AUTOMATIC DRUG DISPENSER

Smart India Hackathon 2023

STUDENT INNOVATION : MINISTRY OF AYUSH
PS CODE : SIH1503
PROBLEM STATEMENT TITLE : **AUTOMATIC DRUG DISPENSER**
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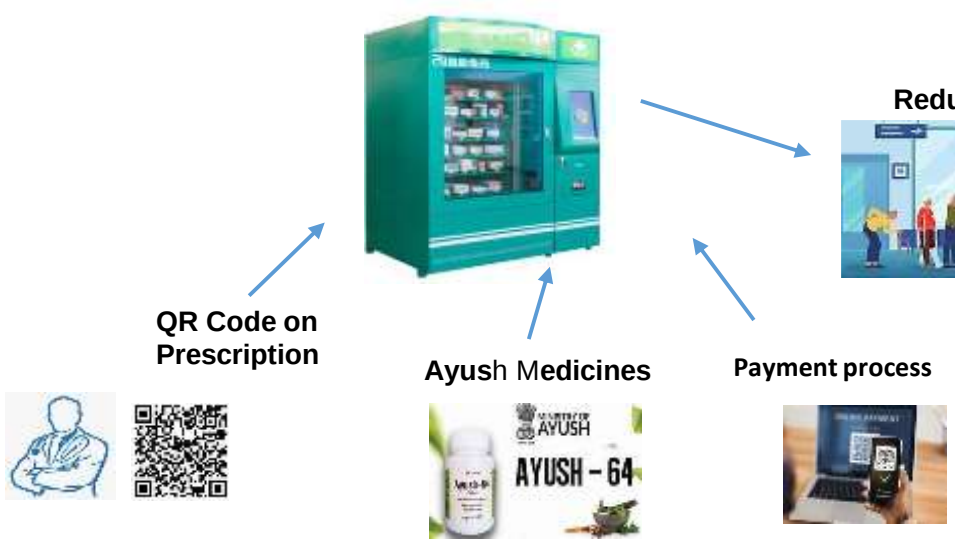
THEME NAME : HARDWARE

Problem given by MINISTRY OF AYUSH :

- Patients who are already coping with the difficulties of their illnesses find waiting in long lines in hospitals to be a big inconvenience. Patients' physical and mental health are both negatively impacted by waiting in these lines.
- Despite the fact that some hospitals have put in place procedures to allow people to register and make appointments in advance, the problem of long lines still exists.
- The creation of a medication ATM with a QR Code could be a viable answer to this issue. The goal of this innovation is to make the distribution of pharmaceuticals to patients more efficient.
- Patients would be given a prescription that included a QR code for their prescribed medication. The medication ATM can be used to scan this QR code.
- To ensure that patients can quickly acquire the medications they need, the drug ATM should be able to dispense a variety of Ayush Medicines that are frequently found in hospitals or pharmacies.
- By implementing such a method, patients would feel a great deal less inconvenience when standing in a queue, which would eventually improve their entire healthcare experience and well-being.

Idea/Approach Details:

Automatic drug dispenser by using a QR code in the prescription will be used to dish out the right drug from the drug dispenser This will end the inconvenience faced by the patients to get their medicine .to make it user friendly a web page will be built using mysql, PHP, html and Apache web server. The hardware part will be made with a simple vending machine mechanism. A coil spring is fixed with a DC servo motor which is connected to Arduino after getting input from Arduino the motor will rotate for 180*. the medicine stacked in the coil spring will be dispensed according to the given input.



Use cases:

- Medication Verification
- Patient Access
- EHR Integration
- Appointment Scheduling
- Pharmacy Management
- Telemedicine
- Medication Adherence
- Emergency Information
- Clinical Research
- Prescription Renewals

System parameters:

- QR Code Integration
- Medication Inventory
- User Authentication
- Prescription Validation
- Inventory Management
- User Interface
- Security Measures
- Maintenance and Support
- Data Analytics
- Regulatory Compliance

Quantitative measurements:

- Average Wait Time
- Patient Throughput
- Patient Satisfaction Ratings
- Medication Dispensing Speed
- Medication Error Rate

Hardware Dependencies:

- Medication Dispenser Hardware
- QR Code Scanner
- Microcontroller or Embedded System
- Power Supply
- User Interface Components

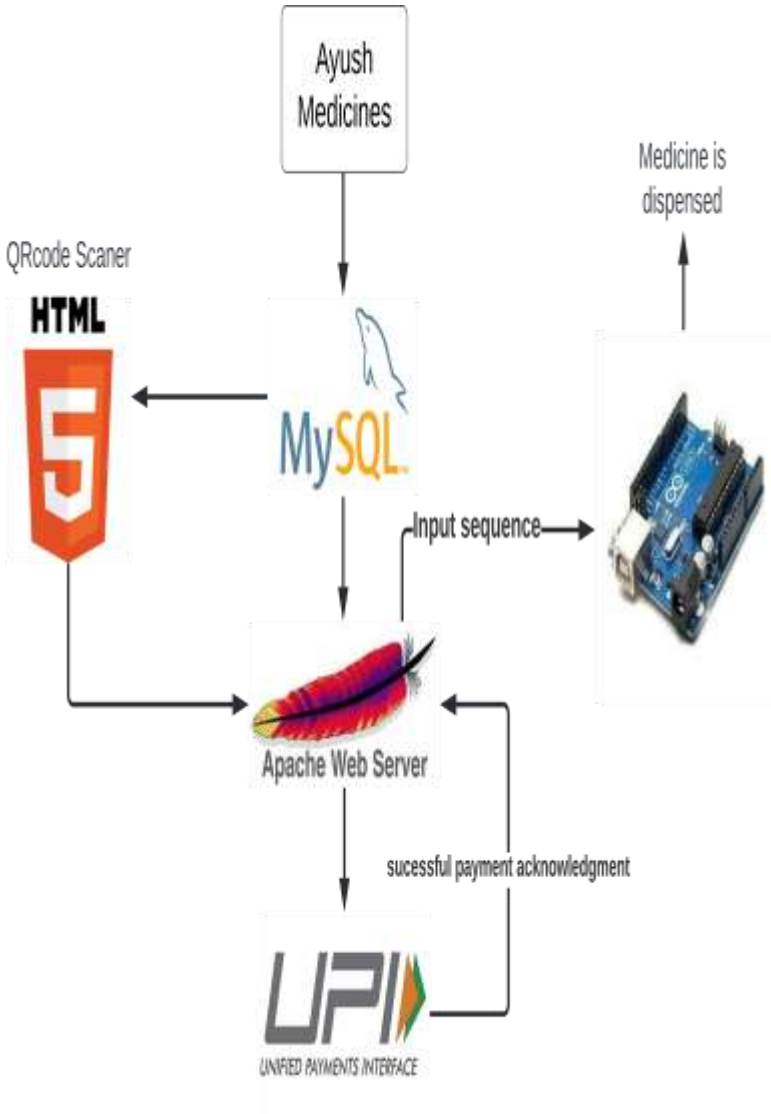
Software Dependencies:

- QR Code Decoding Software
- Dispensing Logic Software
- User Interface Software
- Database System
- Authentication and Authorization Software
- Data Security

Qualitative measurements:

- Efficient Queue Management
- Comprehensive Medication Inventory
- User-Friendly Interface
- Quality Assurance
- Patient Education

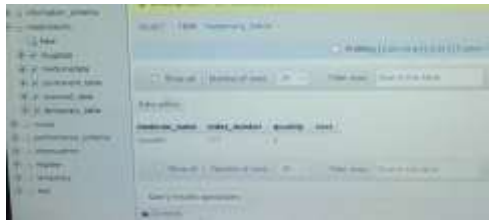
TECHNOLOGY STACK:



Project Overview:

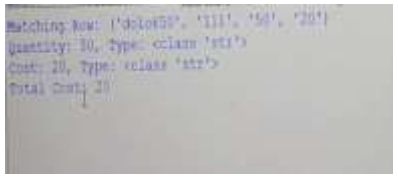
1. The doctor will generate the first QR code inbuilt prescription using the software we developed. The prescription will include the sno, medicine name, quantity, and dosage of the medicine.

2. The patient will next scan the Qr code embedded in the prescription in the QR code scanner.



3. The scanned data will be compared to a database to determine whether all of the medications are currently available in the machine.

4. If the medicine is unavailable or in short supply, it will display another medicine with the same medicinal value that is recommended by doctors.

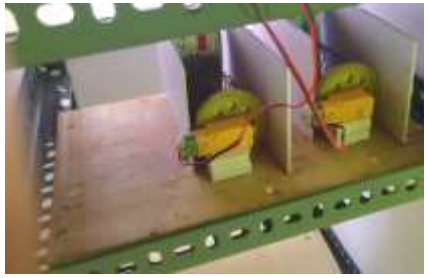


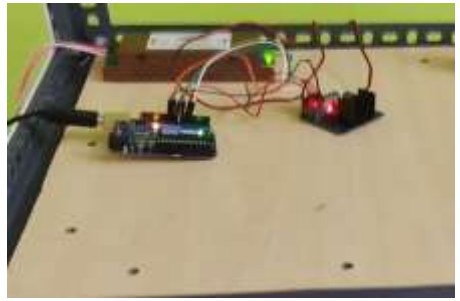
5. After this step, the payment process will begin.

6. An upi payment QR code will then appear on the screen; the user should scan the QR code with their preferred upi transaction app. They are able to pay with that.

7.When the payment process is finished. The web server will transmit inputs to the Arduino.

8. The Arduino will begin the medication dispensing process based on the input given to it. The Arduino will provide inputs to the DC servo motor.






9. A coil spring is mounted in the DC servo motor, in that coil spring only medications will be stacked
10. When the motor receives input. The motor spins to 180* and the medications stored in the spring will be dispensed.


Conclusion:

The implementation of a QR-code drug ATM system in hospitals holds the promise of alleviating the persistent issue of long queues, greatly benefiting patients. Through quantifiable metrics such as reduced average wait times, increased patient throughput, improved satisfaction ratings, faster medication dispensing, and decreased medication error rates, this innovative solution demonstrates its potential to transform the healthcare experience. While challenges and costs exist, the overall impact of such a system can lead to enhanced patient care, increased operational efficiency, and a more patient-centric healthcare environment, ultimately offering a compelling solution to a longstanding problem.

Pros:

- Reduces waiting times and streamlines medication distribution, enhancing patient convenience.
- Shorter queues lead to higher patient satisfaction and potentially better health outcomes.
- Automated tracking minimizes medication shortages and optimizes stock levels.
- Provides valuable data for healthcare management to make informed decisions and optimize operations.

Cons(show stopper):

- Initial setup and maintenance expenses can be high, posing financial challenges for hospitals.
- Potential system glitches or failures may disrupt medication dispensing and patient care.
- Automated systems may be vulnerable to unauthorized access and tampering.
- Hospitals may become reliant on the system, making them vulnerable to technology-related disruptions.