Intellitory

Smart Shelf for Intelligent Inventory Management

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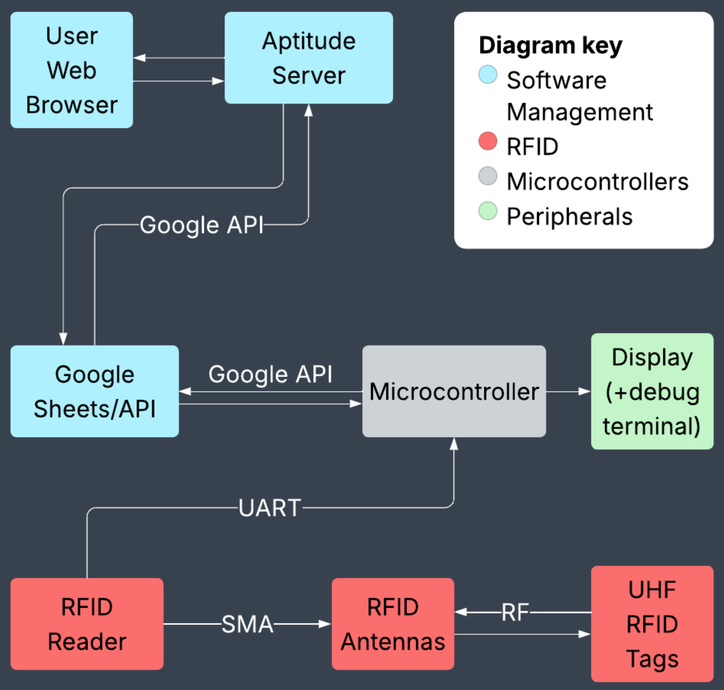
Overview

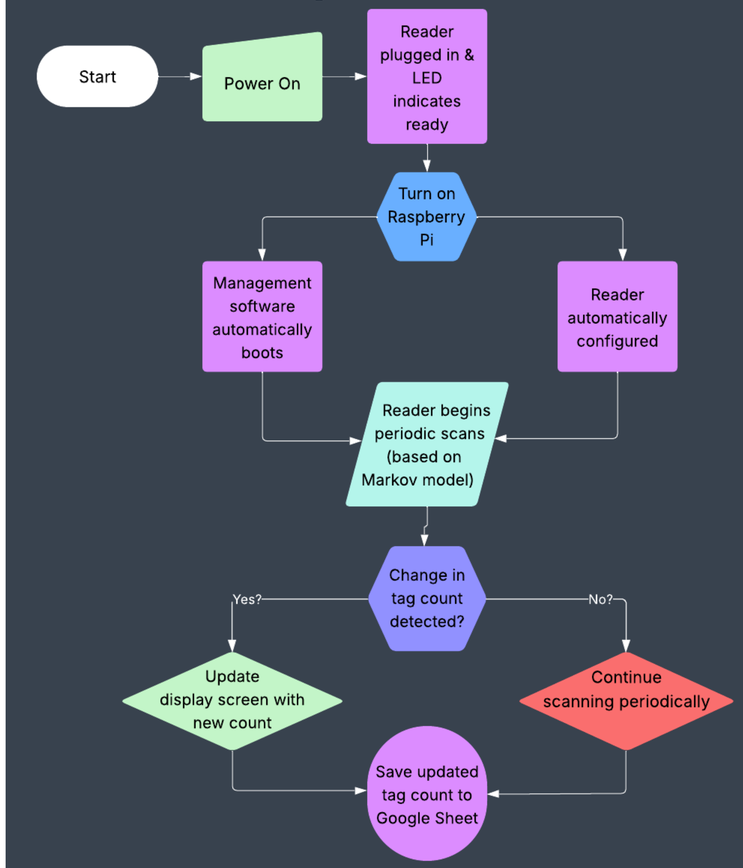
Traditional inventory management in clinical and lab settings is often manual, slow, and error-prone, leading to stockouts, misplaced items, and poor supply tracking. These issues disrupt operations, raise costs, and put patient care at risk. To address this, we developed an intelligent shelving system using UHF RFID to automate real-time inventory tracking and make the process easier for users. Our smart shelving system automatically tracks items as they are added or removed, with each shelf unit featuring a display that shows real-time inventory, giving users instant insight into stock levels. Inventory data syncs wirelessly to a web application, enabling authorized users to remotely monitor, review, and manage updates from anywhere. This ensures accurate, efficient, and reliable inventory control across all platforms and fully streamlines and automates the item/tag tracking process

Block Diagram

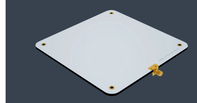


Software Flow

Physical Device



Main Parts



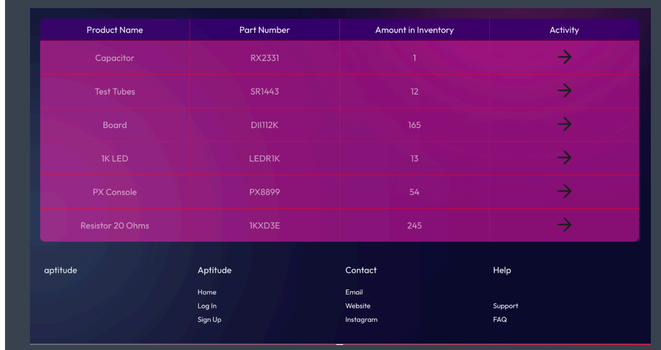
RFID Reader

- A Zebra FX9600 reads RFID tags inside the shelf
- Connects to the Raspberry Pi for inventory management

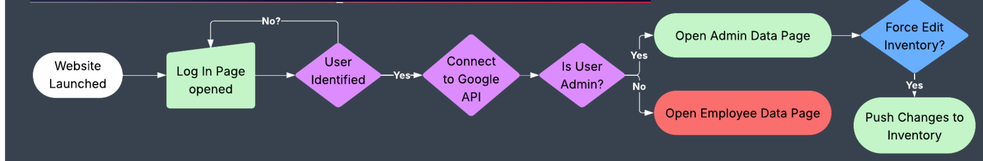
RFID Antenna

- A Vulcan P11 UHF Antenna detects RFID tags in the shelf
- Connected to the reader with RP-TNC Male to SMA Male cables

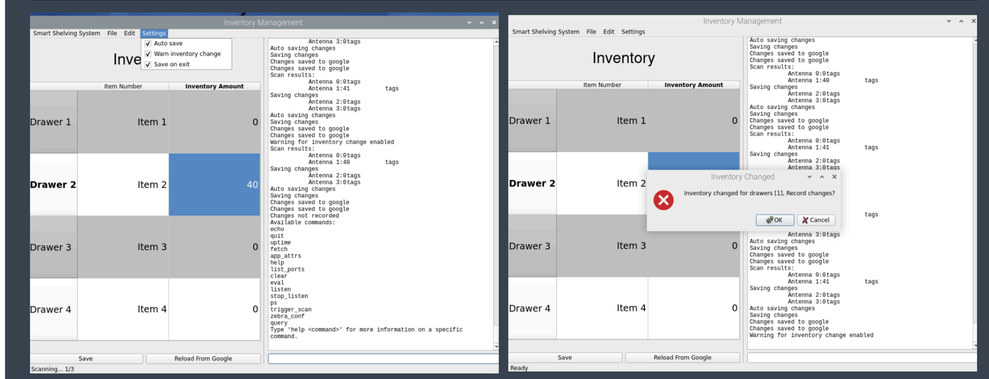
Web Application



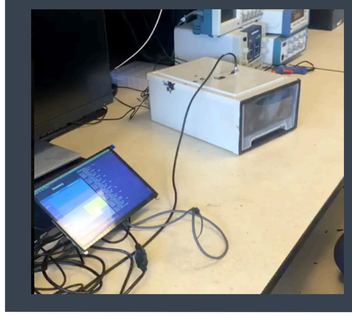
- Displays real-time inventory data syn ced from the smart shelf.
- Allows admins to create and manage user accounts through the web app.
- Enables admins to manually edit inventory counts when needed.

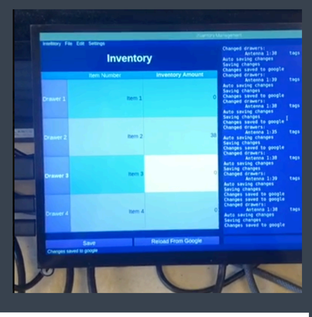


On - Shelf UI



Final Product





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