International Journal of Interdisciplinary Innovative Research &Development (IJIIRD)
ISSN: 2456-236X
Vol. 05 Special Issue 01 | 2020

Smart Meditron

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ABSTRACT

This paper reflects the design of Smart Meditron which is an emerging concept where biomedical and electronics field hybrid to generate a new project. Our proposed system is used to replace the manual work of doctors and nurses. This concept was initially brought into practice by Japan with a need for advancement in the health care sector. Based on the findings, we will reflect on the technology assessment, i.e., in rural areas there can be a possibility where the availability of doctors and nurses on a dedicated time is often a problem.

Keyword : **- NodeMCU, IR sensor, motor, cellphone**

1. INTRODUCTION

Smart Meditron is a vital role performed by Japan to develop an easy and feasible medical field. Artificial intelligence (AI) is a relatively new concept in health care, particularly in nursing practice. Other once-revolutionary technologies developed for high quality, safe patient care are now commonplace in care delivery and education, ranging from electronic health record (EHR) to cellphone health (mHealth), telehealth and sensors for remote patient monitoring and simulation. [1] If the Internet of Things (IoT) is set to transform nursing, it is also starting to change the way nursing is taught. It is likely that technology will fundamentally change nursing over the coming years and, provided it is used correctly, it seems it really could improve the quality of care and lead to increased patient safety. [4] Hospitals are charged with the dual task of keeping patients well while also keeping patients safe. The two are inextricably linked, as patient safety concerns often tie directly into patient health concerns — hand hygiene, transitions of care and medication errors are a few such concerns that come to mind. In certain situations nurses and doctors might not be available to approach patients, one more thing if the patient is suffering from a viral disease like AIDS (acquired immune deficiency syndrome) or bacterial disease like 3rd stage TB (TUBERCULOSIS) OR CANCER patient the nurse does not prefer working for them due to the risk of infections. Also if they are busy with their work they might forget to approach patients at a particular time. Healthcare-associated infections (HAIs) have long plagued health care facilities, both clinically and financially. The protocol including hand hygiene and antimicrobial stewardship play directly into the rate and prevalence of HAIs, and all three are continuously deemed patient safety concerns. According to the CDC, one in every 25 patients will contract an HAI during a hospital stay, and treating such infections costs the health care industry upwards of $9.8 billion, by some estimates. [5] zeLua project and built on the Espressif Non-OS SDK for ESP8266.Introduction related your research work Introduction related your research work Introduction related your research work

2. PROPOSED SYSTEM

The proposed system consists of the following parts-

2.1 NodeMCU

NodeMCU is an open source firmware for which open source prototyping board designs are available. It initially included firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which was based on the ESP-12 module. Later, support for the ESP32 32-bit MCU was added.

2.2 IR Proximity Sensor

IR Proximity Sensor is used to detect objects and obstacles in front of the sensor. The sensor keeps transmitting infrared light and when any object comes near, it is detected by the sensor by monitoring the reflected light from the object. It gives a digital low output on detecting objects in front.

2.3 DC Motor

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of the current in its field windings.

2.4 Software Part

The hardware and the software parts are connected through NodeMCU. Once the connection between hardware and software parts is according to the time settings and commands sent through the cellphone application, NodeMCU rotates the respective motors in clockwise and anticlockwise direction through the motor driver IC L293D. Based on algorithm, the drawer can be made operable at different durations. The drawer is provided with multiple slots so that the patient can be provided with medicine for different timings as per the dosage. Autonomy of this project is achieved through the use of a unique control system which takes input from NodeMCU as per the inputs provided by the IR sensors fixed on the slots of the drawer. Depending on the operation of the drawer and the data provided by the sensors, the operator (basically a nurse or a watch-keeper) can be alerted whether the patient has taken his/her medicines on time.

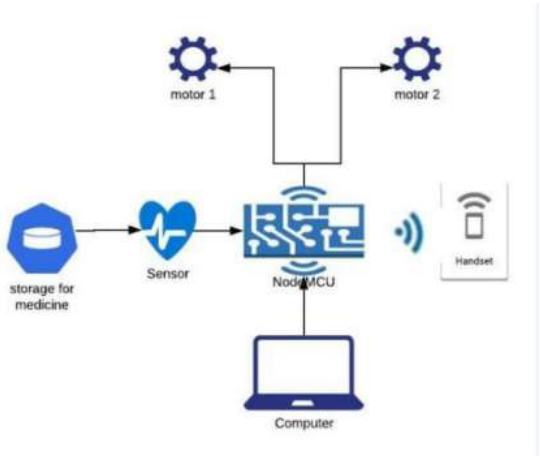

Fig-1: Structural diagram of Smart Meditron

3. FLOWCHART OF THE SYSTEM, ADVANTAGES AND LIMITATIONS

3.1 Flowchart of the system

The following is the flowchart of the system

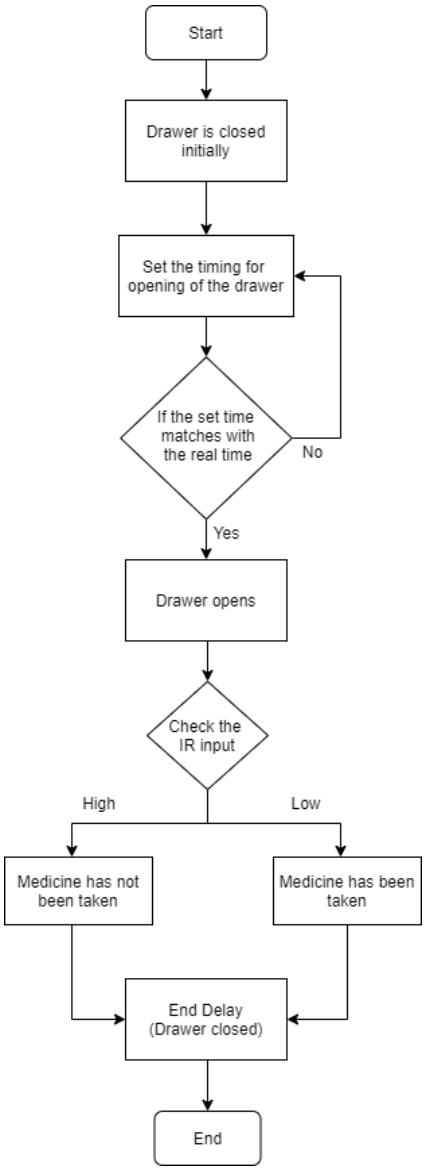

Chart-1: Flowchart of the system

3.2 Advantages

The merit of this project is the reduced work of nurses as well as doctors by providing medicines to patients on specified time. Also in case of emergency, a button (emergency button) is provided on Meditron, which will inform the doctor. Also a report regarding patient health recovery can be displayed.

3.3 Limitations

Range of operation: As we have developed a prototype of ideas, its coverage range is defined to a specific operational area. Another limitation of our project is the capability of the Wi-Fi device, i.e. handling capacity of the device. Interfacing of multiple devices and sensors becomes difficult as the number of available interfacing pins is less.

4. CONCLUSIONS

The vast development in science and technology is leading to formulation of new concepts and ideas into models that are very useful to us. This system is developed in order to make it useful in different areas of Medical field. Surely in future, Meditron will be a promising device which will be implemented in most of the fields all over the world.

5. ACKNOWLEDGEMENT

It is always a difficult job to acknowledge all those who have been of tremendous help in the development of any work. In spite of that, we honestly thank all those who had put in tremendous efforts in guiding and helping us to successfully build this project named "SMART MEDITRON". We take this opportunity to thank each and everyone for their cooperation and support. First and firmly we are grateful to MRS. J. M. NAIR (The Principal) for allowing us to do this project collectively and with advanced techniques. We express our sincere gratitude towards MRS. SHOBHA KRISHNAN (Head of Electronics and Telecommunication Department).We are thankful to MR. SHOBHIT KHANDARE, our project guide for his valuable guidance throughout, without which the project would not have stood its ground as it has now. We sincerely thank the Electronics and Telecommunication department for giving us the opportunity to put forward this concept to the real world. We would even like to thank people who have directly or indirectly helped us with the making of the project and their support.

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