Business Expenses Management Platform Deliverable II

I. Domain Classes: Noun Technique

Step I: Identify Nouns

Noun Identified	Source (Use Case/Actor/Other)
Expense	Expense Submission, Expense Approval Workflow
Budget	Budget Allocation Subsystem, Real-time Budget Monitoring Subsystem
Project	Expense Submission, Budget Allocation Subsystem
Department	Budget Allocation Subsystem
Admin	Expense Approval Workflow
Employee	Expense Submission, Role Management Subsystem
Finance Manager	Expense Approval Workflow, Reporting Subsystem
Department Head	Budget Allocation Subsystem
Project Manager	Expense Submission, Real-time Budget Monitoring Subsystem
Role	Role Management Subsystem
Approval	Expense Approval Workflow, Role Management Subsystem
Report	Reporting Subsystem
Alert	Real-time Budget Monitoring Subsystem
Reminder	Temporal Event - Send Expense Approval Reminder
Financial Summary	Temporal Event - Generate Monthly Financial Summary
Monthly	Temporal Event - Generate Monthly Financial Summary
Budget Status	Information Event - View Budget Status
Expense Entry	Expense Submission Subsystem
Expense History	Expense Approval Workflow Subsystem
Budget Allocation	Budget Allocation Subsystem
Expense Submission Status	Expense Submission Subsystem
Expense Trends	Reporting Subsystem
Approval History	Reporting Subsystem
Real-Time Budget Usage	Real-time Budget Monitoring Subsystem

Step II: Add Items from Other Sources

Additional Noun	Source (System/Procedure/Report/Form)
Invoice	Expense submission form
Receipt	Expense submission form
Account	Current financial procedures
Transaction	Financial reports
Policy	Expense approval policies
Notification	System alerts and reminders
Record	Database records for expenses and approvals
Schedule	Temporal events for reminders and summaries
User	System users, including employees and managers
Access	Role-based access control

Step III: Refine the List of Nouns

We will now go through each noun and ask the questions provided to determine if it should be included, excluded, or researched further.

Noun Identified	Include/Exclude/Research	Justification
Expense	Include	The system needs to track and manage expenses.
Budget	Include	Central to the system's functionality for allocation and monitoring.
Project	Include	Essential for categorizing expenses and budgets.
Department	Include	Required for budget allocation and tracking.
Admin	Include	Required for the money pool.
Employee	Include	Actors who submit expenses and have roles in the system.
Finance Manager	Include	Actors with specific roles in the approval process.
Department Head	Include	Actors responsible for budget allocation and adjustment.
Project Manager	Include	Actors who monitor budgets and report on expenses.
Role	Include	Necessary for role-based access control.
Approval	Include	Core functionality of the workflow subsystem.
Report	Include	Outputs generated by the reporting subsystem.
Alert	Include	Alerts are part of the real-time monitoring subsystem.

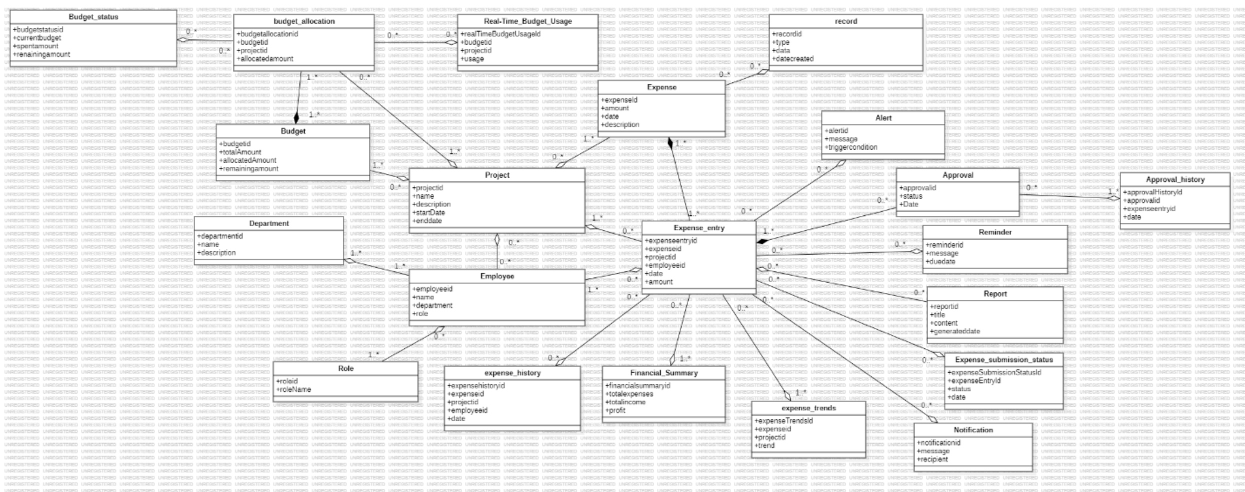
Reminder	Include	Temporal events that trigger system notifications.
Financial Summary	Include	Monthly summaries are a key output of the system.
Budget Status	Include	Information the system needs to display to users.
Expense Entry	Include	Each expense submission creates an entry in the system.
Expense History	Include	Historical data on expense submissions and approvals.
Budget Allocation	Include	The system needs to track allocations to various projects and departments.
Expense Submission Status	Include	Necessary to inform users about the status of their submissions.
Expense Trends	Include	Part of the reporting functionality for expense analysis.
Approval History	Include	Needed for transparency and auditability.
Real-Time Budget Usage	Include	Essential for monitoring current budget expenditure.
Invoice	Research	Determine if the system needs to generate or track invoices.
Receipt	Research	Determine if the system needs to capture and store receipts.
Account	Exclude	Likely part of the financial system, not a unique thing the expense system needs to track.
Transaction	Exclude	Part of the financial system's responsibility.
Policy	Research	May need to store and reference policies for validation.
Notification	Include	Part of the system's communication strategy.
Record	Include	The system must maintain records of all transactions and activities.
Schedule	Research	Determine if the system needs to manage schedules for reminders.
User	Research	Determine if 'User' is distinct from 'Employee,' 'Finance Manager,' etc.

Access	Include	Essential for enforcing role-based access control.

Step IV: Create a Master List of Nouns

Master List of Domain Classes	Included/Excluded/Research
Expense	Included
Budget	Included
Project	Included
Department	Included
Admin	Included
Employee	Included
Finance Manager	Included
Department Head	Included
Project Manager	Included
Role	Included
Approval	Included
Report	Included
Alert	Included
Reminder	Included
Financial Summary	Included
Budget Status	Included
Expense Entry	Included
Expense History	Included
Budget Allocation	Included
Expense Submission Status	Included
Expense Trends	Included
Approval History	Included
Real-Time Budget Usage	Included
Invoice	Research
Receipt	Research
Policy	Research
Notification	Included
Record	Included
Schedule	Research
User	Research
Access	Included

Step V: UML Class Diagram



II. Use Cases and CRUD Technique

Budget Allocation System

1. **Allocate Budget**:
    - Create: Department heads create new budget allocations for specific projects.
    - Read: Department heads and finance teams view existing budget allocations.
    - Update: Department heads adjust budget allocations within financial constraints.
    - Delete: Not applicable (budget allocations are not deleted but adjusted or removed from projects).
2. **Adjust Budget**:
    - Create: Not applicable (budget adjustments are made to existing allocations).
    - Read: Department heads and finance teams view existing budget allocations.
    - Update: Department heads adjust budget allocations within financial constraints.
    - Delete: Not applicable (budget allocations are not deleted but adjusted or removed from projects).
3. **Monitor Budget**:
    - Create: Not applicable (budget monitoring is a read-only activity).
    - Read: Department heads and finance teams view remaining budget for departments.

- Update: Not applicable (budget monitoring is a read-only activity).
- Delete: Not applicable (budget monitoring is a read-only activity).

4. **Enforce Budget Limits**:
    - Create: Not applicable (budget limits are enforced during allocation).
    - Read: System checks existing budget allocations against limits.
    - Update: System prevents overspending by adjusting or rejecting budget allocations.
    - Delete: Not applicable (budget limits are enforced during allocation).

Expense Submission Subsystem

1. **Submit Expense**:
    - Create: Employees create new expense entries for specific projects.
    - Read: Employees and project managers view existing expense entries.
    - Update: Not applicable (expense entries are not updated but validated or rejected).
    - Delete: Not applicable (expense entries are not deleted but removed from projects).
2. **Track Expense Status**:
    - Create: Not applicable (expense status tracking is a read-only activity).
    - Read: Employees and project managers view the status of submitted expenses.
    - Update: Not applicable (expense status tracking is a read-only activity).
    - Delete: Not applicable (expense status tracking is a read-only activity).
3. **Validate Expense Entry**:
    - Create: Not applicable (expense entries are validated during submission).
    - Read: System checks existing expense entries for accuracy.
    - Update: System validates or rejects expense entries.
    - Delete: Not applicable (expense entries are not deleted but removed from projects).
4. **Restrict Excessive Expenses**:
    - Create: Not applicable (excessive expenses are prevented during submission).
    - Read: System checks existing expense entries against budget limits.
    - Update: System prevents excessive expenses by rejecting or adjusting expense entries.

- Delete: Not applicable (excessive expenses are prevented during submission).

Expense Approval Workflow Subsystem

1. **Review Expenses**:
    - Create: Not applicable (expense review is a read-only activity).
    - Read: Finance managers view submitted expenses.
    - Update: Not applicable (expense review is a read-only activity).
    - Delete: Not applicable (expense review is a read-only activity).
2. **Approve/Reject Expenses**:
    - Create: Not applicable (expense approval/rejection is an update activity).
    - Read: Finance managers view submitted expenses.
    - Update: Finance managers approve or reject expenses.
    - Delete: Not applicable (expense approval/rejection is an update activity).
3. **View Expense History**:
    - Create: Not applicable (expense history viewing is a read-only activity).
    - Read: Finance managers and admins view detailed expense submission history.
    - Update: Not applicable (expense history viewing is a read-only activity).
    - Delete: Not applicable (expense history viewing is a read-only activity).
4. **Receive Approval Confirmation**:
    - Create: Not applicable (approval confirmation is a notification activity).
    - Read: Finance managers receive confirmation of approval actions.
    - Update: Not applicable (approval confirmation is a notification activity).
    - Delete: Not applicable (approval confirmation is a notification activity).

Role Management Subsystem

1. **Assign Roles**:
    - Create: Admins create new role assignments for expense approval access.
    - Read: Admins view existing role assignments.
    - Update: Admins update role assignments for employees.
    - Delete: Not applicable (role assignments are not deleted but updated or removed).

2. **Update Roles**:
    - Create: Not applicable (role updates are made to existing assignments).
    - Read: Admins view existing role assignments.
    - Update: Admins update role assignments for employees.
    - Delete: Not applicable (role assignments are not deleted but updated or removed).
3. **Enforce Role-Based Access**:
    - Create: Not applicable (role-based access is enforced during expense approval).
    - Read: System checks existing role assignments for access control.
    - Update: System enforces role-based access control during expense approval.
    - Delete: Not applicable (role-based access is enforced during expense approval).
4. **Confirm Role Changes**:
    - Create: Not applicable (role change confirmation is a notification activity).
    - Read: Admins receive confirmation of role changes.
    - Update: Not applicable (role change confirmation is a notification activity).
    - Delete: Not applicable (role change confirmation is a notification activity).

Real-time Budget Monitoring Subsystem

1. **View Real-Time Budget Usage**:
    - Create: Not applicable (real-time budget usage viewing is a read-only activity).
    - Read: Project managers view real-time budget usage.
    - Update: Not applicable (real-time budget usage viewing is a read-only activity).
    - Delete: Not applicable (real-time budget usage viewing is a read-only activity).
2. **Display Remaining Budget**:
    - Create: Not applicable (remaining budget display is a read-only activity).
    - Read: Project managers and finance teams view remaining budget.
    - Update: Not applicable (remaining budget display is a read-only activity).
    - Delete: Not applicable (remaining budget display is a read-only activity).
3. **Trigger Low Budget Alerts**:
    - Create: Not applicable (low budget alerts are triggered by system).

- Read: System checks remaining budget against thresholds.
- Update: System triggers alerts when the remaining budget is low.
- Delete: Not applicable (low budget alerts are triggered by system).

4. **Restrict Expenses at Zero Budget**:
    - Create: Not applicable (expenses are restricted when budget is fully utilized).
    - Read: System checks remaining budget against zero.
    - Update: System restricts further expenses when budget is fully utilized.
    - Delete: Not applicable (expenses are restricted when budget is fully utilized).

Reporting Subsystem

1. **Generate Budget Allocation Report**:
    - Create: System generates reports on department budget allocation.
    - Read: Users view generated reports.
    - Update: Not applicable (reports are generated based on existing data).
    - Delete: Not applicable (reports are generated based on existing data).
2. **Generate Expense Summary Report**:
    - Create: System generates reports on project expenses.
    - Read: Users view generated reports.
    - Update: Not applicable (reports are generated based on existing data).
    - Delete: Not applicable (reports are generated based on existing data).
3. **Produce Real-Time Budget Monitoring Report**:
    - Create: System generates reports on real-time budget monitoring.
    - Read: Users view generated reports.
    - Update: Not applicable (reports are generated based on existing data).
    - Delete: Not applicable (reports are generated based on existing data).
4. **View Approval History**:
    - Create: Not applicable (approval history viewing is a read-only activity).
    - Read: Finance managers and admins view approval history of expenses.
    - Update: Not applicable (approval history viewing is a read-only activity).

- Delete: Not applicable (approval history viewing is a read-only activity).