

Multi-Speciality Hospital Management System

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ABSTRACT—This paper presents a software for a Multi- Speciality Hospital Management system using MYSQL Database for storage, retrieval and manipulation of data entered through a website employing Web Development Tools. The software provides a web interface between the user and Hospital, for the convenience of the user. The goal of the software is to make all the processes throughout the hospital easily accessible and more convenient to the visitors and staff of the Hospital. Traditionally, most of the management in hospitals was done manually on paper so, the storage and maintenance of these files was a real tedious task. It was more prone to errors and retrieval of particular data was difficult. With the help of this software, anyone can easily get the required information like timings of hospital, Doctors availability, Booking of appointments and availability of Rooms etc. The Website also have some frequently asked questions with answers that makes it easier for visitors to understand the working of the hospital. By using different types of sensors like MAX30100, LM35, and DHT and ESP 32 dev board we have designed a Patient Health Monitoring System

I. INTRODUCTION

The purpose of the project entitled as “MULTI- SPECIALITY HOSPITAL MANAGEMENT SYSTEM” is to develop a software which is simple, easy-to-use and cost-effective to computerize the front office management of hospital It mainly deals with the collection and storage of patient’s information like diagnosis details, medical history etc. Traditionally, it was done manually on paper which is quite hectic and error-prone. The main function of the system is

to register and store patient details and their appointment details through a website so later we can retrieve these details as and when required, and also to manipulate these details meaningfully. Whereas system output is to get these details on to the screen. The Hospital Management System is accessible either by an administrator or receptionist. Only they can add data into the database and also can retrieve these data easily. The data is well protected for personal use and this makes the data processing very fast.

Powerful, flexible and easy-to-use software for anyone who visits your website, designed and developed to provide real value to hospitals. Hospital management systems are designed to help general hospitals better manage all the different facilities and processes performed in hospitals. An integrated, end-to-end management system that provides essential information across hospitals to support effective patient and hospital care decision-making.

II. PRESENT SYSTEM

After going through some research regarding present systems for Hospital Management we found some traditional methods, following are the observations deduced:

- It is very difficult to retrieve the information such as patient’s history, medicines prescribed to patient etc. And this results inconvenience and wastage of time.
- Various transactions in hospitals generate a lot of information and to store that information to right place it requires large amount of time and efforts.
- Another difficult task is preparation of

accurate and prompt result as it is very difficult to collect the information in various registers.

- It is very difficult and time consuming for hospital staff to collect and compute patient data, staff Payment receipts. And this results delay in medical reports.
- Currently, The hospital administration uses health record files to store patient data such as history, medicines prescribed etc. And this file based architecture faces some security problems such as illegal modification in that data or update the patients record.
- Hence the hospital staff usually take a lot of time to collect all this information, to retrieve the data, records.
- The paper work reduces the efficiency of the System.
- Information about Patients is done by just writing the Patients name, age and gender. But this information is not stored permanently. Whenever the Patient comes up his information is stored freshly. It results wastage of time, efforts and wastage of papers.
- The health record of patient such as history, medicines, diagnosis information is stored into one document. After some period of time it is destroyed to reduce the paper load in the office.
- Vaccination records of children are also maintained in file.

All this work is done manually by the receptionist and other operational staff and lot of papers are needed to be handled and taken care of.

Hence the Multi-speciality Hospital Management System is designed for any hospital to replace their existing paper based system by new architecture generated using high technology.

The modified system is used for the administration of hospital like room availability, staff and operating room schedules. These services are to be executed in an efficient, cost-effective and easy-to-use manner.

III. METHODOLOGY

Methodology, as the name suggests, includes the steps and methods followed to develop the project. The basic methodology, we followed, includes the development of web application and its interface with the database. The web application will work as an interface between patients, doctors and management staff, with the database supporting it.

Let's have a look at the functionalities that'll be provided with the web application.

First and perhaps the most important step is, each one of the staff, patient and doctor will have separate logins, which will redirect them to their own home page.

a) For staff

Our research says that, the medical and non-medical staff generally needs an access to appointments of a patient or a doctor, allotted and non-allotted rooms and furthermore appointment history of a patient. So, after logging in, the staff dashboard will be provided with all these functions.

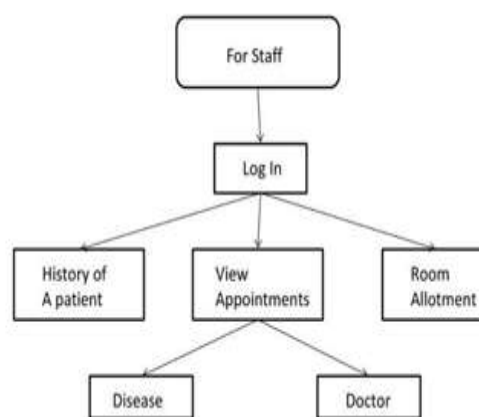


Fig. 3.1 Flow Chart for Staff

b) For doctors

Unlike staff, the doctor is not concerned about the room allotments of the hospital. Hence, he / she'll only have the access to the patient's history. Not to mention, only the doctor will be able to modify the history of his patients. He/she can also prescribe the medicines to the patients. Moreover, he/she can also give the appointments considering his/her availability or consultation time, so the patients can book it. The doctor will also be able to modify already provided slots.

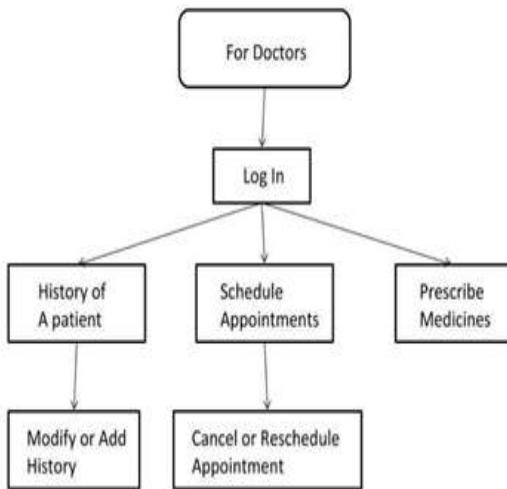


Fig. 3.2 Flow Chart for Doctors

c) **For patients**

Patient is the most important person in all these aspects and perspectives. So, once logged in, he/she can search about the doctor's availability and can book appointment with him. Furthermore, if the patient is not aware that which doctor he/she should consult, then he/she can search the doctors and view their speciality and can proceed accordingly. As well as a patient can view or modify his history of consultations, in case he's consulted more than one doctors.

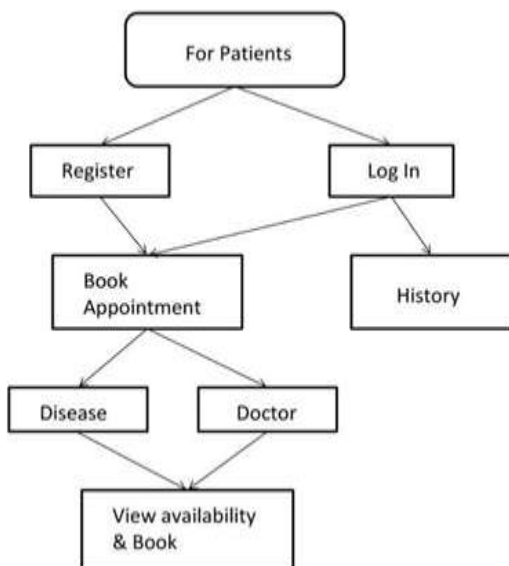


Fig. 3.3 Flow Chart for Staff

IV. HARDWARE COMPONENTS AND WORKING

Nowadays, internet has become the most important part of our lives. We even can't imagine our life without the internet and in pandemic internet is the only path for the day to day activities like education, commercial language and HTML for the web page.

In this system, we had used the following hardware components-

1. ESP32

ESP32 is the most powerful MCU module. It has a wide range of applications. ESP32 has an inbuilt WiFi module in it and an inbuilt Bluetooth module also due to which the range of the working has increased. This module is fast, reliable, robust, efficient, and cost-effective also with multiple functionalities. In this project we have used ESP32 -Dev module as the name suggests it is the module developed by Espressif. It is user friendly and secure module as it supports many WiFi and security protocols. It has many other features like there is clock and timer, sufficient memory and we can use this module for advanced peripheral interfaces.

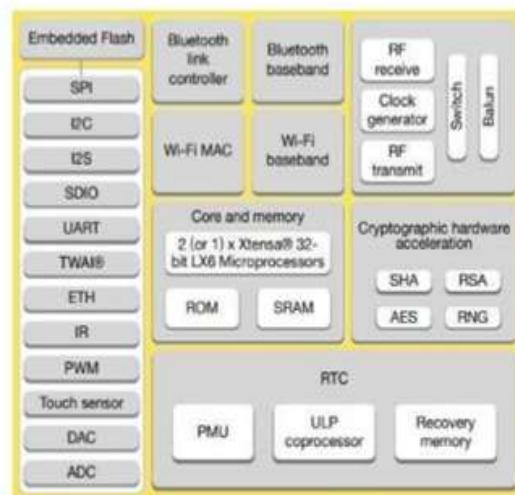


Fig 4.1. ESP32 Development board

Specifications:

- Single or dual-core 32-bit LX6 microprocessor up to 240MHz.
- 520KB SRAM, 448KB ROM and 16KB RTC SRAM. Supports Wi-Fi 802.11 b/g/n up to 150Mbps.
- Supports classic Bluetooth v4.2 and BLE specifications.
- Serial connection includes 4 SPI ports, 2 I2C ports, 2 I2S ports, and 3 UART ports.
- Up to 18 channels of 12-bit serial ADC and 2 channels of 8-bit DAC, 34 programmable GPIOs.
- Slave controller for SDIO/SPI.
- Ethernet MAC for physical LAN communication (requires external PHY). Secure Boot and Flash Encryption Motor PWM and up to 16 channels of LED PWM.

2. DS18B20

This Sensor is a one wire temperature sensor It is manufactured by Dallas Semiconductor corporation . It only requires a pin for 2 way communication with the esp32 board . There are two types of this DS18B20 sensor one is T0-92 package sensor which is perfectly same as our normal transistor and the second type is waterproof probe style sensor which is used to when we need to measure the temperature of the substance or body which is in deep contact of the water.



Fig 4.2. DS18B20

3. DHT 11 Temperature Sensor

It is a humidity sensor whose temperature measurement range is from -40°C to +125°C and its has precision of +-5 °C. It measures Humidity

also . it has separate NTC for the measurement of temperature. And controller circuit foe serial data output as a humidity. It is more efficient, eco-friendly, having less cost and has very less errors

4. MAX30100

The MAX30100 is an integration of pulse oximetry and heart rate monitor sensor. It combines two LED's, a photo-detector, optimized optics, and low-noise analog signal processing to detect pulse oximetry and heart-rate signals. It operates in the range of 1.8V and 3.3V powersupplies.



Fig. 4.3 MAX30100

Pin-out:

- Pin no.1, 7, 8, 14—These number of pins are unused and open pin-outs.
- Pin no.2: SCL.This pin is used for the I2C clock for input.
- Pin no.3: SDA. This is an I2C bidirectional data sending pin-out.
- Pin no.4: PGND.This is pin is used for power ground of drivers of light-emitting diodes.
- Pin no.5 : IR_DRV. This pin is used for the cathode of infrared led to connect with the LED driver's point.
- Pin no.6 : R_DRV. This pin is for the cathode of red LE to connect with its driver point. This can also be suspended in a circuit.
- Pin #9 : R_LED+. This pin is for connecting the red LED to the supply voltage. This pin connects to the infrared LED.
- Pin 10 : IR_LED+. This pin helps connect the anode of the infrared LED to the input voltage. It is connected by a red LED inside.
- Contact number 11 : V dd. This is the input power pinout of this module and can be connected to ground for best performance.
- Pin number 12 : GND

Hardware Circuit:

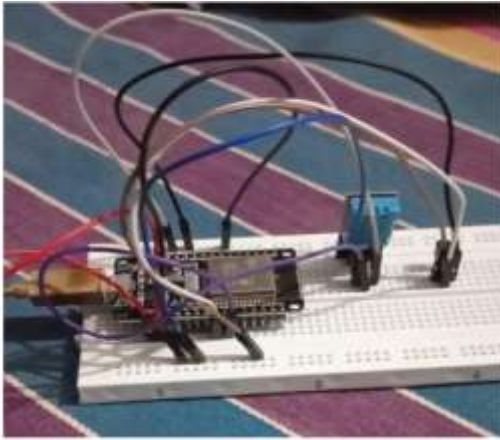


Fig 4.4 Hardware circuit

Output on web-server:



Fig 4.5 Web-page

Output on Serial Monitor:

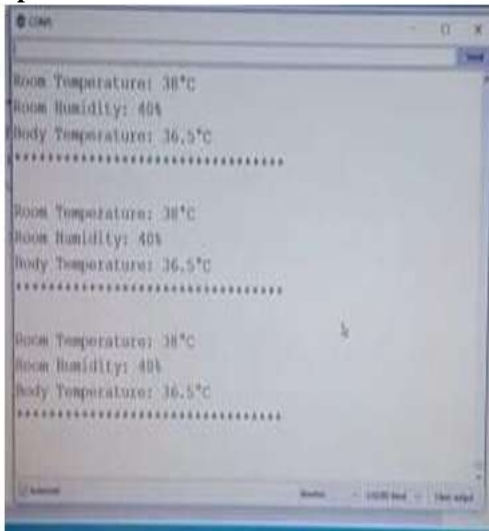


Fig4.6. Serial Monitor

5. HMS Web-pages

I. Home Page



Fig 5.1

II. Services

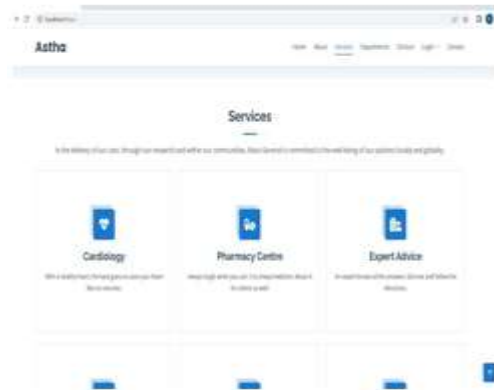


Fig 5.2

III. Department

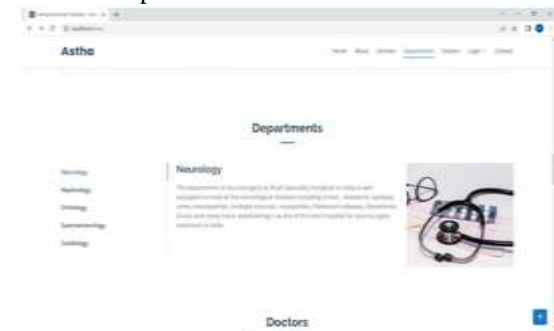


Fig 5.3

IV. Sign-Up page



Fig 5.4

V. Patient's Login

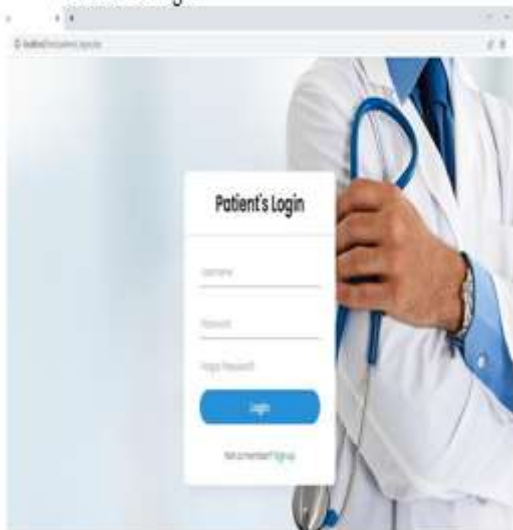


Fig 5.5

VI.FAQ'S



Fig 5.6

VII. Patient's Dashboard



Fig 5.7

VIII. Doctor's Dashboard



Fig 5.8

V. CONCLUSION

By accounting, Hospital Management System many task's of hospital staff and patients will get automated .This system is user friendly, convenient, reliable, robust and fast. In case of any emergency this system will be more helpful for immediate treatment of the patient and on the other hand, this system that is in patient monitoring system doctors monitor the health of the patient remotely even after discharging the patient, This will help to reduce the threat of sudden medical conditions like cardiac arrest. In future also this will help to asses the patient without any physical involvement

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