

# MifsApps: App Concept as Open-Access Food-Sharing Media

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**Abstract.** In 2020, Indonesia generated 67.8 million tons of waste, with organic waste accounting for 60% of the total, particularly food waste. Food waste is a severe problem, particularly in large cities such as Jakarta, where food waste accounts for around 70% of total waste. Poorly managed food surpluses are at the core of the problem, resulting in food waste and greenhouse gas emissions. The Ruang Pangan community in Bandar Lampung is one of several food banks that provide surplus food to disadvantaged communities and orphanages. They created apps like MifsApps to help partners distribute surplus to the community. The app connects food donors and recipients, reducing edible food waste. The app's mechanism is similar to food rescue, except it provides easy access to surplus information. The app enables members of the Ruang Pangan Community to view surplus data, respond to deliveries, and report on food distribution documents. MifsApps promotes SDGs 2 and 12 (Zero Hunger and Responsible Consumption and Production). The app helps to reduce social inequality and poverty, improve people's welfare, and promote responsible production and consumption. MifsApps, as a technical breakthrough, is a real-world application for fulfilling the SDGs holistically.

## 1 INTRODUCTION

According to figures from the Ministry of Environment and Forestry, Indonesia generated around 67.8 million tons of waste in 2020. Approximately 60% of this quantity originates from organic waste, which includes food waste. Food waste is becoming a major concern in Indonesia, particularly in large cities. According to a report by the Bioscience and Biotechnology Development Foundation (YPBB), food waste accounts for approximately 70% of waste in Jakarta. This fact is a concern since food waste not only wastes food that is still edible but also causes greenhouse gas emissions that contribute to climate change. The issue of food waste originates from the presence of food surpluses that are not effectively managed. Food that should still be consumable but lacks a distribution network from a food bank, resulting in the formation of food waste. Ruang Pangan Community is Bandar Lampung's only food bank capable of distributing extra food from supermarkets, hotels, and cake shops to recipients. The impoverished and orphanages stand to benefit from this

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situation.

Ruang Pangan Community frequently encounters challenges in its mechanism, particularly the surplus distribution chain from partners to the community. The food excess distribution mechanism has challenges, such as a lack of coordination on pick-up schedules, poorly organized documentary evidence, and administrative duties related to the day, date, and location of pick-up. Based on these issues, the concept of an application to ease the excess distribution chain from partners to the community emerged. This app works by connecting surplus food donors with food recipients in need, preventing food that is still edible from going to waste. The mechanism of this application is identical to the food rescue technique used by the Ruang Pangan community. The difference is that information about the day, amount, and availability of surplus from partners is easily accessible through this application.

Members of the Ruang Pangan Community only need to view the information provided in this application, and they can easily respond to submissions of surplus information from partners in the form of documentation reports on the distribution of surplus food. The distribution status will automatically change to complete once the partner obtains proof of documentation. This application's aim aligns with attempts to achieve the second and twelfth SDGs. Thus, creating food-sharing applications such as MifsApps can be a type of technical innovation that can help achieve the SDGs holistically.

Food-sharing apps like MifsApps are also strongly tied to the United Nations' Sustainable Development Goals (SDGs) initiative. The SDGs are 17 goals that aim to achieve sustainable development by 2030, including reducing social inequality and poverty and improving people's welfare. The 12th SDG target, titled "Responsible Consumption and Production," applies to food-sharing applications. This goal encourages people to distribute their leftover food to prevent food waste. MifsApps can also implement the SDGs' second goal, "Zero Hunger."

This study focuses on the role of MifsApps in accomplishing the Sustainable Development Goals (SDGs), particularly the Responsible Consumption and Production point. The research objectives include identifying the development plan of the MifsApps application as a solution to Indonesia's food surpluses, analyzing the application concept in the context of achieving the SDG's Responsible Consumption and Production, and determining the application development target using the SMART method.

Academically, the MifsApps concept has great potential as a research issue in environment, technology, and business. Food-sharing applications, such as MifsApps, can be used as a case study to learn about managing consumable leftover food, technology innovation, and long-term business plans. This concept may potentially inspire the creation of comparable applications in other nations dealing with food surplus issues.

From a practical standpoint, MifsApps is intended to reduce food waste, particularly in major cities, by guaranteeing that food that is still edible can be donated to people in need. This application may also pave the way for the creation of comparable apps by other parties, both commercial and non-commercial. MifsApps is also intended to assist in cutting food waste management costs and promote resource efficiency.

## **2 THEORETICAL BASIS**

### **2.1 Mobile apps**

Mobile software operates on mobile devices, including tablets, smartphones, and iPods. The app is intended to run independently with the assistance of the device's operating system. The mobile operating system's owner often maintains applications released on mobile platforms, such as Apple App Store, Google Play, and Windows Phone. Since smartphones were

initially launched, the number of mobile devices, including smartphones, has grown, as has their relevance for Internet access. Mobile applications, or apps for short, are also gaining popularity since they are now available for practically every facet of human existence. People utilize them for entertainment, education, and daily activities in the healthcare sector [1–3]. Mobile apps enable users to connect to internet services that are typically only accessible via a computer or notebook. Thus, mobile applications can make it easier for people to access internet services from their mobile devices [4].

## **2.2 Open-access**

Open access refers to digital technology and the availability of scholarly journal articles in digital format. Open access, in particular, refers to digital material freely available online with no copyright or license restrictions. Library digital services include information search services [5]. One of the library's objectives is to implement an Open Access (OA) policy for all publications produced by its institution, including articles, journals, theses, and dissertations, so that individuals can use them to gain information for free [6]

## **2.3 The Urgency of Mobile Apps, Food Surplus, Food Banks, and Their Relation to the SDGs**

According to the Food and Agriculture Organization (FAO), food waste is food that should have been consumed by humans but was dumped instead. Food waste can occur at any point in the supply chain, including production, processing, distribution, and final consumption. According to the FAO, decreasing food waste is one method to address inequities in food security and worldwide poverty. Reducing food waste can contribute to a more stable food supply while reducing pressure on the environment and natural resources [7]. Surplus food is edible leftovers that supermarkets, businesses, and households typically produce. Food surplus that is fit for consumption should be in good shape and taste, distributed and spent at least two days before expiration, and free of mold and odors that might cause diarrhea. If shops, restaurants, or families have surplus food that is fit for eating, it can be delivered straight to the Food Bank, which is Komunitas Ruang Pangan. Companies and shops can also work with Komunitas Ruang Pangan to distribute extra food sustainably. Surplus food not properly managed will inevitably become food waste [8].

Food waste is a barrier to reaching the Zero Hunger goal in the second Sustainable Development Goals (SDGs) [9,10]. The goal of Zero Hunger in the SDGs is to ensure that everyone has access to enough nutritious and safe food. Food waste, on the other hand, presents issues because it can occur at any level of the food supply chain, from production, processing, distribution, and consumption. Food waste wastes the resources used to make it, such as water, land, and labor. As food insecurity grows, the second goal of the SDGs will become more difficult to achieve [11]. The agricultural industry continues to play an important strategic role in supplying raw food, feed, and energy resources. However, if the agricultural sector is not effectively managed, it has the potential to fall into the 3F syndrome of the food-energy crisis, which threatens many agricultural commodities. Food surpluses, such as unmanaged food waste, can impact global food production and distribution imbalances, with poor countries frequently experiencing hunger and food shortages and wealthy countries wasting a lot of food. [12].

The development of mobile apps to reduce food waste and accomplish the SDGs' Zero Hunger target is driven by several causes, one of which is growing awareness of the importance of environmental sustainability and natural resource conservation. A large reduction in food waste by distributing surplus food to food banks can help mitigate the negative effects of excess food production while ensuring a more stable food supply.

Meanwhile, the vast potential of zakat funds can help the government's efforts to alleviate poverty [13]. Furthermore, using digital technologies, such as smartphone apps, might make it easier for the parties involved to exchange food that is still safe to consume. Those with extra food can quickly donate it to those in need via mobile apps. This process can reduce food waste while also reducing hunger. Mobile apps can also help collect and analyze food excess data.

With precise and up-to-date data, relevant parties can identify weaknesses in the food supply chain and take effective measures to decrease food waste caused by uncontrolled food surpluses. Mobile apps can potentially be one of the innovative solutions that can assist in reaching the SDGs' Zero Hunger goal. It is predicted that various countries' food security and hunger will improve by managing food surpluses and guaranteeing a more consistent food supply.

## 2.4 Frame of Thinking

The framework for this study is built around the issues of food waste and hunger. Food waste and hunger are caused by excessive food intake and consumer behavior. As a result, there is a need for an open-access food-sharing media application that can reach the entire community and increase public awareness about the hazards of food waste and food loss, which will eventually lead to other problems, such as hunger. The MifsApps can be developed as a food-sharing media to achieve the aims of the second and twelfth SDGs. The MifsApps application, as a food-sharing medium, can help reduce food waste and hunger in Indonesia.



**Figure 1.** Frame of Thinking

## 3 Discussion

### 3.1 MifsApps

MifsApps is an idea or concept for an application that works as an open-access food-sharing media, making it accessible to the general public. The MifsApps application has multiple main functions, including making it easier for partners to provide information related to food surpluses and make schedules to pick up the surplus food, making it easier for members of the Ruang Pangan Community to provide documentary evidence of the distribution of food surpluses; providing information to the public at large about the quantity of food surplus that can be overcome through food rescue and food drives activities of the Ruang Pangan Community and at the same time can provide information about the most food surplus producers in Bandar Lampung each year.

Some partners who can join MifsApps as part of the food-sharing network are:

- 1) Restaurant or cafe owners who want to donate edible food but are not sold out.
- 2) Supermarkets or markets that want to donate food that is almost expired but still suitable

for consumption.

- 3) Hotels can also become partners of MifsApps as part of the food-sharing network. Hotels often have leftover food that is still fit for consumption after their guests have left, which can then be donated through MifsApps.
- 4) Interested parties in reducing food waste, such as environmental organizations, charities, or government agencies related to food security and waste management.
- 5) Food recipients, such as underprivileged communities or refugees, need additional food to fulfill their nutritional needs.
- 6) Food recipients, such as the poor or refugees, require additional food to meet their nutritional needs.

## **3.2 MifsApps Implementation Stage**

### *3.2.1 User Identification*

At this stage, the researchers conducted a user needs analysis to determine the MifsApps application's target users, specifically food givers and recipients. This process entails identifying user needs, designing a system to meet those goals, and determining the data required to enable system functionalities [14]. To do this, the first step is to undertake a market study and analysis to thoroughly understand the needs and preferences of the app's target users.

### *3.2.2 App Development*

The next step after determining the target users was to create the MifsApps application. This stage comprises interface design, feature development, and interaction with a database management system for storing and processing information about food donors and recipients.

### *3.2.3 App Distribution*

Once the MifsApps application has been created, the following step is promoting it to the intended audience. Various digital marketing tactics, such as social media, email marketing, and online advertising, can be used to reach a larger audience.

### *3.2.4 Partner Recruitment*

Besides food donors and recipients, MifsApps seeks partners such as restaurants, hotels, and event organizers to join the network. The next stage is to attract partners by presenting and marketing the benefits of joining MifsApps.

### *3.2.5 Monitoring and Evaluation*

The final stage is to regularly monitor and analyze the performance of the MifsApps application to identify problems, make necessary modifications, and assess the impact and effectiveness of the MifsApps application in decreasing food waste and accomplishing Zero Hunger goals.

## **3.3 Timebound Strategic Step**

Table 2 shows the strategic timebound steps that can be made in the short, medium, and long term:

**Table 2.** Timebound Strategic Step

Short-term (6-12 months)	<ul style="list-style-type: none"> <li>• Establishing partnerships with restaurants, hotels, supermarkets, and community organizations that join MifsApps.</li> <li>• Conducting socialization and promotion of MifsApps through social media, websites, and other conference media.</li> <li>• Improving the features of the application to make it easier to use and can provide a better user experience.</li> <li>• Collecting and evaluating app users to improve service quality.</li> </ul>
Medium-term (1-3 years)	<ul style="list-style-type: none"> <li>• Expanding the reach of MifsApps to other regions in Indonesia.</li> <li>• Develop new features that can facilitate the exchange of food quickly and efficiently.</li> <li>• Improving the quality of the data generated to be able to provide accurate information regarding the surplus food that is successfully distributed to those in need through the application.</li> <li>• Building relationships with government agencies and international organizations to gain support in managing food surplus.</li> </ul>
Long-term (< 3 years)	<ul style="list-style-type: none"> <li>• Becoming a food-sharing platform that is a reference for other countries in managing food surplus and achieving the Zero Hunger target.</li> <li>• conducting research and development in creating technology that can optimize the distribution of food surplus</li> <li>• educating the public to care about food surplus management.</li> </ul>

### 3.4 SMART Development Target

The answer to the problem has been properly thought out in the MifsApps. The following is an explanation of the program objectives that have been created according to the SMART concept (Specific, Measurable, Acceptable, Realistic, and Timebound):

- 1) *Specific*: MifsApps aspires to eliminate hunger by facilitating food exchanges between donors and consumers of edible food.
- 2) *Measurable*: MifsApps will measure its success based on the amount of food saved from disposal, the number of app users, and user satisfaction.
- 3) *Acceptable*: MifsApps must appeal to all segments of society, including food donors and recipients. The app must also meet user data security and privacy requirements.
- 4) *Realistic*: MifsApps must be able to be created using available resources, such as labor, technology, and funds. The app should also consider the norms and regulations that apply in the area where it is used.
- 5) *Timebound*: The target implementation is within one year of its introduction, with user upgrades and resolution of difficulties related to the app in stages.

The SMART method can help plan and implement the MifsApps app effectively and efficiently. In the SMART method, it is necessary to ensure that the goals set are specific, measurable, acceptable, realistic, and have a clear time limit.

The strategic steps developed using the SMART method must be divided into short-, medium-, and long-term categories to complete in stages. Short-term priorities should include application development and beginning community marketing. In the medium term, focus on increasing the number of users and partners while optimizing app functionality. Long-term goals should include preserving and improving the application's quality, growing the positive influence on food excess management, and achieving zero hunger. MifsApps can use the SMART method to set clear and quantifiable targets, maximizing their capacity to manage food excess and contribute to attaining the SDGs' zero hunger goals.

### **3.5 Snowball Effect of Solution Achievement**

The snowball effect of achieving solutions with MifsApps can be widespread, positively impacting many elements of life, including health, social, economic, and environmental.

### **3.6 Problems and Anticipation of Idea Implementation**

Problems and anticipations in implementing the MifsApps concept can be addressed by visualizing ideas using the SAHABAT concept: targets, barriers, assistance, and action. Here is an explanation:

- 1) The target of idea visualization aligns with the SMART analysis approach (Specific, Measurable, Acceptable, Realistic, and Timebound) [15]. Obstacles include difficulty reaching and expanding application users in remote areas and limited internet access. Anticipation: Increase MifsApp promotion and socialization through social media, collaborate with institutions or organizations involved in food waste reduction, and use the user relationship network to broaden the application's reach.
- 2) Challenges: Security concerns about user data and personal information retrieved by the app, as well as user doubts and distrust of the app's security. Anticipation: Considering privacy policies and user data security during app development, obtaining app security certification from authorized institutions, and providing users with adequate information and transparency about privacy policies and data usage.
- 3) Action: Obstacles: Lack of clear and consistent regulations for managing food surplus and developing mobile food-sharing applications in Indonesia. Anticipation: Speaking out on the issue of food surplus and the need for mobile food-sharing applications at the policy and government levels, advocating and lobbying related parties to encourage changes in regulations and supportive policies, and monitoring the development of relevant regulations and policies.

The implementation of the MifsApps concept in managing food surpluses and supporting the achievement of SDG goals faces several obstacles and challenges. However, with proper planning and strategy, these challenges should be overcome and positively impact efforts to reduce food waste in Indonesia.

## **4. Conclusion**

Based on the description of MifsApps (Mobile Application Concept of Open-access Food Sharing Media), it is possible to conclude that MifsApps is a mobile application concept developed to manage food surplus and contribute to the sustainable development objective of zero hunger or food security. This program connects surplus food donors with food recipients, allowing food that is still edible to be consumed rather than wasted. MifsApps is based on food waste theories, mobile app concepts, and the SDGs program's Zero Hunger goal. This application can be implemented in the short, medium, and long term using the SMART (Specific, Measurable, Acceptable, Realistic, and Timebound) stages. However, there are some challenges and expectations in implementing this idea, such as a lack of public knowledge of the need for food surplus management collaboration with diverse partners and support from the government and relevant organizations. Nonetheless, implementing the MifsApps concept is projected to have a good influence on reducing food waste caused by poorly managed food surplus and contribute to the Zero Hunger target.

## 5. Suggestion

MifsApps has a lot of room for improvement if some strategic suggestions are implemented. First, stronger collaboration with institutions and organizations involved in the Zero Hunger SDGs program, such as governments, charities, and civil society organizations. This improves the program's effectiveness and broadens MifsApps' positive influence. Furthermore, app development efforts can be aimed at increasing user experience. Including new features, such as a more sophisticated notification system and facial recognition to prevent account abuse, can provide great value to consumers. The security and privacy of users should be considered seriously. Implementing strong security and privacy requirements and providing user-friendly reporting tools will result in a safe and trustworthy app environment. In light of global concerns, broadening the MifsApps application's domestic and global scope can boost community participation in food waste reduction projects. This is consistent with the SDGs' overall goal of zero hunger. Finally, relationships with educational institutions can help raise public knowledge about environmental issues and sustainability projects. Furthermore, these collaborations can help students and college students improve their digital literacy skills. By implementing these suggestions, MifsApps is projected to expand and positively impact food excess management and zero hunger goals.

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