



Smart Automated Pharmacy

Team 48

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Background

Problem Statement: Current pharmacy systems are inefficient and inconvenient for patients, leading to long wait times and inventory management issues for hospitals. Our project seeks to create an automated pharmacy system where doctors can prescribe medication online. Patients can then collect their medication by scanning their national ID card at the pharmacy, improving efficiency and reducing costs.

Constraints:

- Data security: Patients data and files must be secured and encrypted.
- Safety concerns: Some medicines, for safety reasons, cannot be stored in automated systems and should only be dispensed under direct supervision of doctors or pharmacists.

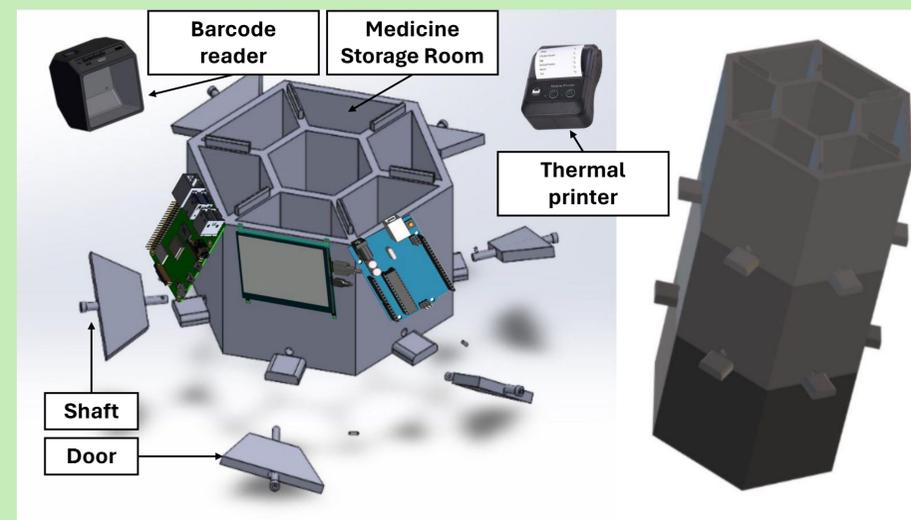
Project impact:

- Social Impact: Enhances patient well-being and healthcare outcomes, providing inclusive services and prioritizing patient safety.
- Environmental Impact: Reduces waste by optimizing inventory management and decreasing resource usage, promoting environmental sustainability.

Specifications

- The automated pharmacy will be able to store 230 different drugs.
- The medicines will be delivered in less than one minute.
- Large database to contain the 230 medicines information and patients' files.
- The diameter of the pharmacy will be 3 meters.

Prototype Design

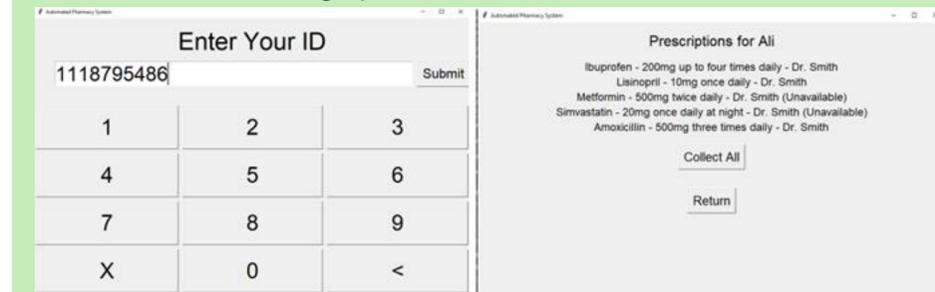


The tower vending machine dispenses medicine and features a housing with a hinge door and space for six medicine packages. Attachments on top allow stacking and connection with additional units for expanded storage. Each column is dedicated to a specific medicine. The machine uses a motor and shaft for automated door opening. The figure shows the components of the prototype which are thermal printer, barcode reader, Arduino, and Raspberry pi.

Validation

All specifications can be met, the medicines are delivered quickly, and all files have been stored in the cloud, but a 3-meter pharmacy is insufficient for storing 230 types of drugs. To increase inventory, the center area of the automated pharmacy can be utilized by adding concentric pharmacies with smaller diameters.

The graphical User Interface GUI



The testing approach focused on validating communication pathways between the database, GUI, and website for functionality and data security. Tools like Wireshark were used to monitor secure communications, and extensive debugging was employed to identify and resolve coding errors.

Conclusion

The automated pharmacy prototype delivers medicine in under a minute, with an innovative vertical design and an accompanying website for prescription management. Utilizing the center area increases capacity. The cost-effective prototype is under 4000 SR, offering pharmacies an efficient and affordable solution.