CSC 510 (001) : Software Engineering (Proj1a1) - Group 3

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1. List of stakeholders

1.1. Core Marketplace Stakeholders

These are the essential participants whose interactions define the food delivery service.

- **Customers & End-Users:** Individuals and groups who order food.
- **Restaurant Partners:** Businesses that prepare and sell the food.
- **Delivery Partners:** The individuals and companies that transport the food.

1.2. Internal Platform Stakeholders

These are the teams and individuals employed by the food delivery company itself.

- **Executive Leadership & Board:** Sets strategy, secures funding, and provides governance.
- **Product & Technology Teams:** Build and maintain the platform.
- **Operations & Support Teams:** Manage the day-to-day marketplace functions.
- **Growth & Corporate Teams:** Drive business expansion and provide administrative support.

1.3. Ecosystem & Partner Stakeholders

These are the external third-party entities the platform relies on to function and grow.

- **Technology & Infrastructure Partners:** Cloud providers (AWS, Google Cloud), mapping services (Google Maps), payment gateways (Stripe, PayPal), and communication services (Twilio) that enable core platform functionality.
- **Financial & Strategic Partners:** Investors, shareholders, banks, insurance providers, and marketing affiliates that provide capital, financial services, and user acquisition support.
- **Supply Chain & Logistics Partners:** Food and packaging suppliers for restaurants, plus vehicle and maintenance partners that support delivery operations.

1.4. Regulatory & Societal Stakeholders

These are the broader governing bodies and groups that shape the market and grant the license to operate.

- **Government & Regulatory Bodies:** Local, state, and federal authorities, health agencies, and labor protection agencies that enforce permits, taxes, food safety, and worker rights.
- **Advocacy & Community Groups:** Trade unions, neighborhood associations, and environmental groups that advocate for worker rights, community impact management, and sustainable practices.
- **Market-at-Large:** Competitors, media, press, food bloggers, and influencers that shape market expectations, public perception, and food trends.

2. Stakeholder biases

2.1. Platform vs. Restaurant Partners: Commissions vs. Profitability

- **The Clash:** The Platform's need to generate revenue through high commission fees directly conflicts with the Restaurant Partner's need to maintain its own profitability.
- **Elaboration:** Online food delivery (OFD) platforms operate as third-party intermediaries, charging restaurants a fee, often a percentage of each order, to be listed and promoted (Vanderlee & Sacks, 2023). While this provides

restaurants with a new sales channel, these fees can significantly cut into their already thin profit margins. This financial pressure is compounded by the numerous food safety regulations restaurants must already bear, such as those outlined in the FDA Food Code and state-level rules (Washington State Board of Health, 2020; U.S. Food and Drug Administration, 2022). The platform's need to satisfy its investors with high growth is often irrelevant to the immediate financial survival of a small, local restaurant.

2.2. Customers vs. Platform: Health vs. Convenience Marketing

- **The Clash:** The Platform's business model, which often promotes unhealthy food to maximize sales, is in direct conflict with the Customer's long-term health needs and the goals of public health advocates.
- **Elaboration:** OFD platforms excel at providing convenience, which has become an essential value in modern lifestyles (Giacomini et al., 2024). However, this convenience is commercially underpinned by promoting "highly palatable, processed, and calorie-dense food" because it sells well (Giacomini et al., 2024). Studies confirm that unhealthy options vastly outnumber healthy ones on these apps, and marketing strategies like images and price promotions are more frequently used for unhealthy items (Jia et al., 2024). This directly clashes with public health goals, as OFD use has been associated with risky conditions like a higher BMI (Giacomini et al., 2024). While platforms could be a tool for improving diet, their current profit motive often works against it.

2.3. Delivery Partners vs. Platform: Flexibility vs. Financial Security

- **The Clash:** The Platform's need for a flexible, low-cost, on-demand workforce (as independent contractors) clashes with the Delivery Partner's need for stable, predictable wages and employee protections.
- **Elaboration:** The gig economy model is central to the OFD platform's success, allowing it to scale its delivery fleet without the costs associated with full-time employment, such as benefits and minimum wage guarantees. For drivers, this offers flexibility. However, this flexibility often comes at the expense of financial security and legal protections. This fundamental conflict is so significant that it has prompted government intervention in some places (Jia et al., 2024).

2.4. Restaurants vs. Regulatory Bodies: Operational Ease vs. Public Safety Compliance

- **The Clash:** The Restaurant's need to operate efficiently with minimal administrative overhead clashes with the Regulatory Body's mandate to enforce complex food safety rules to protect the public.
- **Elaboration:** Regulatory bodies like the FDA and local health departments implement science-based standards, such as the FDA Food Code, to prevent foodborne illness (U.S. Food and Drug Administration, 2022; Washington State Board of Health, 2020). However, compliance creates significant burdens for restaurants. For example, the requirement to have a Certified Food Protection Manager (CFPM) involves costs for training, exams, and employee time, estimated to be over $500 per certification, which is valid for five years (Washington State Board of Health, 2020). For a small restaurant, the intricate rules for things like shell stock tagging or getting approval to reinstate an employee after an illness are operational hurdles that conflict with their need for simplicity and speed (Washington State Board of Health, 2020).

2.5. Platform vs. Local Government: National Scale vs. Local Impact

- **The Clash:** The Platform's goal of rapid, scalable growth in a legally ambiguous "grey zone" conflicts with the Local Government's responsibility to manage civic infrastructure, tax collection, and community well-being.
- **Elaboration:** OFD platforms often expand faster than local laws can adapt. This creates several points of conflict. First, the increase in delivery traffic can strain local infrastructure. Second, tax collection becomes highly complex. In some jurisdictions like North Carolina, platforms are required to remit local meals taxes not to the state, but directly to each individual taxing county, creating a significant administrative burden and a source of friction with local authorities (Ford, 2023).

3. Comments on prompt crafting

1. Zero-shot prompting is best for rapid prototyping. In cases where structure or reliability is important, careful prompting is necessary.
2. Zero shot prompts work well when brainstorming or "trying to know what you don't know yet".
3. Simple, one-dimensional tasks are handled adequately by zero-shot prompts. However, for any multi-step reasoning or nuanced problem, they are insufficient; example-driven prompts are required.

4. Attempting to get structured output (for example, JSON) via zero-shot is unreliable. Providing an explicit example within the prompt is the only method that ensures a consistently parsable format.
5. The higher upfront token cost of a careful prompt is deceptive. It is almost always more economical once the downstream costs of error correction and manual intervention from failed zero-shot attempts are factored in.
6. The simple inclusion of "Let's think step-by-step" is a very effective, low-effort technique that elevates a zero-shot prompt's reasoning capability to a noticeable degree.
7. The value of adding examples plateaus quickly. One to three high-quality examples deliver a significant performance boost; exceeding five rarely provides a return that justifies the increased token cost. There is also the downside of lost creativity.

4. Use Cases

4.1. UC-1: Search for Restaurants and Food

Owner: Discovery & Search Team

1. **Goal / Value Proposition:** To enable Customers to effortlessly discover and explore available restaurants and menu items, which is the crucial first step in the ordering process.
2. **Brief Description:** This use case describes how a Customer uses their location, search terms, and filters to find restaurants or specific food items available for delivery in their area.
3. **Actors:**
   a. Primary Actor: Customer
   b. Secondary Actor(s): Mapping Service
4. **Trigger:** The Customer opens the food delivery app or navigates to the home/search screen with the intent to find food.
5. **Preconditions:**
   a. The Customer's device has an active internet connection.
   b. The Customer has granted the app location permissions, or is prepared to enter an address manually.
6. **Postconditions:**
   a. On Success: A list of relevant restaurants or menu items is displayed to the Customer.
   b. On Failure: The system remains on the search screen, displaying an appropriate error message.
7. **Main Flow (Basic Flow):**
   a. The Customer opens the app.
   b. The System requests the Customer's current GPS location from the device's operating system.
   c. The System sends the location coordinates to the server and displays a list of all restaurants that deliver to the Customer's location, sorted by a default algorithm.
8. **Alternative & Exception Flows:**
   S2 Search by Keyword: The Customer enters a keyword (e.g., "pizza") into the search bar. The System returns a list of restaurants and/or menu items matching the keyword.
   E2 No Delivery Coverage: If the System finds no restaurant partners that deliver to the specified address, it displays a message informing the user that no delivery is available in their area yet.

4.2. UC-2: Place a Food Order

Owner: Checkout & Payments Team

1. **Goal / Value Proposition:** To provide a seamless, secure, and efficient checkout process that allows a Customer to purchase their selected food items, generating direct revenue.
2. **Brief Description:** This use case covers the process from the Customer proceeding to checkout to successfully placing an order, including payment and applying promotions.
3. **Actors:**
   a. Primary Actor: Customer
   b. Secondary Actor(s): Payment Gateway, Restaurant Partner
4. **Trigger:** The Customer taps the "View Cart" or "Checkout" button.
5. **Preconditions:**
   a. The Customer is authenticated within the system.
   b. The Customer has at least one item in their cart.
6. **Postconditions:**

a. On Success: An order is created in the system, transmitted to the Restaurant Partner, and the Customer's payment is authorized.
b. On Failure: No order is created and no payment is processed.

7. **Main Flow (Basic Flow):**
   a. The Customer reviews items in their cart and proceeds to checkout.
   b. The System displays the checkout screen with the default delivery address, payment method, and an itemized summary of all costs.
   c. The Customer clicks the "Place Order" button.
   d. The System sends payment details to the Payment Gateway for authorization.
   e. Upon success, the System creates the order, transmits it to the Restaurant Partner, and displays an "Order Confirmed" screen to the Customer.
8. **Alternative & Exception Flows:**
   S2 Apply Promo Code: The Customer enters a valid promotion code. The System validates the code and applies the discount to the order summary.
   E1 Payment Method Declined: The Payment Gateway returns a "declined" response. The System displays an error message and returns the Customer to the checkout screen to choose a different payment method.

4.3. UC-3: Manage Restaurant Menu and Orders

Owner: Partner Platform Team

1. **Goal / Value Proposition:** To empower Restaurant Partners with tools to control their online storefront, manage incoming orders effectively, and communicate order status.
2. **Brief Description:** This use case describes how a Restaurant Partner uses their portal to update menu items, manage availability, and process customer orders.
3. **Actors:**
   a. Primary Actor: Restaurant Manager / Staff
   b. Secondary Actor(s): Customer, Delivery Partner
4. **Trigger:** A new order is received, or the Restaurant Manager logs in to make administrative changes.
5. **Preconditions:**
   a. The restaurant has an active partnership with the platform.
   b. The Restaurant Manager / Staff is logged into the partner portal.
6. **Postconditions:**
   a. On Success: The restaurant's menu is accurately reflected on the app, and all new orders are either confirmed or rejected.
   b. On Failure: The restaurant's online status is out of sync, and orders may be missed.
7. **Main Flow (Order Management):**
   a. The System sends a new order to the restaurant's device with an alert.
   b. The Restaurant Staff views and confirms the order.
   c. The staff enters an estimated preparation time.
   d. The System updates the order status to "Preparing" and notifies the Customer.
   e. Once ready, the staff marks the order as "Ready for Pickup," which dispatches a Delivery Partner.
8. **Alternative & Exception Flows:**
   S1 Mark an Item as "Out of Stock": The Restaurant Staff navigates to menu management and toggles an item's status to "Out of Stock". The System immediately removes the item from the customer-facing menu.
   E2 Order Not Acknowledged: A new order is not acknowledged by staff within a predefined time (e.g., 3 minutes). The System automatically rejects the order and notifies the Customer.

4.4. UC-4: Track Delivery Status

Owner: Logistics & Customer Experience Team

1. **Goal / Value Proposition:** To provide Customers and Restaurants with real-time visibility into an order's journey, which increases trust and reduces anxiety.
2. **Brief Description:** This use case describes how a Customer monitors the progress of their order through status updates and a real-time map view of the Delivery Partner.
3. **Actors:**
   a. Primary Actor: Customer
   b. Secondary Actor(s): Delivery Partner, Mapping Service

4. **Trigger:** The Customer navigates to their "Active Orders" screen after an order has been confirmed.
5. **Preconditions:**
   a. An order has been successfully placed and confirmed.
   b. The Delivery Partner has their app open with location services enabled.
6. **Postconditions:**
   a. On Success: The Customer has viewed the current status of their order, which is eventually marked "Delivered".
   b. On Failure: The Customer sees outdated or incorrect status information.
7. **Main Flow (Basic Flow):**
   a. The System displays the current order status (e.g., "Preparing").
   b. When the order is ready, the System assigns a Delivery Partner and updates the status.
   c. After pickup, the status changes to "Out for Delivery," and the System displays the driver's location on a real-time map.
   d. The Delivery Partner confirms drop-off, and the System updates the status to "Delivered".
8. **Alternative & Exception Flows:**
   S1 Contact Delivery Partner: The Customer taps "Contact Driver" to initiate an anonymized phone call or chat to provide instructions.
   E2 Significant Delivery Delay: The System's algorithm detects a significant delay. It automatically sends a push notification to the Customer with a new ETA.

4.5. UC-5: Rate and Review an Order

Owner: Customer Experience & Trust Team

1. **Goal / Value Proposition:** To capture customer feedback on their order and delivery, which provides valuable quality control data and helps future customers make informed choices.
2. **Brief Description:** Describes how a Customer provides separate ratings for the food/restaurant and the delivery service, and can leave an optional text review.
3. **Actors:**
   a. Primary Actor: Customer
   b. Secondary Actor(s): Restaurant Partner, Delivery Partner
4. **Trigger:** An order's status changes to "Delivered," prompting a notification to the Customer.
5. **Preconditions:** The Customer has a completed order in their history that has not yet been rated.
6. **Postconditions:**
   a. On Success: The ratings and reviews are saved, aggregate ratings are updated, and the review is sent to a moderation queue.
   b. On Failure: No rating or review is saved.
7. **Main Flow (Basic Flow):**
   a. The System prompts the Customer to rate their recent order.
   b. The Customer selects a star rating (1-5) for the Restaurant/Food and another for the Delivery.
   c. The Customer optionally types a text review and taps "Submit".
   d. The System saves the feedback and displays a confirmation message.
8. **Alternative & Exception Flows:**
   A1 Report an Issue: If the Customer provides a low rating (1-2 stars), the System displays a list of common issues for them to select. This flags the order for review by Customer Support.
   E1 Submission Failure: If submission fails due to a network error, the System displays an error message and saves the entered data locally for a future attempt.

4.6. UC-6: Onboard a New Restaurant Partner

Owner: Partner Acquisition Team

1. **Goal / Value Proposition:** To provide a streamlined, self-service onboarding process for new restaurants to join the platform, expanding food options for customers.
2. **Brief Description:** Describes the process for a restaurant owner to register, upload documents and menu information, and submit their profile for review.
3. **Actors:**
   a. Primary Actor: Restaurant Owner
   b. Secondary Actor(s): Platform Admin Team

4. **Trigger:** A prospective Restaurant Owner navigates to the "Partner With Us" page and clicks "Sign Up".
5. **Preconditions:** The owner has a registered business, necessary permits, and a digital menu.
6. **Postconditions:**
    a. On Success: A new restaurant profile is created in a "Pending Approval" state, and the Admin Team is notified.
    b. On Failure: No profile is created, and the owner is returned to the last step with an error message.
7. **Main Flow (Basic Flow):**
    a. The Restaurant Owner creates an account.
    b. The owner completes a multi-step form, entering business information, uploading legal documents, providing banking details, and creating their menu.
    c. The owner sets operating hours, reviews the application, and submits it.
    d. The System validates the application and sends it to the admin review queue.
8. **Alternative & Exception Flows:**
    A1 Platform Admin Requests More Information: An Admin reviews the application and rejects it with a specific reason (e.g., document is illegible). The System emails the owner with a link to edit their submission.
    E2 Bank Account Verification Fails: The system's verification service cannot validate the provided bank details. It displays an error message asking the owner to double-check the numbers.

4.7. UC-7: Manage Delivery Tasks

Owner: Driver Logistics Team

1. **Goal / Value Proposition:** To provide Delivery Partners with a simple mobile interface for accepting, managing, and completing deliveries, which is critical for customer satisfaction.
2. **Brief Description:** Covers the lifecycle of a delivery from the driver's perspective, including receiving an offer, navigation, and completion.
3. **Actors:**
    a. Primary Actor: Delivery Partner
    b. Secondary Actor(s): Restaurant Staff, Customer, Mapping Service
4. **Trigger:** A new delivery opportunity is offered to a geographically relevant driver.
5. **Preconditions:** The driver is logged in, online, and has location services enabled.
6. **Postconditions:**
    a. On Success: The order is marked as "Delivered," and the driver's earnings are calculated.
    b. On Failure: The delivery is not completed by this driver and is reassigned.
7. **Main Flow (Basic Flow):**
    a. The System sends a new delivery offer to the driver's app.
    b. The driver accepts the offer within a time limit.
    c. The driver navigates to the restaurant, confirms arrival, and confirms pickup of the order in the app.
    d. The System provides the customer's address for navigation.
    e. The driver travels to the customer, confirms the delivery is complete in the app (e.g., with a photo), and finishes the task.
8. **Alternative & Exception Flows:**
    A1 Reject a Delivery Offer: The driver taps "Decline" or lets the timer expire. The System immediately offers the delivery to the next-best-available driver.
    E2 Restaurant is Closed: The driver arrives to find the restaurant unexpectedly closed and reports it in the app. The System cancels the order, notifies the customer, and issues the driver a small compensatory payment.

4.8. UC-8: Process a Customer Refund

Owner: Customer Support & Payments Team

1. **Goal / Value Proposition:** To provide a clear and fair process for handling customer complaints and issuing refunds, turning a negative experience into a retention opportunity.
2. **Brief Description:** Describes how a Customer Support agent investigates an order issue and issues a full or partial refund.
3. **Actors:**
    a. Primary Actor: Customer Support Agent
    b. Secondary Actor(s): Customer, Payment Gateway
4. **Trigger:** A Customer contacts support to report a problem with a delivered order.

5. **Preconditions:** The agent is logged into the support panel, and the customer has a completed order.
6. **Postconditions:**
    a. On Success: A refund is processed, the customer is notified, and the action is logged.
    b. On Failure: No refund is issued, and the ticket is updated with a reason for denial.
7. **Main Flow (Basic Flow):**
    a. A Customer Support Agent reviews a new support ticket linked to an order ID.
    b. The Agent reviews the order details and determines the complaint is valid.
    c. The Agent navigates to the "Refund" section for the order and selects the item(s) to be refunded or enters a custom amount.
    d. The Agent submits the refund, which sends a command to the Payment Gateway.
    e. Upon success, the System logs the action and notifies the customer.
8. **Alternative & Exception Flows:**
    S1 Issue Platform Credit Instead of Refund: Instead of a monetary refund, the agent issues platform credit to the customer's account wallet.
    E2 Suspected Fraudulent Activity: The system's fraud detection algorithm flags a customer for a high number of refund requests. The system displays a warning to the Agent, who follows a specialized investigation procedure.

4.9. UC-9: Manage User Profile and Settings

Owner: Customer Accounts Team

1. **Goal / Value Proposition:** To empower customers to manage their own personal information, addresses, and payment methods, reducing the burden on customer support.
2. **Brief Description:** Describes how a Customer accesses their account settings to add, edit, or delete personal data.
3. **Actors:**
    a. Primary Actor: Customer
    b. Secondary Actor(s): Payment Gateway
4. **Trigger:** The Customer taps on the "Account" or "Profile" icon.
5. **Preconditions:** The Customer is authenticated within the system.
6. **Postconditions:**
    a. On Success: The customer's profile information is successfully updated in the database.
    b. On Failure: The information remains unchanged, and an error message is displayed.
7. **Main Flow (Basic Flow):**
    a. The Customer navigates to their Account screen and selects a section, such as "Saved Addresses".
    b. The Customer taps "Add New Address".
    c. The Customer fills out the address form and saves it.
    d. The System validates the address, adds it to the customer's saved list, and displays a confirmation.
8. **Subflow & Exception Flows:**
    S2 Add a New Payment Method: The Customer selects "Payment Methods" and taps "Add Payment". They enter card details, which the system securely transmits to the Payment Gateway to be tokenized and saved.
    E2 Invalid Payment Card: The Payment Gateway rejects the card as invalid or expired. The System displays an error message asking the user to check the details.

4.10. UC-10: View Order History

Owner: Customer Accounts Team

1. **Goal / Value Proposition:** To provide customers with a detailed record of their past orders for easy reordering, expense tracking, and support requests.
2. **Brief Description:** Describes how a Customer accesses their account to view a list of all past orders and can select an order to see its full details.
3. **Actors:** Primary Actor: Customer.
4. **Trigger:** The Customer navigates to the "Orders" section and selects "Order History".
5. **Preconditions:**
    a. The Customer is authenticated.
    b. The Customer has placed at least one order in the past.
6. **Postconditions:**

a. On Success: The Customer has viewed their list of past orders.
b. On Failure: The system is unable to retrieve the history and shows an error.

7. **Main Flow (Basic Flow):**
   a. The Customer navigates to their Order History screen.
   b. The System retrieves and displays a chronological list of all past orders.
   c. The Customer taps on a specific order.
   d. The System displays the Order Detail screen with the full itemized list, cost breakdown, and delivery information.
8. **Subflow & Exception Flows:**
   S1 Reorder a Past Order: On the Order Detail screen, the Customer taps "Reorder". The System adds all items from that order into the current cart and notifies the user of any price or availability changes.
   E1 Unable to Load History: The system fails to retrieve order history due to a server error. It displays a message asking the user to try again in a few moments.

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