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IoT-Based Smart Medicine Dispenser to Control and Supervise Medication Intake

Gleiston Guerrero Ulloa

Miguel J. Hornos

Carlos Rodríguez Domínguez

Ma. Mercedes Fernández Coello

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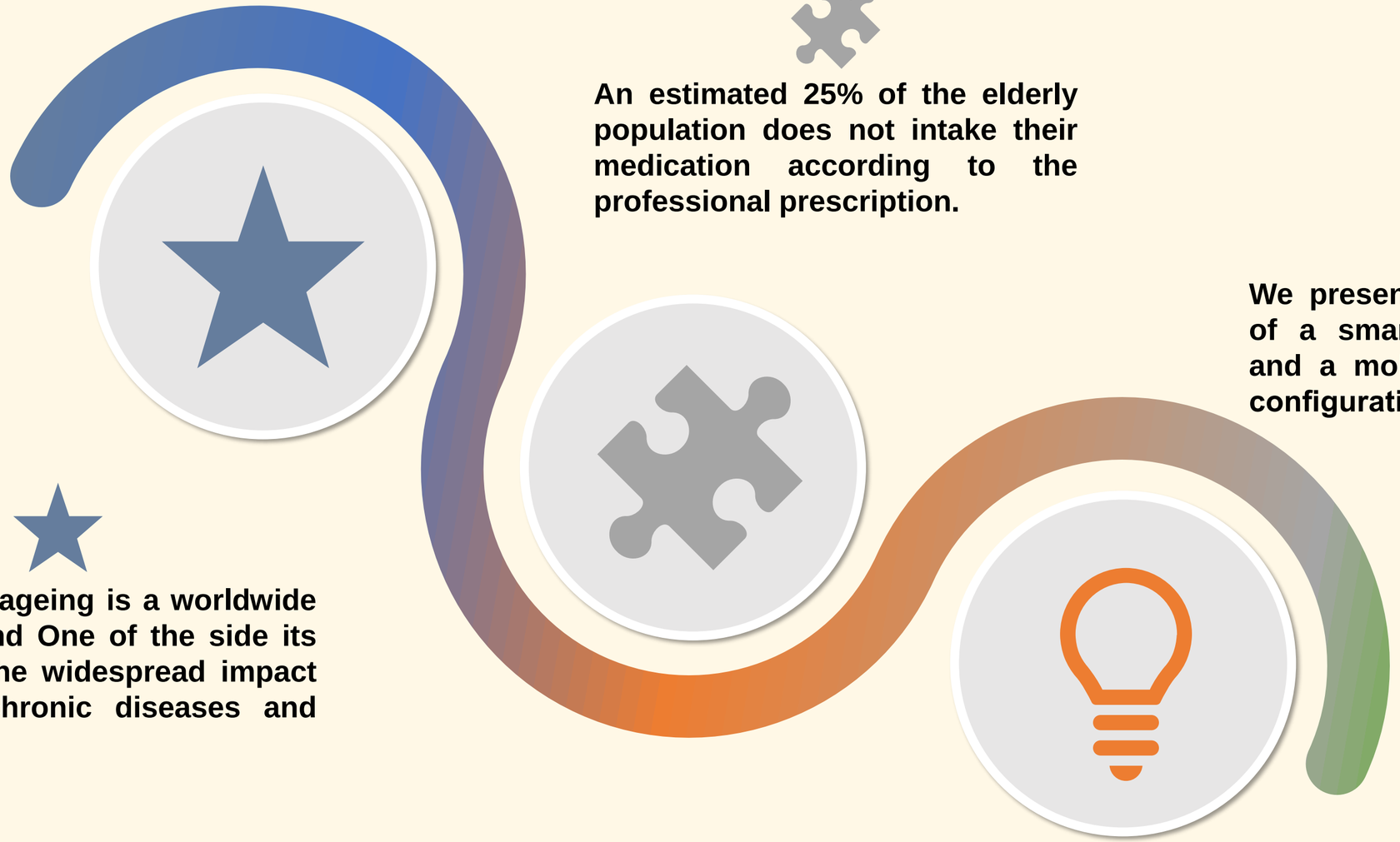
INTRODUCTION

IoT-Based Smart Medicine Dispenser to Control and Supervise Medication Intake



Population ageing is a worldwide concern, and One of the side its effects is the widespread impact of many chronic diseases and conditions.

An estimated 25% of the elderly population does not intake their medication according to the professional prescription.

We present a system consisting of a smart medicine dispenser and a mobile application for its configuration and management.

Comparison of the medicine dispensers analysed in the literature review that we have carried out

None of the systems analysed meet all the aspects that have been considered.

Table 1. Comparison of existing dispensers

Reference	Dispensation	Programing	Detection	Identification	Reminders	Alerts	Notificacions	Multiple Patients
[6]	A	✗	✗	⌨	-	📱	✗	✗
[8]	A	✗	✗	-	✗	✗	✗	✗
[14]	A	✔	✗	-	📱,♫,☼	📱	✔	✗
[15]	-	✔	X	-	✉,♫	✉	✔	✗
[16]	M	✔	✔(IR)	✗	✉,♫	✉	✗	✗
[17]	A	✔	✔(FP)	✔	♫	-	✔	-
[18]	A	✔	✔(US)	✗	♫, ✉,@	✗	✗	✗
[19]	M	✔	✗	-	☼	✉	✗	✗
[20]	A	✔	✗	-	☼, ♫	✗	✔	✗
[21]	-	✗	✔(US)	✗	📱	📱	✔	✗

Features of the Proposed System

IoT-Based Smart Medicine Dispenser to Control and Supervise Medication Intake

HARDWARE SOFTWARE

Network of sensors and actuators.
Raspberry Pi B single-board computer.
Mobile application.

EVALUATION

We are currently evaluating with a real patient who is undergoing medical treatment for diabetes.

METHODOLOGY

Test-Driven Development Methodology for IoT-based Systems (TDDM4IoTS).

System Architecture

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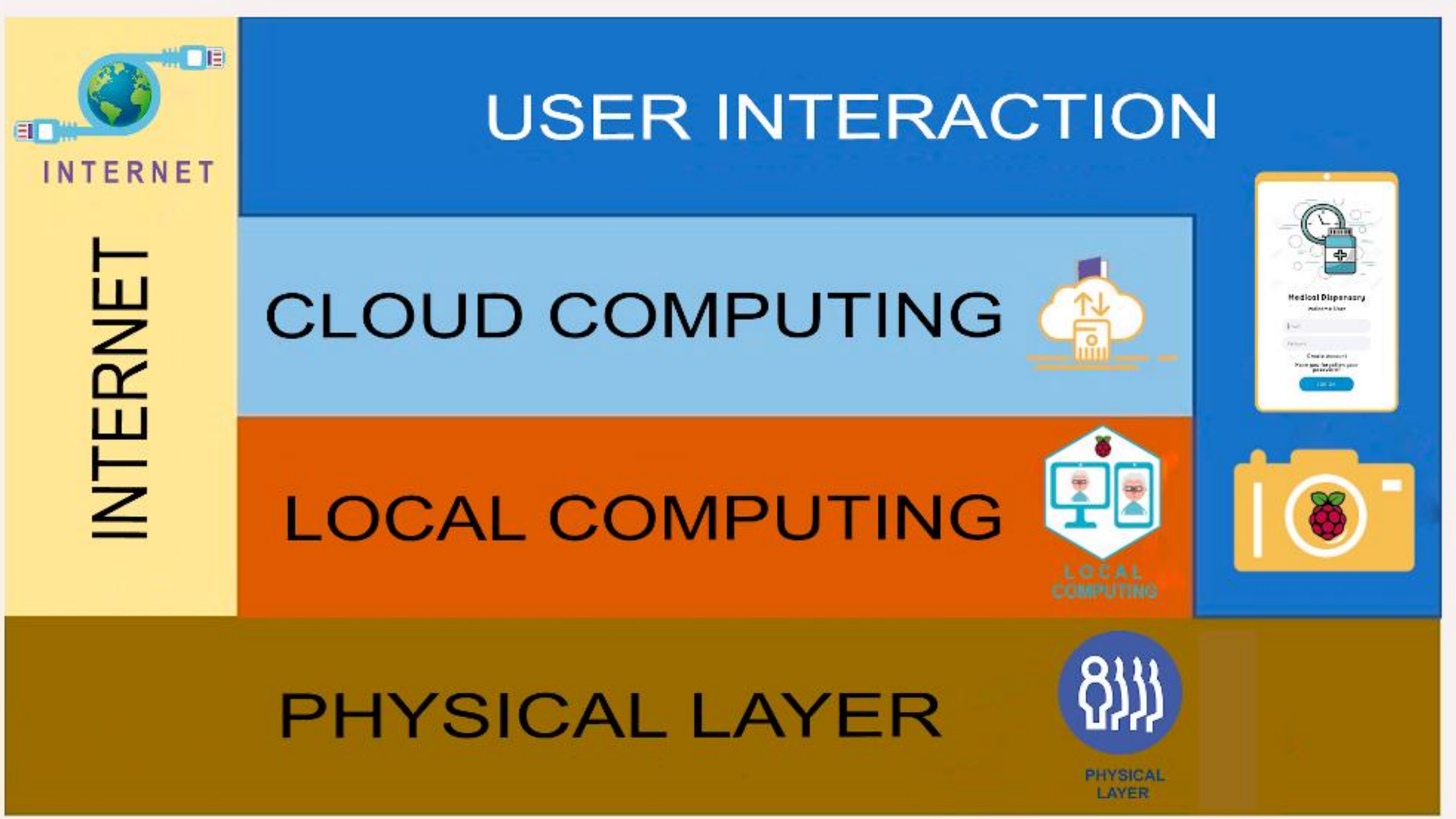
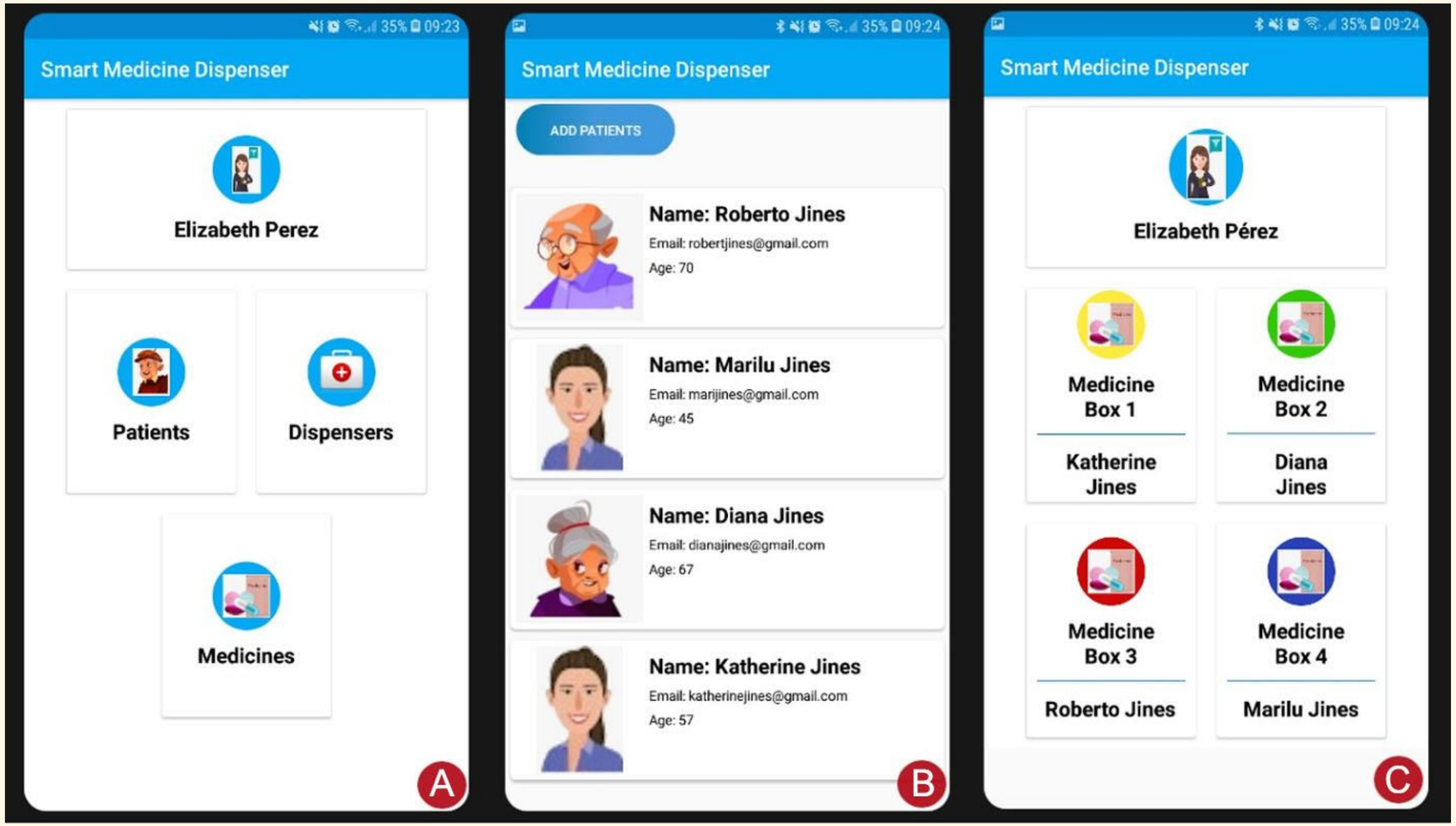


This architecture enables to interconnect sensors and actuators, and also to emit remote notifications from Cloud computing servers. Furthermore, it will allow a future interaction with other IoT devices.

User Interaction

IoT-Based Smart Medicine Dispenser to Control and Supervise Medication Intake



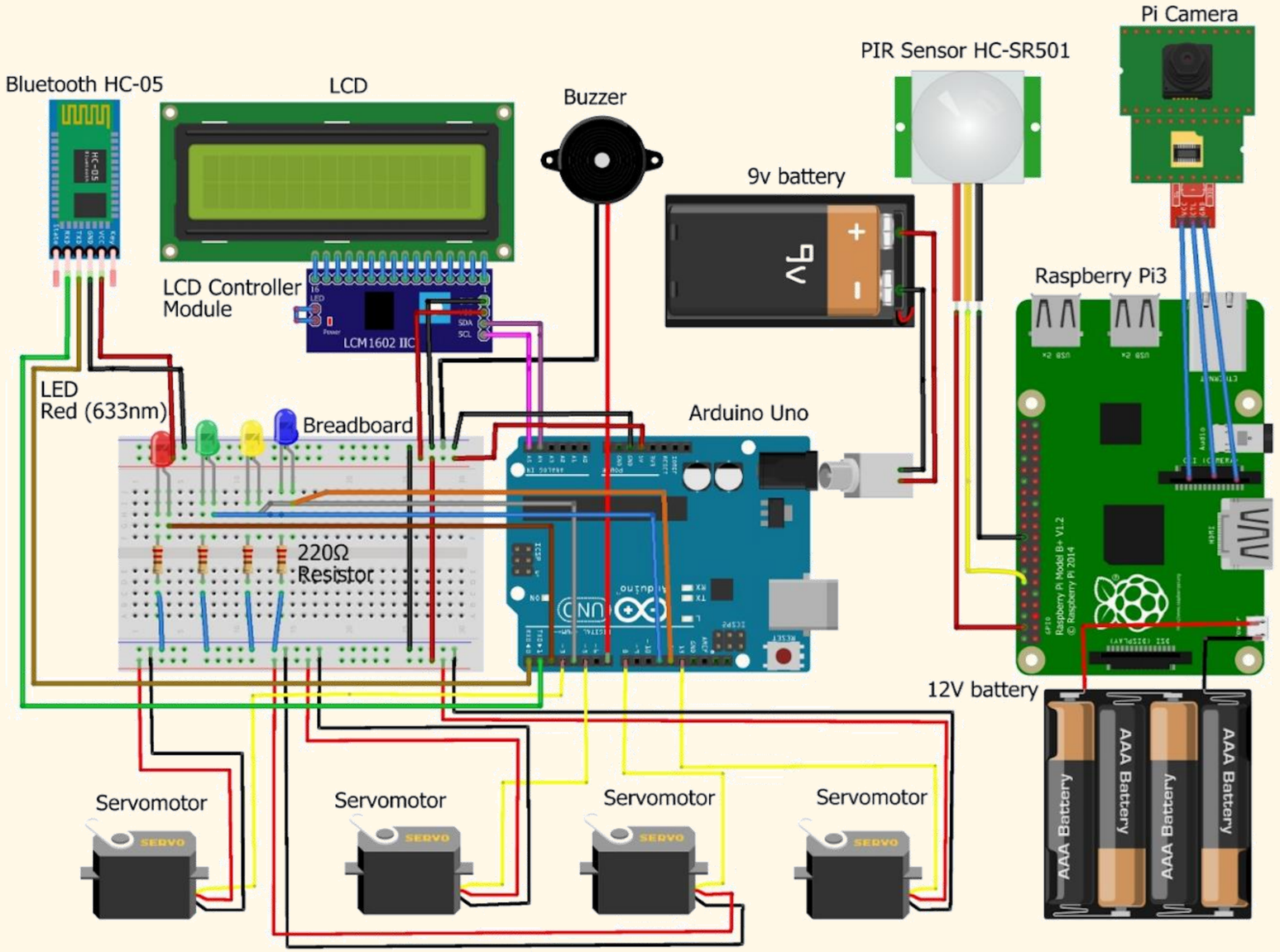
A Menu for the Caregiver Profile

B Dispensers Option

C Medicine Boxes Option

Design and Implementation Details

IoT-Based Smart Medicine Dispenser to Control and Supervise Medication Intake



Design and Implementation Details

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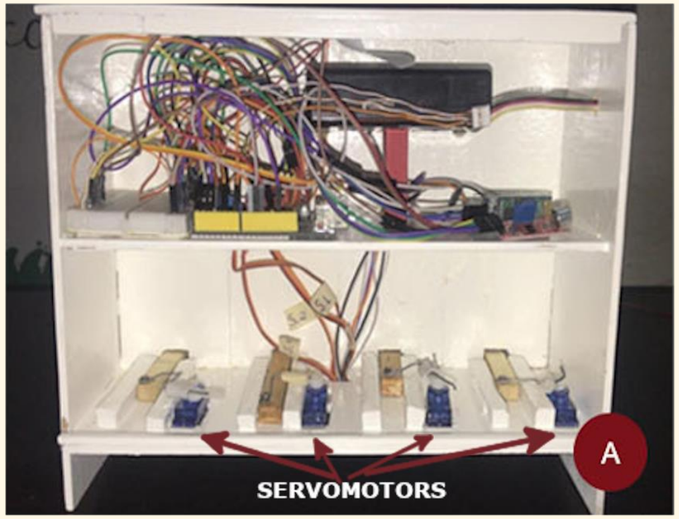
BOXES

All the medicines that a patient must take at a certain time should be introduced in one of these boxes.

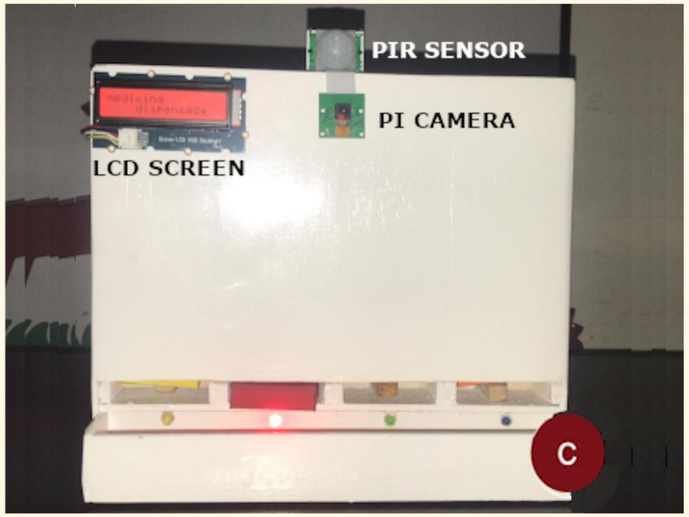


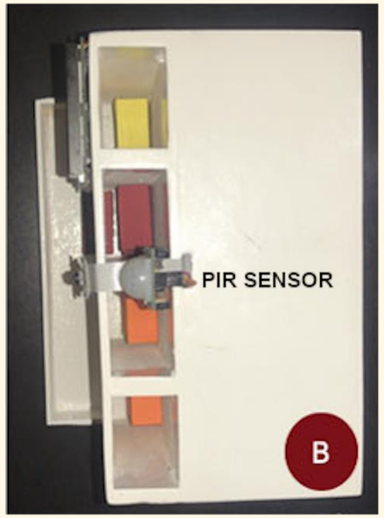
SHELVES

Shows the internals of the dispenser (with the back cover removed), where we can see two shelves.

COMPARTEMENTS

The dispenser, it has four vertical compartments.





SENSORS

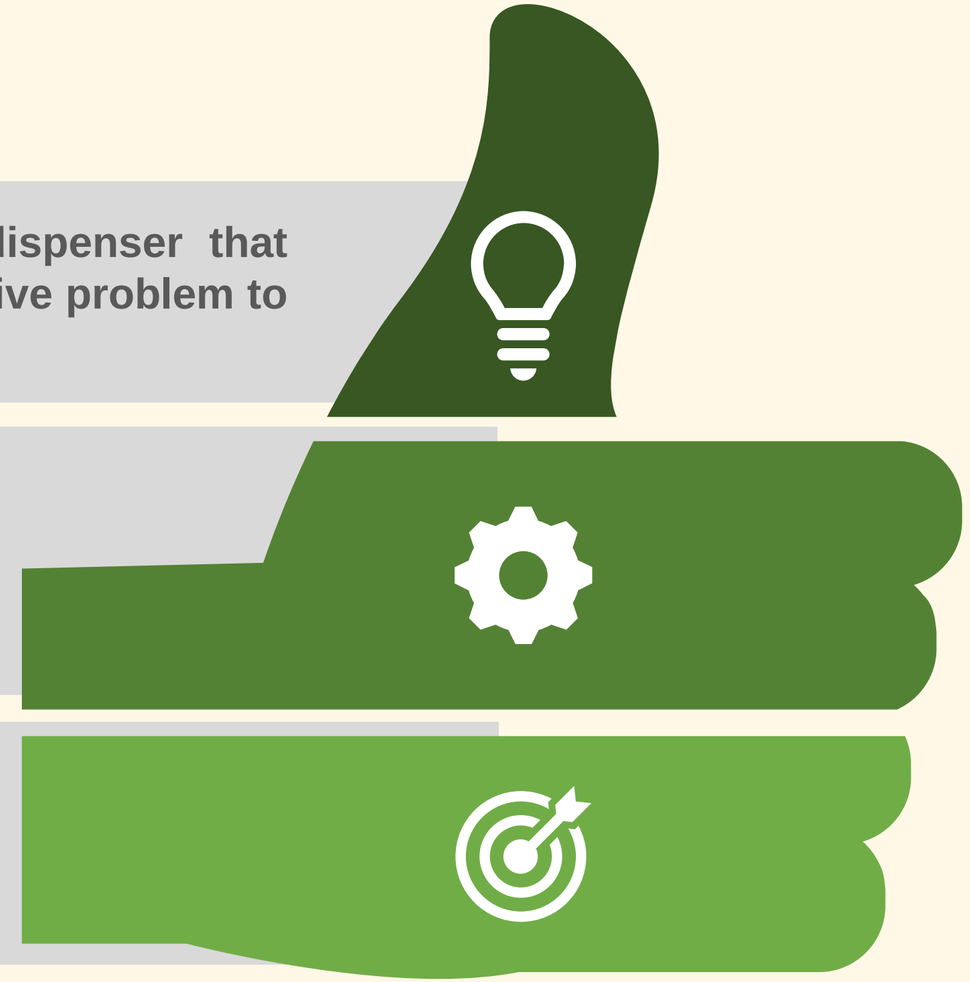
The Raspberry Pi B+ controls the PIR sensor and PI Camera. And Arduino board controls servomotors, the Bluetooth module and the LCD screen.

Conclusions and Future Work

We have presented a smart medicine dispenser that helps older people or people with a cognitive problem to take their medicine doses on schedule.

As for future work, we want to improve the proposed system.

Besides, the overall system performance will be evaluated after encrypting the whole patient database and face detection images.



Thank You!

Any Questions?