Technology Stack & System Architecture

Technology Stack

The Family Expense Calculation System will be developed using ServiceNow as the primary platform. The technology stack defines the set of tools, platforms, programming languages, and plugins that will be used to build, deploy, test, and maintain the application.

1. Platform

Component	Description
ServiceNow Developer Instance	Core platform where application tables, UI forms, automation, workflows, reports, and security will be developed.
Service Portal	Used to create a user-friendly interface for expense entry and dashboard viewing.

2. Backend Technologies

Component	Purpose
ServiceNow Server-Side Scripting (Glide Script / GlideRecord)	Used to store, retrieve, update, and manipulate expense and income records in database tables.
Business Rules	Automate calculations such as total expenses, balance left, monthly aggregation, etc.
Scheduled Jobs	Used to trigger monthly reminders or alerts for overspending.

3. Frontend Technologies

Component	Purpose
HTML / CSS	Used inside Service Portal widgets for custom UI design.

Client Scripts (JavaScript)	Used for form validation, dynamic calculations, and improving user experience.
Service Portal Widgets	Display charts, tables, input forms, and dashboards interactively.

4. Database Layer

Component	Purpose
Custom Tables (Expense, Income, Category, Users)	Stores financial data for each family.
CMDB-like table structure	Ensures relational and structured data storage.
Access Control Rules (ACLs)	Maintains data privacy for each family/user.

5. Reporting & Analytics

Component	Usage
Performance Analytics (PA)	To generate automated dashboards and monthly reports.
Visualization Widgets	Bar charts, pie charts, line charts for spending patterns.
Notifications & Alerts	Triggered when spending exceeds planned limits.

6. Integration / External Tools

Component	Usage
Lucidchart / Draw.io	Designing DFD, Use Case Diagrams, and ER Diagrams.
Excel/CSV Import (optional)	Upload expense records in bulk if required.

7. Security & Authentication

Method	Purpose
ServiceNow User Authentication	Prevents unauthorized access.
Role-based Access Control	Allows only registered users to add or view expenses.
Data Policies & Field Encryption	Protects confidential financial information.

8. Testing Tools

Tool	Purpose
ServiceNow Automated Test Framework (ATF)	Testing forms, workflows, and records.
Manual Testing Logs	For validating calculations, dashboard results, and UI.

Why This Technology Stack?

- Everything runs inside a single ServiceNow instance – **no external hosting needed**

- Fully secure with **built-in authentication & ACL**

- Dashboards and workflows can be **automated easily**

- Suitable for real-time calculations and analytics

- Ideal for academic projects due to free developer instance