CSC510 Fall 2025: Software Engineering

Proj1b1 Solutions

Group number: 12

Github Repository Link:
https://github.com/Asoingbob225/CSC510

1. Extended Use Cases

1.1 UC11 Process Tax Compliance Report

This use case describes how an Admin generates tax compliance reports to ensure proper calculation and documentation of sales tax according to state and local regulations for food service operations.

Preconditions

- The Admin is authenticated with reporting privileges.
- At least one taxable transaction exists in the system (otherwise [No Tax Data] applies).
- Tax rates for applicable jurisdictions are configured in the system.

Main Flow

An Admin generates a tax compliance report by [Select Tax Period] and applying [Filter by Location]. The system calculates applicable sales tax based on state and local requirements, as different jurisdictions may have varying tax rates for prepared food versus grocery items. The system displays results or [No Tax Data] if no transactions match criteria. The Admin can [Export Tax Report] for regulatory submission; failure triggers [Export Error].

Subflows

- [Select Tax Period]: Admin chooses reporting period (monthly, quarterly, annual) required by tax authorities.
- [Filter by Location]: Admin filters by delivery location to apply correct local tax rates.
- [Export Tax Report]: Admin exports report in required format for tax authority submission.

Alternative Flows

- [No Tax Data]: Triggered when no taxable transactions exist for selected period.
- [Export Error]: Triggered if export fails; Admin prompted to retry or select different format.

1.2 UC12 Conduct Health Inspection Compliance Check

This use case describes how an Admin or Staff member performs internal health compliance checks to ensure adherence to food safety regulations and prepare for official health inspections.

Preconditions

- The user is authenticated with Admin or Staff privileges.
- Health compliance checklist templates are configured in the system.
- At least one operational area exists for inspection.

Main Flow

A user initiates a compliance check by [Select Inspection Type] and [Choose Areas]. The system guides through food safety requirements including temperature controls, hygiene protocols, and sanitation procedures to prevent health code violations. Each item is marked as [Compliant] or triggers [Violation Found]. Completed checks generate [Compliance Report]; critical violations trigger [Immediate Action Required].

Subflows

- [Select Inspection Type]: User chooses from routine, pre-service, or preparation area inspections.
- [Choose Areas]: User selects specific operational areas (kitchen, storage, serving) for inspection.
- [Compliance Report]: System generates documented report of all inspection items and results.

Alternative Flows

- [Violation Found]: System flags non-compliant items and suggests corrective actions.
- [Immediate Action Required]: Triggered for critical violations requiring immediate correction before service can continue.

1.3 UC13 Track Food Temperature Monitoring

This use case describes how Staff records and monitors food temperatures to comply with food safety regulations and maintain proper food handling standards during order fulfillment.

Preconditions

- The staff member is authenticated with Staff privileges and temperature monitoring access.
- Temperature monitoring schedules are configured in the system.
- Food items requiring temperature monitoring are present during UC2 order fulfillment.

Main Flow

During UC2 order preparation, Staff accesses the temperature monitoring interface to [Record Temperature] for food items being prepared. The system validates temperatures against FDA Food Code standards for cooking, cooling, refrigerating, reheating, and holding food. Acceptable temperatures are logged and allow continued UC2 fulfillment; violations trigger [Temperature Alert] which may halt order processing. Staff can [View Temperature History] or add [Corrective Action Notes]. Missed recordings trigger [Missing Log Alert].

Subflows

- [Record Temperature]: Staff enters temperature readings during UC2 food preparation for hot holding, cold storage, or cooking temperatures.
- [View Temperature History]: Staff reviews historical temperature data for trend analysis and compliance verification.
- [Corrective Action Notes]: Staff documents actions taken when temperatures fall outside safe ranges during order preparation.

Alternative Flows

- [Temperature Alert]: System alerts when recorded temperature falls outside safe range and may halt UC2 order fulfillment until corrected.
- [Missing Log Alert]: System notifies when required temperature checks are overdue, potentially affecting UC2 order processing capabilities.

1.4 UC14 Calculate Multi-State Sales Tax

This use case describes how the system automatically calculates appropriate sales tax for orders based on delivery location, considering varying state, county, and municipal tax requirements.

Preconditions

- A customer order is being processed for checkout.
- Delivery address has been validated and confirmed.
- The tax rate database is current and includes all applicable jurisdictions.

Main Flow

During checkout, the system [Determine Tax Jurisdiction] based on delivery address. The system applies appropriate tax rates considering that delivery charges and prepared food may have different tax treatment depending on state regulations. The system [Calculate Tax Amount] and displays itemized breakdown. If [Tax Rate Unavailable], the system applies default rates and triggers [Manual Review Required].

Subflows

- [Determine Tax Jurisdiction]: System identifies state, county, and municipal tax authorities for delivery location.
- [Calculate Tax Amount]: System applies appropriate tax rates to taxable items and services separately.

Alternative Flows

- [Tax Rate Unavailable]: Triggered when the system cannot determine tax rates for unusual delivery locations.

- [Manual Review Required]: Triggered when unusual tax situations require admin intervention before order completion.

1.5 UC15 Manage Allergen Information Compliance

This use case describes how an Admin maintains and displays allergen information to comply with food safety labeling requirements and protect customers with food allergies.

Preconditions

- The Admin is authenticated with menu management privileges.
- Menu items exist in the system requiring allergen information.
- Allergen database is configured with common allergen categories.

Main Flow

An Admin accesses the menu management interface to [Update Allergen Information] for menu items. The system requires documentation of major allergens and potential cross-contamination risks. Changes trigger [Allergen Warning Update] displayed to customers. The system can [Generate Allergen Report] for health department requirements. Missing information triggers [Incomplete Allergen Data].

Subflows

- [Update Allergen Information]: Admin adds or modifies allergen warnings for menu items including ingredients and preparation methods.
- [Allergen Warning Update]: System updates customer-facing displays with current allergen information.
- [Generate Allergen Report]: Admin creates comprehensive allergen documentation for regulatory compliance.

Alternative Flows

- [Incomplete Allergen Data]: System prevents menu item activation until all required allergen information is provided.

1.6 UC16 Process Nutritional Benefit Program Integration

This use case describes how the system processes orders using government nutritional assistance programs (such as WIC or SNAP) while maintaining compliance with program regulations.

Preconditions

- The Customer has valid nutritional assistance program benefits.
- The system is configured to accept program-specific payment methods.
- Eligible food items are properly categorized in the system.

Main Flow

A Customer selects eligible items and proceeds to [Verify Program Eligibility] at checkout. The system validates that selected items meet program requirements for supplemental food categories and ensures proper authentication methods are used. Payment is processed through [Program Payment Gateway]; ineligible items trigger [Item Restriction Notice]. The system generates [Program Compliance Receipt] and updates benefit balances.

Subflows

- [Verify Program Eligibility]: System checks customer's program enrollment status and available benefit balance.
- [Program Payment Gateway]: System processes payment using program-specific authentication and validation requirements.
- [Program Compliance Receipt]: System generates receipt meeting program documentation requirements.

Alternative Flows

- [Item Restriction Notice]: System notifies customer when selected items are not eligible under their assistance program and offers alternatives.

1.7 UC17 Maintain Food Safety Training Records

This use case describes how an Admin tracks and maintains food safety training records for all staff members to ensure compliance with health department requirements.

Preconditions

- The Admin is authenticated with training management privileges.
- Staff members exist in the system requiring food safety certification.
- Training programs and certification requirements are configured.

Main Flow

An Admin accesses training management to [View Training Status] for all staff members. The system tracks required food safety certifications, training completion dates, and renewal requirements to maintain compliance with state food handling regulations. Expiring certifications trigger [Renewal Notice]; new staff require [Initial Training Assignment]. The system can [Generate Training Report] for health inspections.

Subflows

- [View Training Status]: Admin reviews current certification status and training completion for all staff members.
- [Initial Training Assignment]: Admin assigns required food safety training modules to new staff members.

- [Generate Training Report]: Admin creates comprehensive training compliance documentation.

Alternative Flows

- [Renewal Notice]: System alerts when staff certifications are approaching expiration and may restrict duties.
- [Training Incomplete]: System prevents staff from performing food handling duties until required training is completed.

1.8 UC18 Customer Filters by Dietary Preferences

This use case describes how a customer applies filters to search for menu items or restaurants that meet specific dietary or health-related criteria. This allows users to easily find food aligned with their health consciousness or dietary restrictions.

Preconditions

- The Customer is authenticated in the system.
- The Customer is browsing the menu or a list of restaurants.

Main Flow

The Customer accesses the filter options from the browsing interface. They then [Select Dietary Preference] from a predefined list (e.g., "Vegan", "Gluten-Free", "Low-Calorie", "Keto"). Upon applying the filters, the system dynamically updates the display to show only matching restaurants or menu items. The customer can [Clear Filters] to remove all active selections. If no items or restaurants match the selected criteria, the system triggers [No Matching Items Found].

Subflows

- [Select Dietary Preference]: The user chooses one or more dietary or health-related options from a presented list.

Alternative Flows

- [Clear Filters]: The system removes all active filters, reverting to the full list of available restaurants or menu items.
- [No Matching Items Found]: The system displays a message indicating that no results match the applied filters, optionally suggesting broadening the criteria.

1.9 UC19 Customer Views Nutritional Information

This use case details how a customer accesses comprehensive nutritional facts and allergen information for a specific menu item before making a purchase decision, supporting informed health choices.

Preconditions

- The Customer is authenticated in the system.
- The Customer is viewing the details page of a specific menu item.

Main Flow

The Customer selects a menu item to view its detailed information. On the item's detail page, they locate and click on a designated section or button for "Nutritional Information" or "Allergen Info". The system then displays a pop-up window or expands a section containing detailed data such as calorie count, macronutrient breakdown, full ingredient list, and explicit warnings for common allergens. If some critical information is not available for the item, the system triggers [Incomplete Nutritional Data].

Subflows

- [Access Item Details]: The user navigates to the specific page displaying information about a single menu item.

Alternative Flows

- [Incomplete Nutritional Data]: The system notifies the customer that certain nutritional or allergen details are currently unavailable for the selected item, potentially advising to contact the restaurant directly.

1.10 UC20 Customer Reports Food Safety Incident

This use case describes how a customer reports a specific food safety or quality concern related to a recently received order, initiating an internal investigation and potential resolution.

Preconditions

- The Customer is authenticated in the system.
- The Customer has completed an order from a restaurant.

Main Flow

The Customer navigates to their order history and selects the relevant order. They then initiate the [Report an Issue] process, choosing "Food Safety Concern" or a similar category. The customer provides detailed text feedback describing the incident and may [Upload Evidence] such as photos. Upon submission, the system logs the report, associates it with the order and restaurant, and notifies relevant staff for [Incident Investigation]. If the nature of the report is critical, the system triggers [Immediate Escalation] to management.

Subflows

- [Report an Issue]: The user selects an option within a past order to report a problem or concern.
- [Upload Evidence]: The user attaches one or more files (e.g., images) to support their reported issue.

Alternative Flows

- [Incident Investigation]: System flags the report for review by customer service or restaurant management, who may contact the customer for more details and determine corrective actions.
- [Immediate Escalation]: For severe or critical safety concerns, the system automatically flags the report for urgent attention from higher management or compliance teams.

1.11 UC21 Configure Sales Tax Rates

This use case describes how an Administrator defines and updates sales tax rates for different jurisdictions within the WolfCafe system, ensuring accurate tax calculation on orders.

Preconditions

- The Administrator is logged into the WolfCafe system with appropriate privileges.
- The system has defined geographical tax jurisdictions.

Main Flow

The Administrator navigates to the "Tax Management" section. They can [Add New Tax Rate] for a specific jurisdiction and item category, [Update Existing Tax Rate] to reflect changes, or [Deactivate Old Tax Rate]. The system validates the input, ensuring no overlapping rates for the same jurisdiction and date range. Upon successful configuration, the system applies the new or updated rates to future transactions. If an invalid rate is entered, the system triggers [Invalid Rate Entry].

Subflows

- [Add New Tax Rate]: Administrator specifies jurisdiction, effective date range, tax percentage, and applicable item categories.
- [Update Existing Tax Rate]: Administrator selects an existing rate, modifies its percentage or effective dates, and saves changes.
- [Deactivate Old Tax Rate]: Administrator sets an end date for an existing tax rate, rendering it inactive for future transactions.

Alternative Flows

- [Invalid Rate Entry]: System rejects the input, provides an error message (e.g., "Rate must be positive," "Overlapping date range"), and allows the Administrator to correct and retry.

1.12 UC22 Manage Tax-Exempt Customer Status

This use case describes how an Administrator or Super Admin designates specific customers or university departments as tax-exempt, ensuring that their orders are processed without sales tax.

Preconditions

- The Administrator or Super Admin is logged into the WolfCafe system.
- The customer or department account already exists in the system.

Main Flow

The Administrator navigates to the customer management section and [Select Customer Account]. They then [Toggle Tax-Exempt Status] and provide a [Tax Exemption Reason] and documentation reference (e.g., exemption certificate ID). The system validates the input and updates the customer's profile. When the customer places an order, the system automatically applies the exemption; otherwise, [Tax Exemption Documentation Invalid] is triggered.

Subflows

- [Select Customer Account]: Administrator searches for and selects a customer or department account by name or ID.
- [Toggle Tax-Exempt Status]: Administrator activates or deactivates the tax-exempt flag on the customer's profile.
- [Tax Exemption Reason]: Administrator enters a brief description of the exemption and a reference ID for audit purposes.

Alternative Flows

- [Tax Exemption Documentation Invalid]: If the provided documentation or reason is deemed invalid by the system (e.g., missing ID, expired date), the system prevents the exemption from being applied and prompts for correction.

1.13 UC23 Export Tax Audit Data

This use case describes how an Administrator generates and exports specific transaction data in a required format to support requests from regulatory bodies during a tax audit.

Preconditions

- The Administrator is logged into the WolfCafe system with Super Admin privileges.
- A request for tax audit data has been received from a regulatory body.

Main Flow

The Administrator accesses the "Audit Data Export" module. They [Specify Audit Parameters] such as date range, transaction types, and required data fields. The system then [Generate Audit Data] based on these parameters. If the data volume is too large, it may trigger [Large Data Export Warning]. The Administrator then [Export Data File] in a specified format (e.g., CSV, XML). If no data matches the criteria, [No Matching Data Found] is triggered.

Subflows

- [Specify Audit Parameters]: Administrator inputs the start and end dates, selects specific order types, and chooses which data fields (e.g., item price, tax amount, customer ID) to include.
- [Generate Audit Data]: System queries the database using the specified parameters and compiles the raw data.
- [Export Data File]: System packages the generated data into the selected file format and makes it available for download.

Alternative Flows

- [Large Data Export Warning]: If the generated data set exceeds a predefined size limit, the system warns the Administrator and offers options to refine parameters or proceed with a potentially long export.
- [No Matching Data Found]: If the specified parameters yield no relevant transactions, the system informs the Administrator that no data could be generated for export.

1.14 UC24 Collect Taxpayer Identification for Employees/Contractors

A WolfCafe administrator collects and records taxpayer identification information (e.g., W-4 for employees, W-9 for contractors) from new hires or vendors, ensuring the data is available for payroll and tax reporting.

Preconditions

- The WolfCafe administrator is authenticated in the system with appropriate HR/Payroll privileges.
- A new employee or independent contractor has been identified and is in the onboarding process.
- The system is configured to securely store sensitive tax identification data.

Main Flow

The Administrator initiates the collection of tax identification for a new employee or contractor. The system presents the relevant digital form (e.g., W-4 for employees, W-9 for contractors) for completion. The employee/contractor submits the form digitally, providing their name, address, and Taxpayer Identification Number (TIN). The system performs [Basic Data Validation] (e.g., format checks for TIN) and stores the validated information securely. This data is then made available for [Export to Payroll System]. If the data is invalid or incomplete, the system triggers [Request Correction].

Subflows

- [Basic Data Validation]: Checks the format and presence of required fields (e.g., 9 digits for SSN/EIN, name match with TIN if external service integrated).
- [Export to Payroll System]: Formats and sends the collected tax identification data to the integrated external payroll processing system.

Alternative Flows

- [Request Correction]: If the submitted data fails basic validation, the system notifies the administrator and the employee/contractor, requesting corrections or additional information.
- [Manual Override/Review]: If automated validation is inconclusive, the system flags the entry for manual review by an administrator before final approval.

1.15 UC25 Calculate and Report Sales Tax on Orders

The WolfCafe system calculates applicable sales tax for customer orders based on location and item type, records these transactions, and generates periodic reports for sales tax remittance to state authorities.

Preconditions

- Customer has placed an order in the WolfCafe system.
- Sales tax rates for relevant jurisdictions (delivery/pickup locations) are configured and up-to-date in the system.
- Items in the menu have been categorized for sales tax applicability (e.g., food vs. non-food).

Main Flow

When a customer places an order, the WolfCafe system identifies the [Applicable Sales Tax Rate] based on the delivery or pickup location. For each item in the order, the system determines if it is taxable and then [Calculates Sales Tax] for that item and the total order. The calculated tax is added to the order total, and the transaction details, including tax collected, are recorded. Periodically (e.g., daily, weekly, monthly), the system [Generates Sales Tax Report] summarizing all tax collected for the period, which is then used for remittance. If tax rates are missing or invalid, [Tax Rate Configuration Alert] is triggered.

Subflows

- [Applicable Sales Tax Rate]: Retrieves the current sales tax rate(s) based on the order's geographical coordinates or associated zip code/address.
- [Calculates Sales Tax]: Applies the determined tax rate to the taxable items in the order, handling any specific tax rules (e.g., reduced rates for certain food types).
- [Generates Sales Tax Report]: Compiles a detailed report of sales tax collected by jurisdiction, date, and order, suitable for use in filing sales tax returns.

Alternative Flows

- [Tax Rate Configuration Alert]: If a sales tax rate is missing for a given location or item category, the system alerts the administrator and may apply a default or flag the order for manual review.
- [Tax Exemption Handling]: If a customer presents a valid tax exemption certificate (e.g., for a non-profit organization), the system allows the administrator to apply the exemption and records the certificate details.

1.16 UC26 Track Employee Wages, Tips, and Withholdings for Payroll

The WolfCafe system tracks employee work hours, wages, tips earned, and calculated tax withholdings, providing comprehensive data for external payroll processing and accurate annual wage reporting (W-2).

Preconditions

- Employees are clocked in/out using the WolfCafe system or an integrated timekeeping system.
- Employee wage rates, withholding preferences (from UC24), and tip reporting mechanisms are configured.
- The payroll period is active.

Main Flow

Throughout the payroll period, the WolfCafe system [Tracks Employee Hours Worked] and records any declared tips. Based on these inputs and the employee's configured wage rate, the system [Calculates Gross Wages]. Using the withholding information provided (from Form W-4 via UC24), the system then [Estimates Tax Withholdings] for federal and state income taxes, as well as FICA. At the end of the payroll period, the system [Generates Payroll Data Export] containing all necessary information for an external payroll system to process payments and file employer tax returns. Any discrepancies in time tracking follow [Time Entry Discrepancy].

Subflows

- [Tracks Employee Hours Worked]: Records clock-in/clock-out times, breaks, and calculates total regular and overtime hours for each employee.
- [Calculates Gross Wages]: Applies hourly rates or salary to recorded hours/period to determine gross pay before deductions.
- [Estimates Tax Withholdings]: Applies federal and state tax tables, FICA rates, and employee W-4 preferences to estimate the amount of tax to be withheld from gross wages.
- [Generates Payroll Data Export]: Creates a structured data file (e.g., CSV, API call) containing employee IDs, gross wages, tips, estimated withholdings, and other relevant payroll data for transfer to an external payroll provider.

Alternative Flows

- [Time Entry Discrepancy]: If there are missing clock-ins/outs or discrepancies, the system flags the issue for administrator review and manual adjustment.
- [Tip Reporting Adjustment]: If reported tips require adjustment (e.g., for tip pooling or service charges), the system allows administrators to modify and verify these amounts before export.

1.17 UC27 Validate High Caffeine Product Compliance

This use case scans products for caffeine content and formulation risk, applying warnings or restrictions consistent with FDA guidance regarding highly concentrated caffeine in dietary supplements.

Preconditions

- CTO, QA, or Developer is authenticated with Product Compliance privileges.
- Catalog items include caffeine-related metadata (serving size, estimated caffeine per serving/volume) or ingredient lists.
- Internal policy thresholds and categorization rules are configured.

Main Flow

The user runs a compliance scan. The system [Identify Product Category] (e.g., beverage, dietary supplement) and [Estimate Caffeine Per Serving]. Products exceeding policy thresholds or matching prohibited forms trigger [Restrict Item Availability] pending [Compliance Review]. Items within allowed ranges but high caffeine get [Add Safety Warning]. Items with missing data enter [Insufficient Caffeine Data] for follow-up. A compliance summary is generated for audit.

Subflows

- [Identify Product Category]: Classify item as beverage/food/dietary supplement using item attributes and labels.

- [Estimate Caffeine Per Serving]: Derive caffeine from ingredient data, supplier specs, or lab results.
- [Add Safety Warning]: Add consumer-facing advisory notes and age restrictions as per policy.
- [Restrict Item Availability]: Temporarily remove items from sale channels or limit channels until cleared.
- [Compliance Review]: Route to Compliance Manager for exception handling and documentation.

Alternative Flows

- [Insufficient Caffeine Data]: Flag item; block publication until data is provided or item is reclassified.
- [Prohibited Formulation Detected]: System blocks sale of items resembling highly concentrated caffeine supplement forms; creates incident ticket.
- [Not in Scope]: Items with no caffeine or clearly out-of-scope are marked compliant and excluded from future scans.

1.18 UC28 Manage Employee Health Reporting

Describes how WolfCafe staff or managers record, update, and review employee health information related to transmissible diseases, ensuring compliance with food safety regulations and maintaining required logs.

Preconditions

- The user is logged in with Staff or Manager privileges.
- Employee data exists in the system.

Main Flow

Staff accesses the Employee Health module. They can [Report Employee Illness] for a specific employee or [View Employee Health Records]. If an employee returns after an illness, the system may require [Clearance Documentation Upload]. The system automatically retains records for the regulatory period (e.g., 90 days). If a severe or reportable illness is detected, the system may trigger an [Alert Regulatory Authority].

Subflows

- [Report Employee Illness]: Staff selects an employee, records symptoms/diagnosis, date of onset, and "fit for work" status.
- [View Employee Health Records]: Staff can search and display historical illness reports for a specific employee or period.
- [Clearance Documentation Upload]: Staff uploads medical clearance documents, if required, for employees returning to work after illness.

Alternative Flows

- **[Alert Regulatory Authority]:** The system identifies specific diagnoses that, based on configured rules, require immediate notification to public health authorities and prompts the user to take action.
- **[Data Retention Policy Violation]:** The system flags records older than the required retention period (e.g., 90 days) for archival or deletion, or automatically archives them.
- **[Bare Hand Contact Approval Check]:** If an employee with bare hand contact capability reports illness, the system reminds staff of the need for regulatory approval to reinstate bare hand contact.

1.19 UC29 Submit WIC Program Transaction Data

This use case details how WolfCafe processes and transmits eligible food item transactions for WIC participants to the Food Delivery Portal (FDP), ensuring compliance with federal reporting requirements and proper benefit redemption.

Preconditions

- WolfCafe is registered as an approved WIC vendor.
- The Staff user is authenticated with appropriate permissions.
- The customer has a valid WIC EBT card or equivalent identification.
- The order contains items that are WIC-eligible according to program rules.

Main Flow

A Staff member processes a customer's order. During the payment stage, the customer indicates WIC usage. The system proceeds to [Validate WIC Eligibility] and [Identify WIC-Eligible Items] within the customer's cart. The Staff confirms the WIC-eligible items and the system then attempts to [Process WIC Payment]. Upon successful transaction, the system automatically [Generates FDP Transaction Record] and queues it for submission to the FDP. If validation or payment fails, the system triggers a [WIC Rejection Notification].

Subflows

- [Validate WIC Eligibility]: The system sends a request to an external WIC API to verify the customer's WIC status and available benefits.
- [Identify WIC-Eligible Items]: The system applies predefined WIC program rules to mark which items in the current order qualify for WIC benefits.
- [Process WIC Payment]: The system communicates with the WIC payment processor to deduct the appropriate benefits for the eligible items.
- [Generate FDP Transaction Record]: The system creates a structured data record of the WIC transaction, including item details, amounts, and participant information, for the Food Delivery Portal.

Alternative Flows

- **[WIC Rejection Notification]**: The system informs the staff and customer of the specific reasons for WIC payment failure (e.g., insufficient benefits, ineligible items, card error) and suggests alternative payment methods.
- **[Manual WIC Adjustment]**: In specific cases (e.g., system error), Staff may be allowed to manually adjust the WIC-eligible items or amounts, requiring manager override.
- **[FDP Submission Failure]**: If the FDP transaction record fails to submit, the system retries the submission or alerts IT support for manual intervention and error resolution, ensuring data integrity.

1.20 UC30 Manage Food Facility Registration

This use case describes how a Business Owner or Administrator manages WolfCafe's registration details with relevant regulatory authorities (e.g., FDA Food Facility Registration), tracking key information and renewal dates to ensure continuous compliance.

Preconditions

- The user is logged in with Admin or Business Owner privileges.
- Initial facility information (address, contact, type) is available in the system.

Main Flow

The Business Owner accesses the Facility Compliance module. They can choose to [Initiate New Registration] for a new facility, [Update Existing Registration Details] for an active registration, or [View Registration Status] of all registered facilities. The system provides [Renewal Reminders] based on the registration expiry date. Any changes or new registrations may require [Document Upload for Approval]. Failure to renew by the deadline can lead to a [Registration Lapse Alert].

Subflows

- **[Initiate New Registration]**: The system guides the user through entering all necessary facility details (e.g., name, address, owner, contact information, type of operations) required by the regulatory body.
- **[Update Existing Registration Details]**: The user modifies current facility information, such as changes in ownership, address, or operational scope.
- **[View Registration Status]**: The system displays a dashboard with current registration IDs, expiry dates, and overall compliance status for each facility.
- **[Document Upload for Approval]**: The user uploads supporting documentation (e.g., permits, licenses, attestations) directly to the system for internal record-keeping and potential submission to authorities.

Alternative Flows

- **[Renewal Reminders]**: The system sends automated notifications (e.g., email, in-app alerts) to the Business Owner and designated contacts X days, weeks, or months before a registration is due for renewal.
- **[Registration Lapse Alert]**: The system automatically detects an expired registration and notifies the Business Owner and relevant stakeholders, potentially triggering an urgent compliance task.
- **[Regulatory Information Change]**: The system, through integration or manual input, alerts users to updates in facility registration requirements from regulatory bodies, prompting a review of existing data.

1.21 UC31 Verify Menu Item Labeling Compliance

This use case enables a Staff member or Business Owner to review and verify the accuracy and regulatory compliance of menu item descriptions, nutritional information, and allergen declarations before items are published or updated on the menu.

Preconditions

- The user is logged in with Staff (with menu management privileges) or Admin/Business Owner privileges.
- Menu items with associated ingredient lists, nutritional data, and allergen information exist in the system.
- Current regulatory guidance (e.g., FDA menu labeling, dietary fiber declarations, allergen disclosure rules) is configured and up-to-date within the system.

Main Flow

A Staff member accesses the Menu Compliance module. They select a specific menu item to [Review Item Labeling Details]. The system then performs an [Automated Compliance Check] against all configured regulatory rules. If compliance issues are detected, the Staff can either [Correct Labeling Data] directly or [Request Expert Review] for complex cases. Once all issues are resolved and the item is deemed compliant, it is marked as "Approved for Publication." Any unresolved non-compliance triggers a [Non-Compliance Alert].

Subflows

- **[Review Item Labeling Details]**: The system presents a comprehensive view of all labeling-related information for the selected menu item, including ingredients, allergens, nutritional facts, and consumer-facing descriptions.
- **[Automated Compliance Check]**: The system algorithmically compares the item's data (e.g., calorie count visibility, allergen declarations, dietary fiber claims based on RAG context) against the stored regulatory guidelines.
- **[Correct Labeling Data]**: The user directly edits and updates the nutritional values, allergen flags, ingredient lists, or descriptive text for the menu item within the system.

- **[Request Expert Review]**: For ambiguities or complex regulatory interpretations, the system allows the user to escalate the item for review by a designated compliance expert or manager.

Alternative Flows

- **[Non-Compliance Alert]**: The system clearly highlights specific areas of non-compliance (e.g., missing allergen declaration, incorrect dietary fiber claim) and provides suggested corrective actions or links to relevant regulations.
- **[Regulatory Update Notification]**: The system proactively notifies users when new labeling guidance is released by regulatory bodies, prompting a mandatory re-verification of relevant menu items.
- **[Ingredient Change Trigger]**: Any modification to an ingredient's profile (e.g., new allergen, changed nutritional value) automatically flags all associated menu items for re-verification of their labeling compliance.

1.22 UC32 Generate Regulatory Compliance Report

This use case allows a Business Owner or Manager to generate and export various types of compliance reports (e.g., employee health logs, facility registration status, temperature logs) for specific periods, primarily for regulatory inspections or internal audits.

Preconditions

- The user is logged in with Admin or Business Owner privileges.
- Relevant compliance data (e.g., employee health records, facility registration details, temperature monitoring logs) exists in the system for the requested period.
- Required regulatory formats for the selected report type are configured in the system.

Main Flow

The Business Owner accesses the Compliance Reporting module. They select the desired [Report Type] (e.g., "Employee Health Log", "Facility Registration Status", "Food Temperature Log") and specify a [Date Range for Report] if applicable. The system then proceeds to [Compile Regulatory Data] and formats it according to the pre-configured regulatory standards. The user can [Preview Report] to ensure accuracy before [Exporting Report] in a suitable format. If no data is found for the selected criteria, a [No Records Found Notification] is displayed.

Subflows

- **[Report Type]:** User selects the specific compliance report needed from a dropdown list (e.g., Employee Health Log, Facility Registration Status, Food Temperature Monitoring Log).

- **[Date Range for Report]:** User inputs the start and end dates for the report's data inclusion (e.g., the last 90 days for employee health logs).
- **[Compile Regulatory Data]:** The system queries its databases to gather all relevant records pertaining to the selected report type and date range.
- **[Preview Report]:** The system displays a read-only, formatted version of the report, allowing the user to review its content and layout before final export.
- **[Exporting Report]:** The system saves the report in a compliant and widely accepted format (e.g., PDF, CSV, XML) to a user-specified local or network location.

Alternative Flows

- **[No Records Found Notification]:** The system informs the user if no relevant compliance records exist for the chosen report type and date range.
- **[Regulatory Format Update]:** The system alerts the user if the required format for a specific report type changes due to new regulations, prompting a system update to maintain compliance.
- **[Insufficient Permissions]:** If a user attempts to generate a report for which they do not have the required privileges, the system denies access and informs the user.

1.23 UC33 Manage Nutritional Labeling Compliance

This use case describes how WolfCafe management and staff input, maintain, and verify the accuracy of nutritional information for all menu items to ensure compliance with FDA menu labeling regulations. This process supports transparency for customers and adherence to health standards.

Preconditions

- The user (Staff or Admin) is authenticated in the WolfCafe system with appropriate permissions.
- Menu items exist in the system, potentially with associated ingredient lists.
- Relevant FDA menu labeling guidance (e.g., on calorie counts, dietary fiber) is accessible or integrated.

Main Flow

The user accesses the Nutritional Data Management module. They [Select Menu Item] for which to manage data. The user then [Enter or Update Nutritional Data] for the selected item. The system automatically [Validates Nutritional Data] against predefined rules and regulatory guidelines. If data is incomplete or incorrect, the system triggers an [Invalid Data Alert]. Upon successful validation, the system [Publishes Nutritional Information], making it available for customer viewing and internal reporting. If an [Ingredient Change Impact Assessment] is triggered, the process may restart for affected items.

Subflows

- **[Select Menu Item]:** The user searches for and selects a specific food or beverage item from the WolfCafe menu.
- **[Enter or Update Nutritional Data]:** The user inputs or modifies values for calories, fat, sugar, sodium, fiber, and other required nutrients based on recipes and ingredient information.
- **[Validates Nutritional Data]:** The system checks for mandatory fields, data type consistency, and potential regulatory thresholds (e.g., for highly concentrated caffeine as per FDA guidance).
- **[Publishes Nutritional Information]:** The system updates the menu item's public-facing nutritional profile, ensuring it is displayed accurately to customers (e.g., via UC19 Customer Views Nutritional Information).

Alternative Flows

- **[Invalid Data Alert]:** If validation fails, the system displays an error message detailing the issue (e.g., missing values, data outside an acceptable range) and prompts the user for correction before publishing.
- **[Regulatory Update Notification]:** The system, or an administrator, receives an alert when new FDA guidance (e.g., revised declaration for dietary fiber) necessitates a review and potential update of existing nutritional data for affected items.
- **[Ingredient Change Impact Assessment]:** If an ingredient in a menu item's recipe changes, the system or staff triggers an assessment to determine if the nutritional data of the final item needs to be recalculated and updated, potentially requiring a re-entry of data.

1.24 UC34 Manage Employee Tip Reporting Compliance

This use case outlines the process for WolfCafe management to ensure accurate tracking, aggregation, and timely reporting of employee tips, thereby complying with federal and state tax regulations and preventing penalties.

Preconditions

- Employees are registered in the WolfCafe system with appropriate payroll and tax identification information (UC24).
- Sales data, including credit card tip amounts, is recorded by the system.
- The user (Staff or Admin) is authenticated with permissions to manage payroll and tax data.

Main Flow

At the end of each shift or pay period, staff [Declares Tips Earned] through the system. The system then [Aggregates Tip Data] from both declared cash tips and recorded credit card tips for each employee. Management periodically [Reviews Aggregated Tip Data] for accuracy and to identify any significant discrepancies. If total reported tips fall below a statutory threshold (e.g., 8% of gross receipts), the system automatically performs a [Calculate Allocated Tips] process. Finally, the system [Generates Tip Reporting Forms] required for payroll processing and submission to tax authorities.

Subflows

- **[Declares Tips Earned]:** WolfCafe staff members log into the system and input the total cash tips they received during their shift or designated period.
- **[Aggregates Tip Data]:** The system combines the declared cash tips with credit card tips automatically processed by the POS system, linking them to the respective employee.
- **[Reviews Aggregated Tip Data]:** A manager or administrator accesses a report summarizing employee tip data, looking for unusual patterns or potential errors before finalization.
- **[Calculate Allocated Tips]:** If mandated by tax regulations (e.g., IRS Form 8027 rules), the system computes and allocates additional tips to employees to meet the minimum reporting threshold.
- **[Generates Tip Reporting Forms]:** The system produces necessary internal reports and external forms (e.g., Form 8027 for the business, W-2 entries for employees) based on the aggregated and allocated tip data.

Alternative Flows

- **[Tip Data Discrepancy Alert]:** If the system detects a significant difference between declared tips and expected tips (e.g., unusually low tips relative to sales), an alert is sent to management for investigation.
- **[Employee Tip Adjustment Request]:** An employee can submit a request to adjust previously declared tips, which requires manager approval and an audit trail.
- **[Regulatory Reporting Deadline Alert]:** The system sends automated notifications to management reminding them of upcoming federal and state deadlines for tip reporting (e.g., quarterly Form 941, annual Form 8027).

2. Differences in the LLM reports

2.1 Zero-shot prompting vs Careful prompting

Zero-shot prompting leads to chaotic output formats that fail to adhere to the expected use-case template. The LLM consistently adds extraneous content, such as actors or background information, to the use cases.

Furthermore, in a zero-shot scenario, even when RAG provides relevant contextual information, the LLM struggles to grasp the system's background and goals. Consequently, it produces some general use cases that are unrelated to a wolfcare food-delivery system. For instance, the LLM generates use cases for a general tax regulation system (similar to Sprintax) when asked about tax management.

2.2 Gemini vs GPT-5

With the same system prompt and contextual information, Gemini (2.5-flash) demonstrates a strong understanding of the context, producing results with a style (length and format) similar to the few-shot examples. In contrast, GPT-5 mini disregarded the system's background (wolfcafe), creating more generic use cases based on the context and yielding highly redundant results. We deduce this may be caused by the difference of context windows.

3. Total cost of LLM usage

$2 for Chat API. We used Ollama for text-embedding.