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Project 1b1
Problem Anticipation

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UC-01: Customer Registers for an Account
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Secure and easy access to the platform, ability to save preferences and payment methods.
- **Platform Admin/Owner:** Efficient user acquisition, secure management of customer data, growing the user base.
- **Developers/IT Staff:** Robust authentication and data management systems, compliance with security standards.

Preconditions: Customer has internet access and has not yet registered.
Trigger: Customer opens the app or website and seeks to create an account.
Main Flow:

1. Customer selects "Sign Up" or "Create Account" option.
2. System presents a registration interface (e.g., email, phone number, social media login).
3. Customer enters required profile details (e.g., name, email, password) or chooses a social login option.
4. System verifies the information, creates the user account, and logs the customer in, displaying the home screen.

Subflows:

- 1a. Email verification required → System sends a verification link (expires 24 hrs). If link expired, customer can request resend (max 3 times/hour).
- 1b. Optional MFA enrollment → After registration prompt user to enable MFA (TOTP or SMS); store enrollment flag.
- 1c. CAPTCHA challenge on suspicious activity → present CAPTCHA and block after repeated failures.
- 1d. Duplicate-detection → If email already exists, system suggests account recovery flow and provides a 'Forgot password' link.

Alternative Flows:

- 3a. Customer provides invalid or already-registered details → System displays an error message and prompts for retry.

UC-02: Customer Tracks Real-time Delivery Status
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Ability to select multiple items easily, see costs, apply discounts.
- **Restaurant Staff:** Receives clear order details for preparation.
- **Platform Admin/Owner:** Accurate order capture, improved user satisfaction.

- **Developers/IT Staff:** Ensure order creation workflow works without errors.

Preconditions: Customer is logged in and browsing the menu.
Trigger: Customer selects items and proceeds to checkout.
Main Flow:

1. Customer browses menu and selects multiple items to add to the cart.
2. System displays cart with itemized list, subtotal, taxes, and applicable discounts.
3. Customer modifies quantities or removes items if needed.
4. Customer proceeds to checkout and selects payment method.
5. System confirms order, generates order ID, and sends details to restaurant staff.

Subflows:

- 2a. Address outside delivery zone → System prompts for pickup or alternate address and prevents checkout outside service area.
- 2b. Item became out-of-stock during checkout → System notifies customer, removes item, and recalculates total (option to choose substitution).
- 2c. Scheduled order handling → If customer selects a future time, system validates restaurant availability and reserves slot.
- 2d. Idempotency on submit → On duplicate submission, return same order ID and avoid duplicate payment capture.
- 2e. Split payment / multiple payers → Allow adding multiple payment instruments and calculate per-payer totals.
- 3a. Cart exceeds restaurant's maximum order limit → System prompts user to adjust quantity.
- 4a. Customer applies a promo code → System validates discount and updates total.

Alternative Flows:

- 3a. GPS or system connectivity issue → System displays the last known status and an estimated time, with option to retry.

UC-03: Customer Views Detailed Nutrition and Allergen Information
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Make informed and safe food choices, especially concerning allergies and dietary needs.
- **Restaurant Staff:** Ensure accurate and comprehensive information is presented to avoid health risks and legal liabilities.
- **Regulators/Legal:** Compliance with government nutrition labeling regulations and allergen disclosure laws.

Preconditions: Customer is browsing a menu.
Trigger: Customer selects a menu item or explicitly seeks nutrition/allergen details.
Main Flow:

1. Customer selects a menu item to view its details.
2. System displays **detailed ingredient lists, nutrition information panels**, and **summary nutrition information** (e.g., energy content), presented prominently and consistently.

3. System also displays **clear allergen information** associated with the item to address food safety concerns.
4. If applicable, health connotations from symbols or logos are displayed based on clear, transparent, and government-aligned criteria.

Subflows:

- 2a. Customer can access **automated nutrition calculators** that help them track and understand the nutritional composition of orders placed.
- 3a. Customization recalculation → If the customer modifies ingredients/toppings, the system recalculates nutrition and highlights changes.
- 3b. Missing data fallback → If nutrition data is missing, show disclaimer and "Request Info" button for staff to provide data.

Alternative Flows:

- 3a. Nutrition/allergen data missing → System displays disclaimer "Data not available" and provides option to notify restaurant for details.
- 3b. Calculation error → System logs error, shows "Data temporarily unavailable" and offers to retry.

UC-04: Customer Views Order History
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Ability to view past orders for convenience, reordering, or record-keeping.
- **Platform Admin/Owner:** Insights into customer behavior, repeat orders, and sales trends.
- **Developers/IT Staff:** Secure and efficient storage and retrieval of historical data.

Preconditions: Customer is logged into their account.
Trigger: Customer selects "Order History" from the app or website menu.
Main Flow:

1. Customer navigates to the "Order History" section.
2. System retrieves and displays a chronological list of past orders, including details (items, date, total amount).
3. Customer may select a past order for details or reorder.

Subflows:

- 2a. Customer filters by date, restaurant, or order status.
- 2b. Customer exports history (PDF/CSV).

Alternative Flows:

- 3a. No past orders → System displays a message indicating no orders found.
- 3b. Data retrieval error → System shows an error message with an option to retry..

UC-05: Customer Tracks Order Delivery in Real-Time
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Transparency, peace of mind, ability to plan for the arrival of their order.
- **Delivery Staff:** Efficient routing and communication of progress.
- **Platform Admin/Owner:** Enhanced customer experience, improved service quality, data for logistics optimization.

Preconditions: An order has been placed and accepted by the restaurant and assigned to a delivery person.
Trigger: Customer accesses the order details in the app or website after placing an order.
Main Flow:

1. Customer navigates to the "Order Tracking" section of the app/website.
2. System displays the **current status of the order** (e.g., "preparing," "picked up," "on the way").
3. System displays the **real-time location of the delivery driver on a map**.
4. System provides an **estimated time of arrival (ETA)**.
5. Customer receives push notifications for key status changes (e.g., "driver is 5 minutes away").

Subflows:

- 5a. If the ETA changes significantly due to unforeseen circumstances (e.g., traffic), the system updates the customer proactively.
- 5b. Delivery reassigned to another driver → System updates driver details and ETA.

Alternative Flows:

- 3a. GPS or connectivity failure → System shows last known status and allows manual refresh.

UC-06: Customer Leaves Feedback/Review
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Ability to express satisfaction or dissatisfaction, influence service quality, share experiences.
- **Restaurant Staff:** Receive feedback to improve food quality and service.
- **Delivery Staff:** Receive feedback on delivery service.
- **Platform Admin/Owner:** Gather data for service improvement, vendor/driver performance evaluation, and customer satisfaction analysis.

Preconditions: Customer has received and completed an order.
Trigger: Customer decides to provide feedback after an order is fulfilled, or the system prompts them.
Main Flow:

1. System prompts the customer to rate their experience (e.g., food quality, delivery service, app usability).
2. Customer provides ratings (e.g., star ratings for various aspects).
3. Customer can optionally leave textual comments or reviews.
4. System submits the feedback and associates it with the specific order, restaurant, and delivery experience.

Subflows:

- 6a. Severe-complaint escalation → If rating <= 2 or keywords (safety/health), system auto-creates support ticket and notifies Ops.
- 6b. Verified purchase badge → If review corresponds to an order, flag as 'Verified' and show order date.
- 6c. Moderation hold → Potentially abusive reviews flagged by ML are held for human review; author notified.

Alternative Flows:

- 3a. Customer reports a negative experience (e.g., **safety and hygiene grievances**, dissatisfaction, negative word of mouth) → System routes feedback for specific investigation and potential resolution, potentially influencing future recommendations.
- 6d. Anonymous review request → If customer requests anonymity, system strips PII from public display but retains contact for dispute resolution.
- 6e. Incentivized reviews → If promo applied to elicit review, show disclosure and expiration for reward.

UC-07: Staff Manages Menu Items (Create, Edit, Update Availability) with Nutritional and Allergen Compliance
Primary Actor: Staff
Stakeholders & Interests:

- **Staff:** Efficiently manage menu offerings, ensuring accuracy and compliance with health information.
- **Customer:** Access to an up-to-date and accurate menu with crucial health information.
- **Platform Admin/Owner:** Maintain consistent menu data, ensure regulatory compliance, support healthier options visibility.
- **Regulators/Legal:** Compliance with existing government nutrition labeling regulations (e.g., energy content) and allergen disclosure laws.

Preconditions: Staff user is authenticated and has appropriate permissions to manage the menu.
Trigger: Staff needs to update the menu due to new items, changes in existing items, or stock adjustments.
Main Flow:

1. Staff accesses the menu management interface.
2. Staff selects to Create, Edit, or Update Availability of a menu item.
3. If creating/editing, staff inputs/modifies details: item name, description, pricing, **detailed and summary nutrition information**, and **health symbols** (aligned with government-endorsed criteria).
4. Staff inputs/modifies **clear allergen information** for the item.
5. Staff updates item availability (in-stock/out-of-stock) as needed.
6. System validates entries and saves changes, updating the menu visible to customers.

Subflows:

- 3a. System automatically calculates summary nutrition based on detailed ingredients.
- 4a. System warns if critical allergen information is missing for a new or edited item.

Alternative Flows:

- 3b. Missing critical information (e.g., name, price) → System shows an error and prevents saving.
- 3c. Invalid nutritional data format → System shows an error and prompts for correction.

UC-08: Staff Accepts/Rejects Customer Order
Primary Actor: Staff
Stakeholders & Interests:

- **Staff:** Manage kitchen capacity, prevent unfulfillable orders, ensure operational efficiency.
- **Customer:** Timely notification of order status, clear communication if an order cannot be fulfilled.
- **Wolfcafe Owner:** Reliable operations, positive customer experience, accurate order tracking.

Preconditions: A customer has placed an order, and it is pending in the restaurant's queue.
Trigger: An incoming order appears in the staff's queue.
Main Flow:

1. System displays pending orders in the staff queue.
2. Staff selects an order to view its details.
3. Staff assesses feasibility (e.g., ingredient availability, kitchen capacity, preparation time).
4. Staff selects either "**Accept Order**" or "**Reject Order**" from the system.
5. If accepted, the order moves to "in progress" status, and items are sent to the kitchen for preparation.
6. If rejected, the order is removed from the queue, and the customer is notified.

Subflows:

- 8a. Auto-timeout acceptance → If staff does not accept/reject within X minutes, system either auto-reassigns or flags order for supervisor review (configurable).
- 8b. Partial acceptance → Staff can accept only available items; system notifies customer to confirm partial fulfillment or cancel remaining items.
- 8c. Paid-and-rejected handling → If order was paid and rejected, system auto-initiate refund/credit workflow and notify customer.

Alternative Flows:

- 4a. If rejected, the system prompts staff for a reason (e.g., "item out of stock," "kitchen too busy").
- 4b. If staff fails to accept/reject within a set timeframe, the system may automatically reject or flag the order for review.

UC-09: Staff Manages Order Preparation, Adhering to Local Food Safety and Hygiene Regulations
Primary Actor: Staff (Kitchen Staff, Chefs)
Stakeholders & Interests:

- **Staff:** Clear guidance on food safety, efficient workflow, compliance with health standards.
- **Customer:** Safe, high-quality, and hygienically prepared food.

- **Food Service Specialist/Regulators:** Enforcement of local food safety regulations and the FDA Food Code.

Preconditions: An order has been accepted by the restaurant.
Trigger: Staff begins preparing food for an accepted order.
Main Flow:

1. Staff accesses the order details on a kitchen display or wireless device.
2. Staff prepares food following **documented food safety practices** (e.g., employee health, contamination prevention, temperature control, cooking, thawing).
3. Staff ensures all equipment and facilities (e.g., handwashing sinks, restrooms, water systems) meet **local health codes and FDA Food Code standards**.
4. Staff verifies ingredient freshness and cooking temperatures as part of quality control.
5. Staff marks the item as "ready for pickup" or "completed" once prepared and packaged appropriately.

Subflows:

- 2a. Staff refers to digital checklists for each order to maintain safety and quality.
- 3a. Staff receives regular training on food safety regulations and proper food handling.

Alternative Flows:

- 2b. Suspected contamination or safety issue → Staff halts preparation, quarantines ingredients, and reports the issue for investigation.

UC-10: Staff Manages Ingredient Inventory
Primary Actor: Staff
Stakeholders & Interests:

- **Staff:** Maintain accurate inventory levels, prevent out-of-stock situations, ensure ingredients for recipes.
- **Wolfcafe Owner:** Cost control, efficient resource management, reliable operations.
- **Platform Admin/Owner:** Accurate menu availability linked to inventory.

Preconditions: The Staff user is authenticated and has permission to manage inventory.
Trigger: Staff needs to update ingredient levels (e.g., after a delivery, or observing low stock).
Main Flow:

1. Staff accesses the inventory management interface.
2. System displays current ingredient stock levels.
3. Staff selects an ingredient to add, remove, or adjust quantity.
4. Staff enters the new quantity or amount to add/remove.
5. System updates the inventory record and recalculates available menu items based on recipes.

Subflows:

- 10a. Auto-reorder triggered → When below par level, system creates PO suggestion and notifies purchasing staff.
- 10b. Inventory discrepancy → If counts mismatch audit, system starts reconciliation workflow and locks affected SKUs until resolved.

Alternative Flows:

- 4a. Invalid Quantity (e.g., zero, negative, non-numeric) → System shows an error and does not update inventory.

- 5a. Low stock alert → System notifies staff and automatically updates menu item availability to "out-of-stock" if an item cannot be prepared.

UC-11: Delivery Staff Logs In/Out and Sets Availability
Primary Actor: Delivery Staff
Stakeholders & Interests:
- **Delivery Staff:** Flexible work schedule, transparent availability status, secure access to the platform.
- **Platform Admin/Owner:** Efficient allocation of deliveries, management of the driver network, ensure service coverage.

Preconditions: Delivery Staff has an approved account and internet access.
Trigger: Delivery Staff wishes to start or end their work session.
Main Flow:
1. Delivery Staff opens the app and selects "Log In" or "Log Out".
2. If logging in, system authenticates credentials (e.g., phone number, email, social media login).
3. Delivery Staff toggles their "Available" status to indicate readiness for assignments.
4. System updates the driver's status in the dispatch system.

Subflows:
- 11a. Account suspension / appeal → If driver account is suspended, show reason, suspension period, and appeal link to support.
- 11b. Break hold → When driver toggles unavailable for break, system holds new assignments and preserves current queue for on-return.

Alternative Flows:
- 2a. Invalid credentials → System displays error message and prompts for retry.

UC-12: Delivery Staff Receives New Delivery Assignments
Primary Actor: Delivery Staff
Stakeholders & Interests:
- **Delivery Staff:** Receive clear assignment details, efficient workflow, fair assignment distribution.
- **Restaurant Staff:** Timely pickup of prepared orders.
- **Platform Admin/Owner:** Optimal delivery logistics, customer satisfaction.

Preconditions: Delivery Staff is logged in and marked as "Available".
Trigger: A new order needs to be delivered, or an existing order is ready for pickup.
Main Flow:
1. System sends an alert/notification of a new delivery assignment to the Delivery Staff.
2. Delivery Staff views assignment details (e.g., restaurant, pickup location, customer address, order items, estimated time, special instructions).
3. Delivery Staff accepts or rejects the assignment.
4. If accepted, the assignment is added to their active delivery queue.

Subflows:
- 2a. System may group multiple orders for a single delivery run based on location for efficiency

Alternative Flows:

- 12c. Driver rejects or times out → System reassigns to next eligible driver and notifies dispatcher; if none available, notify customer of delay.

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UC-13: Delivery Staff Navigates to Pickup and Delivery Locations Efficiently
Primary Actor: Delivery Staff
Stakeholders & Interests:

- **Delivery Staff:** Efficient routing, reduced travel time and fuel consumption.
- **Customer:** Timely delivery, accurate ETA.
- **Platform Admin/Owner:** Optimized logistics, reduced operational costs, environmental sustainability through route optimization.

Preconditions: Delivery Staff has accepted a delivery assignment.
Trigger: Delivery Staff needs directions to the restaurant or customer location.
Main Flow:

1. Delivery Staff accesses the navigation feature within the app.
2. System displays optimal route to the pickup location using GPS/mapping services.
3. Delivery Staff follows navigation to the restaurant.
4. After pickup, system automatically updates navigation to the customer's delivery address.
5. Delivery Staff follows navigation to the customer, potentially using **route optimization software to cut fuel consumption and emissions**.

Subflows:

- 13a. Traffic incident reroute → If major incident detected, system recalculates route and sends ETA update to customer and driver.
- 13b. Offline navigation mode → If connectivity lost, system uses cached route and continues navigation; syncs when online.
- 13.4a. System provides real-time traffic updates and suggests alternative routes.

Alternative Flows:

- 13c. Driver route deviation → If driver deviates > X km without note, system flags for ops review and optionally pauses customer ETA.
- 13d. Map provider failure → Switch to alternate map provider and show simplified status to customer until map restored.

UC-14: Delivery Staff Adheres to Food Safety and Hygiene Protocols During Transit
Primary Actor: Delivery Staff
Stakeholders & Interests:

1. **Delivery Staff:** Safe handling practices, compliance with regulations, personal hygiene.
2. **Customer:** Receipt of safe, uncontaminated food, particularly important in a post-COVID-19 environment.
3. **Platform Admin/Owner:** Maintain food safety standards, avoid legal liability, uphold brand reputation.

Preconditions: Delivery Staff has picked up an order from the restaurant.

Trigger: Food is in transit from the restaurant to the customer.
Main Flow:

1. Delivery Staff places the packaged order into an insulated delivery bag or appropriate container to maintain proper food temperatures.
2. Delivery Staff ensures the food is transported in a manner that **prevents contamination** (e.g., separated from non-food items, secure packaging).
3. Delivery Staff maintains personal hygiene (e.g., hand sanitization) during interactions with food packaging and customers.
4. Delivery Staff handles items with care to prevent damage or spills.

Subflows:

- 1a. System may provide digital reminders or checklists for food safety during transit.

Alternative Flows:

- 2a. Damage to packaging or spill during transit → Delivery Staff reports issue, follows protocol for damaged food, and customer support is notified.

UC-15: Admin Manages Food Waste and Donation Program
Primary Actor: Admin
Stakeholders & Interests:

- **Admin:** Efficiently track and manage excess food and coordinate donations.
- **Recipients/Charities:** Receive timely, safe food donations.
- **Platform Owner:** Demonstrates corporate social responsibility, reduces waste, complies with regulations.
- **Staff/Kitchen:** Properly label and manage leftover food items.

Preconditions: Admin is logged in with appropriate permissions.
Trigger: Admin opens the food waste management interface to review or update donation activities.
Main Flow:

1. Admin views current food waste inventory and donation schedule.
2. Admin updates status of food items (e.g., available for donation, collected, disposed).
3. System logs updates and notifies relevant recipients or charities.
4. Admin generates reports on food waste trends and donation history.

Subflows:

- 15a. Charity rejection → If recipient refuses donation (quality/volume), admin logs rejection reason and system lists alternate recipients or disposal options.
- 15b. Donation expiry → If donation pickup missed and perishable window elapsed, system marks items 'disposed' and records for audit/tax receipts.

Alternative Flows:

- 2a. No recipients available → System prompts admin to schedule future pickup or hold food safely.
- 3b. Donation data fails to save → System displays an error and requests retry.
- 15c. Regulatory hold → If donated items require inspection, system flags and prevents release until inspection cleared.

UC-16: Admin Conducts Virtual and On-site Vendor Oversight and Investigations (WIC specific)
Primary Actor: Admin
Stakeholders & Interests:

- **Admin:** Ensure vendor compliance, maintain program integrity, adapt monitoring methods to changing environments.
- **WIC State Agency:** Effective oversight, compliance with federal monitoring requirements.
- **Regulators:** Uphold program standards, protect public funds.

Preconditions: Vendors are authorized, and routine monitoring/investigation schedules are established.
Trigger: A routine monitoring event is scheduled, or a potential compliance issue (e.g., based on customer complaints or system flags) is raised.
Main Flow:

1. Admin initiates a routine monitoring visit or compliance buy.
2. Admin selects the method of oversight: **virtual or on-site**, appropriate for the vendor type (e.g., internet vendor) and current environmental conditions (e.g., during a pandemic).
3. Admin conducts the monitoring/buy, identifying themselves (for routine monitoring) or acting covertly (for compliance buys).
4. Admin collects documentation, including details to accommodate situations where **no cashier is present** for an internet-based transaction.
5. Admin analyzes findings and determines if the vendor is compliant with WIC regulations.

Subflows:

- 16a. Evidence capture → During oversight, system collects and saves evidence files (photos, receipts) with timestamps and chain-of-custody metadata.
- 16b. Virtual-checklist → For virtual visits, present standardized checklist and auto-save responses for audit.

Alternative Flows:

- 5a. Non-compliance detected → Admin initiates a formal compliance investigation, following established procedures for evidence collection and corrective action.
- 5b. Virtual preauthorization visits are used to streamline vendor onboarding.

UC-17: Admin Configures Multi-State Sales Tax Collection & Remittance (Marketplace Facilitator)
Primary Actor: Admin
Stakeholders & Interests:

- **Admin:** Ensure legal and financial compliance, avoid penalties, accurate financial reporting across multiple jurisdictions.
- **Wolfcafe Owner:** Accurate revenue and expense tracking, legal protection, efficient financial operations.
- **Regulators/Legal:** Compliance with state and local tax laws, proper tax collection and remittance, especially under marketplace facilitator laws.

Preconditions: The OFD platform operates in multiple jurisdictions with varying tax laws.

Trigger: Changes in state/local tax laws, expansion into new operating regions, or periodic review of financial settings.
Main Flow:

1. Admin accesses the system's financial settings for tax configuration.
2. Admin identifies applicable state **marketplace facilitator laws** and determines the platform's obligations to collect and remit transaction taxes.
3. Admin configures system rules for **accurate collection and remittance of state and local sales taxes** on food and delivery fees.
4. Admin defines the taxability of various platform fees (e.g., delivery, service, convenience, bag fees) based on each state's nuances.
5. System automatically applies the configured tax rates during customer checkout.

Subflows:

- 3a. Admin reviews legal interpretations of "marketplace facilitator" (e.g., requiring contractual privity with meal providers) in specific states.
- 4a. Admin considers options for WIC State agencies to potentially pay for delivery fees in special circumstances, distinct from customer fees.

Alternative Flows:

- 17d. Conflicting rules detected → System flags configuration conflict, prevents publish, and requires legal/admin resolution.

UC-18: Admin Develops and Manages Promotional Campaigns with Nutrition and Age-Based Restrictions
Primary Actor: Admin
Stakeholders & Interests:

- **Admin:** Drive user engagement, acquire new customers, comply with ethical marketing guidelines, promote public health outcomes.
- **Marketing Team:** Effective promotion, targeted campaigns.
- **Public Health Groups/Regulators:** Restrict exposure to unhealthy food marketing, particularly for children.

Preconditions: Marketing strategy is defined; system has promotion/discount capabilities.
Trigger: Admin plans a new promotional campaign or needs to adjust existing ones.
Main Flow:

1. Admin accesses the marketing campaign management interface.
2. Admin designs a promotional campaign, implementing **restrictions on exposing children (under 18 years of age) to marketing of unhealthy foods**.
3. Admin ensures the campaign avoids youth-appealing promotion techniques (e.g., partnerships with celebrities/influencers, sponsorships for children-focused events).
4. Admin configures the system to use **premium offers/discounts exclusively to incentivize healthier selections**, limiting them for unhealthy products.
5. Admin defines target marketing methods with transparency and ensures **responsible use of consumer data** to avoid inequitably targeting vulnerable groups.
6. System launches and monitors the campaign, collecting data on its effectiveness and compliance.

Subflows:

- 18a. Legal/ethical approval → Campaign enters 'Pending Review' status until legal/public-health team approves age/nutrition restrictions.
- 18b. A/B testing → System can create variant campaigns and collect comparative metrics; automatically route best-performer to full roll-out.

Alternative Flows:

- 2a. Attempted promotion of an unhealthy item to a child demographic → System flags violation and prevents campaign launch.
- 18c. User opt-out request → If a user opts out of targeted campaigns, system excludes them from current/pending campaigns and logs consent change.

UC-19: System Processes Payment Transaction
Primary Actor: System / Payment Gateway
Stakeholders & Interests:

- **Customer:** Quick, secure, and successful payment for orders.
- **Platform Admin/Owner**: Reliable payment processing, revenue assurance, fraud prevention.
- **Developers/IT Staff:** Secure integration with payment providers, error handling.

Preconditions: Customer has selected items and proceeds to checkout with a valid payment method.
Trigger: Customer confirms order and initiates payment.
Main Flow:

1. System sends payment request to the selected payment gateway.
2. Payment gateway authenticates customer payment information.
3. Payment gateway authorizes or declines the transaction.
4. System updates order status to “Paid” upon successful authorization and sends confirmation to the customer.

Subflows:

- 3c. Suspicious transaction → System flags for review before authorization.
- 3d. Payment gateway timeout → System retries and notifies customer.

Alternative Flows:

- 3a. Payment declined → System displays error message and prompts customer to retry or choose another payment method.
- 3b. Network or gateway failure → System queues payment attempt and notifies customer.

UC-20: Health Researcher Downloads Nutrition Data for a Study
Primary Actor: Health Researcher
Stakeholders & Interests:

- **Health Researcher:** Access to accurate, comprehensive nutrition data for analysis and studies.
- **Platform Admin/Owner:** Ensures data privacy and proper licensing for research use.
- **Developers/IT Staff:** Secure, efficient, and scalable data extraction and export system.

Preconditions: Health researcher has approved credentials and access rights.
Trigger: Researcher requests export/download of nutrition data from the platform.
Main Flow:

1. Researcher logs in and navigates to the nutrition data download interface.
2. Researcher specifies parameters (e.g., date range, food categories, anonymization options).
3. System retrieves and compiles requested data in the selected format (e.g., CSV, JSON).
4. Researcher downloads the compiled dataset.

Subflows:

- 3c. Large dataset → System queues request and notifies when ready.
- 3d. Anonymization fails → System prompts researcher to adjust parameters.

Alternative Flows:

- 3a. Insufficient permissions → System displays an access denied message.
- 3b. Data extraction fails → System logs error and provides retry option.

UC-21: Customer Places Order with Multiple Items
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Smooth ordering experience, accurate pricing
- **Staff:** Clear order details for fulfillment
- **Dining Services:** Accurate sales and revenue tracking
- **UI/UX:** Intuitive cart and checkout flow

Accessibility Expert: Compliance with accessibility standards
Preconditions: Customer logged in; items available
Trigger: Customer clicks "Add to Cart"
Main Flow:

1. Customer browses menu and adds items to cart.
2. System updates cart with items, quantities, and subtotal.
3. Customer reviews and edits cart as needed.
4. Customer proceeds to checkout, system shows summary.
5. Customer selects tip option.
6. System calculates total, order placed.
7. Confirmation displayed; order sent to staff queue.

Subflows:

- Customers change quantities or remove items.

Alternative Flows:

- 2a. Item out of stock → System shows "unavailable".
- 5a. Custom tip invalid → System rejects negative values.
- 6a. Customer cancels → Return to cart review.

UC-22: Customer Receives Pickup Notification
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Timely notification

- **Staff:** Smooth pickup process
- **Dining Services**: Efficient handoff
- **Developers**: Reliable notification system
- **Testers/QA:** Ensure delivery of notifications

Preconditions: Order placed; marked "ready for pickup"
Trigger: Staff marks order as ready
Main Flow:

1. System detects status change.
2. System sends notification (email, SMS, or app).
3. Customer receives details and goes to pickup.
4. Customer provides ID/order number.
5. Staff locates order, hands it to customer, marks "picked up".

Alternative Flows:

- 2a. Notification fails → System retries.
- 4a. Customer can't find number → Staff searches by name/phone.
- 5a. Missing items → Staff resolves issue.

UC-23: Customer Browses Menu and Manages Cart
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Easy discoverability, filters, availability
- **Accessibility Expert:** WCAG compliance
- **UI/UX:** Smooth navigation, clarity
- **Developers:** Maintain reliability of cart and menu system

Preconditions: Authenticated or guest mode
Trigger: Customer opens menu
Main Flow:

1. System displays accessible menu with categories.
2. Customer views details, filters, and selects options.
3. Customer adds/removes items; system updates cart live.
4. System calculates subtotal, tax estimate, tip preview.
5. Customer proceeds to checkout.

Alternative Flows:

- 2a. Out-of-stock → Add button disabled with explanation.

UC-24: Customer Checkout with Tax and Tip
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Clear totals, transparency
- **Dining Services:** Tax compliance
- **Wolfcafe Owner:** Accurate revenue tracking
- **Regulators/Legal:** Compliance with taxation laws
- **Testers/QA:** Validate payment and calculations

Preconditions: Cart has items; tax configured

Trigger: Customer clicks checkout
Main Flow:

1. System shows summary and subtotal.
2. System calculates tax, customer selects tip.
3. System computes final total.
4. Customer enters payment and pickup info.
5. System authorizes payment, creates pending order.
6. Order confirmed and sent to staff queue.

Alternative Flows:

- 5a. Payment failure → Retry with error summary.
- 2a. Invalid custom tip → Error and reset.

UC-25: Customer Customizes Tip Amount
Primary Actor: Customer
Stakeholders & Interests:

- **Customer:** Clear totals, transparency
- **Dining Services:** Tax compliance
- **Wolfcafe Owner:** Accurate revenue tracking
- **Regulators/Legal:** Compliance with taxation laws
- **Testers/QA:** Validate payment and calculations

Accessibility Expert: Inclusive input validation
Preconditions: Items in cart; checkout started
Trigger: Customer reaches tip step
Main Flow:

1. System shows tip options.
2. Customer selects "Custom" and enters amount.
3. System validates entry, updates total.
4. Order proceeds to confirmation.

Alternative Flows:

- 2a. Negative tip → Error message.
- 2b. Very high tip → Confirmation dialog.
- 2c. Customer changes mind → Return to tip options.

UC-26: Staff Views and Fulfills Customer Order
Primary Actor: Staff
Stakeholders & Interests:

- **Staff:** Clear queue and order details
- **Customer:** Timely preparation and pickup notification
- **Dining Services:** Efficient processing
- **Wolfcafe Owner:** Reliable operations and fulfillment
- **Food Service Specialist:** Good preparation practices

Preconditions: Staff logged in; pending orders exist

Trigger: Staff opens order fulfillment interface
Main Flow:

1. System displays pending orders.
2. Staff selects order, views details.
3. Staff marks "in progress", then "ready for pickup".
4. System notifies customer.
5. Customer arrives, staff confirms identity, marks "completed".

Alternative Flows:

- 2a. Missing ingredients → Staff marks unavailable, notifies customer.
- 4a. Notification fails → Staff contacts customer manually.
- 5a. Customer late → Staff calls or sets aside order.

UC-27: Staff Creates a New Menu Item
Primary Actor: Staff
Stakeholders & Interests:

- **Staff:** Needs to manage the menu efficiently
- **Customer:** Wants to see an up-to-date and accurate menu
- **Dining Services:** Efficient processing
- **Wolfcafe Owner:** Reliable operations and fulfillment
- **Food Service Specialist:** Cares that the item and its recipe are viable

Preconditions: The Staff user is authenticated; ingredients required for the new item's recipe exist in the system
Trigger: The Staff user decides to add a new product (e.g., "Iced Caramel Latte") to the menu
Main Flow:

1. The system displays pending orders.
2. Staff selects order, views details.
3. Staff marks "in progress", then "ready for pickup".
4. The system notifies customers.
5. Customer arrives, staff confirms identity, marks "completed".

Alternative Flows:

- 3a. Missing Information → Name or Price left blank → System shows error and prevents saving.
- 1a. Permission Denied → Admin or Customer tries to access → System denies access.

UC-28: Staff adds Inventory
Primary Actor: Staff
Stakeholders & Interests:

- **Staff:** Needs to keep inventory levels accurate to prevent ordering of unavailable items
- **Wolfcare Owner:** Wants to track inventory for cost management
- **UI/UX:** Intuitive cart and checkout flow

Preconditions: The Staff user is authenticated; ingredients are already defined in the system

Trigger: A new shipment of supplies has arrived, and the Staff user needs to update the to invent the update counts

Main Flow:

1. Staff finds ingredients on the Inventory Management page and chooses to add stock.
2. Staff enters quantity being added and confirmed.
3. System validates amount is positive number, adds to existing stock and updates UI.

Alternative Flows:

- 2a. Invalid Quantity**:** Quantity is zero, negative, or not a number → System shows error and does not update inventory.

UC-29: Admin Manages Staff User Account

Primary Actor: Admin

Stakeholders & Interests:

- **Admin:** Needs to control system access securely
- **Staff:** Clear queue and order details
- **Wolfcafe Owner:** Wants to ensure only authorized personnel can access staff functions

Preconditions: Staff logged in; pending orders exist

Trigger: Staff opens order fulfillment interface

Main Flow:

1. Admin selects “Manage Staff” from the dashboard.
2. System displays existing Staff user list.
3. Admin chooses "Add New Staff" (or "Edit"/"Delete" existing).
4. System presents form for Staff details.
5. Admin fills required information and submits.
6. System validates input and creates/updates/deletes account.
7. System logs action and displays success message.

Alternative Flows:

- 2a. Missing ingredients → Staff marks unavailable, notifies customer.
- 4a. Notification fails → Staff contacts customer manually.
- 5a. Customer late → Staff calls or sets aside order.

UC-30: Admin Sets Sales Tax Rate

Primary Actor: Admin

Stakeholders & Interests:

- **Admin:** Needs to ensure cafe compliance with state tax regulations
- **WolfCafe Owner:** Wants accurate financial accounting
- **Customer:** Is affected by tax calculation on final bill
- **Regulator:** Requires compliance with local tax laws

Preconditions: The Admin is authenticated; system has default or previously set tax rate

Trigger: The Admin accesses system's financial settings to update sales tax percentage

Main Flow:

1. Admin navigates to "System Settings" → "Financial".
2. System displays current sales tax rate.
3. Admin enters new tax rate value and clicks "Save".

4. System validates input is valid, non-negative number.
5. System updates global tax rate and displays confirmation.

Alternative/Exception Flows:

- 4a. Invalid Input: Input not a number or negative → System shows inline error and prevents saving.
- 1a. Permission Denied: Staff or Customer user attempts access → System redirects with permission error.

UC-31: Restaurant Sets Surge Pricing for Peak Hours
Primary Actor: Restaurant Staff
Stakeholders & Interests:

- **Restaurant:** Wants to manage demand during peak hours.
- **Customer:** Needs transparent pricing.

Preconditions: Restaurant logged in; has permission to adjust pricing.
Trigger: Staff enables surge pricing in the system.
Main Flow:

1. Staff opens pricing settings.
2. Selects peak time slots and sets surge percentage.
3. System updates menu prices accordingly.
4. Customers see surge rates during those hours.

Subflows:

- 2a. Staff edits or removes previously set surge pricing.
- 2b. Staff applies different surge percentages for different categories (e.g., beverages vs entrées).
- 3a. System logs surge pricing history for reporting.

Alternative Flows:

- 2a. Invalid surge value → System rejects and prompts correction.

UC-32: System Suggests Combo Deals
Primary Actor: System
Stakeholders & Interests:

- **Customer:** Wants better value.
- **Restaurant:** Increases sales with combos.

Preconditions: Customer is browsing the menu.
Trigger: Customer adds an item that has an associated combo offer.
Main Flow:

1. System detects eligible item in the cart.
2. Displays combo suggestion with price difference.
   Customer accepts or ignores the suggestion.

Subflows:

- 2a. System suggests multiple combo options (e.g., “Add fries + drink” or “Upgrade to family meal”).
- 2b. Customer chooses to customize the combo (e.g., replace drink with another beverage).

- 3a. If accepted, system auto-updates the cart with combo pricing.

Alternative Flows:
- **2a. Combo item out of stock** → System removes suggestion.

UC-33 : Customer Schedules Order for Later
Primary Actor: Customer
Stakeholders & Interests:
- Customer: Wants flexibility in receiving food at a preferred time.
- Restaurant: Can prepare orders in advance.
- Delivery Staff: Better route planning.

Preconditions: Customer logged in; restaurant supports scheduled orders.
Trigger: Customer selects "Schedule Order" option at checkout.
Main Flow:
1. Customer adds items to cart.
2. At checkout, selects "Schedule for Later."
3. System displays available time slots.
4. Customer selects preferred delivery/pickup time.
5. System confirms scheduled order and places it in queue.

Subflows:
- Customer changes scheduled time before confirmation.

Alternative Flows:
- 3a. No slots available → System prompts to order immediately.
- 4a. Selected time invalid (restaurant closed) → System rejects and prompts re-selection.

UC-34: Admin Suspends Restaurant for Policy Violation
Primary Actor: Admin
Stakeholders & Interests:
- Admin: Ensures platform compliance.
- Customer: Protected from fraudulent/unreliable vendors.
- Restaurant: Receives fair handling of issues.

Preconditions: Admin logged in; violation report exists.
Trigger: Admin reviews violation case.
Main Flow:
1. Admin selects restaurant profile.
2. Opens violation details.
3. Chooses "Suspend Account."
4. System disables restaurant temporarily.
5. Notifications sent to restaurant and pending customers.

Subflows:
- Admin sets suspension duration.

Alternative Flows:
- 3a. Invalid suspension reason → System rejects action.

UC-35: System Recommends Restaurants Based on Dietary Preferences
Primary Actor: System
Stakeholders & Interests:

- Customer: Gets personalized options.
- Restaurant: Reaches relevant audience.

Preconditions: Customer logged in; preferences set.
Trigger: Customer opens homepage or search.
Main Flow:

1. System checks stored dietary tags (vegan, gluten-free, halal, etc.).
2. Filters restaurants based on compliance.
3. Displays recommended list.

Subflows:

- Customer updates dietary preferences.

Alternative Flows:

- 2a. No matching restaurant → System shows nearest alternatives.

Observations:
Proj 1a:
Our observations from the LLMs showed us that the use cases were missing elements and parts were unstructured. Apart from that the report stayed consistent.

Additional use cases for Proj1b:
Idea - 1 :
To go further than our original outputs of use cases from our past experiences, we divided the categories for use cases. We defined the use cases in 3 major roles that we named Customer, Staff and Admin. These gave us a broad spectrum to target for prompting and divide the use cases so we can cover the ones important for us to develop the initial system.
Outcome:
ChatGPT - Provided us with more customer-focused outputs on prompting
Claude - A balanced out across Customer, Staff, Admin. It also provided additional System use cases, which were out of the scope, but the details were shorter and straightforward.
DeepSeek - It had unique ideas which went out of scope, but most were quite futuristic and innovative as opposed to helping someone make a new product. It also provided the most additional use cases without prompting.

Idea - 2:
To make the most out of the edge cases provided to us by the links, we decided to compare two RAG-based systems. One is Google's NotebookLM, and the other is the model provided by the professor.
Outcome:
NotebookLM:
Upon zero-shot prompting for the Project1A1 it returned 30 use cases. A unique challenge we faced was that it assumed WIC is one of the integral stakeholders, and generated a lot of use cases surrounding it. To resolve the bias, we used Chain of Thought Prompting, which later

resulted in the generation of use cases that were much more acceptable within the scope of the project.

RAG code:

The RAG code was interesting as it provided the most on-point outputs. With zero shot and few-shot prompting an interesting list of stakeholders was provided that focused on the health sector, with a very different outcome from NotebookLM. Our analysis concluded that since the code focused on keywords from the scraped data, it provided an interesting list of use cases that was least biased.

Cost:

The total cost for our LLMs accounted for roughly $25. Cost breakdowns for the tools used:
Gemini Pro - Free
NotebookLM Pro - Free
Perplexity Pro - Free
ChatGPT - Standard Model, API - $5 subscription
Deepseek - Standard Model
Claude - $20 Pro subscription