Outpatient Automated Pharmacy System

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Abstract

Automation is the use of control systems, such as computers or robots, and information technologies for handling different processes and machineries in an industry to replace a human being. It is the second step beyond mechanization in the scope of industrialization. Today, the focus of automation has shifted to increasing quality and exibility in a manufacturing process from increase productivity. Research and design of automated pharmacy were introduced. It has been pointed out that the system should be provided with three main functions namely medicine supply, data analysing, medicine fetching and the realization scheme of each function. On the basis of the design of the systematic mechanical structure, the corresponding controlling systems for analysing information of medicine, automated medicine fetching device, automated medicine supply device were designed, and the study on the controlling method of each executing mechanism was carried out. Finally a detailed analysis was carried through on the function of the system software. The database of systematic medicines was constructed, and the software design of four modules of database management, automated medicine supply and automated medicine fetching was achieved by applying the multithread technology. Presently the development of system had already been accomplished, and this system can be applied to the outpatient service pharmacy of hospitals with good operational effects. The basic mechanism behind the machine relies on X-Y plotter mechanism. The medicines are picked up using vacuum pump and is released to outdoor which is then picked up by pharmacist. RFID tag is used as the medium to enter the medication data through a computer interface.

Keywords: Automation, Outpatient, RFID Tag

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I. INTRODUCTION

The hospital is one of the important networks of health services, the conditions with the tasks, burdens, problems and hopes that are hung on it. The development of number of hospitals in Indonesia, followed by the development of disease patterns, the development of medical technology and health and the development of public expectations of hospital services. It should be realized that the main purpose of hospital activities is to serve patients and their families, in various forms of service. One part of the hospital service that is busy every day is outpatient pharmacy service. The large number of patients served by the number of patients who serve also affects the speed of service.

If the service personnel is too little while the patient must be served greater then it will impact on service quality and patient satisfaction. On the other hand, if the service personnel is more than the optimal number, this means needing excessive capital investment, but if the amount is less than optimal result is delayed service. A medication (a medicinal product) is a product that contains a compound with proven biological effects, a medication error can be considered as a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient.

The following project can help to minimize errors.

Drug identification up to the moment of delivery.

Lower medication rates.

Effective pharmacist participation in de_ning drug therapy.

Improved patient assistance.

Medication dispensing was a time-consuming task for pharmacists.s before the 1970s. A typical pharmacy staff_ was working longer hours with increased workloads, which led to less time to focus on patient care. These factors led to the use of a machine to count medications. The new counting technology replaced manual methods in many industries. In the 1980s and 1990s, the development of high-speed machines for counting and bottling occurred, these units were designed to be fast and simple to operate, and be compact and cost effective. From the 1990s through 2012, numbers new pharmacy automation products came to the market, migrating from entry-level product to the next level of pharmacy automation.

Pharmacy automation involves the mechanical process of handling and distributing medications. By automating your pharmacy, you will reduce _filling errors, prescriptions in less time, increase patient safety and staff productivity. The solutions offers range from simple packaging technology to enterprise-level perpetual inventory management. It not only provides you with the tools to enable your pharmacy to be more efficient and reliable, but also the strategy behind those tools. The benefits of automated pharmacy systems are substantial, as your pharmacy can automate the pill dispensing process to affordably stay competitive.

1

There have been numerous variations of automation equipment through the years. Today, automation solutions can be scaled from simple packaging technology to enterprise-level perpetual inventory management. Pharmacy automation systems improve the way in which pharmacies operate. It has a wide range of solutions that are capable of storing, administering, _filling, and labeling prescription medications effectively and securely.

II. PROPOSED ALGORITHM
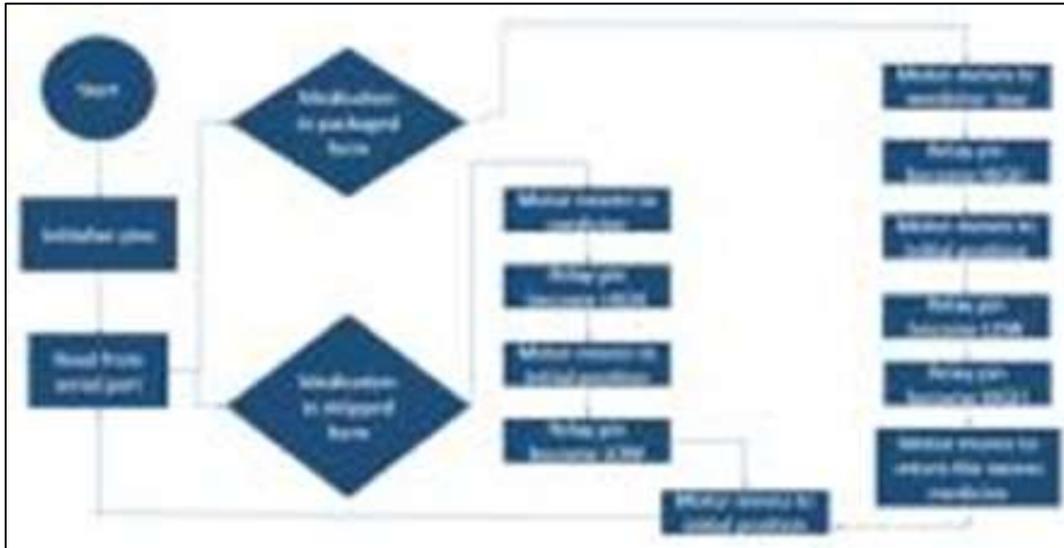
The objectives of this project is to design and implement automated pharmacy system which will be able to identify the medicine and supply to outpatient. The coordinates are uploaded to the machine controller by a separate program. The coding is done in ardiuno software which is a combination of c language and java. Then the code is transferred to the microcontroller by which the motor mechanism is instructed to rotate the motor. In this project, we are going to present a simple design for an outpatient automated pharmacy system. Our idea is an arduino based design using ATMEGA 328P microcontroller.

The machine will have four motors to implement the X, Y, and Z axis(two motor are provided to balance the weight). The movement consists of three motion stages. The X and Y axis stage sits upon three rods located in between the two side support plate, here the three rods are the two guide rods and the lead screw, the lead screw located at the middle of guide rods allows linear motion. The Z axis stage sits upon two rods, guide rod for support and lead screw but are provided at two ends for the support .A stepper motor drives a shaft that is coupled to the lead screw with a motor coupler on two side of the Z axis, allowing it to move the X stage platform along with the Y stage mounted on it upward and downward direction. The X axis stage is for left and right movement where Y stage is for back and fro motion, also a bed is place over Y axis.

Here, the Z,X,Y stages is located in between the two side plates of to restrict the linear motion . Another two stepper motor with motor coupler drives the lead screw in each axis. The entire XY stage assembly is resting on the support rods of squared and grooved cross section made of Aluminium. Machine is worked on input as codes of Design and Converting it via use of arduino, Stepper Drivers, RAMPS Shield, Stepper the surface of a piece of paper. This project is to operate drawing the _gure or text by milling machine. By using this XY Plotter, can draw the complex line art and including text. The result is very accurate. This project mainly uses three software: CorelDraw,Lazy CAM and Mach 3 milling. Based on G-code command the desire outputs can be loaded rapidly.

III. EXPERIMENT AND RESULT

Here's the complete circuit schematics. Well use the drive in Full Step Mode so we will leave the 3 MS pins disconnected and just connect the Direction and the Step pins of the drive to the pins number 3 and 4 on the Arduino Board and as well the Ground and the 5 V pins for powering the board. Also well use a 100F capacitor for decoupling and 12V, 1.5A adapter for powering the motor. We will use a NEMA 17 bipolar Stepper Motor and its wires A and C will be connected to the pins 1A and 1B and the B and D wires to the 2A and 2B pins.
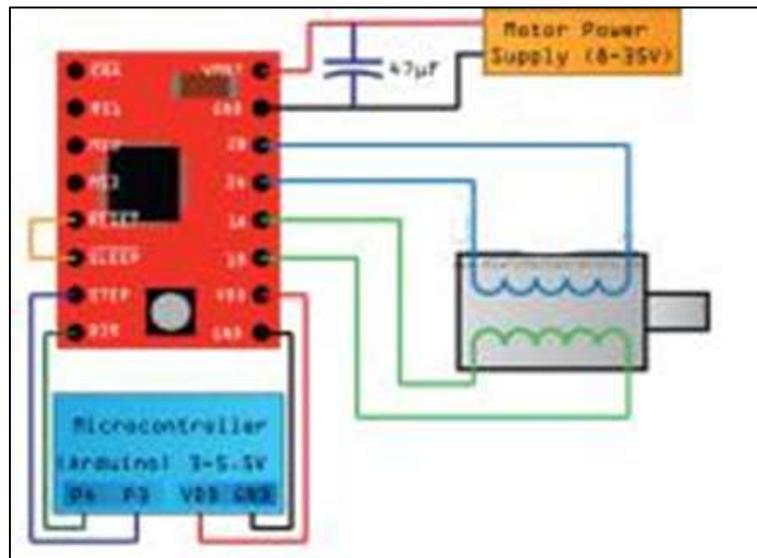
IV. CONCLUSION

We all make errors from time to time. There are many sources of medication errors and different ways of avoiding them. However, we must start by being aware that error is possible and take steps to minimize the risks. The essential components of this are monitoring for and identifying errors, reporting them in a blame-free environment, analysis of their root causes, changing procedures according to the lessons learnt and further monitoring. Pharmacists should ensure that right patient is receiving the right drug in a right dose. Pharmacists and other health care professionals involved in the medication use process must work together to develop a systems approach to medication use process must work together to develop a systems approach to medication error reduction. Moreover, pharmacists with the expert knowledge on drugs perform medication calculations, which are extremely crucial in dosages adjustment. Counselling at the point of delivery in the pharmacy is an area in which pharmacists can significantly improve medication safety and patient compliance. All healthcare professionals should have a common vision and that everyone works towards a common goal with the monitoring system. Professionals can help monitor each other to achieve the objective of improving the service for patients. From the perspective of the pharmacy profession, we think that we will do the justice by providing such pharmaceutical care services. The control of narcotics is of particular concern in a hospital because it may be the only type of institution regularly stocking, dispensing, and administering them. Drug addiction among physicians, pharmacists, and nurses is quite common.

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