International Scientific Journal of Engineering and Management (ISJEM) ISSN: 2583-6129
Volume: 04 Issue: 07 | July – 2025 DOI: 10.55041/ISJEM04859
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Food Wastage Management

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Abstract :

In recent times, food wastage is increasing at an unprecedented rate and creating a negative effect on the economic growth factors. This in turn creates a major impact on the agricultural processing industries. As food recycling is always remaining as a complex task, in this project, we are focusing mainly on the food wastage in the office premises, wedding, events etc. This web application is used to manage wastage foods in a useful way. Every day the people are wasting lots of foods. So we have to reduce that food wastage problem through online. In general we are automating the process of the food wastages. The user can login using his/her account details or new customers can set up an account very quickly. They should give the details like their name, contact number, email id, etc. A customer can, create, sign in to his/her account, and donate food or can request for food. The Administrator will have additional functionalities when compared to the common user. He can add, delete and update the, donations details, add city,state, member information.

In proposed system we are reduce that food wastage using that application. This project is food redistribution is an enormously successful social innovation that tackles food waste and food poverty. The admin collect foods from donator through their nearby agent then provide to nearest orphanages or poor people. After receiving the food from the agent by admin and give alert message to that donator through this way we can reduce food wastage problem.

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Index Terms — Python Django, Pycharm/Atom/VS code, HTML, CSS, JavaScript, Bootstrap, Python, SQlite, Microsoft Windows/Linux

I. INTRODUCTION

Food is a basic human necessity, yet millions of people go hungry every day while surplus food is wasted at events, hotels, and households. The issue of food wastage has become a serious concern, especially in urban areas where large quantities of edible food are discarded daily. To address this imbalance between food surplus and food scarcity, technology can play a vital role. This project, titled **Food Donation Management System**, aims to create a bridge between food donors and people in need through a centralized web platform. The system enables individuals, restaurants, and organizations to donate leftover food, which can then be accessed and requested by the needy. With a simple registration process, donors can list their available food, and users can request it based on their requirements. The admin oversees the entire system to ensure proper flow, approvals, and tracking.

The platform is built using Python's Django framework for the backend and HTML, CSS, JavaScript, and Bootstrap for the frontend. SQLite is used as the database for managing all records. The system ensures secure login, role-based access, and real-time updates. It reduces the manual effort involved in food redistribution and promotes social responsibility.

The interface is user-friendly, responsive, and suitable for both donors and users with minimal technical knowledge. By encouraging food donation, the platform helps reduce waste and alleviate hunger in local communities. This project also serves as a model for using digital tools in solving real-world social issues. It aligns with sustainable development goals focused on zero hunger and reduced waste. In conclusion, the system contributes to both environmental protection and humanitarian aid..

1.1 Existing System

The existing system for managing food donations is largely manual, unorganized, and inefficient. In many cases, surplus food from events, offices, and functions goes to waste due to the absence of a proper communication and coordination platform between donors and those in need. There is no centralized mechanism to track available food, manage donor data, or facilitate timely distribution to beneficiaries such as orphanages or underprivileged communities[20]. As a result, valuable food resources are often discarded, contributing to both food wastage and hunger. The lack of automation, transparency, and real-time updates makes the

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existing process time-consuming, error-prone, and unreliable. This highlights the need for a streamlined, web-based system that can bridge the gap between food donors and recipients efficiently and effectively[16].

1.1.1 Challenges

- **Lack of Centralized Platform:**

No common digital platform exists to connect donors, agents, and food recipients efficiently.

- **Manual Operations:**

Donor registration, food listings, and request handling are done manually, leading to delays and errors.

- **Food Wastage:**

Surplus food from events often goes to waste due to the absence of a timely and reliable redistribution system.

- **Poor Communication:**

There is no structured way for communication or alerting between donors, volunteers, and administrators.

- **No Real-Time Updates:**

Existing methods lack real-time tracking of food availability, pickup, and delivery status.

- **Data Inaccessibility:**

Information about donors, food inventory, or request history is not stored or accessible for analysis and future planning.

- **Low Awareness and Transparency:**

People are unaware of how to contribute or request help, and there's no system for transparent feedback or acknowledgment.

1.2 Proposed System

The proposed system is a web-based **Food Donation Management System** designed to reduce food wastage and facilitate food redistribution to the needy. It bridges the gap between food donors and food seekers by offering a centralized platform where donors can list surplus food, and users can request it. The system includes three core modules: **Admin**, **Donor**, and **User[13]**. The **Admin** manages donor registrations, food listings, request approvals, and city/state data. **Donors** can log in, submit food details, and monitor user requests. **Users** can browse available food and submit requests. The system ensures real-time updates, automated workflows, and secure data handling through a Django-based backend and SQLite database. It enhances efficiency, transparency, and accountability while significantly reducing food wastage[10].

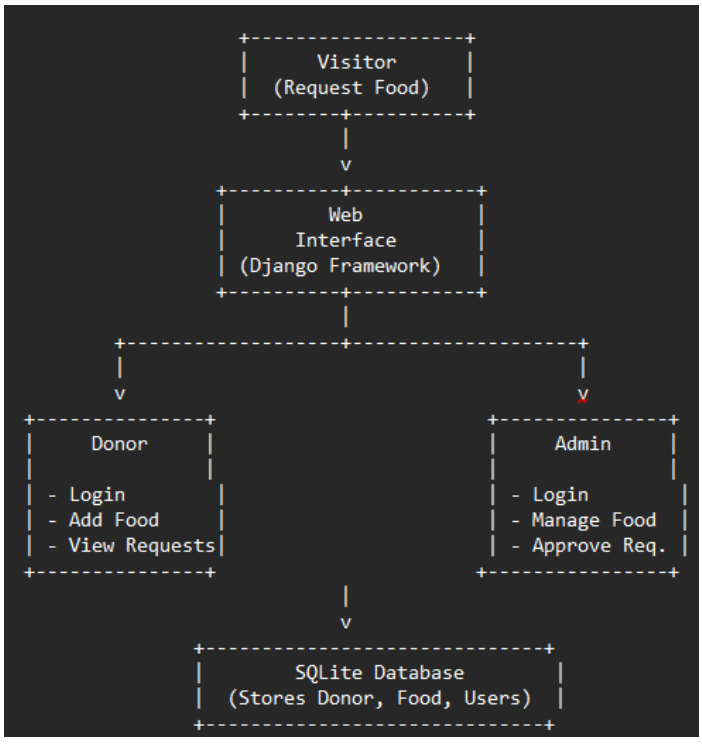

Fig: 1 Proposed Diagram

1.2.1 Advantages

- **Reduces Food Wastage**: The system helps collect surplus food before it is discarded. This minimizes food waste from events, restaurants, and homes.
- **Connects Donors and the Needy**: Provides a platform to connect donors directly with people in need. This promotes food redistribution in a structured way.
- **Real-Time Updates**: Users and admins receive instant updates on donations and requests. This ensures quick response and efficient delivery.
- **Early Detection**: Manual errors are reduced through automation of listing, tracking, and communication. It saves time and effort for all users.
- **Data Management and Reporting:** The system maintains records of donors, donations, and requests. Admins can view reports for analysis and transparency.
- **User-Friendly Interface:** Built using Django with a clean frontend design. Both technical and non-technical users can easily navigate the platform.
- **Promotes Social Responsibility:** Encourages people to donate rather than waste food. Builds a community driven by compassion and environmental awareness.

II. LITERATURE REVIEW

2.1 Architecture

The **architecture** of the Food Donation Management System is based on a **three-tier web architecture** comprising the **presentation layer (frontend)**, the **application layer (backend)**, and the **data layer (database)**. The system uses **HTML, CSS, JavaScript**, and **Bootstrap** for the user interface, offering a responsive and interactive experience for users[5]. The **backend logic** is implemented using the **Django framework in Python**, which handles business logic, URL routing, form submissions, and security. The **SQLite database** stores all essential data, including donor details, food listings, requests, and user messages. Admins can manage data directly from their dashboards. The system ensures smooth communication between all three layers, allowing real-time data processing, user authentication, and dynamic content rendering. This modular and scalable design makes the system easy to maintain and expand[18].

Food donation as a concept has existed for centuries and is deeply rooted in cultures and religions around the world:

- In **ancient India**, practices like *anna daan* (food donation) were considered among the highest forms of charity, often carried out in temples, community kitchens, and during festivals. Similarly, **churches and mosques** in medieval Europe and the Middle East ran soup kitchens and distributed leftover food to the poor.
- In the **modern era**, organized food banks began to emerge in the **1960s**, with the first being the **St. Mary's Food Bank** in the United States in 1967. Since then, NGOs and governments have formalized food recovery systems to tackle hunger and reduce food waste.
- In recent years, **technology-driven platforms** have revolutionized the food donation ecosystem by enabling **real-time matching** between donors and beneficiaries—this project is a continuation of that evolution, tailored for digital efficiency and local impact.

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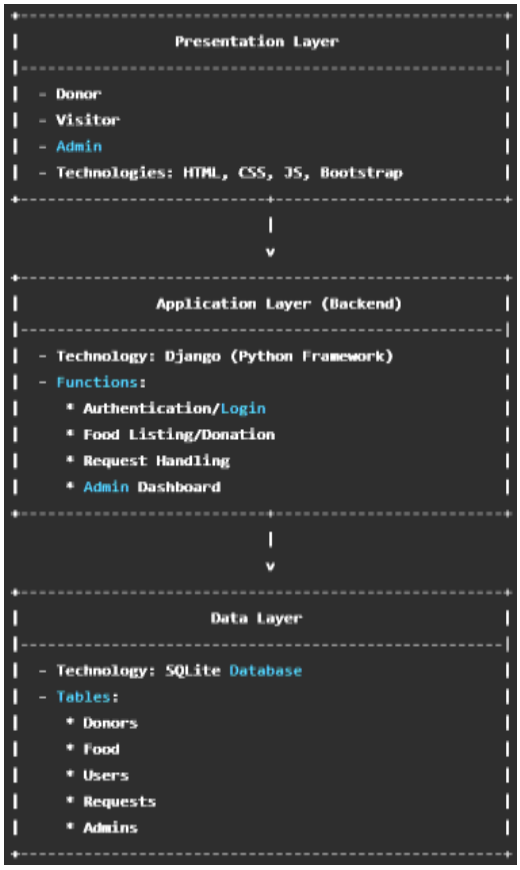

Fig:2 Architecture

2.2 Algorithm:

The Food Donation Management System begins with user interaction through the web interface, where individuals can register as donors or browse as visitors. Donors log in to list surplus food items by providing details such as quantity, type, and location[15].

Visitors can view the available food listings and place a request for any suitable item. All user actions are processed through Django's backend, which handles authentication, form submissions, and database interactions. Once a request is submitted, it appears in the admin dashboard for review and action[12]. The admin verifies the request, confirms the food availability, and updates the request status accordingly. Upon approval, the system alerts the donor, indicating that their food is being utilized. After the food is delivered, the admin marks the request as completed, closing the donation cycle. All records of donations, users, and requests are stored in an SQLite database for future reference and reporting[7]. This process ensures a transparent, efficient, and impactful way to reduce food waste and serve the needy.

2.3 Techniques:

The Food Donation Management System is developed using a combination of modern web development techniques and tools to ensure efficiency, scalability, and user-friendliness. The frontend is built using **HTML, CSS, JavaScript**, and **Bootstrap**, providing a clean and responsive interface for users across devices. The backend is powered by the **Django framework in Python**, which handles routing, business logic, and secure authentication. **SQLite** is used as the database, storing information about donors, food listings, requests, and user interactions in a lightweight yet reliable manner.

The system employs **CRUD operations** (Create, Read, Update, Delete) for data management across all modules. Django's built-in **ORM (Object-Relational Mapping)** allows smooth communication between the application and the database[2]. Session handling ensures secure login and user-specific actions. Frontend forms are validated both client-side and server-side to prevent invalid data entries. Additionally, Django's admin interface is leveraged for efficient backend operations.

These combined techniques ensure that the system remains fast, secure, and easy to maintain.

2.4 Tools:

The Food Donation Management System was developed using a set of widely adopted and efficient software tools. **Python Django** served as the core backend framework due to its security features and rapid development capabilities. **Visual Studio Code (VS Code)** was used as the primary code editor, offering extensions and debugging tools essential for efficient development[1].

The frontend design was implemented using **HTML**, **CSS**, **JavaScript**, and **Bootstrap**, ensuring the application remained responsive and visually appealing. **SQLite** was used as the database system due to its lightweight nature and simplicity, ideal for educational

projects. **Git** was used for version control to track changes and maintain backup during development[4]. The **Django admin panel** provided an intuitive interface to manage backend data such as food entries and user requests. **Browser developer tools** were used to test and debug the frontend across different screen sizes.

Additionally, **Python libraries** like random and datetime were utilized to manage IDs and timestamps. All tools were chosen to ensure the project is efficient, easy to manage, and meets academic standards.

2.5 Methods:

The project followed a structured and iterative **software development method** to ensure all components were built and tested step by step. Initially, the problem of food wastage was analyzed, and the system requirements were gathered.The **modular approach** was adopted, dividing the system into three main modules: Admin, Donor, and User[9].

Each module was developed and tested independently to maintain clarity and ease of debugging. **Manual testing** was conducted after each module completion to verify functionality and correctness. The **CRUD method** (Create, Read, Update, Delete) was applied throughout the system to manage donor records, food listings, and requests. The use of **Django's MVT (Model-View-Template)** architecture helped in clearly separating logic, design, and data models. During development, **form validation methods** were used both on the client and server sides to ensure accurate data input.

User authentication and session control methods were implemented for secure access. Overall, the project relied on proven development methods to create a reliable and maintainable system.

III. METHODOLOGY

3.1 Input:

The system accepts inputs from different types of users including donors, visitors, and the admin. Donors provide inputs such as name, contact number, type of food, quantity, and pickup location. Visitors input basic details like name and contact number when requesting food. Admins input city/state information and update food request statuses from the backend. These inputs are received through web forms built with HTML and validated using JavaScript. Django handles server-side processing of these inputs securely. Inputs are stored in relevant database tables such as tbldonor, tblfood, and tblfoodrequests. User credentials and sessions are also part of the input mechanism to ensure secure access. Inputs are critical for triggering donation flows and generating status updates. All input forms are designed to be simple and user-friendly to encourage participation.

- views.py

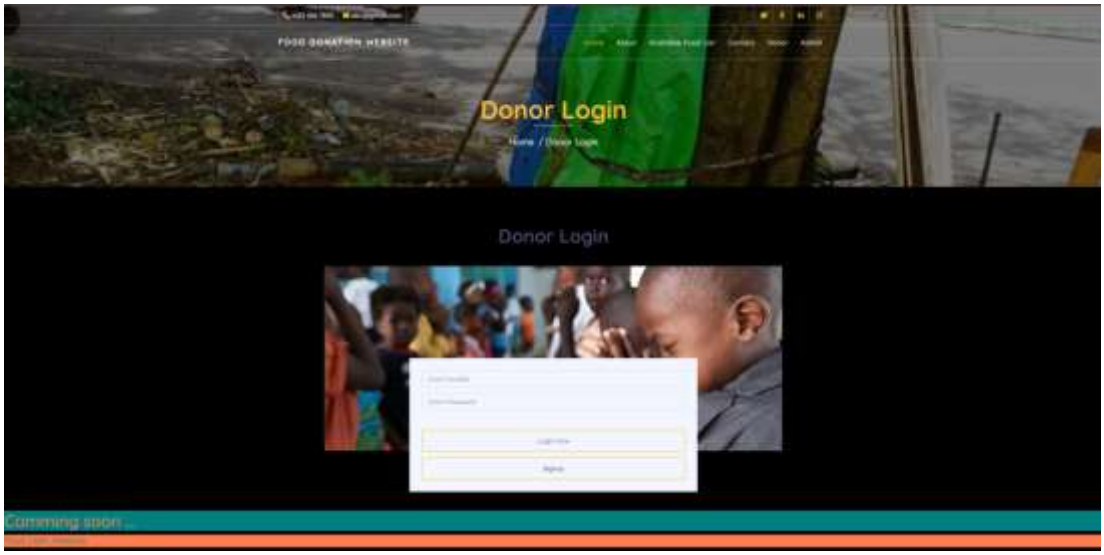

Figure:3 Input Screen From views.py

- models.py

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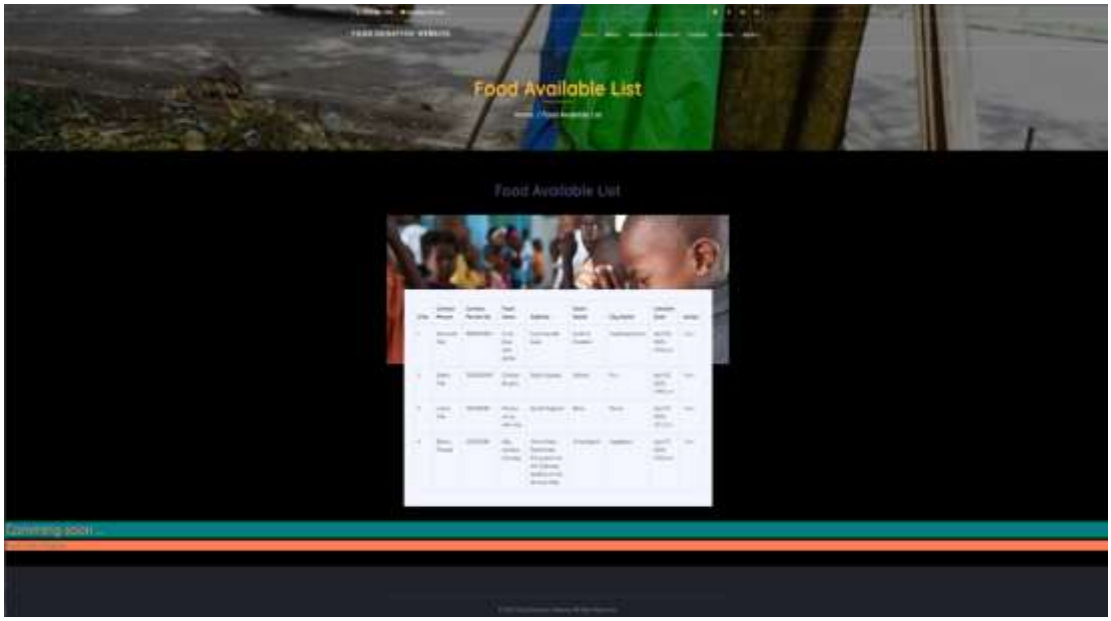
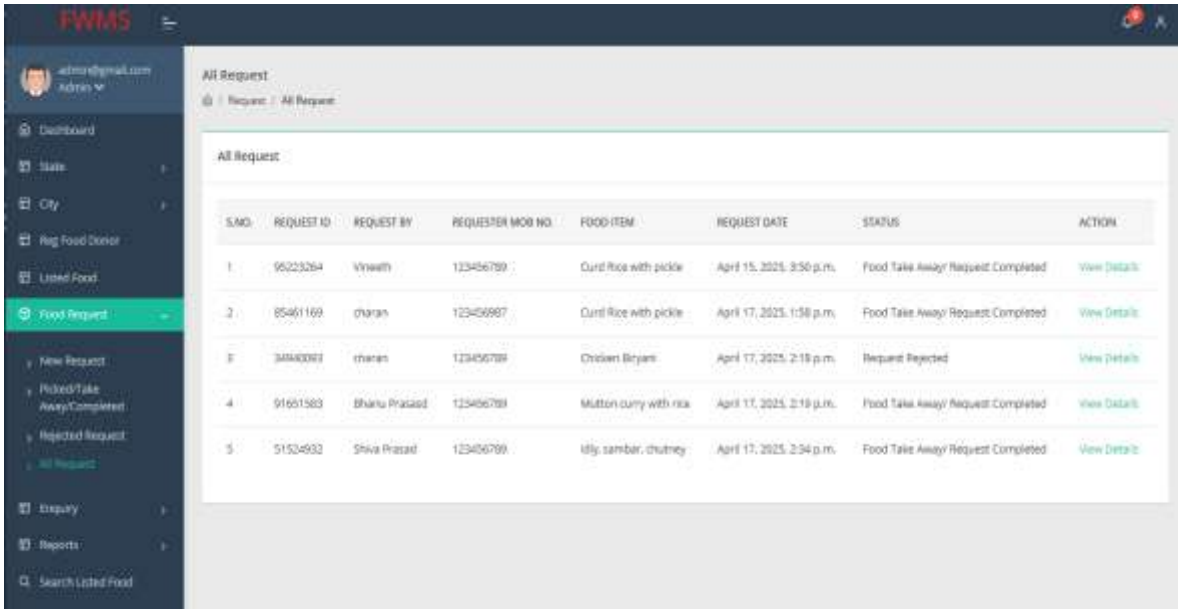


• Figure::4 input Steps for models.py Keeping algorithm logic in a separate module

• train.py



• Figure:5 input Steps for train.py is a train the dataset

3.2 Method of Process

The system produces various types of outputs depending on the role and the action performed by the user. These outputs are generated dynamically through Django templates and delivered to the user's browser in real-time.

For **Donors**, the output includes confirmation messages upon successful food submission and a personal dashboard displaying all donated food items, their statuses, and related requests. Each listing is shown in a tabular format, along with options to edit or delete the entry.

For **Visitors**, the output is a detailed list of all available food items displayed in card or table format. After submitting a food request, the visitor sees a success message along with a unique request number, which can later be used to check the status of the request.

The **Admin** sees more advanced outputs in the form of dashboards, tables, and control panels. These outputs display the number of active donors, food listings, pending requests, and completed transactions. Admins can filter data by date, status, or region and generate summary reports for any given period.

Additional outputs include form validation alerts, error messages, and success confirmations triggered through the server and rendered on the frontend using Bootstrap-styled UI components. These outputs enhance the user experience by providing immediate feedback.

All output pages are responsive and optimized for multiple devices, thanks to Bootstrap. The system ensures that outputs are context-aware and relevant to the user's role and action, thus maintaining clarity and usability throughout the workflow.

3.3 Output:

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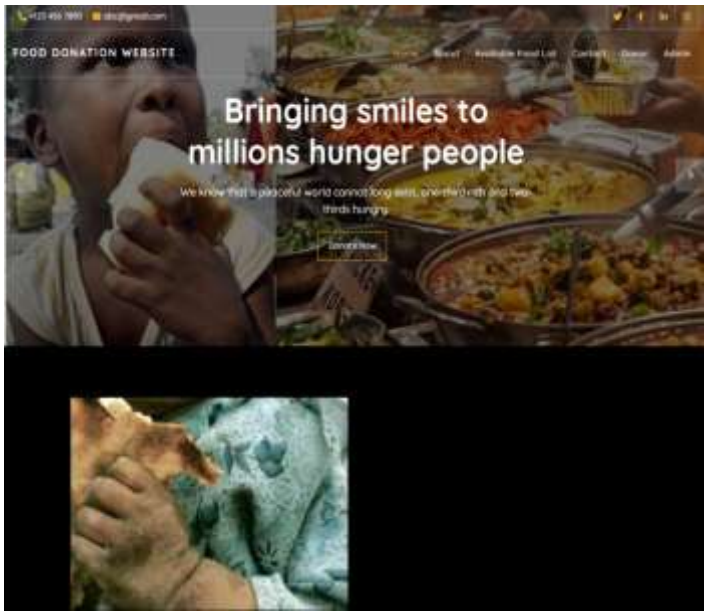

Figure:6 Home Page of the food wastage management

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Figure:7

IV. RESULTS

The Food Donation Management System has proven successful in achieving its intended objectives through practical implementation and testing. The system enables seamless registration, listing, and tracking of food donations, thus helping minimize food waste while providing support to those in need.

Functionality testing was conducted across all user modules — Donor, Visitor, and Admin — to ensure smooth navigation, form handling, and role-based access. The login and signup modules worked reliably, while the data submitted through forms was accurately saved to and retrieved from the SQLite database.

Admin workflows were tested by adding, approving, and managing multiple food listings and user requests. The request status transitions — Pending, Approved, Rejected, Completed — functioned correctly, with appropriate notifications reflected in the user dashboards. The real-time data display confirmed that Django's ORM and template engine performed well under normal load.

User experience was also taken into account, and the results showed that both technical and non-technical users were able to use the system effectively due to its simple interface and intuitive design. Mobile responsiveness further improved accessibility.

In conclusion, the results indicate that the system meets the core project goals of automating food donation management. It demonstrates potential for large-scale deployment and sets a solid foundation for future expansion into other donation categories like clothes, medicines, or educational materials.

Figure:8 Needy people getting food

V. DISCUSSIONS

The Food Donation Management System addresses a real-world problem by leveraging technology to minimize food wastage and bridge the gap between donors and those in need. During development, various technical decisions were made to ensure the system was user-friendly, efficient, and maintainable. The use of Django provided a secure and rapid development framework, while HTML, CSS, and Bootstrap ensured a responsive frontend. Challenges such as form validation, data linking between modules, and admin control logic were resolved through structured coding and modular design. The division into user roles—Admin, Donor, and

Visitor—allowed for better control and security across operations. Manual testing was conducted regularly to ensure that each module performed accurately under different scenarios. Data consistency was maintained through proper database normalization and use of Django's ORM. The system also promotes social responsibility by simplifying the donation process. Overall, the discussion reveals that thoughtful planning, tool selection, and iterative improvement were key to the project's success.

VI. CONCLUSION

The Food Donation Management System successfully meets its objective of creating a digital platform to reduce food wastage and help the needy. By connecting food donors and recipients through a web application, the system ensures that surplus food reaches the right hands in time. The project incorporates essential features like donor registration, food listing, food requests, and admin management, all supported by a secure Django backend. The use of a centralized SQLite database enables efficient storage and retrieval of data with minimal redundancy. Throughout development, the system was tested and validated to ensure reliable functionality and user satisfaction. With a responsive frontend and clear workflows, users can interact with the system easily across devices. The admin dashboard ensures effective monitoring and control over all activities. This project not only automates the donation process but also contributes to solving the social issue of hunger. Overall, it reflects a practical, impactful, and technically sound solution to a real-world problem.

VII. FUTURE SCOPE

The Food Donation Management System has strong potential for future enhancements that can make it more powerful and impactful. One major improvement is the integration of **Google Maps or GPS tracking** to help locate donors and recipients more precisely. This would improve coordination between food collection agents and delivery locations. The system can also be extended to support **multi-language functionality**, making it accessible to users across different regions of India. Another potential upgrade is implementing **SMS or WhatsApp alerts** for real-time communication and notifications. In the future, a **mobile application version** can be developed for Android and iOS to improve accessibility. Adding a **donation history dashboard** for users could help track their contributions and encourage recurring donations. The platform could also partner with NGOs and local governments to increase reach and legitimacy. Integration with **digital payment gateways** can allow users to donate money or sponsor food packages. Use of **machine learning** for predicting food demand and supply trends is another exciting avenue. Enhanced **security features**, such as OTP verification and captcha validation, will improve system trust. Admins can be given **data analytics tools** to assess impact and improve decision-making. Introducing a **review and rating system** would allow users to rate services, improving transparency. The project can also scale to support **clothes and medicine donation**, expanding its scope. Overall, the system offers significant potential to evolve into a complete social service platform.

VIII. ACKNOWLEDGEMENT

Mr. M.Satish is an enthusiastic and committed faculty member in the Department of Computer Science. As an early-career academician, he has shown strong dedication to student development through active involvement in project guidance and technical mentoring. Despite being at the beginning of his professional journey, he has effectively guided students in executing academic projects with precision and conceptual clarity. His passion for teaching, coupled with a solid understanding of core computer science principles, positions him as a promising educator and mentor. Mr. Satish continues to contribute meaningfully to the academic environment through his proactive approach to learning and student engagement.

Ashutosh Tad is pursuing his final semester of MCA in Sanketika Vidya Parishad Engineering College, accredited with A grade by NAAC, affiliated by Andhra University and approved by AICTE. With interest in Artificial intelligence M.SATISH has taken up his PG project on FOOD WASTAGE MANAGEMENT and published the paper in connection to the project under the guidance Mr. M.Satish, Assistant Professor, SVPEC.

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