

Child Health Care Monitoring Using Sensor Technology

Krishana Tupe¹, Vinod Jandrao², Sachin Chappe³, Pawankumar Bhusalwad⁴,
Dr.A.V.Turukmane⁵

¹P.E.S.College of Engineering Aurangabad, Maharashtra, India

²P.E.S. College of Engineering Aurangabad, Maharashtra, India

³P.E.S. College of Engineering Aurangabad, Maharashtra, India

⁴P.E.S. College of Engineering Aurangabad, Maharashtra, India

⁵ Assistant Professor, Dept. of Computer Science & Engineering, P.E.S.C.O.E Aurangabad, Maharashtra, India.

Abstract - Child Health Monitoring Using Sensor Technology is a framework to support a unique health care for children. Using this framework the parents and other related persons who take care the child's and keep intense monitoring on the children's physical health condition from anywhere. This framework also can be used to reduce or prevent things that can be harmful for children's health, grow, and development progress. The CHC (Child Health Care) will be provides many features and such as notification and monitoring system to a professional health care of school as well as parent, based on the children (student) record. This framework will improve the children's health, grow and development progress.

Key Words: Child care, Child health monitoring, Sensor technology, Student, Framework.

1. INTRODUCTION

Child health care monitoring is one of the most important factors of child's growth and development in the school. Child which are age 5-10 years they need proper monitoring about their physical and mental conditions. Monitoring of child is one very important duty of the parent. But busy schedule of parents, lack of awareness about how to monitor child?, this is not done properly by parents. So that it will affect directly on to the child's life & development progress in the school academics. A child with good health and fitness in life (physically as well as mentally) then he/she will be live healthy in and happy life.

Child which are age 5-10 years they are not able to understand their physical as well as mental condition of their body because of their weak immunity system and weak ability to communicate to anyone's. If the parent gives better monitoring on their child's then the growth and development of child's will be increased (i.e. Performance of child in growth and development progress will be increased).In earlier, because of lack of child health care monitoring and lack of awareness in parent due to the growth and development of child's is degraded. Some of the child's are died because of some normal causes that are easily treated or prevented by the child monitoring.

The causes are such as fear(worry) when teacher speak in school rudely or loudly with child, heart beats will also

increase when teacher or any person speak loudly or rudely with child in school so can the chances of causes like heart attacks, etc. will be increased.

Child health care monitoring using sensor technology provides the quite unique and flexible solution to overcome the causes of health monitoring.it will reduce the issues related to health of Childs(students).This framework is provided to a school organization to monitor the child's physical condition (Heartbeat and Body temperature) can be sensed using sensors. The aim of this paper to provide the information about child's health (heart rate and body temperature) monitoring via SMS (Short Messaging Service) and web application to a parent as well as associated teacher and related persons who takes care of child(student). This framework provides the health related information to an authorized parent anywhere between school times using the web application. It will provide automatic monitoring service to a parent incidentally. This framework requires an internet connection to access the information of child by parent. By using this framework the causes of health monitoring that are easily treated or prevented and it will also increase the performance of the child's.

2. LITERATURE SURVEY

2.1 Existing System

Electronic Medical Record (EMR) is the work related to a health care monitoring technology of child's. In existing system there are major two actors one is Child and another is Clinic Administration. The child is registered by the parent. Parent needs to go to clinic administration and register their child details to get this monitoring service. This service can be accessed by the parent by using smartphone. The administrator plays role like a Medical service provider. When the child is registered successfully then administrator provides the services on the basis of electronic Medical Record (EMR) that are given by parent to a parent such as Food related information, Medical related information via SMS. It also provides the reminder monitoring service regularly or incidentally. It also gives the responds to a user queries.

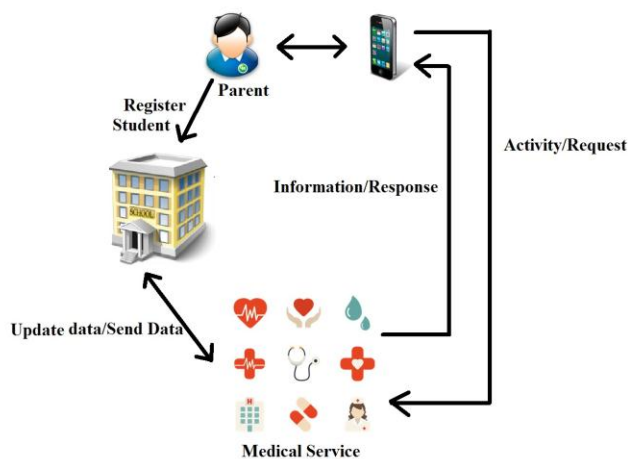


Fig -1: Medical Service Provider.

3. PROPOSED SYSTEM

This project we will propose a child health care framework using sensor technology that can be based on the child’s physical condition and enable to provide the information accurately, directly to parents, persons who takes care the child, and school persons. In this framework we are uses two sensors one is Heart Rate and second one is body temperature. Heart rate sensor provides the Heart Beats of child’s per minutes and Body Temperature sensor gives the output of temperature in Celsius of child. Heart rate and body temperature sensor are fitted into a card (electronic sensor card) formerly called as I-Card.

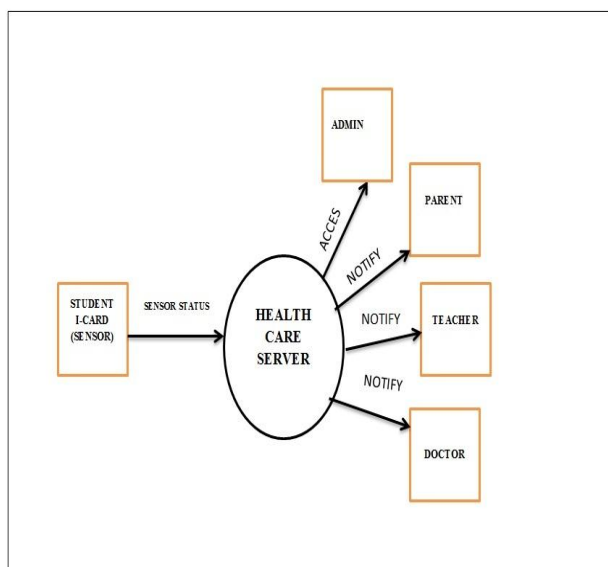


Fig -2: DFD of Child Health Care Monitoring Using Sensor Technology

In fig.2 indicates that this is high abstraction view of flow of data in this framework. In this framework student ID card send the data to a framework and then framework will check

the data and then it will send notification to parents and other relevant persons who take care the children.

This framework quite similar to an existing system, In which parent needs to registered their child by go to school administrator. School administrator registered child (student) and after successful registration administrator give one unique user id and password to parent for accessing the child information via web application using internet. This framework provides each Student one I-card. Card sense the physical condition of a particular child’s (students) using s sensors (Temperature & Heart rate) and sends that information will to the server. Server will check that information of that child & check if it is harmful or not. If it is harmful to a child then it will send notification/reminder SMS to its parent as well as school persons. This framework also provides a Web Application to check child information time to time via internet. Only authorized person can access only their child information. This framework provides features such as child school record, child school performance record, child health physical condition to a parent. Using web application parent gets the direct & accurate child information anywhere but only in official school time. Parent can also change their password.

Table -1: Advantages and Disadvantages of Proposed System

ADVANTAGES	DISADVANTAGES
This framework is unique as compare to other child monitoring frameworks.	Without internet connection parent can't get the information.
It is reliable and flexible.	Smart phone is required to access information fast.
Easy to communicate and gets the accurate health information of child.	Administration tasks are increased to maintain data.
It is centralized and parent can access from anywhere.	Administrator needs to keep track on each notification.
It is used to predict the area where max number of child's are affected.	
It will increase the growth and development progress of child's.	

❖ **Following are the Modules of Proposed System**

3.1 Student ID-Card (Temperature and Heartbeat pulse Sensor)

3.1.1 LM35 Temperature

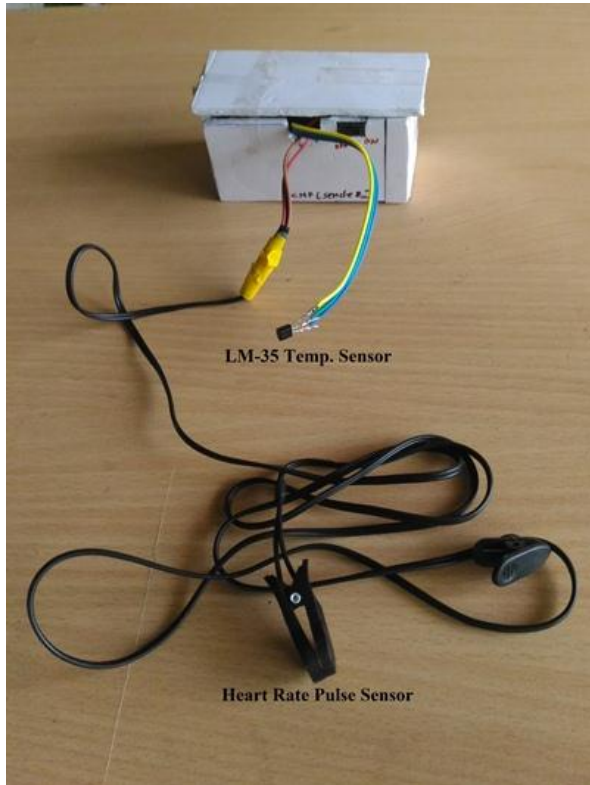


Fig -3: LM-35 Temperature & Heart Rate Pulse Sensor.

LM35 is integrated-circuit (IC) temperature sensor. It has 3 pins VCC, OUTPUT, GND. It provides the output in -55°C to 150°C temperature range. No need to subtract the constant voltage to get desired output temperature in Celsius. The device is used with + and - supplies or with 1 power supplies. LM35 sensor operates from 4 voltages to 30 voltages. Cost is low and accuracy is high as compare to other temperature sensor.

3.1.2 Heartbeat Pulse Sensor.

Heart rate measurement is very difficult to measure. The pulse sensor is very useful to solve this problem. Pulse sensor amped heart-rate sensor generally used for Arduino. It contains simple optical heart rate sensor and noise reduction circuit design due to which is fast and reliable to get readings accurately. It is working on 5 voltage inputs. We need to connect heart rate sensor with child's fingerprint so we will get the accurate heart beats. Arduino programs are used to gets the heart beats on to the server. Heart beat

pulse sensors having in build male headers connectors so there is no need for soldering

3.2 Administrator

- It has full authorization to manage the framework.
- Admin can keep control on all modules.
- Admin can send notification to class teacher.
- Admin can be Headmaster of a School/Institute.
- Admin Module Associated with all modules.

3.3 Teacher

- A teacher module is the class teacher of a particular class.
- class teacher have one class .
- class may contain 30-40 students .
- The duty of class teacher to keep track of every student who are admitted in there class.
- Teacher Module is associated with a Student as well as Admin.

3.4 Parent

- The parents are associated with a student.
- The parent module is used to notify its child health information by an admin or child monitoring server.
- The parent can gets their child health detail via web application.

3.5 Student

- The student is important Module in this framework.
- Each Student has one Unique ID Card.
- The Unique ID Card gets the physical information of student and sends it to the child heath monitoring server.
- ID-card equipped with heartbeat pulse and body temperature sensor.

4. CONCLUSIONS

In this paper we will propose a child health care monitoring framework that can be provides information accurately, directly to parents, person who take care the child, and school persons. A framework for health systems provides service-oriented architecture in the field of e-health monitoring system. This framework would offer a high flexibility and extensibility which are required for the field of healthcare. By using this framework parents, person who take care of child can monitor alteration in body temperature and heart rate of child as soon as possible accurately, so they can analyze the physical characteristics of child and get decisions properly.

5. FUTURE SCOPE

This project is very useful in e-health monitoring system. By using wearable health monitoring devices we can monitor various physical characteristics of a person and distribute information by using health web application that used by parents on the smart phone. We can extend the functionality of this project by using IOT (Internet of Things). This framework also can be used to prevent things that can be harmful for children's health, grow, and development. Further development can also be done using this project such as implement a device that will detect the position of child.

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BIOGRAPHIES



Krishana H. Tupe
BECSE-2017
P.E.S. College Of Engineering
Aurangabad, Maharashtra.



Vinod P. Jandrao
BECSE-2017
P.E.S. College Of Engineering
Aurangabad, Maharashtra.



Sachin S. Chappe
BECSE-2017
P.E.S. College Of Engineering
Aurangabad, Maharashtra.



Pawankumar G. Bhusalwad
BECSE-2017
P.E.S. College Of Engineering
Aurangabad, Maharashtra.



Dr. Anil V. Turukmane
Assistant Professor, Dept. of
Computer Science & Engineering,
P.E.S.C.O.E Aurangabad