PROJECT ON TEMPERATURE BASED VENTILATION SYSTEM

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1. ABSTRACT

The last decade has witnessed an increasing number of deaths caused by chronic and cardiovascular diseases (CVDs) in all countries across the world. CVDs are disorders affecting the blood vessels and the heart. CVDs involving the blood vessels are known as vascular diseases, such as coronary artery disease. Those involving the heart include heart failure, cardiomyopathy, rheumatic heart diseases, stroke, heart attack, and arrhythmias.

According to the World Health Organization (WHO), CVDs are the number one cause of death globally, with 17.9 million deaths every year . It remains the number one cause of death of all Americans, claiming more than 840,000 lives in 2016 . Furthermore, the European Health Network European Cardiovascular Disease Statistics 2017 edition revealed that CVDs cause 3.9 million deaths in Europe and over 1.8 million deaths in the European Union (EU) yearly. This accounts for 45% of all deaths in Europe and 37% of all deaths in the EU.

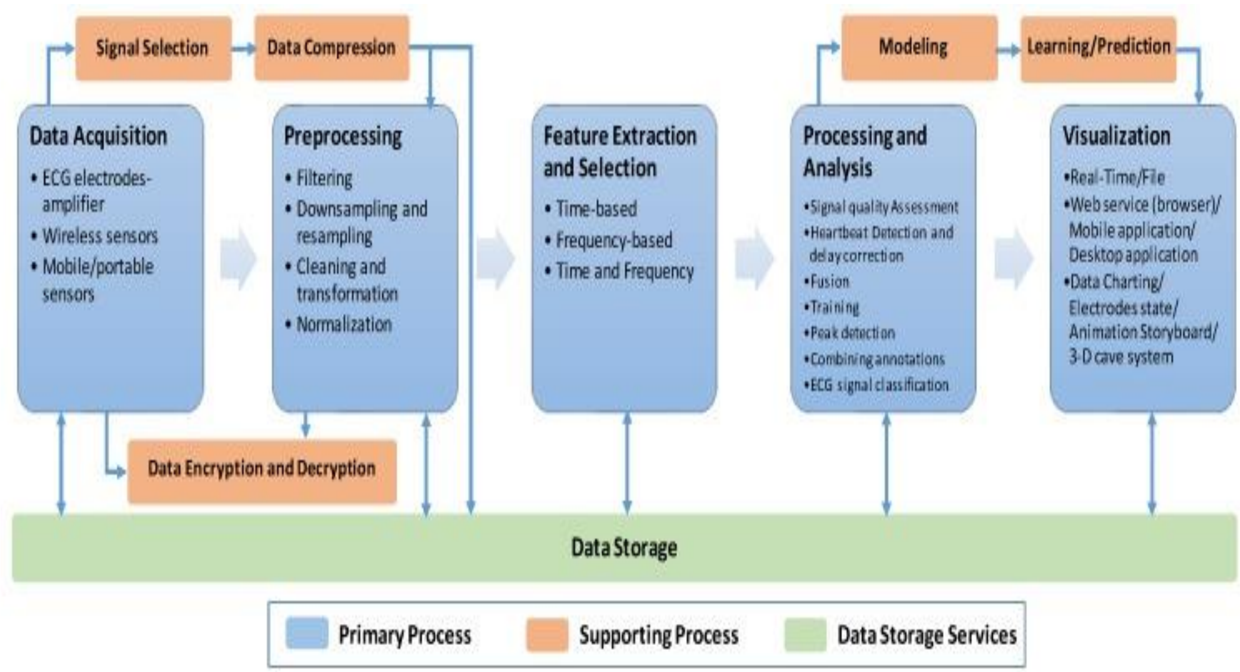
Continuous heart rate monitoring and immediate heartbeat detection are primary concerns in contemporary healthcare. Experimental evidence has shown that many of the CVDs could be better diagnosed, controlled, and prevented through continuous monitoring, as well as analysis of electrocardiogram (ECG) signals. Hence, the monitoring of physiological signals, such as electrocardiogram (ECG) signals, offers a new holistic paradigm for the assessment of CVDs, supporting disease control and prevention. With advances in sensor technology, communication infrastructure, data processing, and modeling as well as analytics algorithms the risk of impairments could be better addressed more than ever done before. This, in turn, would introduce a new era of smart, proactive healthcare especially with the great challenge of limited medical resources.

2. BASIC LOGIC NEED TO BE KNOWN

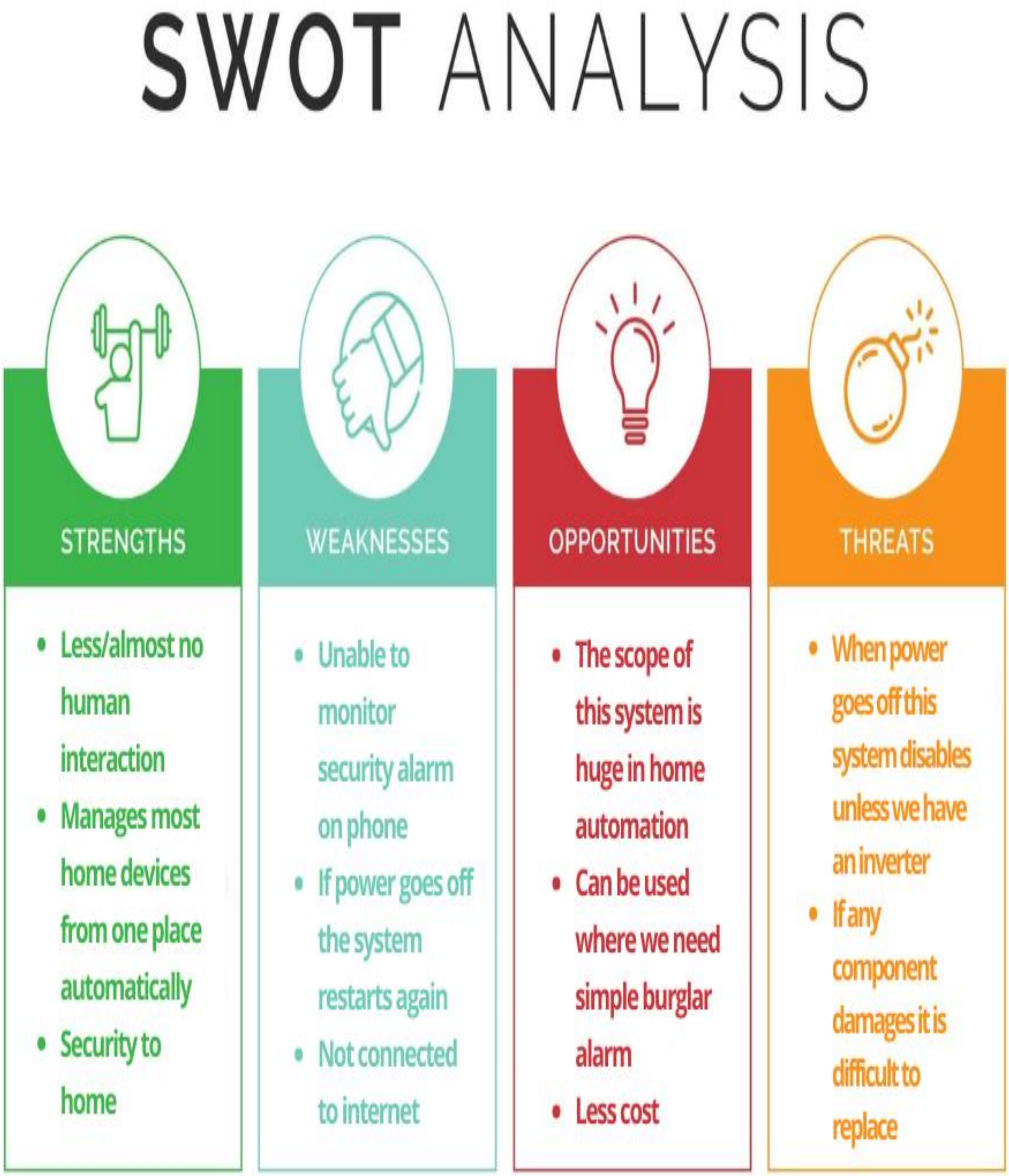
ECG monitoring systems have been developed and widely used in the healthcare sector for the past few decades and have significantly evolved over time due to the emergence of smart enabling technologies . Nowadays, ECG monitoring systems are used in hospitals , homes , outpatient ambulatory settings , and in remote contexts . They also employ a wide range of technologies such as IoT, edge computing , and mobile computing. In addition, they implement various computational settings in terms of processing frequencies, as well as monitoring schemes. They have also evolved to serve purposes and targets other than disease diagnosis and control, including daily activities , sports , and even mode-related purposes.

This massive diversity in ECG monitoring systems' contexts, technologies, computational schemes, and purposes makes it hard for researchers and professionals to design, classify, and analyze ECG monitoring systems. Some efforts attempted to provide a common understanding of ECG monitoring systems' processes , guiding the design of efficient monitoring systems. However, these studies lack comprehensiveness and completeness. They work for specific contexts, serve specific targets, or are suitable for specific technologies. This makes the available ECG monitoring system processes and architectures hard to generalize and reuse. On the other hand, some studies attempted to analyze ECG monitoring systems' attributes and provide classification taxonomies, supporting better analysis and understanding of the ECG systems reported in the literature. However, exiting reviews related to ECG monitoring in the literature can be intuitive and incomprehensive. They do not consider the latest technological trends , and they target very narrow research niches, such as wearable sensors , mobile sensors , disease diagnosis , heartbeat detection , emotion recognition , or ECG compression methods . Hence, there is a need to provide a comprehensive, expert-verified taxonomy of ECG monitoring systems, a common architecture, and a complete set of processes to guide the classification, analysis, and design of these systems.

Therefore, in this work, we propose an expert-verified taxonomy of ECG monitoring systems, a generic architectural model, and a complete, general set of processes to support better understanding, analysis, design, and validation of ECG monitoring systems from a broader perspective. Our experts' taxonomy is composed of five distinct, cohesive clusters. Each cluster focuses on one dimension of ECG monitoring systems, detailing the features and attributes of these systems in that dimension. These include monitoring contexts, technologies, schemes, targets, and futuristic monitoring systems. In addition to our experts' taxonomy, the proposed ECG monitoring systems' layered architecture depicts essential structural components and elements of ECG monitoring systems, their interfaces, and the data inputs/outputs of each layer. We also complement our experts' taxonomy and the generic architecture with a comprehensive ECG monitoring process model, highlighting the major processes, sub-processes, and supporting processes, emphasizing factors adding value to each process. Based on the proposed taxonomy, architecture, and common process model, we conduct an extensive, thorough analysis of the literature surrounding ECG monitoring systems, highlighting systems' categories, attributes, functions, challenges, and current trends, leading to a panorama of ECG monitoring systems. To our best knowledge, this is the most comprehensive, expert-verified review of ECG monitoring systems to date.

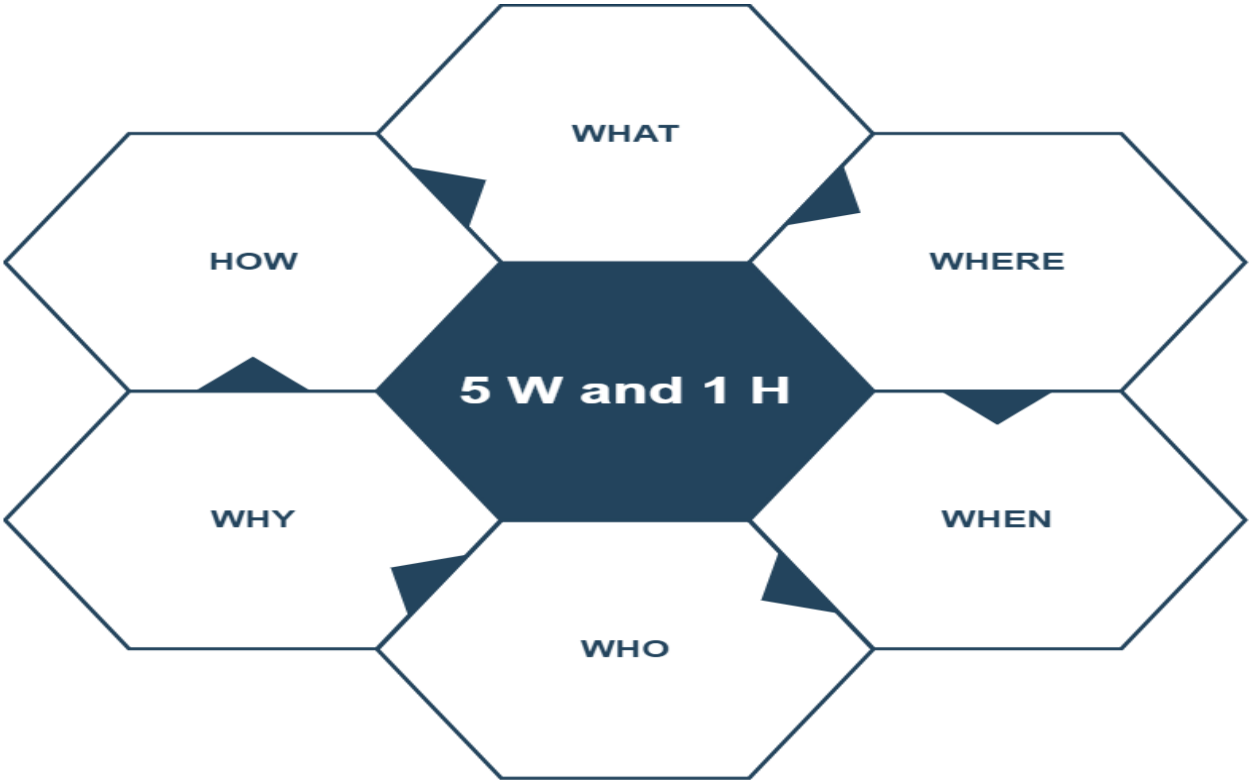


3. SWOT ANALYSIS



	Helpful	Harmful
Internal	**Strengths** (S) • Biomarkers are used in and work for other diseases (for example, cancer) • Acute insults, such as injury, infection or genetic abnormalities, enable identification of at-risk individuals • Combinations of biomarkers could improve prediction	**Weaknesses** (W) • Only initial studies are currently available, with no rigorous characterization of biomarkers • Biomarkers in categories other than diagnostic are also needed; markers of risk, susceptibility and prognosis are a priority • The diversity of epilepsy means different biomarkers might be needed for different aetiologies • Preparation of samples is not harmonized between centres • Phenotypes and the quality of samples collected are not characterized well • Competence in informatics is needed
External	**Opportunities** (O) • Some promising results have already been obtained • The aims are technically feasible • Technical improvements are on the horizon; for example, the Human Brain Project and the BRAIN Initiative • Repositories provide an opportunity for data sharing • Many modalities for biomarker analysis are standard of care; for example, blood tests, EEG and ECG • Some biomarkers are ready to move to phase III studies; for example, EEG for TSC • CDEs and quality control examples are available	**Threats** (T) • Future investments might be limited if barriers to the development of anti-epileptogenic therapies are not lowered • Existing data repositories are of low quality and heterogeneous • The field might not be prepared • Acquisition of some biomarkers, such as imaging markers, could have adverse effects

4. 5W's and 1'H



4.1. Who:

The project can be used almost by all the people who is suffereing from heart related problems.

4.2. What:

BPM ,Heart rate and distance to the hospital must be noted in real time.

4.3. When:

This project can be implemented in all real time application and real time life of patients is connected to it.

4.4. Where:

Simply can also be worn by the patients in terms oa bands or also a monitoring system in environment areas.

4.5. Why:

Patients in Hospitals who suffer from this kind of problem, can be implemented to avoid medical accidents

4.6. How:

There might not be a valid reason for this kind of accident occurs, it is discrete may be due to temperature or any environmental and mental issues.

5. DETAIL REQUIREMENTS

5.1. HIGH LEVEL REQUIREMENTS:

ID	**Description**	**Status**
HLR1	Atmega AVR-16 series (x 2) microcontroller	Implemented
HLR2	Embedded C language	Implemented
HLR3	LCD display	Implemented
HLR4	Gcc avr compiler	Implemented
HLR5	Heart beat sensor (used potentiometer)	Implemented

5.2. LOW LEVEL REQUIREMENTS:

ID	**Description**	**Status**
LLR1	SIM 900D GSM module	Implemented
LLR2	4x4 Keypad module	Implemented
LLR3	Microcontroller (Atmega328)	Implemented
LLR4	Memory (EEPROM)	Implemented

6. SIMPLE ALGORITHM:

1.start

2.input bpm

3.input distance   //in meters

5.if ((bpm>100 || bpm<60) && (dis<=100)

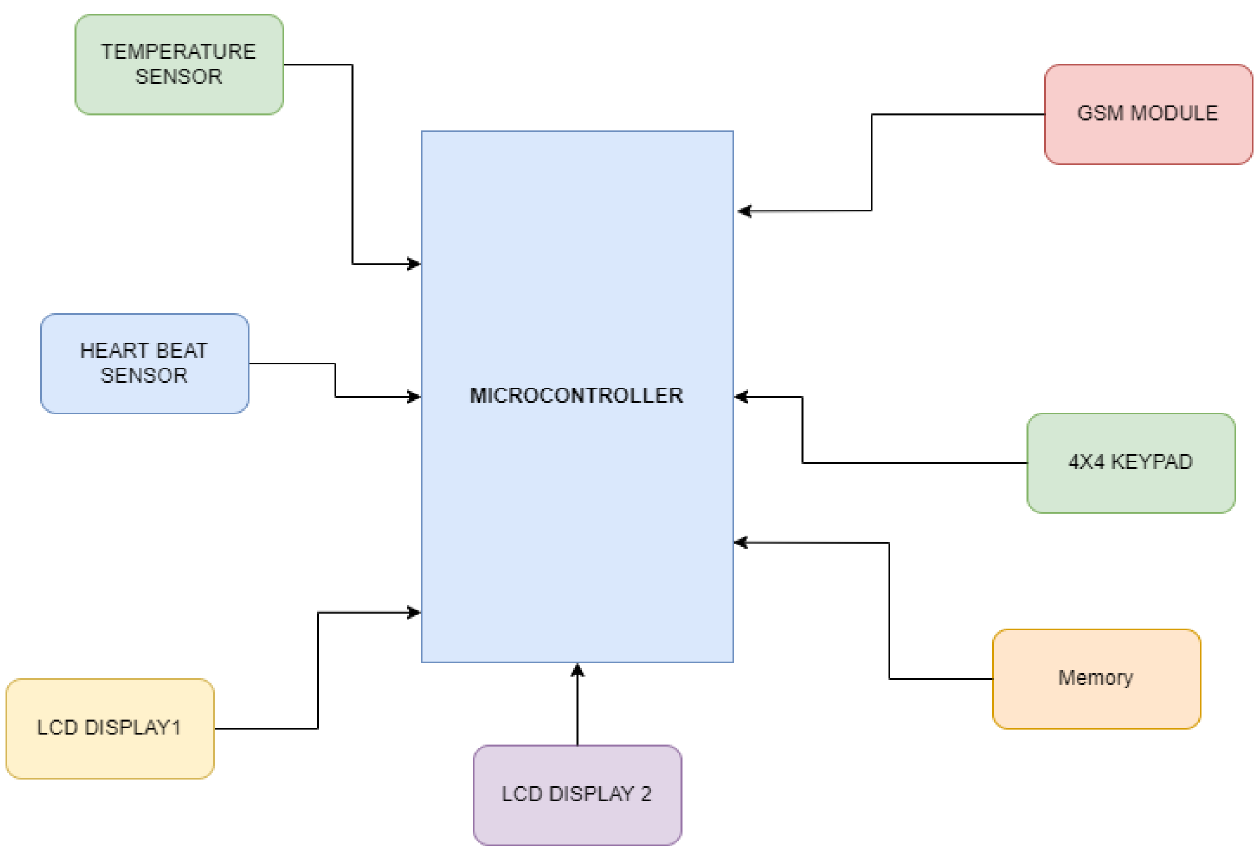
6.call the doctor via stored number in keypad

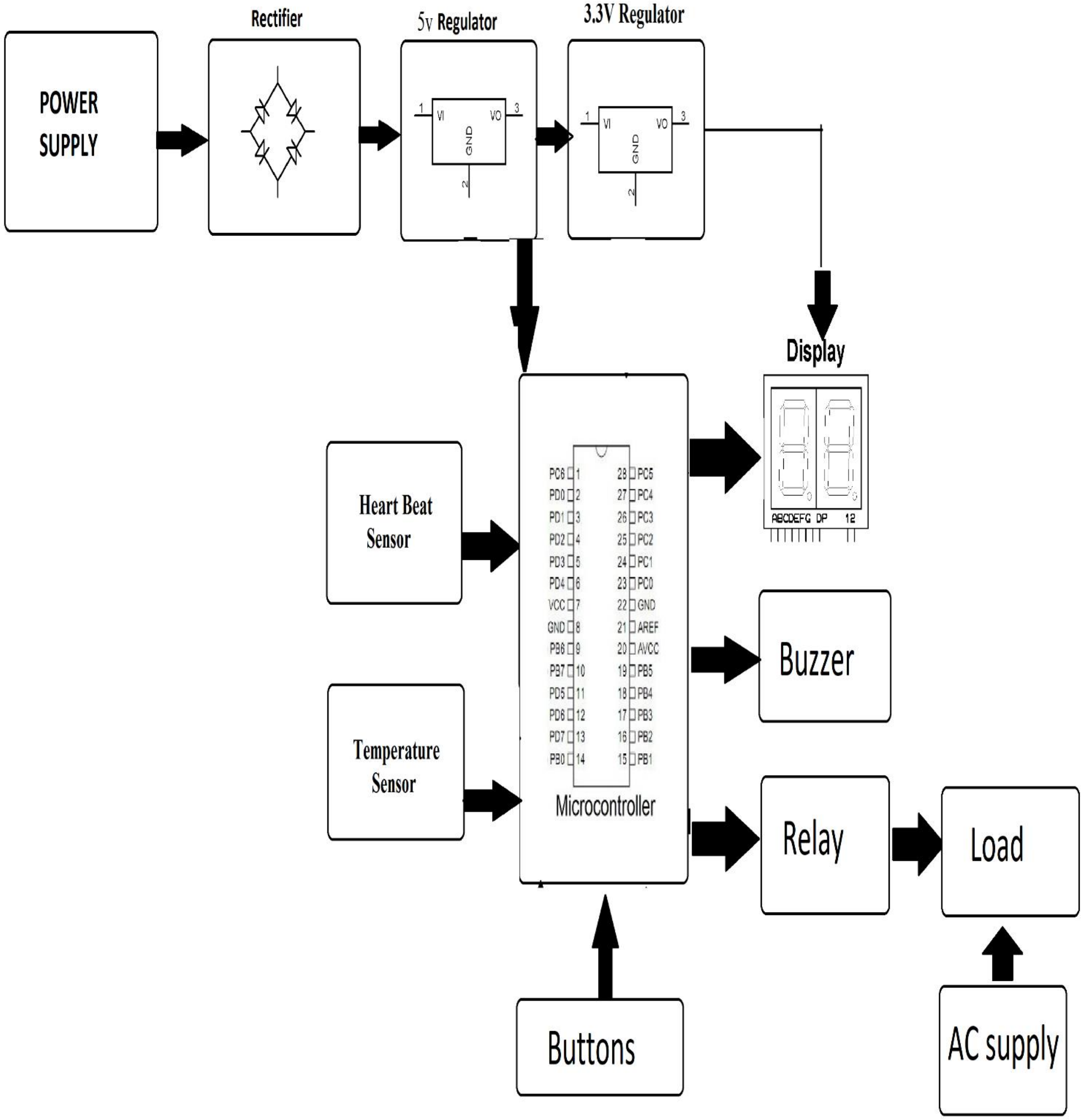
7.else

8.print patient is safe for now

9.stop

7. ARCHITECTURE:




Rectifier
5v Regulator
3.3V Regulator
POWER SUPPLY
VI
VO
GND
Display
Heart Beat Sensor
Temperature Sensor
Microcontroller
Buzzer
Relay
Load
Buttons
AC supply

8. FLOW DIAGRAM: