

Calulating family expenses using Servicenow

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Requirement analysis

Solutional requirements

Functional Requirements

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Register family members through a form or ServiceNow login.
FR-2	Expense Entry	Add daily or monthly expenses with date, category, and amount.
FR-3	Category Management	Create, edit, or delete expense categories such as Food, Travel, Utilities, etc.
FR-4	Budget Setup	Define monthly or category-wise budget limits.
FR-5	Expense Analytics	Generate charts, graphs, and summaries of monthly spending.
FR-6	Notifications	Send alerts or notifications when expenses exceed predefined budget limits.
FR-7	Report Generation	Export expense summaries and analytics reports to PDF or Excel format.
FR-8	Multi-User Access	Allow multiple family members to contribute and view shared expenses under one account.

Non-Functional Requirements

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	Provide a simple and intuitive interface for easy entry and visualization of expenses.
NFR-2	Security	Ensure only authorized users can access or modify financial data. Implement secure login and role-based access.
NFR-3	Reliability	Guarantee accurate storage and retrieval of expense records without data loss.
NFR-4	Performance	Enable real-time dashboard updates and fast processing of data inputs.
NFR-5	Availability	Ensure the application is accessible 24×7 via the ServiceNow platform.
NFR-6	Scalability	Support increasing numbers of users and historical expense data over time.
NFR-7	Maintainability	Facilitate easy updates to categories, workflows, or budget rules without major redevelopment.
NFR-8	Data Integrity	Prevent duplicate or invalid expense entries through validation and checks.

Data flow diagrams and user stories

Data Flow Diagrams (DFD)

Overview:

A **Data Flow Diagram (DFD)** illustrates how financial data moves across different modules of the *Family Expense Calculator*. It shows how users input expenses, how the system processes and stores them, and how results (like budget alerts or summaries) are displayed.

Data Flow Description:

1. **User Login:**
 - The user logs in through the ServiceNow interface.
2. **Expense Entry:**
 - The user enters expense details such as category, date, and amount.
3. **Data Storage:**

- Expense data is stored securely in the **Expense Table**.
- 4. **Budget Verification:**
 - The system cross-checks the entered expense against limits stored in the **Budget Table**.
- 5. **Notification Trigger:**
 - If the spending exceeds the budget, the system automatically triggers a **budget alert notification**.
- 6. **Dashboard Insights:**
 - The dashboard retrieves data from the **Expense Table** to display real-time visual insights and summaries.

DFD Representation (Conceptual Description):

User → [Expense Entry Form] → [Expense Table] → [Budget Table] → [Notification System] → [Dashboard / Reports]

User Stories

Functional Requirement (Epic)	User Type	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Expense Entry	Family Member	USN-1	As a family member, I want to record my daily expenses so that I can track my spending.	Expense entries are stored and visible on the dashboard.	High	Sprint-1
Budget Setup	Family Member	USN-2	As a user, I want to set monthly budget limits to avoid overspending.	Alerts trigger when expenses exceed the set limit.	High	Sprint-2
Expense Validation	System	USN-3	As a system, I must validate entered expenses and update total spend automatically.	Total amount updates correctly per category.	High	Sprint-2
Analytics Dashboard	Administrator	USN-4	As an admin, I want to generate graphical	Reports show category-wise and	Medium	Sprint-3

Functional Requirement (Epic)	User Type	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Report Generation	Family Member	USN-5	reports for family expenses.	monthly spending trends.	Medium	Sprint 3
			As a user, I want to export a monthly summary to PDF.	Reports download successfully.		

Technical Architecture

The **Family Expense Calculator** is built on **ServiceNow's cloud platform**, leveraging its built-in tools such as **tables, flows, notifications, and dashboards**.

The system automates data entry, budgeting, and analysis while ensuring **secure access, reliability, and scalable performance** for multiple users.

Key Features of the Architecture

- **Modular Design:** Custom tables for expense and budget management.
- **Automated Workflows:** Use of ServiceNow Flow Designer for expense validation and notifications.
- **Integrated Visualization:** Dashboards and reports provide real-time insights.
- **Cloud-Hosted:** ServiceNow's SaaS infrastructure ensures high availability.
- **Secure Access:** Role-based authentication for family members and administrators.

Table 1 – Components & Technologies

S.No.	Component	Description	Technology
1	User Interface	Expense entry and dashboard access through ServiceNow portal.	ServiceNow Web UI
2	Application Logic-1	Records and categorizes expense data.	Flow Designer / Server Scripts
3	Application Logic-2	Calculates totals and checks budget limits.	GlideRecord, Script Includes
4	Application Logic-3	Sends notifications when spending exceeds limits.	ServiceNow Notifications

S.No.	Component	Description	Technology
5	Database	Stores expense, user, and budget data.	Custom Tables in ServiceNow
6	Cloud Database	Securely hosts all financial data in the cloud.	ServiceNow Cloud Backend
7	File Storage	Stores generated reports and logs.	ServiceNow Attachments / System Logs
8	External API-1	Optional integration for importing bank transactions.	REST API (ServiceNow IntegrationHub)
9	External API-2	Optional SMS alert service for over-budget notifications.	Twilio API (via IntegrationHub)
10	Infrastructure	Hosted on ServiceNow's SaaS environment ensuring scalability and uptime.	ServiceNow Cloud Platform

Table 2 – Application Characteristics

S.No.	Characteristic	Description	Technology
1	Security	Role-based access control ensures secure data usage for each family member.	Scoped Application & ACLs
2	Usability	Simple, responsive, and user-friendly interface for quick data entry and visualization.	ServiceNow Forms & UI Pages
3	Scalability	Supports multiple users and extensive historical expense data.	ServiceNow Cloud Scalability
4	Availability	Ensures continuous access with ServiceNow's load-balanced cloud infrastructure.	Load-Balanced Instances
5	Performance	Enables real-time reporting and fast dashboard updates.	Optimized Server Scripts & Queries