Assignment 1

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February 7, 2025

Course Title: Software Engineering
Date: February 7, 2025

1 Introduction

1.1 Purpose

The purpose of the *SaveN'Savor* system is to minimize food waste by connecting businesses that have surplus or unsold food items (restaurants, bakeries, grocery stores, hotels) with environmentally conscious consumers in the United Arab Emirates (UAE). By offering discounted surplus meals through a user-friendly digital platform, *SaveN'Savor* promotes corporate social responsibility, reduces food wastage, and provides affordable meal options to users.

1.2 Scope and Perspective

System Name: SaveN'Savor

Relationship to Other Systems and Products:

- Interacts with existing payment gateway APIs (e.g., Stripe or PayPal) for secure transaction processing.
- Uses map-based services (e.g., Google Maps) to display nearby surplus listings.
- Exports sustainability metrics or sales data so vendors can integrate into their own CSR or accounting systems.

System Scope (In-Scope):

- Vendor Portal for creating and managing surplus food listings.
- User App (web/mobile) that displays nearby surplus items, handles payments, and allows pick-up scheduling.
- Analytics & Sustainability Reporting for vendors to track food waste reduction metrics.

- Gamification features (e.g., badges, achievements) to encourage user engagement.
- Unique Features and Differentiation: The system will include elements that set it apart from competing apps and services, ensuring a distinct user experience and value proposition in the food waste reduction market.

System Scope (Out-of-Scope):

- Direct Delivery Logistics: The platform does not provide or manage couriers/drivers.
- Quality Assurance / Inspection: The system does not verify food safety compliance beyond local UAE regulations.
- Advanced Supply Chain Integration with vendor kitchen systems is not included.

2 Stakeholders

The following stakeholders have been identified for the *SaveN'Savor* system, ranked with HIGH-MEDIUM-LOW significance:

1. **Food Providers (Vendors) – HIGH**
   Businesses listing surplus food. Without them, there is no inventory for the system.
2. **End-Users (Consumers) – HIGH**
   They purchase the surplus meals; their adoption is critical for success.
3. **Platform Administrators – HIGH**
   Responsible for daily operations, maintenance, and support.
4. **Payment Gateway Providers – MEDIUM**
   Provide secure payment services, but operate as a third-party.
5. **Environmental Activist Groups / NGOs – MEDIUM**
   Potential advocates to promote the platform and expand outreach.
6. **Potential Investors / Sponsors – MEDIUM**
   Fund or support the platform's growth but are not involved in daily operations.
7. **Potential Competing Apps – LOW**
   Other applications offering similar food rescue or discount meal services.
8. **Local Government / Regulatory Bodies – LOW**
   Provide oversight and enforce regulations affecting digital commerce and consumer rights.

3 Regulations, Guidelines, Standards, Laws

Below is a list of relevant regulations and guidelines for *SaveN'Savor*, ranked by importance:

1. **GDPR-like Data Protection / UAE Data Privacy Laws**
   Description: Federal Decree Law No. 45 of 2021 regulates the processing, storage, and transfer of personal data—ensuring confidentiality and protecting individual rights. Additional frameworks include the DIFC Data Protection Law No. 5 of 2020 (applicable in the Dubai International Financial Centre) and Federal Decree Law No. 34 of 2021 addressing cybercrime and digital fraud. The IAM Policy also enforces restrictions on fraudulent or privacy-invasive online content.

   Rank: HIGH

2. **Electronic Transactions and Data Protection Laws**
   Description: Federal Law No. 1 of 2006 governs the validity of electronic transactions, digital signatures, and the secure storage of eDocuments, ensuring their legal recognition. Federal Law No. 6 of 2010 regulates the protection and sharing of credit information to maintain financial transparency and safeguard consumer data. The Dubai Data Law focuses on ensuring data privacy and protecting individual information within Dubai's digital ecosystem, reinforcing the emirate's commitment to secure digital operations.

   Rank: HIGH

3. **Consumer Protection Laws**
   Description: Federal Law No. 15 of 2020 on Consumer Protection ensures fair trade practices, clear labeling, and the secure delivery of goods and services (including e-commerce), thereby safeguarding consumer rights.

   Rank: MEDIUM

4. **Environmental Regulations**
   Description: Regulations aimed at reducing waste and promoting sustainability, which may include reporting requirements on food waste reduction and environmental impact. Cabinet Resolution No. (39): implements the executive regulations of Federal Resolution No. (12) of 2018 on integrated waste management, setting guidelines for waste reduction, recycling, and sustainable resource use.

   Rank: MEDIUM

5. **Local Municipal Business Licensing**
   Description: Requirements for obtaining and maintaining a business license to operate digital platforms or commercial services within UAE municipalities, ensuring adherence to local commercial regulations. Law No. (6) of 2023: establishes the Dubai Business Registration and Licensing Corporation, streamlining business licensing and regulatory compliance in Dubai.

   Rank: LOW

6. **UAE Food Safety Standards**
   Description: Regulations concerning the safe handling, labeling, storage, and hygiene of food products as enforced by municipal authorities (e.g., Dubai Municipality). For *SaveN'Savor*, food safety compliance is primarily the responsibility of the food providers, while the platform's role is limited to connecting vendors with consumers.
   Rank: LOW

4 Requirements Elicitation

4.1 Technique 1: Vendor Interview

Rationale: Vendor interviews are conducted exclusively with vendors because they directly manage surplus food inventories, pricing, and logistics. Their firsthand experience and operational challenges are critical for defining the technical and process-oriented requirements of the vendor portal. Consumers, by contrast, provide end-user feedback on usability and satisfaction but lack the detailed operational perspective that vendors possess.

Proof of Activity (Sample Interview Questions):

- **Structured:**
  - Can you describe your current process for managing surplus food inventory?
  - What specific challenges do you encounter when trying to sell or donate surplus food?
- **Semi-structured:**
  - What features would you value most in a digital dashboard for managing your surplus food listings (e.g., ease of use, real-time updates, integration with existing systems)?
  - How frequently do you update your surplus food inventory and what obstacles do you face during this process?
- **Unstructured:**
  - Tell me about a recent experience where you struggled with surplus food management.
  - In your opinion, how could a dedicated digital platform alleviate the challenges you face?

4.2 Technique 2: Goal-Based Elicitation

Rationale: Goal-based elicitation translates the high-level mission of the system into concrete, measurable objectives that guide both the design and development processes. This technique ensures that the platform aligns with the strategic business goals and that every functional requirement supports these goals.

Proof of Activity (Mission Statement & Derived Goals):

- **Mission Statement:**
  "To reduce food waste in the UAE by connecting vendors with surplus meals to environmentally aware and cost-conscious consumers, thereby promoting sustainability, social responsibility, and economic efficiency."

- **Derived Business Goals:**
  - **Promote Corporate Social Responsibility:** Enable vendors to engage in a community-oriented platform that emphasizes sustainable practices and social accountability.
  - **Minimise Food Waste:** Provide a robust system that reduces food waste by facilitating efficient surplus food distribution and rescue sales.
  - **Implement Sustainability Metrics:** Capture and report key sustainability metrics for each user and vendor, including total food rescued, estimated CO_2 emissions avoided, and cost savings.
  - **Drive Revenue and Scalability:** Design the platform to support scalable growth and generate revenue through a commission-based model on each rescue sale.
  - **Monetize through Subscriptions and Loyalty Programs:** Offer tiered subscriptions and loyalty programs to encourage bulk rescue packages and recurring consumer engagement.
  - **Foster Local Partnerships:** Build strong relationships with UAE-based eateries, hypermarkets, and other food and beverage groups, ensuring a steady supply of surplus food.
  - **Create Win-Win Deals:** Develop mutually beneficial deals that reduce partner costs while improving the brand image of all stakeholders.

4.3 Technique 3: Consumer Survey / Questionnaire

Rationale: Surveys are administered exclusively to consumers because they provide a broad range of quantitative and qualitative data on user behaviors, preferences, and perceptions. Consumers can easily report on their purchasing habits, responsiveness to discounts, and attitudes toward sustainability—data that is vital for designing the end-user experience. Vendors, on the other hand, offer detailed operational insights best captured via interviews.

Proof of Activity (Sample Survey Questions):

- How many times per week do you purchase discounted food items?
- Would a 30% discount motivate you to buy surplus meals?
- On a scale of 1 to 5, how important is eco-friendliness when choosing food services?
- Which payment methods do you prefer (e.g., credit card, digital wallet)?
- How far are you willing to travel to pick up surplus food?

Additional Evidence: Our domain analysis revealed no competitor app dedicated solely to surplus food management in the UAE. Instead, available platforms address broader food waste challenges without tailored features for the local market. Moreover, industry literature and governmental data indicate that approximately 38% of food prepared daily in the UAE is wasted—rising to 60% during Ramadan—and that food waste costs the UAE around $3.5 billion per year. Studies have further found that the average UAE household wastes about 197 kilograms of food annually. These statistics underscore the critical need for a locally tailored solution like *SaveN'Savor*.

5 Requirements

Below are the requirements generated using the chosen elicitation techniques.

1. The system shall allow vendors to create surplus food listings via a dedicated vendor portal. [HIGH]
2. The system shall enable vendors to update surplus food listings in real-time. [HIGH]
3. The system shall enable vendors to delete surplus food listings in real-time. [HIGH]
4. The system shall allow users to search surplus food items by distance, cuisine, and dietary preference. [HIGH]
5. The system shall securely process payments using a PCI-compliant payment gateway. [HIGH]
6. The system shall encrypt all user data at rest using industry-standard protocols. [HIGH]
7. The system shall send push notifications to users regarding new surplus offers. [HIGH]
8. The system shall send push notifications to users regarding scheduled pick-up times. [HIGH]
9. The system shall log all user interactions with timestamps for auditing purposes. [HIGH]
10. The system shall display available surplus food items on the user app based on current geolocation. [HIGH]
11. The system shall provide analytics reporting to vendors that displays metrics on surplus food sales and waste reduction. [MEDIUM]
12. The system shall allow vendors to export sustainability reports in standard formats such as PDF. [MEDIUM]
13. The system shall assign a unique identifier to each transaction for validation during food pick-up. [MEDIUM]

14. The system shall support a multi-language interface for both the vendor portal and the user app. [MEDIUM]
15. The system shall integrate with geolocation services to accurately display vendor locations. [MEDIUM]
16. The system shall maintain a history of user transactions for future reference and analysis. [MEDIUM]
17. The system shall provide search functionality that allows users to sort surplus food items by price and rating. [MEDIUM]
18. The system shall display promotional banners for vendors on the user app. [LOW]
19. The system shall support social media sharing of user achievements and sustainability impact statistics. [LOW]
20. The system shall allow users to submit feedback for surplus food items. [LOW]
21. The system shall allow users to rate surplus food items. [LOW]
22. The system shall include basic accessibility features to accommodate users with disabilities. [LOW]
23. The system shall provide a help section and FAQ accessible from both the vendor portal and the user app. [LOW]

6 Use Cases

Use Case 1: Create Surplus Food Listing

Main Success Scenario:

1. The vendor logs into the dedicated vendor portal.
2. The vendor selects the "Create Listing" option.
3. The system displays a form with required fields (item name, description, quantity, price, expiration date).
4. The vendor enters the required details.
5. The vendor submits the listing.
6. The system validates the input and creates the listing.
7. The system displays a confirmation message indicating successful creation.

Alternate Courses:

1. **Incomplete Information:**
   (a) The system detects missing or invalid data.
   (b) The system displays a prompt indicating the specific field(s) that require correction.
   (c) The vendor enters or corrects the missing information.
   (d) The vendor resubmits the listing.
2. **Editing Before Submission:**
   (a) The vendor selects the "Edit" option while filling out the form.
   (b) The system reloads the form with the entered data.
   (c) The vendor modifies the necessary details.
   (d) The vendor submits the updated listing.

Error Courses:

1. **System Error During Submission:**
   (a) The system fails to save the listing due to an internal error.
   (b) The system displays an error message advising the vendor to retry.
   (c) The system logs the error for further investigation.

Use Case 2: Search Surplus Food Items

Main Success Scenario:

1. The consumer opens the user app.
2. The consumer selects the "Search" option.
3. The system displays a search interface requesting criteria such as distance, cuisine type, and dietary preference.
4. The consumer enters the search criteria.
5. Call display nearby food items
6. The system processes the query and retrieves matching surplus food listings.
7. The system displays the results as a list or map view.

Alternate Courses:

1. **No Matching Listings:**
   (a) The system detects that no listings match the entered criteria.

(b) The system displays a "No results found" message.

(c) The consumer is prompted to modify the search criteria.

2. **Manual Location Entry:**

   (a) If geolocation fails or is disabled, the system prompts the consumer to manually enter a location.

   (b) The consumer inputs the desired location.

   (c) The system processes the query based on the manually entered location.

Error Courses:

1. **Database Query Error:**

   (a) The system encounters an error while querying the database.

   (b) The system displays an error message advising the consumer to try again later.

   (c) The error is logged for technical review.

Use Case 3: Process Payment for Surplus Food

Main Success Scenario:

1. The consumer adds a surplus food item to the cart and proceeds to checkout.
2. The system displays the payment screen requesting payment details.
3. The consumer enters or confirms payment details.
4. The system securely transmits the payment information to the PCI-compliant payment gateway.
5. The payment gateway processes the transaction and returns a confirmation.
6. The system displays a payment confirmation message to the consumer.

Alternate Courses:

1. **Modify Payment Details:**

   (a) Before final submission, the consumer selects the "Edit Payment" option.

   (b) The system reloads the payment form with the previously entered details.

   (c) The consumer modifies the details as needed.

   (d) The consumer resubmits the payment information.

Error Courses:

1. **Invalid Payment Information:**

(a) The system detects invalid or incomplete payment details.

(b) The system displays an error message indicating the issue.

(c) The consumer is prompted to re-enter the correct payment information.

2. **Payment Gateway Unavailability:**

(a) The system fails to connect to the payment gateway.

(b) The system displays a "Service unavailable" message.

(c) The consumer is advised to try again later.

Use Case 4: Display Nearby Surplus Food Items

Main Success Scenario:

1. The consumer opens the user app.
2. The system automatically retrieves the consumer's current geolocation using map-based services
3. The system queries the database for surplus food listings within a preset radius of the consumer's location.
4. The system displays the listings as either a map view or a list view.

Alternate Courses:

1. **Manual Location Input:**

(a) If geolocation retrieval fails or is disabled, the system prompts the consumer to manually enter a location.

(b) The consumer enters the location data.

(c) The system processes the query based on the manually entered location.

Error Courses:

1. **Geolocation Error:**

(a) The system fails to retrieve geolocation data.

(b) The system displays an error message and requests the consumer to manually enter a location.

2. **Database Retrieval Error:**

(a) The system encounters an error during the database query.

(b) The system displays an error message and advises the consumer to try again later.

(c) The system logs the error for further analysis.

Use Case 5: Send Scheduled Pick-up Notification

Main Success Scenario:

1. After purchase, the consumer selects a preferred pick-up time.
2. The system records the scheduled pick-up time.
3. The system schedules a push notification to be sent 30 minutes before the pick-up time.
4. The system sends the push notification to the consumer's device.

Alternate Courses:

1. **Rescheduling Pick-up:**
   (a) The consumer selects the "Change Pick-up Time" option.
   (b) The system displays the current scheduled time and prompts for a new time.
   (c) The consumer enters a new pick-up time.
   (d) The system updates the schedule and reschedules the push notification accordingly.

Error Courses:

1. **Notification Failure:**
   (a) The system fails to send the scheduled push notification.
   (b) The system automatically retries sending the notification every minute for up to 3 minutes.
   (c) If the notification still fails, the system logs the error and sends an alternative notification via SMS.

7 Use Case Diagram

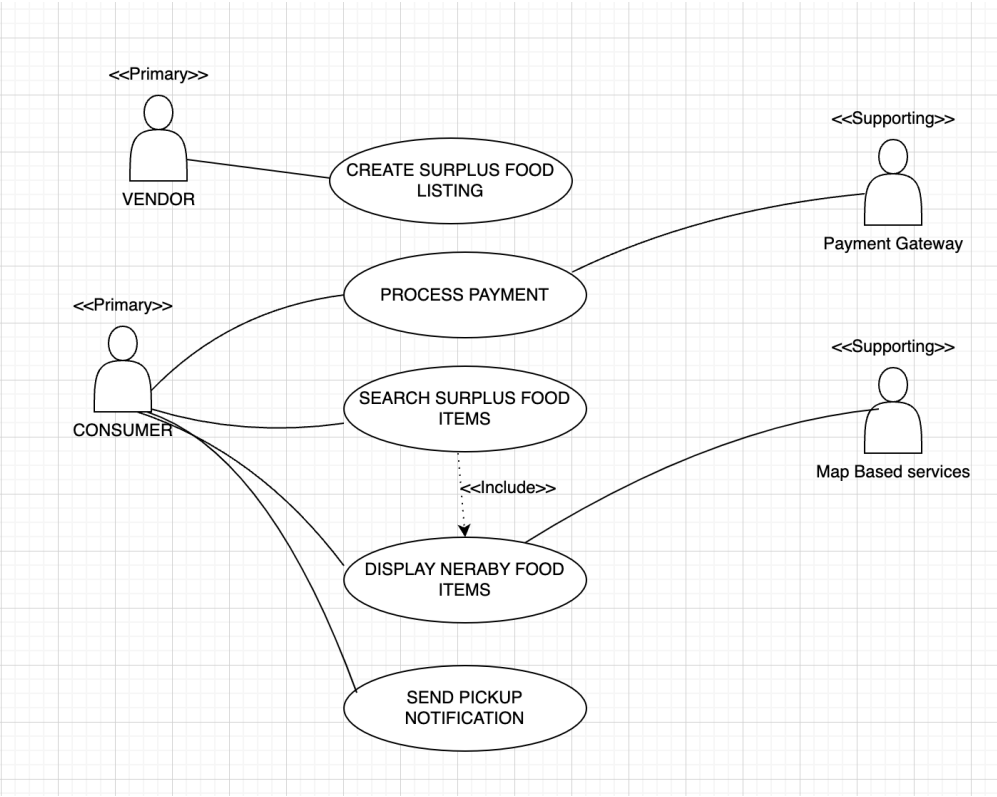

Figure 1: Use Case Diagram for SaveN'Savor System