www.ijarp.com ISSN 2456-9992 Page: 01-06

International Journal Advanced Research Publications

Case Study

Volume: 02
Issue: 04

FOOD DONATION SYSTEM

[*1]Mr. Aditya Gade, [2]Mr.Om Kulkarni, [3]Mr.Yashraj Shinde, [4]Mr.Om Kadam

[5]Prof. Babar S.M.

[1,2,3,4]Student,[5]Professor of Computer Technology Department Shriram Institute of Engineering & Technology Polytechnic, Paniv.

Article Received: 28 February 2026, Article Revised: 18 March 2026, Published on: 08 April 2026

***Corresponding Author: Mr. Aditya Gade**

Student, Computer Technology Department Shriram Institute of Engineering & Technology Polytechnic, Paniv.

DOI: https://doi-doi.org/101555/ijarp.3202

ABSTRACT

Whether it is preventing food waste or tackling food insecurity, this dual agenda is often present in many urban areas worldwide. This research paper presents the design and implementation of a Food Donation System (FDS), a central digital platform based on mobile and web applications that helps to connect food donors (i.e. restaurants, banquet hall and citizens) to NGOs/ local charities. The proposed system enhances the current status quo by decreasing the time delay between food surplus and food distribution and as such it helps to reduce food wastage and address hunger and its causes. The value proposition of the application is to provide a modern, integrated approach to food donation with a web and mobile interface to allow donors to easily and quickly share reports and to track the location of the donor and to easily collect the donated food and transfer it to the intended recipient. This paper presents the detailed design and implementation of the FDS. Preliminary system evaluation shows that the proposed system will ensure that food reports are presented in real-time and thus dramatically reduces the time lag between food donation and its distribution.

INDEX TERMS: Food security, Food waste management, Hunger alleviation, Logistics optimization, Mobile application, Surplus food distribution.

I. INTRODUCTION

One of the economic and social challenges confronting the modern urban environment is food waste and food insecurity. While hundreds of tons of food derived from nature are thrown away every day by homes, restaurants, and banquet halls, hundreds of people at the same time are suffering from being undernourished. The main difficulty is not with the food

resources, but the absence of efficient and real-time communications and logistics for surplus food from donors to NGOs or charities that feed people.

This paper proposes a solution to the problem by introducing a digital Food Donation System (FDS) to address the gap. The FDS provides a web and mobile application that offers centralized, real-time capabilities for users to list, claim, and track surplus food. Consequently, the final aim of the paper is to describe the system architecture and logistics matching algorithms and achieved impact of the system on localized urban areas.

II. PROCEDURE FOR PAPER SUBMISSION

A.Stage of Donor Listing

When an operational surplus is reported, a donor (e.g., restaurant owner) logs into the platform for the first time. The user enters the loss type, the amount, the time it was prepared, and the time it can be stored. The user states the exact location since the system needs it for the routing.

B.Stage of NGO Claiming

When the food is registered in the platform, the verified NGOs (up to 5) in the given geographic area receive notification of the food on the platform. The NGOs can unpublish the food on the platform based on additional needs and capacity, thereby preventing more than one arriving for the same donation..

C.Logistics and Tracking

The system calculates the best possible path for the food collection vehicle after a claim is made. For all figures in the system design and user interface, please place them directly in the text.

III. UNITS

On our systems database, while logging the quantities of the food, we have to maintain consistency across the database and thus, the SI (MKS) units have to be applied. All solids are recorded and shown in the database as kilograms (kg) and all liquids are shown

in the database as liters (L). Distances for the routing API are shown in kilometers (km). We avoid mixing units i.e. picking pounds and kilometers as that would cause a lot of confusion during the picking stage of the logistics.

IV. HELPFUL HINTS

A. Figures and Tables

The performance metrics for the Food Donation System include organized data in certain tables, for example in the table titled “Table I: Monthly Food Rescued”. It should be mentioned that the system dashboard does present the same data in the form of graphs. For ease of understanding, all performance graphs have axes labeled using complete phrases and units (i.e., instead of "kg" or “Weight” the axes will be labeled “Food Rescued (kg)”).

B. System Scalability

The system is designed with cloud architecture that can scale. As stated in the most recent research [1], real-time databases that are cloud based are able to make multiple requests almost instantly to hundreds of donors and NGOs.

C. Abbreviations and Acronyms

The documentation of the platform and the paper itself will have the first example of each acronym, for example, NGO (Non-Governmental Organization) and API (Application Programming Interface). That will assist all readers regardless of their technical knowledge.

V. PUBLICATIONPRINCIPLES

The process of designing, developing, and documenting the Food Donation System (FDS) is governed by strict academic and software engineering principles. Considering that the system falls between the domains of computer science and social welfare, the guidelines for publishing and developing the system are centered on transparency, technical excellence, and practicality. The foundational principles of this project are listed below:

1) Expanding the Body of Knowledge One of the main goals of the research being conducted is expanding the existing body of knowledge in the realm of urban resource management. Conventional approaches to surplus food management make extensive use of communication that is fragmented and manual (e.g., phone calls or instant messaging apps), which is highly inefficient and creates unnecessary delays in the process. The present paper proposes a new, algorithm-driven system for surplus food redistribution.

2) Methodological Transparency and System Replicability : If any scientific or technological advancement is expected, then replicating systems becomes an imperative. One of the key

development philosophies behind the FDS is the "open architecture" approach. In this paper, there is enough information on the internal workings of the system, including the backend architecture, database schema, and the algorithms used for matching donors with receivers in order to allow anyone else who might wish to do so to replicate the same setup.

3) Technical Quality and Data Integrity : The authors appreciate that the technology behind the management of perishables has to meet the best-in-class standards for quality and accuracy. This is illustrated by the system's capacity for effective error detection and handling, optimal response time, and security of data transfer. Additionally, considering that the system will process delicate data, including the real-time location of the delivery trucks and the operations data from collaborating NGOs, ensuring data integrity and encryption, such as OAuth 2.0, is paramount.

VI. Measurable Societal Impact and Scalability : While traditional theoretical computer science models do not focus on measurable societal impact, the FDS is an application-oriented technology whose development philosophy relies on this very notion. In this case, not only the conventional performance parameters like the minimum server latency and uptime are used for judging the efficiency of the system, but the measurable social impact of the program is taken into account as well. These include how much waste is successfully diverted from landfills and reduced time of deliveries. Furthermore, the software is scalable within the cloud environment, thus allowing it to scale up from a small local community project to a citywide level, making only marginal changes to the code.

CONCLUSION

It can be safely concluded that the suggested Food Donation System is an effective and technological way to solve both the issues of food wastage and hunger. This system cuts down the communication and logistics time involved in food redistribution from the donors to charitable organizations. One possible future extension of the project would be the incorporation of AI prediction models for identifying the trends of surplus food during important holidays or celebrations in specific locations.

ACKNOWLEDGMENT

We hereby sincerely express their heartfelt gratitude towards the Department of Computer Science, Shriram Institute Of Engineering & Technology Polytechnic, Paniv for providing the vital technical and academic environment needed for the development and evaluation of the Food Donation System. They would also like to sincerely thank Ms. Babar S.M for

their valuable supervision and guidance throughout the research and development process.

Furthermore, they are also thankful for the cooperative efforts by their partners from the community, more particularly the regional associations of the restaurants, and the participating Non-Governmental Organizations (NGOs). Their participation in the beta testing phase and their valuable input on daily practical problems played an important role in improving the user interface and the routing algorithms.

REFERENCES

1. M. Ghazal, S. Ali, F. Haneefa and A. Sweleh, "Towards smart wearable real-time airport luggage tracking", 2016 International Conference on Industrial Informatics and Computer Systems (CIICS), 2016.
2. M. Ghazal, M. Akmal, S. Iyanna and K. Ghoudi, "Smart plugs: Perceived usefulness and satisfaction: Evidence from United Arab Emirates", Renewable and Sustainable Energy Reviews, vol. 55, pp. 1248-1259, 2016.
3. M. Ghazal, A. Amer and A. Ghrayeb, "Homogeneity-based directional sigma filtering of video noise", IEEE International Conference on Image Processing 2005, 2005.
4. Developer.android.com. (2017). Android, the world's most popular mobile platform | Android Developers. [online] Available at: https://developer.android.com/about/index.html [Accessed 14 Dec. 2017].
5. Betz A., Buchli J., Gobel C. and Mulle C., "Food waste in the Swiss food service industry–Magnitude and potential for reduction," Waste Management, pp. 218-226, January 2015.
6. Leejiah J. Dorward, "Where are the best opportunities for reducing greenhouse gas emissions in the food system (including the food chain)? A comment," Food Policy, vol. 37, no. 4, pp. 463-466, August 2012.
7. Neo Chai Chin, "An 11th Hour answer to cutting down on food waste," 07 November 2016. [Online]. Available: [http://www.todayonline.com/singapore/11th-hour-answer-cutting-downfood-waste. [Accessed 14 December 2017].
8. Paola Garrone, Marco Melacini, and Alessandro Perego, "Opening the black box of food waste reduction.," Food policy, vol. 46, pp. 129-139, 2014.
9. Kummu M, de Moel H, Porkka M, Siebert S, Varis O, and Ward PJ., "Lost food, wasted resources: Global food supply chain losses and their impacts on freshwater, cropland, and fertiliser use.," A science of the total environment, vol. 438, pp. 477-489, September

2012.

10. Joris Tielens and Jeroen Candel, "Reducing food wastage, improving food security?," Food & Business Knowledge Platform, 2014.
11. Andrea Segre and Silvia Gaiani, Transforming food waste into a resource, Philadelphia: Royal Society of Chemistry., 2012.