BHOJANSAMVEDI: FOOD DONATION MOBILE APPLICATION

Prof. Swati. M. Patil*1, Kshitija Mane*2, Shruti Pondkule*3, Ganesh Hale*4, Kshitij Pise*5

*1Asst. Prof. Department of Comp Eng. SCOE, Pune, India.

*2,3,4,5Student, Department of Comp. Eng. SCOE, Pune, India.

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ABSTRACT

Bhojansamvedi is a groundbreaking mobile application designed to address the issue of food wastage and promote smart living by facilitating seamless food donation. The app aims to create a sustainable and technologically-driven solution to connect surplus food providers with individuals or organization in need. This is highly significant, particularly during crises such as the COVID-19 pandemic. This paper focuses on creating an interesting mobile application app called Bhojansamvedi that provides the power of modern smartphones and digital platforms to streamline the process of food donation, reducing food waste and conducting to a more equitable distribution of resources. It boasts an intuitive and user-friendly interface, making it easy for both food donors and recipients to navigate the app. The design emphasizes simplicity to encourage widespread adoption. The app employs a sophisticated matching algorithm that considers factors such as location, types of food, and urgency to connect surplus food providers with nearby recipients in real time. This ensures timely and efficient food distribution. It ensures the security of all transactions by implementing robust authentication and verification processes. This builds trust among users and encourages more people to participate in food donation initiatives. The app incorporates data analytics tools to track and analyze the impact of food donations. This fits the general realm of AI for smart living in smart cities. In addition to entailing IoT (Internet of Things) and ubiquitous computing, this work makes positive impacts on both healthcare and environment by reducing hunger and food waste respectively. We describe our Bhojansamvedi app development using principles from AI, and especially HCI (Human Computer Interaction).

I.   INTRODUCTION

The year 2020 brought unprecedented challenges globally with the outbreak of COVID-19, impacting societies in profound ways. Beyond health concerns, the pandemic triggered shortages in essential supplies, including disinfectants, personal protective equipment, and even food. As schools closed, the abrupt disruption of daily life left vulnerable populations, especially school children reliant on school meals, facing food shortages. In response to these challenges, food donation centers emerged to address the immediate needs. Moreover, the pandemic accelerated the adoption of AI-based virtual environments by businesses, prompting some to enhance their platforms to address new demographics. Amid these circumstances, the Bhojansamvedi mobile application was developed as a solution to the food shortage exacerbated by COVID-19. Functioning as a bridge between food suppliers and consumers, Bhojansamvedi incorporates a knowledge base for users to facilitate communication. Both suppliers and consumers can create accounts, providing essential information. For instance, food suppliers can input details about the type and quantity of food for donation, expiry dates, and perishability. The app integrates geographic and temporal parameters, ensuring the freshness of donated items during delivery, drawing inspiration from principles of constraint satisfaction problems in AI.

II.   RELATED WORK

Christina Varghese et al. (2021) developed an android application namely SeVa. Within the context of contemporary challenges, a paramount goal was the mitigation of food waste by repurposing existing food reservoirs in local communities, encompassing surplus items approaching expiration in restaurants, stores, and distribution centers. These objective gains heightened significance during crises, such as the ongoing COVID-19 pandemic. This research centered on the creation of an innovative mobile application, SeVa, designed to establish a comprehensive platform facilitating user access to and visualization of local food resources. The primary aim was to effectively address the dual issues of hunger and food waste. Aligned with the United Nations Sustainable Development Goals (UN SDGs) and situated within the broader framework of AI for Smart Living in Smart Cities, the SeVa app integrated principles from AI, particularly emphasizing Human-Computer Interaction (HCI), IoT (Internet of Things), and ubiquitous computing.[1]

Ebin George et al. (2023) developed a food donation mobile application and gave overview for the same. The project addressed food waste and hunger issues through an Android application, aiming to seamlessly connect food donors with recipients. The initiative envisioned transforming the traditional process of food donation into a well-organized, community-driven experience. By adopting agile methodologies and a user-centered design approach, the project pursued to create an inclusive platform involving donors, recipients, and volunteers. Key features, such as GPS, real-time tracking, and volunteer assistance, were used to enhance the impact of each donation. Beyond technological solutions, the project signified a commitment to social good, fostering a sense of community and shared responsibility in addressing societal challenges related to food abundance and scarcity.[14]

Hassan Hajjdiab et al. (2018) developed an android application to address the prevalent issue of food wastage in our society, our research focuses on the critical aspect of food waste management for improved environmental and economic sustainability. To tackle this challenge, we harnessed mobile technology, leading to the creation of an Android application. This innovative app facilitates restaurants in donating and sharing surplus food with those in need. Users can seamlessly engage with the app by registering, logging in, viewing items, adding items to their cart, removing items, and logging out. Leveraging Firebase storage and a real-time database, this platform ensures efficient and secure food management. Through this app, users in need can easily access a variety of donated food images from different sources, adding items to their carts for potential distribution.[12]

John Amiel R. Morilla et al. (2021) developed an android application to address persistent food insecurity, particularly in low-income areas, this research focuses on mitigating the dire impacts of hunger, poor nutrition, and health issues. The paper introduces Foodernity, a mobile and web application, aiming to provide accessible food solutions to those in need. Amid crises like the COVID-19 pandemic, where budget constraints in low-income areas exacerbate the problem, Foodernity strives to alleviate the burden on the needy. The application, developed following the Agile Model, not only aids the hungry but also contributes to reducing food waste. By enabling donors to contribute to organizations supporting the needy, Foodernity facilitates a streamlined process to ensure food access for those who rely on donations during critical times.[11]

III.   SYSTEM DESIGN
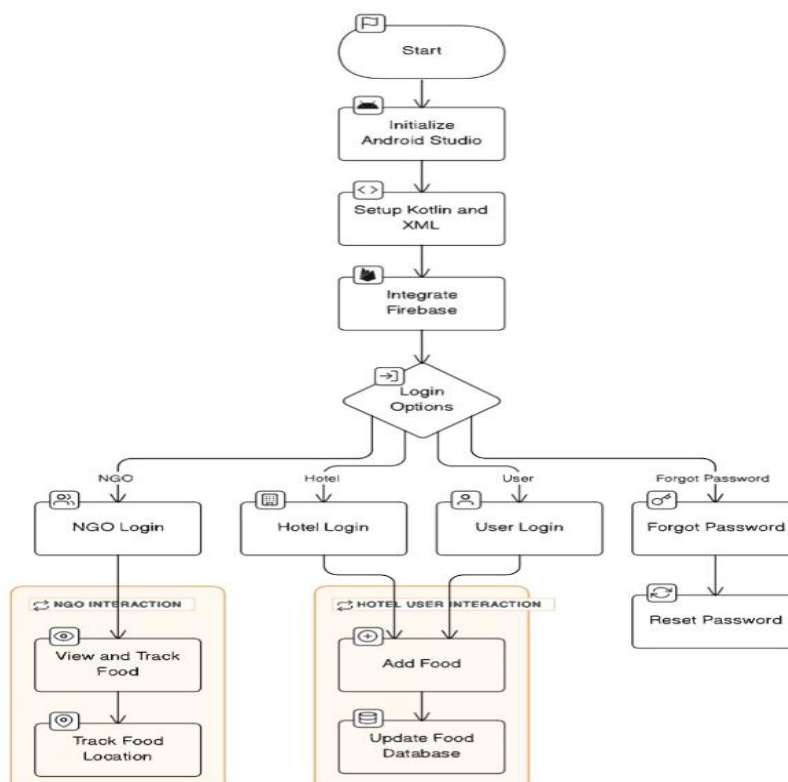
1. Programming Languages and Tools:

The application is developed using Android Studio, with Kotlin as the primary programming language for the backend logic and XML for designing the user interface.

2. Database:

The application uses Firebase as its online database. Firebase provides a real-time database and backend as a service and allows you to sync data across all clients in real time.

3. User Roles and Authentication:

The application has three types of users: hotels, NGOs, and individual users. Each type of user has a different role and capabilities within the app.

- Hotels and Users: They can add available food in quantities. They need to log in to the app to add food.

- NGOs: They can see the added food and track it. They also need to log in to the app to access these features.

The application includes a login option for each type of user, as well as a forgot password option for account recovery.

4. Core Features:

- Food Addition: Hotels and individual users can add food that they wish to donate. They can specify the type of food and the quantity available.

- Food Tracking: NGOs can view the food added by hotels and users. They can track the food and arrange for its pickup and distribution. This architecture allows for efficient food donation and distribution, making "Bhojan Samvedi" a valuable tool for reducing food waste and helping those in need. It leverages modern Android development tools and practices, and uses Firebase for reliable, real-time data syncing.

IV. CONCLUSION

In conclusion, this app stands as a promising and impactful solution in the realm of smart living by addressing the critical issue of food shortage exacerbated by the challenges of the COVID-19 pandemic. The app's development was driven by a recognition of the immediate need for efficient food distribution channels during a global crisis and a commitment to fostering selfless service. The innovative approach leverages modern technology, incorporating a user-friendly interface and a real-time matching algorithm to seamlessly connect surplus food providers with individuals or organizations in need. By creating a knowledge base within the app and emphasizing community engagement, Bhojansamvedi goes beyond being a mere transactional platform, fostering a sense of responsibility, awareness, and support among its users. The incorporation of AI principles, such as constraint satisfaction problems, ensures the efficient and effective matching of food suppliers with consumers while considering crucial factors like geography and temporal constraints. The app not only addresses the immediate challenges posed by the pandemic but also contributes to the broader United Nations Sustainable Development Goals, specifically targeting No Poverty, Zero Hunger, Good Health and Well Being, and Sustainable Cities and Communities.

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