

Project Design Phase

Solution Architecture

Date	31 OCTOBER 2025
Team ID	NM2025TMID00036
Project Name	Calculating Family Expenses using Service Now
Maximum Marks	4 Marks

Solution Architecture:

Goals of the Architecture:

- 1. Centralized Expense Management**
 - Create a single platform within ServiceNow to record, categorize, and track all family expenses in one place.
- 2. Automation of Expense Tracking**
 - Automate repetitive processes like expense categorization, monthly summaries, and budget alerts to minimize manual work.
- 3. Data Accuracy and Consistency**
 - Ensure all expense entries are validated and stored correctly using ServiceNow's database and workflows, avoiding duplication or errors.
- 4. User-Friendly Interface**
 - Provide an intuitive dashboard for users to easily add, view, and analyze family expenses with minimal training or technical knowledge.
- 5. Role-Based Access Control**
 - Implement secure access levels (e.g., admin for parents, viewer for children) to protect sensitive financial data.
- 6. Real-Time Reporting and Analytics**
 - Generate instant visual reports and charts to help users understand spending patterns and make informed financial decisions.
- 7. Integration with External Systems**
 - Allow optional integration with bank APIs or Excel/Google Sheets for easy import/export of expense data.
- 8. Scalability and Flexibility**
 - Design the architecture to support more family members, categories, and future financial features without major redesign.
- 9. Notifications and Budget Alerts**
 - Set up ServiceNow workflow notifications to alert users when expenses exceed predefined budgets or spending limits.
- 10. Data Security and Privacy**

- Protect financial information using ServiceNow's built-in encryption and access controls.
- 11. Sustainability and Maintainability**
 - Build a modular architecture so that new features (like savings tracking or goal planning) can be easily added in the future.
- 12. Performance Optimization**
 - Ensure quick data retrieval and smooth performance even with large expense histories.

Key Components:

- 1. User Interface (UI) Module**
 - Provides an easy-to-use dashboard for users to enter, view, and analyze expenses.
 - Includes forms for adding income, expenses, and budget categories.
- 2. Expense Management Module**
 - Handles recording, categorizing, and storing all expenses.
 - Supports expense types such as food, utilities, education, entertainment, etc.
- 3. Database (ServiceNow Tables)**
 - Central repository for storing expense data, user profiles, and transaction history.
 - Ensures data integrity and consistency through ServiceNow's CMDB or custom tables.
- 4. Workflow and Automation Engine**
 - Automates processes such as approval, notification, and monthly expense summaries.
 - Triggers alerts when budget limits are reached.
- 5. Budget and Savings Module**
 - Allows users to set monthly/annual budgets and track savings goals.
 - Provides comparative analysis between actual vs. planned spending.
- 6. Reporting and Analytics Component**
 - Generates visual reports and charts to show spending trends and financial health.
 - Uses dashboards for quick insights.
- 7. Notification and Alert System**
 - Sends real-time alerts for overspending or unusual transactions.
 - Uses ServiceNow Flow Designer or notification rules.
- 8. User Authentication and Access Control**
 - Manages secure logins and role-based permissions for family members.
 - Ensures only authorized users can modify or view data.
- 9. Integration Layer**
 - Connects with external systems such as bank APIs, spreadsheets, or budgeting tools.
 - Facilitates import/export of data.
- 10. Admin Configuration Module**
 - Enables administrators to manage categories, user roles, and expense rules.
 - Handles maintenance, updates, and customizations.

11. Audit and Logging Component

- Tracks all expense updates, user activities, and financial transactions for transparency.

12. Mobile Access (Optional)

- Provides on-the-go access through ServiceNow mobile app for quick expense entry.

Development Phases:

1. Requirement Analysis Phase

- Identify user needs and define functional and non-functional requirements.
- Gather information on expense categories, reporting needs, and budget goals.

2. System Design Phase

- Create the architecture design using ServiceNow modules.
- Define database structure (tables, relationships) and user interface layout.
- Design workflows for expense tracking and automation.

3. Module Development Phase

- Develop key modules such as Expense Management, Budget Tracking, and Reports.
- Configure forms, lists, and dashboards in ServiceNow.
- Set up Flow Designer for automation and notifications.

4. Database Configuration Phase

- Create custom tables to store expense records, users, and categories.
- Define relationships between tables for better data organization.

5. Integration Phase

- Integrate the system with external data sources (e.g., Excel or bank APIs).
- Ensure smooth data import/export functionality.

6. Testing Phase

- Perform unit testing for individual modules.
- Conduct system and user acceptance testing (UAT) to ensure all functions work correctly.

7. Deployment Phase

- Deploy the final version of the application on the ServiceNow instance.
- Configure roles, permissions, and user access controls.

8. User Training Phase

- Provide hands-on training to family members or users on how to use the system.
- Create simple documentation or user guides.

9. Maintenance and Support Phase

- Monitor the system for performance issues or bugs.
- Update workflows and reports as family needs evolve.
- Regularly back up and secure expense data.

10. Evaluation and Enhancement Phase

- Collect user feedback for improvements.

- Add new features such as goal tracking, income visualization, or AI-based suggestions.

Solution Architecture Description:

The solution architecture for **Calculating Family Expenses using ServiceNow** is designed to provide a centralized, automated, and user-friendly platform for managing household financial activities. The architecture is built on the ServiceNow environment, utilizing its core modules such as custom tables, workflows, and reporting dashboards. The system consists of several key components including a user interface for expense entry, a database layer for secure data storage, and workflow automation for managing recurring tasks like expense categorization and budget alerts. Users can record their daily expenses, categorize them into predefined groups such as food, utilities, or entertainment, and generate monthly or yearly financial reports. The architecture also integrates role-based access control to ensure data privacy among family members and supports notification mechanisms to alert users about budget limits or overspending. Reporting and analytics modules provide real-time visualization of spending patterns, helping users make informed financial decisions. Additionally, the modular design of the architecture ensures scalability and easy integration with external systems such as spreadsheets or bank APIs. Overall, this solution architecture offers an efficient, secure, and intelligent framework for simplifying family expense tracking through the automation and analytical capabilities of ServiceNow.

Solution Architecture Diagram :

