



IOT-ENABLED COMMUNITY FRIDGE

A Smarter Way to Share

Community fridges offer an innovative way to tackle food waste and combat food insecurity by fostering a culture of sharing. While they have gained popularity in local resident committees, challenges such as inadequate access management and a lack of data analysis to identify needy families have hindered its effectiveness. It has also led to inefficiencies, wastage and user dissatisfaction. To overcome these challenges, the team designed an IoT-enabled smart fridge to improve food distribution efficiency. The system tracks access and uses data analysis to better identify and support families in need, enhancing overall user satisfaction.

The smart fridge integrates multiple technologies to create a secure, efficient, and user-friendly system. Access is granted via an EZ-Link Card authentication system over a 4G network, ensuring that only authorised individuals can retrieve food items. An electromagnetic lock system provides secure access, while CCTV surveillance deters vandalism. Smart sensors monitor food conditions, including temperature and door status, ensuring safe storage. A cloud-based platform processes the data, allowing administrators to manage and monitor the fridge remotely. Additionally, the team developed a web application that provides real-time updates, helping administrators track food distribution and identify residents who may require additional support.

Innovators' Inspiration

"Seeing the struggles of those facing food insecurity, we wanted to make a difference by integrating IoT technology into community fridges. Through the implementation of smart access control with EZ-Link cards, we made the food exchange process easier for donors and residents. The access records can be analysed to improve services, ensuring food reaches those who need it most. This project not only showcases our technical expertise but also drives meaningful community impact, transforming innovation into action for a more connected, compassionate world."

~ **Santos Rachel Ham**

What's So Special

- An EZ-Link Card authentication system ensures that only registered residents can access food.
- Real-time cloud-based monitoring tracks fridge status and user access data, enhancing operational efficiency and enabling timely support for those in need.
- Fridge usage analytics help community leaders better understand food supply and demand, enabling better resource allocation. Administrators can also leverage on data insights to identify residents who may require additional financial support.
- The team tested their smart fridge with a community partner and received positive feedback. Plans are underway to expand and make more of these smart fridges available at more locations.

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