Software Requirements Specification

for

NourishNow: The Waste food Management and Donation

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

"NourishNow: The Waste Food Management and Donation App" is an innovative mobile application designed to address the growing issue of food wastage and hunger simultaneously. The app serves as a platform that connects food donors, such as restaurants, grocery stores, and individuals, with local food banks, shelters, and charities in need of food donations.

1.1 Purpose

The primary purpose of the "NourishNow: The Waste Food Management and Donation App" is to create a platform that connects those with surplus food to those in need, thereby reducing food waste, alleviating hunger, and promoting social responsibility, sustainability, and community engagement.

Product Name: "NourishNow: The Waste Food Management and Donation App"

Revision/Release Number: Version 1.0

The app aims to connect food donors with charitable organizations, reduce food waste, and alleviate hunger by simplifying the process of food donation.

1.2 Product Scope

The product scope of "NourishNow" encompasses the range of features and functionalities that the Waste Food Management and Donation App provides to meet its objectives and address the critical issues of food waste and hunger. Here's an overview of the product scope:

1. User Registration and Profiles:
   - Users can register and create profiles, specifying their role as donors, recipients, or volunteers.
   - User profiles include personal information, contact details, and preferences.
2. Donor Management:
   - Donors, including businesses and individuals, can create and manage their donation listings.
   - They can input details about surplus food items, including item name, description, quantity, and expiration date.
3. Donation Requests:
   - Charitable organizations, shelters, and food banks can submit specific donation requests for the food items they need.
   - Donors can review and respond to these requests, offering food items that match recipients' needs.
4. Food Safety Guidelines:
   - The app includes guidelines and best practices for food safety to ensure that donated items meet safety standards.
   - Donors and recipients are encouraged to follow these guidelines for the safe handling and transfer of food.
5. Community Engagement:
   - "NourishNow" promotes community engagement through events, challenges, and volunteering opportunities.

- Users can participate in community-driven activities to support food rescue and donation efforts.

6. Feedback and Ratings:
   - Users can provide feedback and ratings based on their experiences with other users and donation transactions.
   - Feedback and ratings help build trust and accountability within the "NourishNow" community.
7. Reporting and Analytics:
   - The app provides data and analytics on the amount of food saved, meals provided, and the environmental benefits of food donations.
   - Users can track their impact and make data-driven decisions.
8. User Roles and Permissions:
   - The app incorporates role-based access control to manage permissions and access levels for different user roles.
   - This ensures that users have the appropriate level of access to the app's features.
9. Localization and Scaling:
   - "NourishNow" may be designed to support multiple languages and regions, enabling scalability and adoption in various geographic areas.
10. Data Privacy and Security:
    - The app prioritizes data privacy and security, implementing measures to protect user information and maintain trust within the user community.
11. Support and Assistance:
    - Users can access support resources, including FAQs, guides, and contact information for assistance when needed.
12. Environmental Impact Tracking:
    - The app tracks and reports on the environmental benefits of food donations, such as reducing food waste and greenhouse gas emissions.

1.3 References

- https://www.researchgate.net/publication/235774246_The_Evolution_of_Food_Donation_with_Respect_to_Waste_Prevention
- https://journal.ijresm.com/index.php/ijresm/article/view/1859
- https://www.youtube.com/watch?v=6IN_HbAePo4

2. Overall Description

2.1 Product Perspective

The app is a standalone platform designed to facilitate the donation of surplus food from donors to charitable organizations.

2.2 Product Functions

The app includes features such as donor registration, inventory management, donation requests, food safety guidelines, community engagement, feedback and ratings, and reporting and analytics.

2.3 User Classes and Characteristics

- Donors:
  - Characteristics:
    - Donors can be individuals, restaurants, grocery stores, or other businesses.
    - They have surplus, edible food items to donate.
    - Donors are motivated by social responsibility, sustainability, and reducing food waste.
  - Roles:
    - Creating and managing donation listings.
    - Responding to donation requests from charitable organizations.
    - Following food safety guidelines.
- Recipients (Charitable Organizations, Shelters, Food Banks):
  - Characteristics:
    - Recipients include nonprofit organizations, shelters, and food banks.
    - They aim to provide meals to those in need.
    - Recipients have specific food requirements based on their programs and the populations they serve.
  - Roles:
    - Submitting donation requests for needed food items.
    - Receiving and managing donated food.
    - Ensuring food safety and compliance with regulations.
- Volunteers:
  - Characteristics:
    - Volunteers are individuals who want to actively participate in food rescue and donation efforts.
    - They may participate in community events and volunteer to transport food.
    - Volunteers are motivated by a desire to contribute to charitable causes.
  - Roles:
    - Participating in community events and challenges.
    - Assisting with food collection and delivery.
    - Engaging with other users and the community.
- App Administrators:
  - Characteristics:
    - App administrators are responsible for managing and maintaining the app.
    - They ensure the security and functionality of the platform.
    - Administrators may be part of the app development team or the organization operating the app.
  - Roles:
    - Managing user accounts and access permissions.
    - Addressing technical issues and ensuring data security.
    - Updating the app with new features and improvements.
- General Users:
  - Characteristics:
    - General users may include individuals who are exploring the app or learning about its features.
    - They may or may not be actively participating in food donations.
    - General users may become donors, recipients, or volunteers over time.
  - Roles:
    - Browsing app content and information.
    - Registering and creating user profiles.
    - Potentially becoming donors, recipients, or volunteers.

2.4 Operating Environment

The operating environment of the "NourishNow" Waste Food Management and Donation App includes the hardware, software, and network infrastructure required for the app to function effectively. Here are the key components of the operating environment:

1. Hardware:
   - Smartphones and Tablets: The app is designed to run on iOS and Android devices, including smartphones and tablets. Users can access the app through their mobile devices, ensuring portability and accessibility.
2. Operating Systems:
   - iOS: "NourishNow" is compatible with iOS devices, such as iPhones and iPads. It is available for download on the Apple App Store.
   - Android: The app is also compatible with Android-based smartphones and tablets, and it can be downloaded from the Google Play Store.
3. Internet Connectivity:
   - The app requires an internet connection, preferably Wi-Fi or mobile data, to enable users to create and manage donations, receive donation requests, and stay updated on app activities and events.

2.5 Design and Implementation Constraints

The app must comply with relevant food safety and privacy regulations.

2.6 User Documentation

The app will provide user guides and tooltips to assist users in navigating the platform.

3. External Interface Requirements

3.1 User Interfaces

User interface requirements for the "NourishNow" Waste Food Management and Donation App are crucial to providing an intuitive and user-friendly experience. Here are some key user interface requirements:

1. Registration and Onboarding:
   - User Registration: Users should be able to create accounts easily with fields for personal information, contact details, and account preferences.
   - Onboarding Tutorials: Provide onboarding tutorials or walkthroughs to introduce users to the app's key features and functionality.
2. User Profiles:
   - Profile Management: Users should be able to view and edit their profiles, including personal information, contact details, and user preferences.
   - Profile Pictures: Allow users to upload profile pictures for personalization.
3. Donation Management:

- Donor Dashboard: Donors should have a dashboard to create, edit, and manage donation listings. The interface should include fields for item name, description, quantity, and expiration date.
- Donation Requests: Recipients should be able to create and manage donation requests, specifying their needs and preferences.

4. Volunteer Engagement:
   - Event Listings: Display a list of upcoming community events, challenges, and volunteer opportunities.
   - Event Sign-Up: Users should be able to sign up for events, challenges, or volunteer opportunities directly from the app.
5. Data Privacy Settings:
   - Data Privacy Management: Users should have interfaces to manage data privacy settings, consent to data processing, and control data sharing preferences.
6. Accessibility:
   - Accessibility Features: Ensure that the app is designed to be accessible to users with disabilities, including support for screen readers and other assistive technologies.

3.2 Hardware Interfaces

The "NourishNow" Waste Food Management and Donation App primarily runs on mobile devices, and its hardware interfaces are closely related to the features and capabilities of these devices. Here are the hardware interfaces relevant to the product:

i. Mobile Devices:
- Smartphones: The app is designed to run on both iOS and Android smartphones, making use of touchscreen interfaces for user interactions.
- Tablets: In addition to smartphones, the app should be compatible with tablets to provide a larger screen experience.

ii. Camera:
- The camera on the mobile device is utilized for capturing images of food items to be donated. Donors can take pictures of their donations to include in their listings.

iii. Microphone:
- If the app includes features such as voice commands or voice input for feedback, the microphone may be utilized for user interactions.

iv. Internet Connectivity:
- The app requires an internet connection, preferably through Wi-Fi or mobile data, to access the server, retrieve data, and send and receive notifications in real time.

v. Physical Buttons and Sensors:
- Users can interact with the app through physical buttons, touch gestures, and various sensors (e.g., accelerometer, gyroscope) on their devices.

vi. Speaker:
- The app may use the device's speaker for playing sounds, notifications, and event-related audio.

3.3 Software Interfaces

The "NourishNow" Waste Food Management and Donation App relies on various software interfaces to function effectively. These interfaces facilitate communication between different components and systems. Here are the key software interfaces for the app:

i. Operating System Interfaces:
   - The app interfaces with the operating systems of iOS and Android devices to ensure compatibility and utilize device-specific features.

ii. Backend Server API:
   - The app communicates with a backend server through a well-defined API (Application Programming Interface). This API handles user authentication, data storage and retrieval, and other server-side operations. It includes endpoints for functions like user registration, donation management, event listing, and notification delivery.

iii. Database Interfaces:
   - The app interfaces with a database system (MySQL databases) to store and retrieve user profiles, donation listings, feedback data, and event information.

iv. Payment Gateway API:
   - If the app includes donation transactions, it interfaces with a payment gateway API (e.g., BKash, Nagad) to process secure and reliable financial transactions.

v. Data Import and Export Interfaces:
   - These interfaces allow users to import or export their data, such as user profiles and donation history, to and from the app.

3.4 Communications Interfaces

The "NourishNow" Waste Food Management and Donation App relies on various communication interfaces to enable data exchange, notifications, and interactions between users. Here are the key communication interfaces for the app:

i. In-App Messaging:
   - Real-Time Chat: The app may include a real-time chat or messaging system, enabling users to communicate with each other, exchange information, and coordinate donation transactions.

ii. Email Communication:
   - Email Notifications: Users may receive email notifications and updates related to their activities within the app, such as account verification, password reset instructions, and summaries of recent interactions.

iii. Integration with Social Media:
   - Sharing on Social Platforms: Users can share their app activities, such as completed donations or community events, on social media platforms through sharing interfaces.

iv. User Support Channels:
   - Contact Form: Users can use the contact form to communicate with the app's support team for assistance, inquiries, or issue resolution.

v. Data Import and Export:
   - Data Exchange Formats: The app includes data import and export interfaces to enable users to transfer data, such as user profiles and donation records, to and from external systems and applications.

4. System Features

4.1 Functional Requirements

Functional requirements for the "NourishNow" Waste Food Management and Donation App describe the specific capabilities and behaviors of the app. These requirements are essential for its effective operation. Here are the functional requirements:

i. User Registration and Authentication:
   - Users must be able to create accounts with their name, email address, and password.
   - Users should receive an email verification link upon registration.
   - Users can log in with their registered email and password.
   - Users may have the option to use biometric authentication (e.g., fingerprint or face recognition) for quick login.

ii. User Profiles:
   - Users can create and manage detailed profiles, including personal information and contact details.
   - Users can upload profile pictures.
   - Users can view and edit their profiles.

iii. Donation Management:
   - Donors can create new donation listings, specifying item details, quantities, and expiration dates.
   - Donors can upload images of the donated items.
   - Donors can edit and delete their donation listings.
   - Recipients can create and manage donation requests, specifying food requirements and quantities.
   - Recipients can manage incoming donations, accepting or declining them.

iv. Volunteer Engagement:
   - Users can browse a list of upcoming community events, challenges, and volunteer opportunities.
   - Users can sign up for events, challenges, and volunteer activities.
   - Users can track their participation in volunteer activities and events.

v. Real-Time Chat:
   - Users can engage in real-time chat for communication related to donation transactions, event coordination, and community engagement.

vi. Feedback and Ratings:
   - Users can provide feedback and ratings for completed donation transactions and interactions with other users.
   - Users can view feedback and ratings they have received.

vii. Reporting and Analytics:
   - Users can access an analytics dashboard to view statistics on the amount of food saved, meals provided, and environmental impact.

viii. Multi-Language Support:
   - Users can select their preferred language and location for multi-language and regional support.

ix. User Support:
   - Users have access to a section with frequently asked questions (FAQs).
   - Users can use a contact form to communicate with the app's support team for assistance.

x. Environmental Impact Reporting:
   - The app measures and reports the environmental benefits of food donations, creating awareness about its sustainability efforts.

xi. Data Privacy and Security:

- The app ensures data privacy by allowing users to manage their data privacy settings and consent to data processing.
- User data is securely stored and protected according to data protection regulations.

5. Nonfunctional Requirements

Non-functional requirements for the "NourishNow" Waste Food Management and Donation App specify the quality attributes, performance expectations, and constraints that the app must adhere to. These non-functional requirements are crucial for ensuring the app's reliability, performance, and user experience. Here are the non-functional requirements:

5.1 Performance Requirements

- The app should respond to user interactions promptly, with minimal loading times for key features.
- The app must support concurrent users, ensuring performance even during peak usage times.

5.2 Safety Requirements

Safety requirements for the "NourishNow" Waste Food Management and Donation App are crucial to protect users, promote responsible food handling, and ensure the app's safe usage. Here are safety requirements for the app:

i. Food Safety Guidelines:
- The app should educate users about safe food handling practices, including proper storage and hygiene, to prevent foodborne illnesses.
- Donors must confirm that donated food items adhere to local food safety regulations and have not exceeded their expiry dates.

ii. User Verification:
- Donors and recipients must undergo a user verification process to confirm their identities and ensure responsible usage of the app.
- The app should include mechanisms to report and address suspicious or unsafe activities.

iii. Donation Review:
- The app should implement a review process for donated food listings, enabling administrators to assess the safety of the items.
- Listings that raise safety concerns or violate guidelines should be flagged and addressed promptly.

iv. Allergen Information:
- Donors must provide detailed information about food items, including potential allergens, to ensure user safety.

v. . Secure Transactions:
- Financial transactions, if applicable, must be conducted securely through integration with a reputable payment gateway to protect users' financial information.

vi. Emergency Reporting:
- The app should include an emergency reporting feature for users to report safety incidents or concerns related to food donations or app usage.
- Users should have access to safety resources, including local emergency contact information.

vii. Data Protection:

- User data, including personal and contact information, must be protected and used in compliance with data protection regulations to safeguard user privacy and safety.

viii. User Education:
- The app should provide educational resources and guidelines on safe food handling, responsible donation practices, and community engagement.

ix. Age Restrictions:
- The app should specify age restrictions for users, particularly for minors, to ensure age-appropriate and safe usage.

x. In-App Reporting:
- Users should have a user-friendly mechanism to report safety violations or concerns, including inappropriate content or behavior.

xi. Regular Safety Audits:
- The app should undergo regular safety audits and security assessments to identify and address potential risks and vulnerabilities.

5.3 Security Requirements

- User data must be encrypted in transit and at rest to protect against data breaches and unauthorized access.
- User authentication and authorization must be robust to prevent unauthorized access to user accounts and data.
- The app should comply with data protection regulations and ensure user data privacy.

5.4 Software Quality Attributes

i. Usability:
- The app must have an intuitive and user-friendly interface to ensure ease of use for users of all ages and backgrounds.
- The app's user interfaces should be accessible to users with disabilities, conforming to accessibility standards.

ii. Reliability:
- The app should be available and operational 24/7 with minimal downtime for maintenance or updates.
- Data integrity and consistency must be maintained at all times, and user data should be securely stored.

iii. Scalability:
- The app should be designed to handle a growing user base and increasing data volume without significant degradation in performance.
- Server infrastructure should be scalable to accommodate additional users and increased data storage requirements.

iv. Availability:
- The app must have a high availability rate, aiming for at least 99.9% uptime.

v. Data Backup and Recovery:
- Regular automated backups of user data and app configurations must be performed.
- A data recovery plan must be in place to quickly restore the app in the event of data loss or system failures.

vi. Cross-Platform Compatibility:
- The app should be compatible with a range of iOS and Android devices to maximize its user base.

vii. Data Privacy and Compliance:

- The app should obtain explicit user consent for data processing and adhere to data protection regulations and user data privacy preferences.

viii. Third-Party Integrations:

- Third-party services and APIs should be monitored for reliability and should not introduce vulnerabilities or disruptions to the app.

ix. Environmental Impact:

- The app should be designed to minimize its own environmental footprint, considering server energy consumption and data storage practices.

x. Updates and Maintenance:

- Regular updates and maintenance should be performed to address bugs, security vulnerabilities, and enhance features.

xi. Documentation: -

- Comprehensive documentation for users, developers, and administrators should be provided to facilitate app usage, development, and maintenance.