FoodShare MERN Application

FoodShare is a MERN (MongoDB, Express, React, Node.js) application designed to address food waste and food insecurity by connecting surplus food donors with individuals or organizations in need. This application allows users to list available food items, claim donations, make monetary contributions and manage their profiles in an easy-to-use and responsive interface.

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1. Functional Requirements Checklist

Feature	Description	Status
User Authentication	Users can register and log in securely using JWT-based authentication.	**Completed**
User Logout	Users can log out, clearing their session token.	**Completed**
Create Listings (CRUD)	Users can add new food listings to donate available food items.	**Completed**
Read Listings (CRUD)	All users can view available food listings, filterable by categories or location.	**Completed**
Update Listings (CRUD)	Users can update their existing food listings.	**In Progress**
Delete Listings (CRUD)	Users can delete their listings.	**Completed**
Claim Items	Users can claim food items from the listings, marking them as unavailable.	**Completed**
Make Donations	Users can make monetary donations with a specified amount and description.	**Completed**
Profile Management	Users can update their profile details, including uploading a profile picture.	**Completed**
Responsive UI Design	Application is fully responsive across mobile, tablet and desktop devices.	**Completed**

Deployment Setup	Application prepared for deployment with instructions for setting up the environment.	**In Progress**

Checklist Completion: The application has achieved 80% of its core features, with all primary CRUD operations, user authentication and profile management implemented and functional. The “Update Listings” and deployment configuration are nearing completion.

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2. System Documentation

a) Technical Architecture

Technology Stack:

- **MongoDB**: Database for storing user details, food listings, claims and donations.
- **Express & Node.js**: Backend server to provide API endpoints for data operations and authentication.
- **React**: Frontend for user interactions and displaying the application interface.

Component Interaction:

- **Frontend (React)**: Manages the user interface, handles authentication and communicates with the backend via API calls.
- **Backend (Express + Node.js)**: Provides RESTful API endpoints for core operations such as user authentication, food listing management, claims and donations.
- **Database (MongoDB)**: Stores all application data, including user profiles, food listings, claims and donation records.

b) Database Schema

The database schema includes four main collections: User, Listing, Claim and Donation.

- **User Collection**: Stores `username`, `password`, `profilePic` and references to listings and claims created by the user.
- **Listing Collection**: Contains details for each food listing, including `title`, `description`, `image`, `location` and the creator’s ID (user reference).
- **Claim Collection**: Tracks each claimed item with references to `userId` and `listingId`.
- **Donation Collection**: Records `userId`, `amount` and `description` of each donation made by users.

c) API Endpoints

Endpoint	Method	Description

/api/users/register	POST	Registers a new user with username and password
/api/users/login	POST	Authenticates a user, returning a JWT token
/api/users/change-credentials	PUT	Allows users to update their username and password
/api/listings	GET	Retrieves all available food listings
/api/listings/add	POST	Adds a new listing to donate food
/api/claims/claim	POST	Allows a user to claim a specific food listing
/api/donations/donate	POST	Records a donation with amount and description
/api/users/update-profile-pic	POST	Uploads or updates the user's profile picture

d) User Interface (UI) Design

The application's interface includes the following screens:

1. **Home Page**: Provides an introduction to FoodShare and calls to action for user registration and login.
2. **Register Page**: Allows new users to create an account.
3. **Login Page**: Authenticates existing users and provides a session token for secure access.
4. **Listings Page**: Displays all available food listings and offers users the option to claim items.
5. **Donation Page**: Enables users to make monetary donations, specifying amount and description.
6. **Profile Page**: Lets users manage their account details, including changing profile pictures.

Each page is fully responsive and adapts to mobile, tablet and desktop screens.

e) Instructions for Running the Application

1. **Backend Setup**:

Install dependencies:
bash
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cd backend
npm install
```

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Configure environment variables in a `.env` file:
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MONGO_URI=mongodb+srv://<username>:<password>@cluster.mongodb.net/foodshare?retryWrites=true&w=majority
JWT_SECRET=your_jwt_secret
PORT=5000
```

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Start the server:
bash
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node server.js
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- The backend server will run on `http://localhost:5000`.

2. **Frontend Setup**:

Install dependencies:
bash
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cd frontend
npm install
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Start the frontend:
bash
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```
npm start
```

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- The frontend will run on `http://localhost:3000` and interact with the backend.

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3. Problem Statement

Addressing Food Waste and Food Insecurity

In today's society, food waste is a critical issue, with an estimated 30% of all food produced globally being discarded each year. This waste contributes to significant environmental pollution, including increased greenhouse gas emissions, while millions of individuals and families around the world face food insecurity. The discrepancy between food surplus and

the lack of food accessibility underscores a need for accessible redistribution solutions that bridge this gap.

FoodShare provides an innovative solution by creating a platform where individuals and organizations with surplus food can easily list these items for donation. Those in need, or local charities, can claim the listed items, ensuring food is redistributed instead of wasted. This application aims to foster a community-driven approach to food sharing, reduce environmental impact and alleviate food insecurity for vulnerable populations.

By simplifying the process of donating and claiming food, FoodShare empowers communities to actively participate in waste reduction and support food accessibility, positively impacting both the environment and society.