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Smart Interactive Pill Dispenser at Public Places

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Abstract*: Assistive care area has turned out to be a significant area of healthcare services. World Health Organization (WHO) termed as Assistive Technology (AT) "As scheme that associated to release of assistive items. That allows the people to live fit, creative, free, and venerable lives. The interconnection in between sensors and other health care strategies (IoT) plays a vital role in taking care of patients since it permits to find the access in concurrent of medical in sequence. Thus, the study and development of an effective Healthcare/loT gateway could be crucial in patient care. The development of this device is focused on the support of helping patients at railway stations, airports, malls or in any public transport service to get assistive help in taking medicines by dispensing the pills from the dispensing machine. The machine will contain the pills for the common symptoms of the disease. The given system is used to help the user to get specific medicines for the general symptoms. It is programmable to specify the pill quantity according to the symptoms and give serve times. It has an interactive display and also a dispensing machine to dispense medicines depending on the input of the user. It is built using embedded systems in real time.*

Key Word: **Pill Dispenser, tft LCD display, common symptoms, Iterative Dichotomiser Algorithm**

1. INTRODUCTION

Due to busy and recognized a true need for a simple yet effective system to ease the unpleasant daily routine of taking prescription medications. In response to these challenges, researchers have been actively seeking for innovative solutions and new technologies that could improve the quality of patient care meanwhile reduce the cost of care through early detection/intervention and more effective disease/patient management.[4] organizing one's medication is an intricate and prolonged job for people mainly during traveling. Suffering from chronic illnesses or other medical conditions that necessitate they take multiple medications several times a day. a number of items promoted to facilitate to make simpler and get the better process. Simple pill boxes provide containers designed for medication. The system we propose is a portable device that is easy to setup, at railway stations, airports, and malls or in any public transport service to get assistive help in taking medicines by dispensing the pills for normal symptoms like a headache, fever, cold

II. RELATED WORK

The progress in medical technologies is one of the main contributions for the aging population. Most of the elders have the chronic diseases. Medication safety for the elderly is extremely vital. The most commonly encountered situations of drug abusing are excessive drug usage and disobeying the medication instructions. Incorrect drug usage will cause side effects or loss of efficacy. The worst case may harm body organs or even fatal. However, the degrading memory and cognition cause the elders hard to prevent these problems. The elders need some supports for them to take the drugs correctly [1]. The medication for every patient is accumulated within a medication dispensing tray (MDT).[2] The pill dispenser normally includes primarily one MDT; though, the distributor is able to enlarge to comprise an additional MDTs so as to carry several users with one distributor. The given dispenser broadcast the medical condition in addition to the structural configurations to the monitoring server. Every procedure is executed mechanically without the interference of patients, throughout the mediator program set up into the dispenser. Finally, all the executive process can be managed by server suitably.

[3] The paper gives open platform depending on the smart medicine box through improved connectivity and exchanged capability for the combination of strategies and services, Intellectual pharmaceutical packing with communication ability to facilitate by Zigbee and, elastic and wearable biomedical sensor tool enabled. If some fundamental signals identified then a vigilant to predefine caretakers throughout by SMS alert and observe the situation constantly with an IP address of WIFI. The two main gaining technologies of health information are sensing and imaging. This only focuses on sensing skill and evaluation of the newest developments in sensing and wearable devices for constant health monitoring [5] and accessing the information.

2. PROPOSED SYSTEM

The proposed system makes an interactive pill dispenser which will generate pills of common symptoms according to user's input in real time information. This system helpful as a life savior for the places where there is difficulty in reaching the doctor or when there is not instant medical support available. It is helpful for people staying in rural areas where they need to go in cities to get basic medicines for regular diseases like fever, cold etc. It can work as an ATM for medicines.

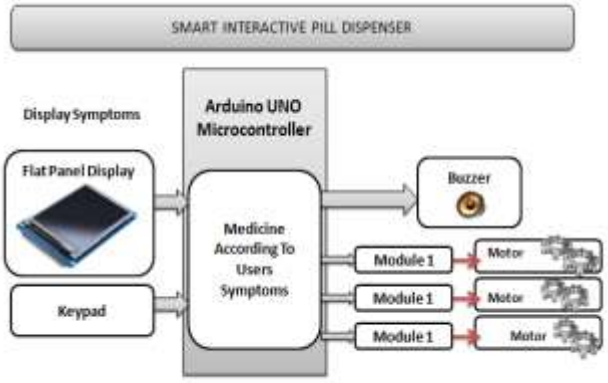

Fig.1: Architecture Diagram

To make the user-friendly system that can be placed at Airports, Railway Stations, Malls, etc. which is very helpful for all aged user and for urgent medicine requirements. Firstly system accepts symptom information from the user for are displayed on the TFT LCD display which is already stored and Keypad also connected to the system. After users, action pill for that symptoms is come out. As pills removed by the user, it is necessary to put the no. of pills removed by the user.

The count for the pills will be according to the user's choice and the pills will be dispensed by the dispenser. every process this scheme is carried out mechanically lacking the interference of patients, throughout the program installed in the dispenser.

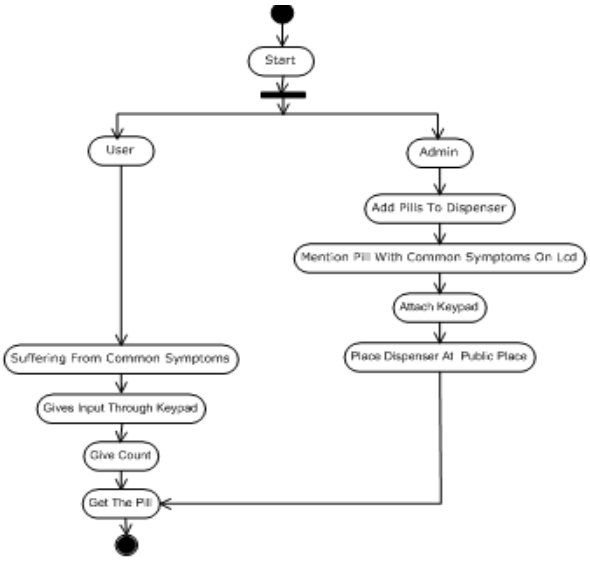

Fig.2: Flow Diagram

3. PROPOSED METHOD

Algorithm Used:

A. ID 3 (Iterative Dichotomiser Algorithm)

ID3 construct a decision tree as of a permanent set of examples. The resultant tree is accustomed to categorizing future model. The leaf nodes of the decision tree enclose the class name while a non-leaf node is a verdict node. The verdict node is a quality test through every branch being a probable charge of the feature. ID3 make use of information gain to make a decision which feature goes into a decision node.

- Algorithm :

1) set up sorting feature (in Table R)
2) Calculate sorting Entropy.
3) For every feature in R, compute Information Gain using classification attribute.
4) Choose feature through the maximum gain to be the subsequent Node in the tree.
5) Eliminate Node feature, creating diminished table RS.
6) Do again steps 3-5 until all features have been used, or the same categorization value leftovers for all rows in the diminished table.

ENTROPY:

$$H(X) = -\sum_{i=1}^{n} p(x_i) \log_b p(x_i)$$

INFORMATION GAIN:

$$\text{For Set } S \text{ , Attribute } A$$
$$\text{Where } S \text{ is split into subsets based on values of } A$$
$$\subset_S^A = \text{Subset A of S}$$
$$I_E = \text{Entropy} \text{ , } p(\subset_S^A) = \frac{\text{size}(\subset_S^A)}{\text{size}(S)}$$

$$I_G(S, A) = I_E(S) - \sum^{n} (p(\subset_S^{A_n}) * I_E(\subset_S^{A_n}))$$

4. EXPERIMENTAL RESULTS

The experimental setup of the project is as shown in figure 3 showing three pill boxes with TFT LCD display and other components.

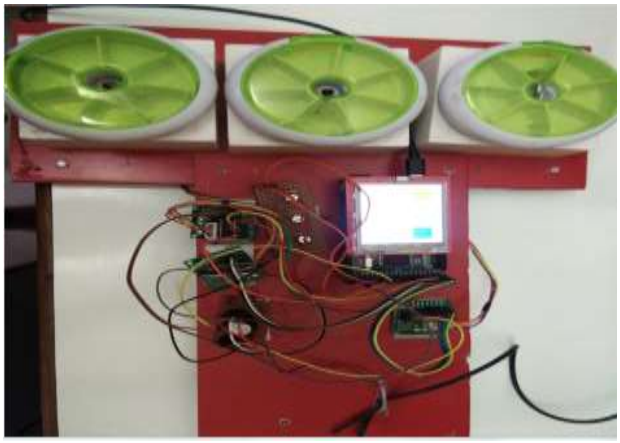

Fig.3: Experimental Setup

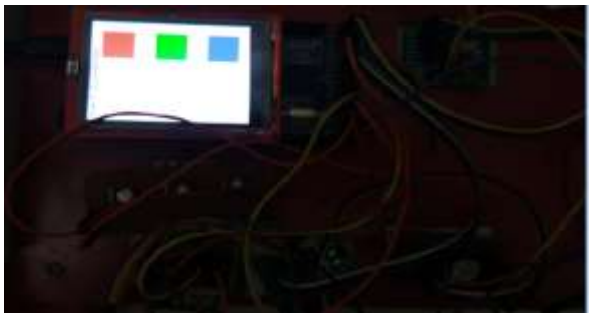

Fig.4: TFT LCD display

The TFT LCD display displays particular symptoms which are already stored. The different color on the display gives the different symptoms name for which the pills are available in the box.

For the public dispenser admin have to Login first to the system with user name and password. After that he has an access to the system.

Admin have to add the disease name along with disease medicine is also added to the dispenser with mentioning the dosage which he is going to provide pill for people at public places

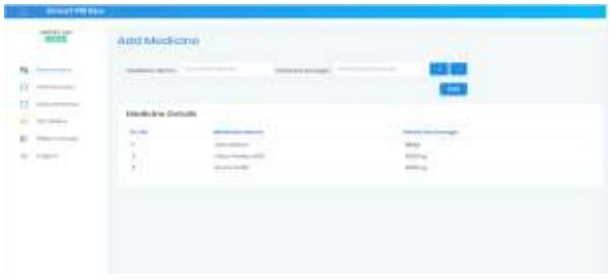

Fig.5: Add Medicine for Disease with Dosage

One kit of the pill box may contain number of boxes having medicine for the particular disease which we put at the public places. Below figure gives the pill box detail along with kit ID, pill box number, Disease Name and medicine name.

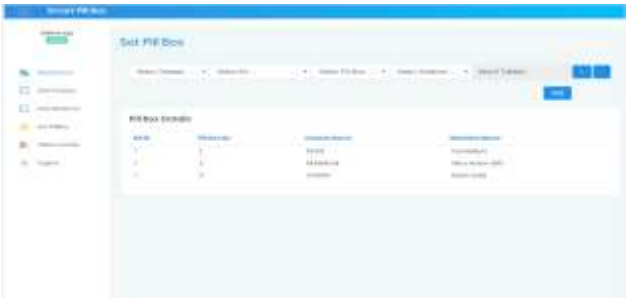

Fig.6: Set Pill Box

Admin have the record of all the pill boxes with disease name, Quantity so that they can be maintained and pills are available to the public.

Fig.7: Pill Box Details

5. CONCLUSION

This system used to improve medication safety and assistive care to patients at public places which can be done by using this proposed a smart pillbox dispenser. The proposed pill box can provide help for people who are situated in rural places where there is difficulty in finding doctors. It also helps for those who are discomfort while traveling by providing the pills for common symptoms.

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