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TECHNION
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Remote Dog Chip Reader

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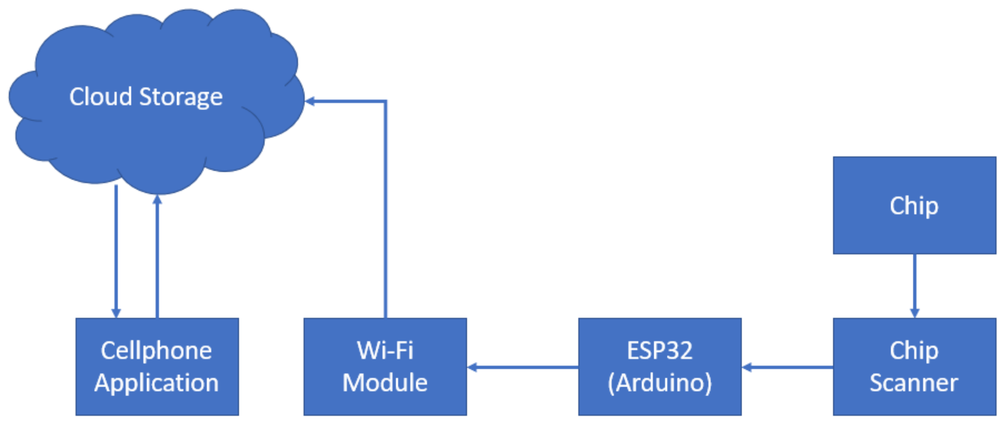
Background

- Lots of pets today have microchips inserted in their body.
- Each one of those microchips has an id which consists of 16 bytes.
- In order to scan the pet's microchip, the user needs an RFID chip scanner.
- Most chip readers are hard to operate.
- They are relatively expensive.
- Available chip readers do not show sufficient and helpful information when scanning the pet.
- In order to get sufficient data about the scanned pet, the user must search for the data manually through a long procedure.

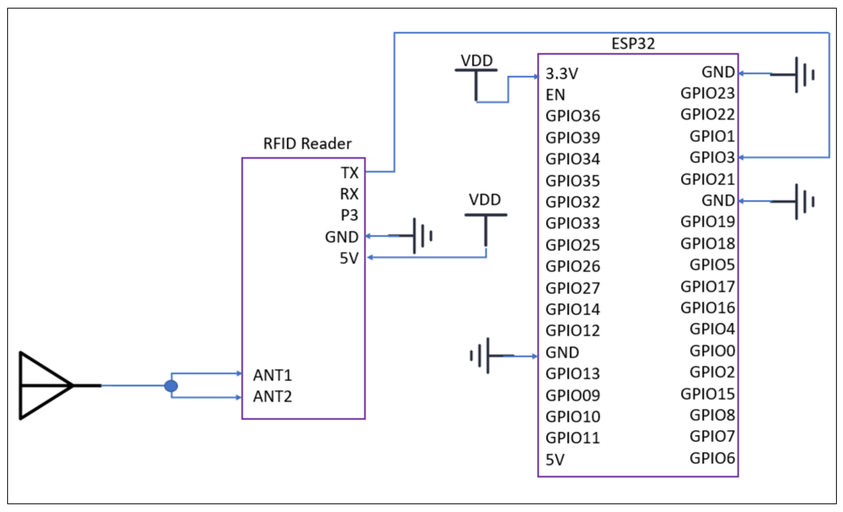
Project Goals and Challenges

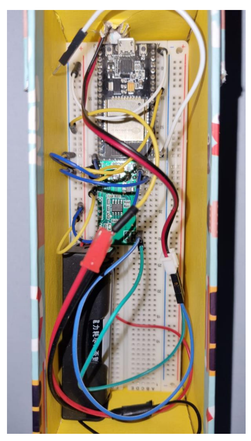
- Design a microchip reader which is compact, cheap and battery powered.
- Scanning the pet should be straightforward and intuitive.
- Save the pets' information in dedicated databases.
- Display the pet's info to the user using an application.



Hardware Implementation

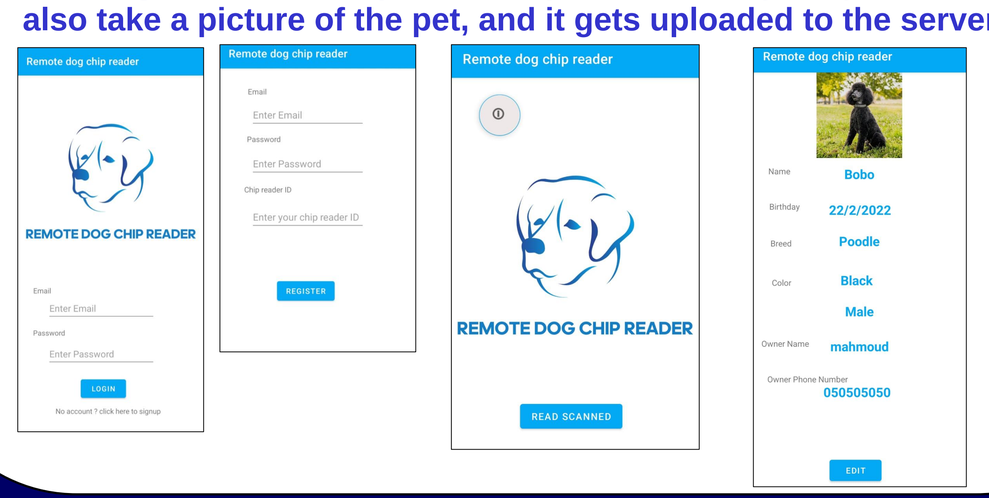
- A device called RDM6300 (EM4100 RFID Reader for ESP32) scans the microchip and transmits the scanned data to ESP32 using UART protocol.
- The ESP32 sends the data to our Realtime Database through Wi-Fi, where it gets synced between all the connected phones that are using the app.





Software Implementation

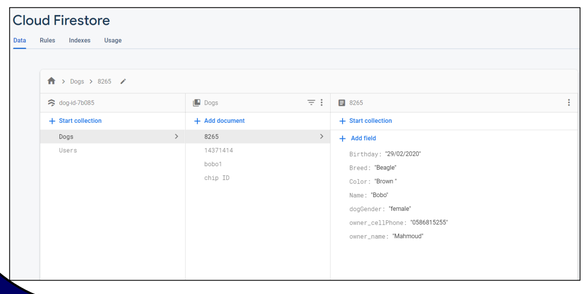
- Using Arduino IDE, we programmed the implementation of the hardware devices in our project.
- Using Android Studio, we programmed our dedicated application which connects to our cloud databases, reads and modifies the data stored in them.
- Entering data of a newly scanned pet is also very easy, the user can also take a picture of the pet, and it gets uploaded to the server.

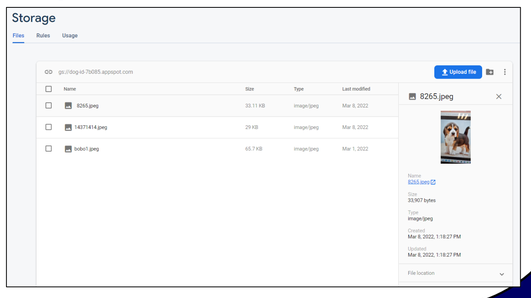


Firebase

Firebase is a very popular toolset for managing cloud storage databases. We used this toolset in order to store and modify the data of the users and the pets in our system.
From Firebase we used three types of databases:

- Realtime Database – to sync between the chip scanner and the application.
- 2 Instances of Cloud Firestore - one to store the users' data and the other for the pets.
- Cloud Storage – to save pictures of the pets.





Results

- We have designed a chip scanner that is compact, low cost and battery powered.
- Using the scanner is easy and intuitive.
- Our dedicated application provides a seamless and a user-friendly experience.
- The databases that we use to store the information are relatively cheap, secure and reliable.