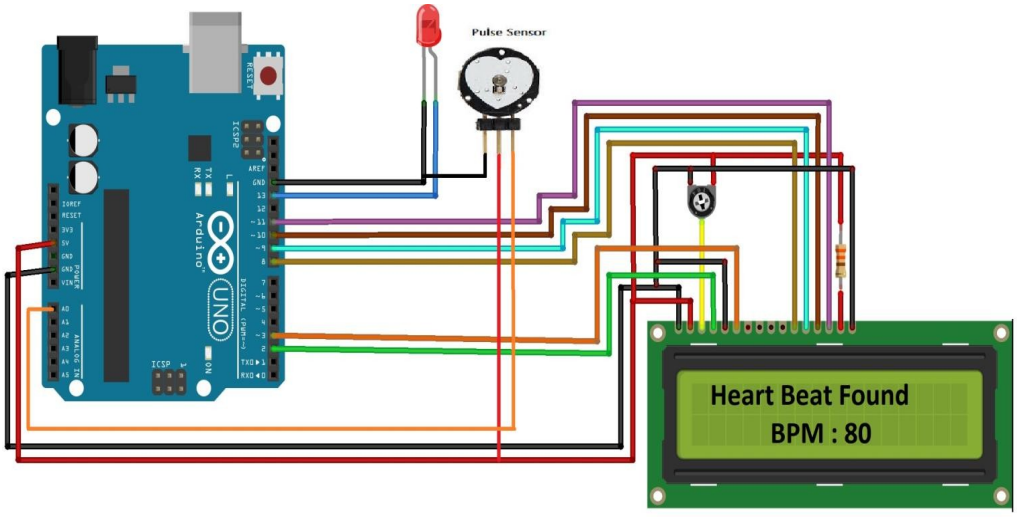
4.5. Software Materials

The mobile application was developed by the MIT inventor App. After developing the application, we simply load it onto the mobile device, and a link will be provided to download the application. After connecting the Bluetooth device to the application through scanning with the mobile, a connected message will be viewed. Then, after performing the required process, we can show our collected results on the screen. Users will use the visual block language to build applications by dragging and dropping components into the design view. This tool enables individuals worldwide to create digital solutions to pressing problems. With the help of the Bluetooth module HC-05, the microcontroller will now be connected to the mobile application. Figure 4 showcases the system from the MIT inventor's view.



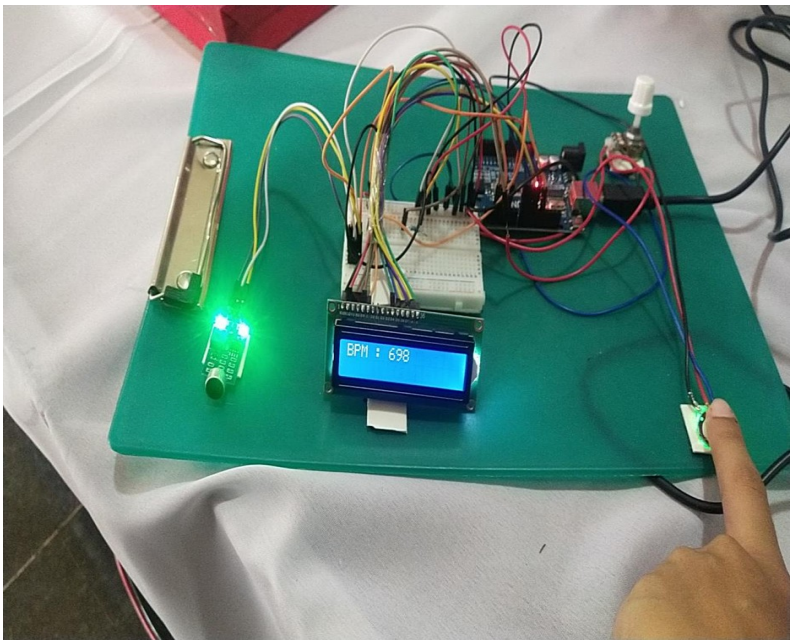
CHAPTER 5. DIAGRAMS

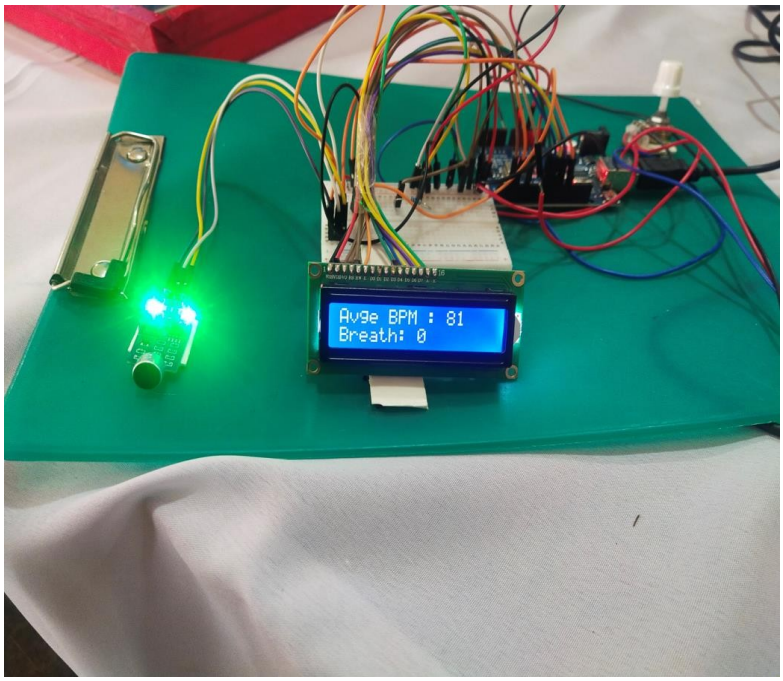
5.1 CIRCUIT DIAGRAM:

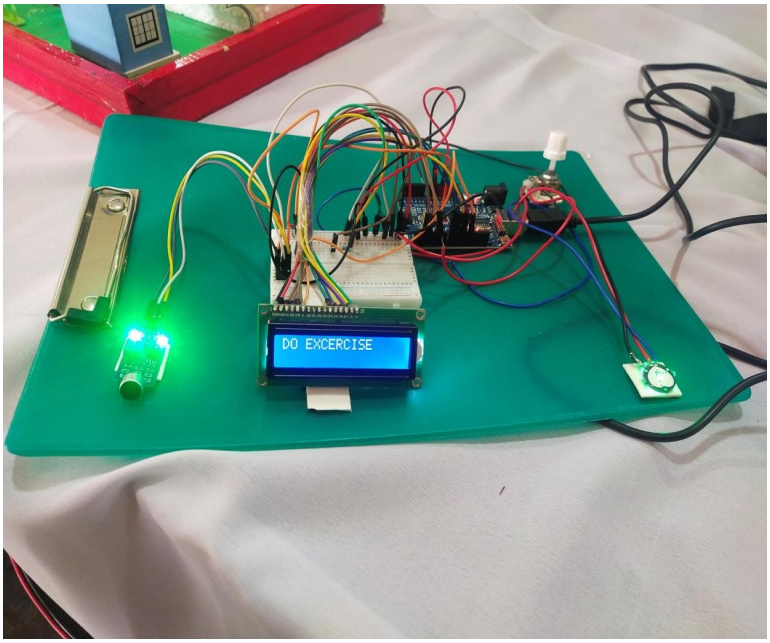


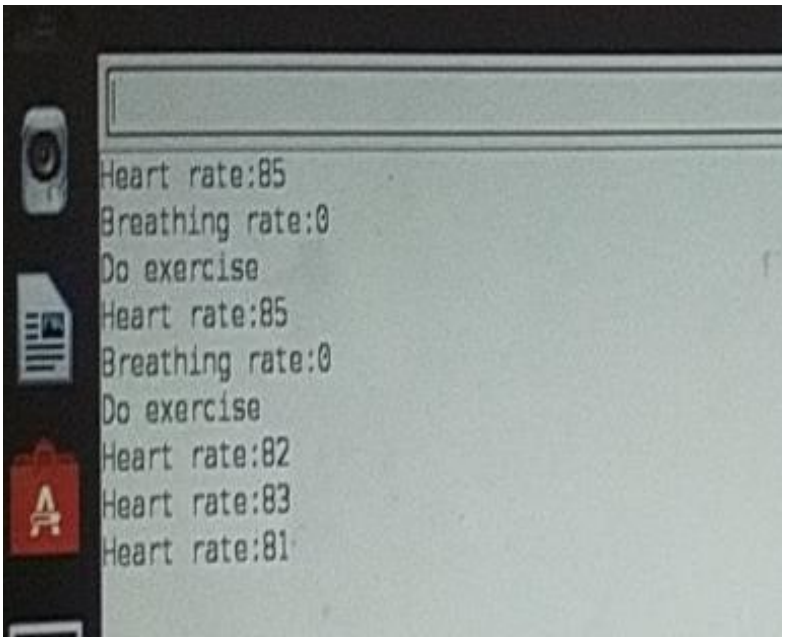
Arduino Heart Rate Monitoring Device

5.2 OUTPUT DIAGRAMS:






DO EXCERCISE


Heart rate:85
Breathing rate:0
Do exercise
Heart rate:85
Breathing rate:0
Do exercise
Heart rate:82
Heart rate:83
Heart rate:81

CHAPTER 6.

6.1 APPLICATONS OF IOT

- Symptom tracking apps that send updates on responses to treatment to the physician and which can avoid hospitialization.
- Connected hospital equipment that notifies doctors of their current location ,informs the hospital management of replacement needs,and monitors staff performance
- Remote temperature monitering ensuring the correct transportation and storage of vaccines.
- Healthcare IT solutions that remind patients to refill medication and digestable sensors that trigger a notification if the medication hasn’t been taken on time.
- Continuous Gulcose moniters(CGM) and smart insulin pens that record and recommend the time and the amount of insulin dose injection which come to the rescue of diabetics
- Smart inhalers connected to an app that help people with asthama and pulmonary disease understand what causes the sympotoms and predict allergens

6.2 ADVANTAGES

The main advantages of IoT implementation in healthcare:

- **Remote monitoring**: Real-time remote monitoring via connected IoT devices and smart alerts can diagnose illnesses, treat diseases, and save lives in case of a medical emergency.
- **Prevention**: Smart sensors analyze health conditions, lifestyle choices, and the environment and recommend preventative measures, which will reduce the occurrence of diseases and acute states.
- **Reduction of healthcare costs**: IoT reduces costly visits to doctors and hospital admissions and makes testing more affordable.
- **Medical data accessibility**: Accessibility of electronic medical records allow patients to receive quality care and help healthcare providers make the right medical decisions and prevent complications.
- **Improved treatment management**: IoT devices help track the administration of drugs and the response to the treatment and reduce medical errors.
- **Improved healthcare management**: Using IoT devices, healthcare authorities can get valuable information about equipment and staff effectiveness and use it to suggest innovations.
- **Research**: Since IoT devices are can collect and analyze a massive amount of data, they have a high potential for medical research purposes.

6.3 DISADVANTAGES

- **Security and privacy**: Security and privacy remain a major concern deterring users from using IoT technology for medical purposes, as healthcare monitoring solutions have the potential to be breached or hacked. The leak of sensitive information about the patient's health and location and meddling with sensor data can have grave consequences, which would counter the benefits of IoT.

- **Risk of failure**: Failure or bugs in the hardware or even power failure can impact the performance of sensors and connected equipment placing healthcare operations at risk. In addition, skipping a scheduled software update may be even more hazardous than skipping a doctor's checkup.

- **Integration**: There's no consensus regarding IoT protocols and standards, so devices produced by different manufacturers may not work well together. The lack of uniformity prevents full-scale integration of IoT, therefore limiting its potential effectiveness.

- **Cost**: While IoT promises to reduce the cost of healthcare in the long term, the cost of its implementation in hospitals and staff training is quite high.

CHAPTER 7. CONCULSION

- This IOT based device allows users to determine their health parameters,which could help regulate their health over time.Eventually the patients could seek medical assitance if the need arises.As we know the IOT is now considered one of the desirable solutions in health monitering.It makes sure that the parameter data is secured in side the cloud and the most important thing is that any doctor can moniter the health of any patient at any distance.The system could be improved and adjusted in a variety of ways in the future.the sensors used in the system can improved and can measure several health parameters when additional sensors are added.For the system’s security ,new alogrithms may be integrated with the whole system.

CHAPTER 8. REFERENCE

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