DESIGN OF AUTOMATIC MEDICINE VENDING MACHINE

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Abstract. Accessibility to basic healthcare is an important cornerstone of development towards building a healthy future. This project presents a machine designed to provide such health care at areas where having a medical store may not be feasible or possible. It allows the user to select a medicine, pay the required amount after which it verifies the amount received and dispenses the medicine. It provides an all-encompassing solution to an individual looking for immediate symptomatic relief for trivial health problems. By relieving small symptoms at work, it can completely eliminate both presentism and absenteeism in the workplace. It can also decrease the current costs of open medicine cabinets. By having an over the counter vending machine in the workplace, worksites without clinics or pharmacies can benefit from increased work efficiency and avoid underperformance of ill employees. Moreover, it prevents hours wasted waiting in queues at clinics for trivial problems like colds and headaches. This situation gets especially magnified when a location is suffering from a localized epidemic or pandemic

Keywords:Healthcare,Vending Machine,pandemic

INTRODUCTION

Degrees of social status are closely linked to health inequalities. Those with poor health tend to fall into poverty and the poor tend to have poor health. According to the World Health Organization, within countries those of lower socioeconomic strata have the worst health outcomes. Health also appears to have a strong social component linking it to education and access to information. In terms of health, poverty includes low income, low education, social exclusion and environmental decay. The poor within most countries are trapped in a cycle in which poverty breeds ill health and ill health leads to poverty. Our project although may not be an out of the box idea in its entirety, it still could prove useful. Especially in developing countries like India where there are innumerable numbers of people who are unable to avail medicines. In this project the

system will contain four medicines which are available as first aid and without prescription. They are Band-Aids for minor abrasions and cuts, Paracetamol for reducing fever, Vicks Action 500 for common cold and ORS packets for dehydration and other problems involving loss of fluids in the body. Nowadays in this fast moving world, appliances which are completely automatic are preferred. This is the biggest advantage of this paper. other advantage would be the use of smart card instead of coins. The system is fully controlled by a 16 bit PIC microcontroller. Automated dispensing machines decentralized medication distribution systems that provide computer controlled storage, dispensing and tracking of medications have been recommended as one potential mechanism to improve efficiency and patient safety and they are now widely used in many hospitals. There is no doubt that these machines can enhance the efficiency of medication distribution, but their capacity to reduce medication errors is controversial and depends on many factors, including how users design and implement the system. Still, we are confident in supporting our position that automated dispensing machines improve patient safety. Automated dispensing machines provide secure medication storage on patient care units, along with electronic tracking of the use of narcotics and other controlled medicines. Automatic dispensing machines enhance rest dose availability and facilitate the timely administration of medications by increasing their accessibility on patient care units.

An automatic medicine vending machine with self-contained on-site medicines dispensing mechanism and a storage facility for the plurality of medicines that can be dispensed based on the user requirement. Major components of the machine include stepper motors for dispensing the medication, large storage space to store the pills

LITERATURE SURVEY

Suhail Beg et al. proposed an FSM based automatic dispense machine[1] which has an expiry date feature using VHDL, in this paper the author described Finite State Machine based automatic dispense machine using Xilinx ISE 14.2. This machine accepts money as an input to dispense the products and returns back the money without dispensing the product to the customer if the product is out of date. Thus, it can be useful to ensure the good quality of the product along with quantity and cost.

Singh [2] proposed a touch screen based automated medical Vending machine and in this paper the author described medicine vending machine based on IR Standard touch technology as the input to select different medical facilities like First Aid facility, ambulance facility, and direct calling facility via GSM, dynamic GPS, smart card facility and restocking medicine alert. The software used is visual basic was programmed such that when the patient selects certain facility, it will be served to that patient. Thus it can be helpful in case of illness, small or big accidents and so can be placed anywhere.Steven Woodbine, The Complete Vending Machine. Published on 18 May 2011.

There are a large variety of medication administration assistance devices for non-• professional users. Most of them are manual, providing multiple compartments called pill trays. The pill tray has a number of compartments that can be filled with medication. Each compartment can hold different sizes and combination of medicines. The user is required to take the medicine from each tray each day for a maximum of 28 days. It does not provide any alarm to indicate the time of taking the medicine.

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OBJECTIVES

➢ Diagnosis is always a concern for the people living in rural area.At the same time medicine availability also has a major impact excluding the factor about complete cure.

➢ The aim of this prototype is that temporary relief is to be given out that can give people a better chance for resisting the health from withdrawing before they are able to reach doctor.

➢ Major advantage is thatpeople would be able to access the drugs via patient kiosks in public places such as drug stores, malls, bus, railway stations, on highways, areas where medical stores are limited. Initially the user has to swipe his/her smart card to

activate the machine. Once he has an access to the device, he can submit his disease's symptoms through the touch screen.

➤ once his medicine is decided by the s/w, he will be given some coin like tokens from an outlet. Once he receives the tokens, a message will be displayed on the screen that the user has to put these tokens in particular medicine box area

➤ As the user puts the tokens in the specified boxes, he will receive one tablet from that box. Thus he will get a onetime dose on the basis of his disease symptom.

PROBLEM IDENTIFICATION

Diagnosis is always a concern for the people living in rural areas and for those traveling long distances in trains or buses. At the same time, medicine availability also has a major impact excluding the factor about a complete cure. The absence of 24 hours of medical providers in rural areas and the absence of medicines in bus stands, railway stations, and highways motivated us towards this work. The aim of this prototype is that temporary relief is to be given out that can give people a better chance of resisting the health from withdrawing before they are able to reach the doctor
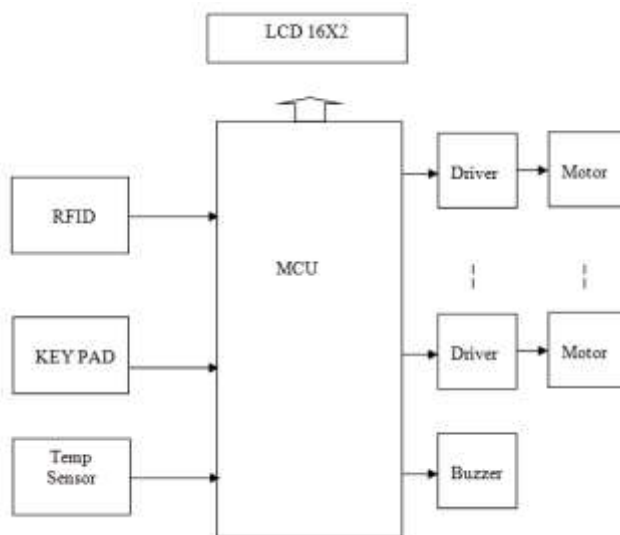
BLOCK DIAGRAM

Figure1: Basic block diagram

The block diagram shows RFID tag connected to the microcontroller unit when patient scans his corresponding RFID tag in the scanner. After scanning the medicine has to be selected using key pad. The microcontroller is connected to dc motors through motor driver. When signal is received from microcontroller, it sends pulses to Motor driver and it dispenses the medicine through rotating springs. The medicine drops at the bottom of

the machine which is then collected by the user. Temperature also monitored using temperature sensor and displayed on LCD.

LCD SCREEN

LCD screen consists of two lines with 16 characters each. Every character consists of 5x8 or 5x11 dot matrix. This book covers 5x8 character display, which is indeed the most commonly used one. 210 Display contrast depends on power supply voltage and whether messages are displayed in one or two lines. For that reason, varying voltage 0-Vdd is applied on the pin marked as VEE. Trimmer potentiometer is usually used for that purpose. Some LCD displays have built in backlight (blue or green diodes). When used during operation, a current limiting resistor should be serially connected to one of the pins for backlight (similar to LED diodes).

If there are no characters displayed or if all of them are dimmed upon the display is switched on, the first thing that should be done is to check the potentiometer for contrast adjustment. The same applies if the mode of operation has been changed (writing in one or two lines).
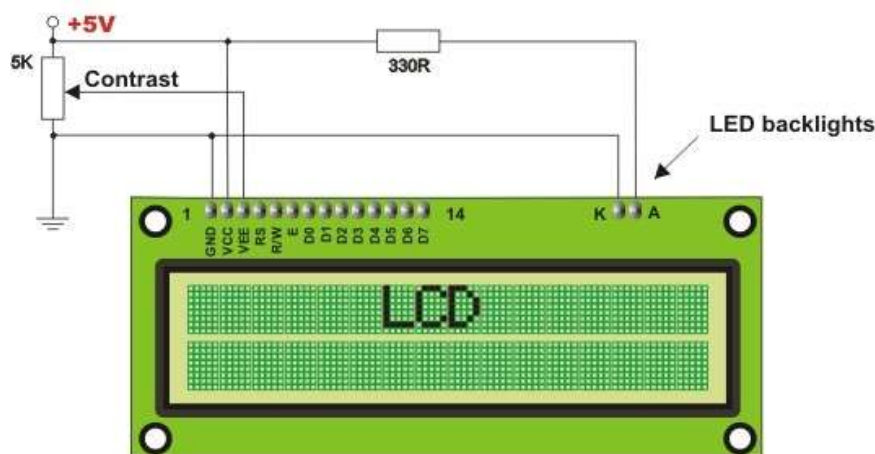

Figure 2: LCD Display

LCD CONNECTING

Depending on how many lines are used for connecting LCD to the microcontroller, there are 8-bit and 4-bit LCD modes. The appropriate mode is selected at the beginning of the operation in that process called initialization. 8-bit LCD mode uses outputs D0-D7 to transfer data as explained on the previous page. The main purpose of 4-bit LED mode is to

save valuable I/O pins of the microcontroller. Only 4 higher bits (D4-D7) are used for communication, while others may be unconnected. Each data is sent to LCD in two steps- four higher bits are sent first (normally through the lines D4-D7) and four lower bits are sent afterwards. Initialization enables LCD to link and interpret received bits correctly. Besides, data is rarely read from LCD (it is mainly transferred from the microcontroller to LCD) so it is often possible to save an extra I/O pin by simple connecting R/W pin to the Ground. Such saving has its price. Messages will be normally displayed, but it will not be possible to read busy flag since it is not possible to read display as well. Fortunately, there is a simple solution. After sending a character or a command it is important to give LCD enough time to do its job. Owing to the fact that execution of the slowest command lasts for approximately 1.64ms, it will be fairly enough to wait approximately 2mS for LCD.

LCD INITIALIZATION

LCD is automatically cleared upon being supplied with electrical power. It lasts for approximately 15mS. After that, display is ready to operate. The mode of operation is set by default.It means that:
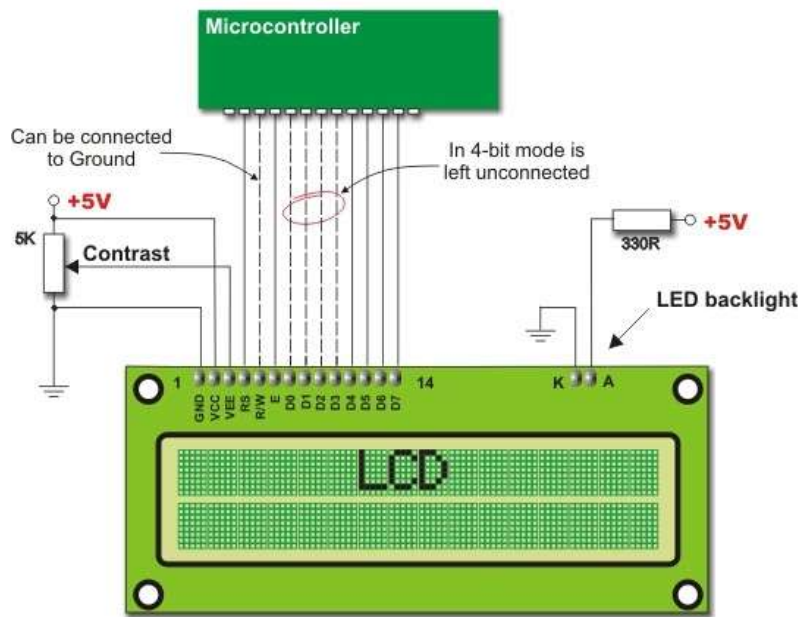
1. Display is cleared.
2. Mode

Figure 3: LCD internal working diagram

DL = 1 Communication through 8-bit interface

N = 0 Messages are displayed in one line

F = 0 Character font 5 x 8 dots

1. Display/Cursor on/off

D = 0 Display off

U = 0 Cursor off

B = 0 Cursor blink off

2. Character entry

ID = 1 Displayed addresses are automatically incremented by 1

S = 0 Display shift off

Automatic reset is mostly done without any problems. If for any reason power supply voltage does not reach full value within 10ms, display will start performing completely unpredictably. If voltage supply unit is not able to meet that condition or if it is needed to provide completely safe operation, the process of initialization is applied. Initialization, among other things, causes a new reset enabling display to operate normally.
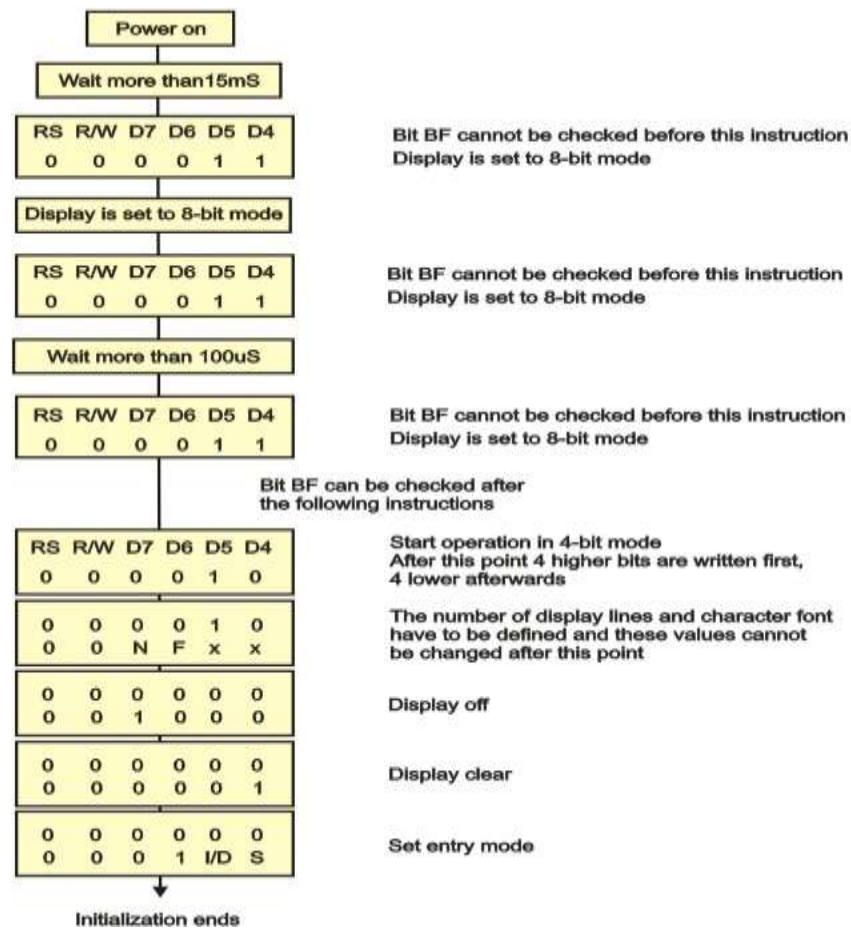
Figure 4 : LCD 4-Bit initialization

CONCLUSION

From this concept we are conclude that, the automatic medicine vending machine is technically feasible to the peoples. It is based in PIC micro-controller provide GSM service. It gives availability of medicines all the time, also in rural areas. it is very helpful and it gives ease of access also.

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