Smart Inventory Control System

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Introduction

With the rising popularity of smart devices, there is a need for cost-effective smart solutions for home use. Our work aims to develop a Smart Inventory Control System that helps users track their groceries, monitor fridge conditions, and prevent food waste.

Goals of the system

1. Track groceries using barcode scanning.
2. Notify users about expiring products.
3. Allow users to manage recipes based on stored inventory.
4. Implement secure communication between devices.

Communication

The secured communication between the device and the server is ensured by the **MQTT** protocol with following topics:

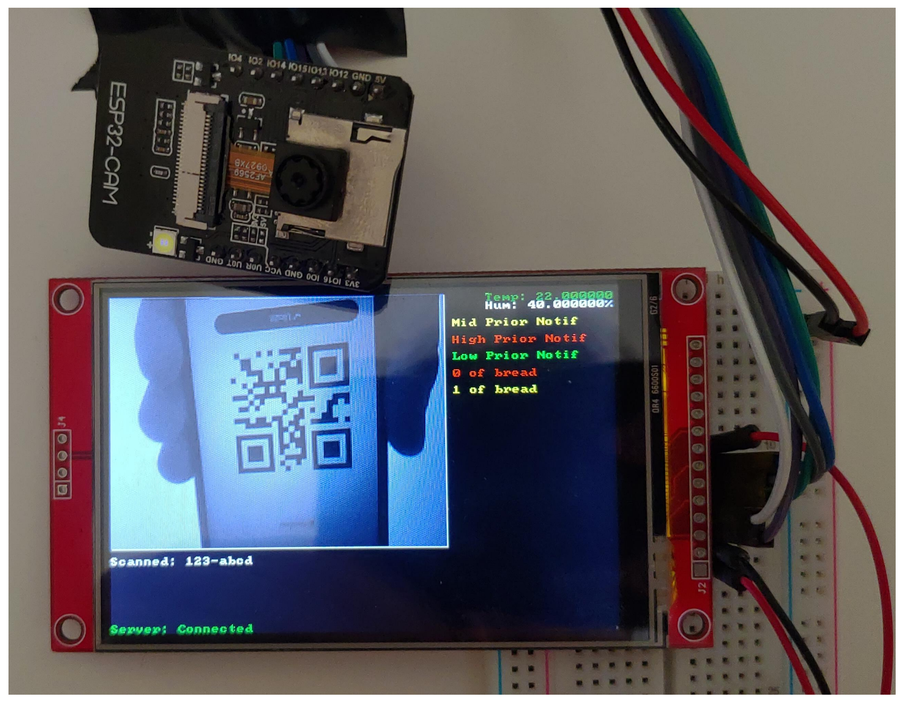
- notifications/<#> (# – priority)
- product/<action>
- humidity
- temperature

Solution

The system consists of a device and a server.

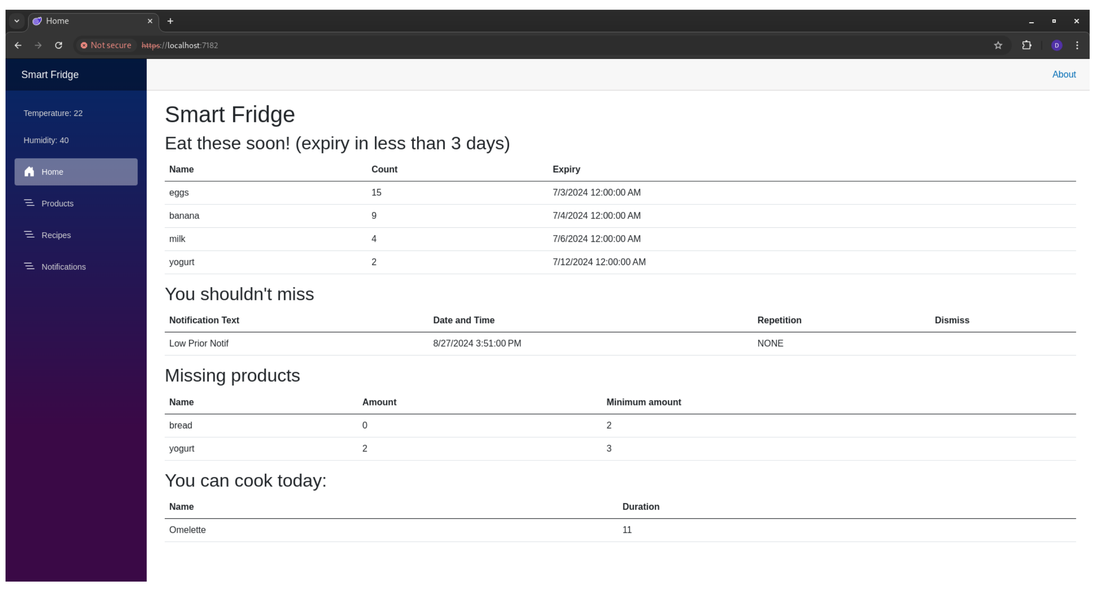
Device

The device uses an **ESP32** microcontroller with a camera to scan barcodes and a display as user interface.



Server

The server is built using **Blazor .NET** for web-based interaction. The web interface allows user to manage products, notifications and recipes.



Conclusions

The system successfully tracks groceries, provides real-time notifications, and allows users to manage their inventory effectively.

The system could serve as a base for a wider smart home system and could be extended to connect more devices.

In future versions, the user experience could be enhanced by incorporating a device board with more pins which would allow the use of the touch screen.

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Further information

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Repository:
github.com/Dejvoid/smart-fridge