Kitchen Store

Mobile Application using IoT techniques to reduce Food wastage Globally.

Abstract

This paper takes you through everything you Need to know about Kitchen Store and its fight Against global issues using IoT Techniques.
However it has become That time in our lives where technology can be Developed to understand people. This research Paper will take you through how Kitchen Store Displays a perfect example of how it understands People, just by understanding a problem which Currently exists and solving it. With that being said It all comes down to results, being able to portray An effortless system that humans can quickly adapt Too and most importantly see the results.

Keywords
IoT- Internet of things
Fao- Food and Agricultural organization

1. **Introduction**
The issues which kitchen store addresses in our society today is against Global food wastage. Intentional or unintentional, whichever the excuse may be, iOT today is developed to solve these issues as it changes the way humans interact. A normal day in our modern society requires us to have some sort of interaction with IoT and you may not even realize it. If you're a daily commuter on public transport you would probably be used to having an app that locates the bus for you, yes that is iOT. See the difference it has made? It has made becoming "late" an unacceptable excuse. So in brief explanation, Kitchen Store tackles this problem for humans by flexing its IoT techniques. Most importantly it focuses to excel in being the solution to the problem.

On the contrary, what is so special about Kitchen store that other mobile apps fail to overcome this issue?
Regardless to whether you think other apps have "failed" to address the issue, They have actually either tried to make a difference and currently still are making a difference or their features are not engaging the interest of users. Besides solving the problem, you need to also be able to allow users to enjoy the app. So while Kitchen store focuses on decreasing food wastage, we interest the customers to use the app by having features which could improve their daily lifestyles, features such as the recipe finder which enables users to cook meals they never thought of or in fact do not know how to cook. Earlier I mentioned that when people have problems they run to google. Well this is a prime example of when someone is looking for a recipe and out of what you have available in your Kitchen, this app will help you create a meal depending on what's available. That is how we engage our users to use the app but in actual fact, or should i say, "behind the scenes" we are fighting the war against food wastage while users are engaging with the app (recipe finder).

Background

The issue of food wastage globally has cost world governments $940 billion, a figure which is $60 billion shy of a trillion dollars.**[1]** At this rate with food wastage growing annually by hundred millions of dollars, that trillion dollar food wastage mark could be reach by the end of 2024.

"**Hunger** defines a short-term physical discomfort as a result of chronic food shortage, or in severe cases, a life-threatening lack of food. **[2]**
With the amount of food being wasted annually, hunger best defines the sort of situation people experience while the fortunate don't realize that the food they waste can save someone from a life threatening situation.

"The United Nations Food and Agriculture Organization (FAO) estimates that about 815 million people of the 7.6 billion people in the world, or 10.7%, were suffering from chronic undernourishment in 2016." **[3]**If every household could learn to donate and not to waste that could benefit every undernourished human being.

Besides the fact that food wastage does not help undernourished people, it simply does not benefit household individuals, the economy and also the world we live in today in the context of climate change. Landfills is where food gets stored when it's wasted and it creates approximately 8% of greenhouse gas emissions in our world today. Not only does a reduced amount of wastage help with individuals and undernourished people but it also helps the planet. Climate change becomes less sabotaged by greenhouse gas emissions produced by landfills.

Being able to use IoT techniques for kitchen stores, the results will prove to show its success by dominating the problems that come with food wastage, and most importantly the problem itself being food wastage.

Literature review

Below we have produced a literature review on apps which are similar and their features. It is key to view comparisons to other apps so that through their reviews and their functions we can identify problems that they have and find a better solution. Like mentioned above by the developer of Freshbox, he mentioned that he deeply regrets not adding the function of allowing people to scan qr codes to update their inventory. Reviews state that people prefer the method of scanning a qr code than manually entering their products.

APPS AVAILABLE	Kitchen store	Fresh box	Best before	Fridge pal
Food expiry reminder	Yes	Yes	Yes	Yes
Food Donating feature	Yes	No	No	No
Recipe Search	Yes	No	No	Yes
Recipe suggestion	Yes	No	No	No
Mark food that you do not like to avoid using those ingredients	No	No	No	No
Share shopping list	Yes	Yes	No	Yes
QR code scanner	Yes	No	Yes	Yes

Analysis of Features

(Based on Literature review)
With the above features, some apps have more than others while some focus more on having little features, and just operate on the fridge inventory only.

Sometimes to have just a simple feature like that as the app is a benefit as people just want to keep track of what's in their fridge. In other cases it would make it more beneficial for people when the app has more features, for example the virtual store. The virtual store then makes it easier for people to purchase online any item they don't have. The more problems the app solves the more the user has a better experience with it.

Feature comparisons

Of these features labelled above they each have their own sort of importance which basically determines the apps need, example if you have to manually enter products, people prefer to scan the product.

QR code scanner

Serves great importance for our app as this is why we compared it across the other apps and based on users reviews they mention that it is a feature they would like introduced to make the app more easier. Users can effortlessly update their inventory after purchasing groceries by just scanning the QR code feature provided.

Sharing the shopping list

This feature is available to users who are in one kitchen. Instead of being able to share the grocery list via text or email, we have allowed users who are joined in one kitchen inventory (many users on one kitchen) to view everything that the moderator of the kitchen can view and access.

Recipe suggestion

This feature basically suggests meals that could be made using ingredients that you have. We have identified this as one of our main features. This is useful as people can try out new recipes frequently. People need options when it comes to meals they could prepare compared to the meals they know how to prepare, this function helps explore different foods that can be made with current items.
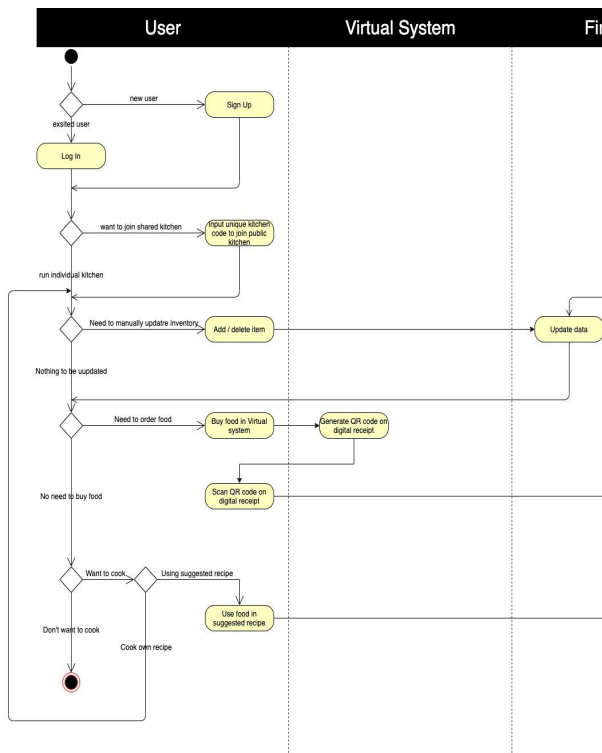
Donating Feature

This is an important feature for our app which looks to help those in need. Other apps that i've done research on have not displayed any way of donating food in order to decrease wastage. We have identified this key feature to help those in need and reduce the food wastage.

Food expiry reminder

This being our most important feature, it fights the war of food wastage overall. Food wastage happens because of factors like people not being able to track expiry dates. Other apps have delivered this feature hence in the introduction we mentioned that these apps do not fail as they make a difference in a household but they are not entertaining enough for people to want to interact with it. So having additional features would be ideal supporting the main feature which is expiry date reminder.

High Level Architecture

Below we have designed a system architecture flow diagram to display the certain features in operation, from user flow through to the database, when a feature is called upon, it describes what goes on in the backend system to make those features work.

User	Virtual System	Fir...

Design

With great focus towards the design and images we have decided to use as icons, we have figured that it would be ideal to either create a design that takes over the full app for example the whole background is a two toned colour, which we did test out but we chose not to use that because of the inconsistency it has especially when we users are using the app, it seems too overwhelming and a app with a lot of colour does not catch the users attention the way you want it too.
If we use uber(eats) for example their app has basic colors when it started off. Just black and white, and a touch of green, yet it still looked modern, that is the sort of touch we have implemented on our app so that users are not too overwhelmed by colors and rather they enjoy a simple modern app which they can use on a daily basis, or more like two to three times on a daily basis. We are avoiding the fact that they have to look at a specific color too many times in a day or a week.

Proposed solution
(Kitchen Store Goals)

Our proposed solution which
Also aligns with our goals are as follow:
1. Decrease food wastage
2. Help users Save funds from all foods wasted
3. Donate food to undernourished people which also helps reduce amount of food wastage that goes to landfills

With the above solutions displayed, we plan on reaching our goals by the fulfillment of our features, our features give great focus on each of these aspect mentioned above and results will follow as long as users stay connected. In order to keep our users satisfied we have introduced the Recipe finder and recipe suggestion features, in this way users can always keep track of whats inside their kitchen along with using items that are about to expire. Already that is the solution to decrease food wastage and users saving funds. If users are saving funds , the global economy would also be saving funds.
Last but not least our donate feature which allows users to donate their food, if they do not want it and also if it has reached its expiry date but it is still in good condition, they can donate it by just pressing donate. All of our features cover the problems as they are solutions which we found to beat this global issue along with our extra features to ensure users are always connected on the app.

Conclusion

Kitchen Stores solution to fight and win the battle against bad habits which provokes the way we live started when this app was developed. Not only did we learn about the problems but we have Played our part by creating a solution to this global issue. Our Important features such as the donation feature which is not focused on materialism but rather focused on saving the lives of people who are not fortunate enough to go through a day blessed with a meal. We have identified our slogan based on that feature and our slogan "No to waste, Press to Donate.". Just with this feature alone we are fighting food wastage as it being decreased along with helping those
In need of a meal. Without the need to mention our other features which are successful, we will be monitoring the results it brings through our databases, and our goals would be to see more food being donated, expiring meals being used before they expire and thrown away and also much less wastage overall which means more savings for individuals and the global economy.

Our future plans once the app is available on play store, we look forward to adding it also on to the app store making it cross platform and eventually making it an essential kitchen item. For example having a device in your kitchen such as an ipad which now has become a household kitchen asset. We have also considered adding different established grocery stores on our app such as coles or woolworths because not everybody would purchase from our online kitchen store or should i say that not everyone will be able to add their coles products onto the kitchen store which limits the use of our app, so introducing the bigger grocery outlets to our online system so that users can update their inventory with those items would be a big plus for kitchen store.

Referencing

[1] OzHarvest. 2021. Food Waste Facts and Hunger Facts | OzHarvest Sustainability. [ONLINE] Available at: https://www.ozharvest.org/sustainability/food-waste-facts/. [Accessed 04 May 2021].

[2]https://www.worldhunger.org/world-hunger-and-poverty-facts-and-statistics/

[3]https://www.worldhunger.org/world-hunger-and-poverty-facts-and-statistics/