



NM 1051 SERVICENOW ADMINISTRATOR
TOPIC: CALCULATING FAMILY EXPENSES USING
SERVICENOW

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BONAFIDE CERTIFICATE

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Title: Calculating Family Expenses Using Servicenow

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Module Name	Description	Inputs	Outputs
User Interface Module	Provides forms for expense entry and viewing		Expense details Confirmation, saved records
Expense Entry Module	Validates and stores expense records	Validated expense fields DB record entries	
Expense Category Module	Manages expense categories	Category add/update Category list	
Database Management Module	Handles CRUD operations	CRUD requests Updated tables	
Expense Calculation Module	Computes totals and summaries	Expense records Totals (daily/monthly/yearly)	
Report Generation Module	Generates CSV and charts via Python	Aggregated data Reports, charts	
Summary Dashboard Module	Shows visual summaries	Processed metrics Dashboards	

Chapter 1 :Abstract

This project focuses on developing a system to calculate and manage family expenses using the ServiceNow platform. The aim of this work is to provide a structured and automated way to record, categorize, and analyze daily, weekly, and monthly expenses of a family. With the increasing cost of living and multiple financial responsibilities, tracking expenses manually becomes difficult and time-consuming. Using ServiceNow, an efficient expense tracking application can be created to store financial records, generate reports, and monitor spending habits. In addition to automation, this system provides better decision-making support by visualizing trends in expenditures. The proposed system is

user-friendly, customizable, and scalable, making it suitable for modern digital households.

The Family Expense Management System Is a web-based application developed on the ServiceNow platform, designed to help families efficiently track, manage, and analyze their expenses. This system enables users to categorize expenses, set budgets, and generate reports, providing real-time insights into their financial health. By leveraging ServiceNow's robust capabilities, the system ensures ease of use, scalability, and secure data management, making it an ideal solution for families looking to streamline their financial management processes.

Chapter 2 : Introduction

In today's fast-paced world, financial planning and expense tracking are essential for maintaining economic stability within families. The rapid increase in daily needs and lifestyle expenditures demands a proper system to manage financial transactions. Most families either track their expenses in notebooks or use manual methods such as spreadsheets, which can lead to errors, missing records, and lack of analysis. Digital transformation in daily life has opened opportunities to simplify this process through automation tools.

ServiceNow is a powerful cloud-based platform widely used for workflow automation and business process management. It offers capabilities like custom application development, database management, and report automation. Leveraging these features, a family expense tracking system can be implemented to manage various categories of expenses such as groceries, education, medical, utilities, transport, entertainment, and savings.

This project uses Python for handling backend data operations and data processing along with ServiceNow integration. The application allows users to insert, update, and review expenses, and visualize data using graphs. It also helps to calculate total expenditure within a defined period and compare trends over time. This report presents the analysis, design, development, and implementation of the system.

Managing family expenses can be challenging, especially when multiple members are involved. Traditional methods like spreadsheets or paper records often lead to disorganization, forgotten expenses, and difficulty in tracking spending patterns. The Family Expense Management System addresses these issues by providing a centralized platform where family members can log expenses, categorize them, and monitor their financial activities in real-time. Built on ServiceNow's Now Platform, this system leverages its powerful workflow automation, reporting, and security features to deliver a seamless experience.

Chapter 3 : Problem Statement

Managing family expenses manually is time-consuming and inefficient. Most families rely on traditional methods like writing expenses in notebooks or using Excel sheets, which are prone to errors and lack proper analysis features. There is no centralized platform that records, categorizes, and tracks expenses over time for better financial planning. Without automation, it is difficult to monitor spending habits or identify unnecessary expenditures, which leads to poor budgeting. Therefore, there is a need for a digital solution that automates expense tracking, stores records securely, and generates reports for financial analysis.

Chapter 4 :Objectives

The main objectives of this project are

- To develop a family expense tracking system using ServiceNow.

- To categorize expenses such as food, transport, education, bills, and healthcare.

- To calculate daily, weekly, monthly, and yearly expenses.

- To generate expense reports and graphical representations.

- To store expense records securely in a database.

- To automate expense tracking and reduce manual work.

- To integrate backend Python scripts for processing calculations where required.

Chapter 5 : Skills Required

To develop this project, the following skills are required:

Basic understanding of financial expense management.

Knowledge of ServiceNow platform and custom application development.

Python programming for logic implementation.

Understanding of database management.

Knowledge of workflow automation.

Data visualization fundamentals.

Basic UI design skills for form creation in ServiceNow.

Chapter 6: Methodology

The methodology followed in this project is based on a structured software development life cycle (SDLC) approach. The following steps were carried out:

Requirement Analysis: Identifying user needs for tracking and managing family expenses.

System Design: Planning the architecture and workflow using ServiceNow modules.

Database Design: Creating tables for storing categorized expense records.

Development: Implementing the system using ServiceNow forms, workflows, and Python integration scripts.

Testing: Checking functionality, accuracy of calculations, and database validations.

Deployment: Deploying the application on the ServiceNow platform.

Maintenance: Updating and improving features as needed.

The development of the Family Expense Management System follows a structured approach:

Requirements Gathering: Identify key features such as expense tracking, categorization, budgeting, and reporting.

1. Design: Create a user-friendly interface and define workflows for expense submission, approval, and reporting.
2. Development: Utilize ServiceNow's low-code development capabilities to build the application, including custom tables, forms, and workflows.
3. Testing: Conduct thorough testing to ensure the system meets all requirements and functions smoothly.

4. Deployment: Deploy the application on the ServiceNow platform and provide user training.

Chapter 7: Existing Work

Many expense tracking applications exist today like Money Manager, Walnut, and Microsoft Excel-based templates. These tools allow users to track expenses manually, but they lack automation, customization, and centralized data storage. Most existing solutions do not integrate workflow automation or support platform-based development like ServiceNow. Some apps do not offer periodic expense calculation, report generation, or family-based shared accounts. Therefore, a custom solution using ServiceNow provides better control and simplicity for users.

The proposed work involves developing a Family Expense Management System on the ServiceNow platform. This system will enable families to track, categorize, and manage their expenses efficiently. Key features will include:

Expense Tracking: Family members can log and categorize expenses.

Budgeting: Set and track budgets for different expense categories.

Reporting: Generate reports to analyze spending patterns.

Notifications: Automated notifications for bill due dates, overspending, and budget updates.

User Management: Secure access for family members with role-based permissions.

The system will leverage ServiceNow's workflow automation, reporting, and security features to provide a user-friendly and efficient solution.

Chapter 8: Proposed Work

The proposed system aims to develop a custom application in ServiceNow that records, manages, and analyzes family expenses in a structured manner. It allows users to:

Add expense records through a user-friendly interface.

Categorize expenses by type and date.

Store records securely in a database.

Generate automated reports using Python scripts.

View summary dashboards for monthly and yearly spending.

Export data for future financial planning.

Currently, families often use:

Spreadsheets: Manual entry and tracking of expenses.

Paper Records: Physical receipts and notebooks for expense tracking.

Mobile Apps: Various expense tracking apps with limited features and security concerns.

These methods have limitations, such as:

Disorganization: Difficulty in tracking and categorizing expenses.

Lack of Real-time Insights: Delayed understanding of spending patterns.

Security Concerns: Risk of financial data exposure.

Chapter 9: System Requirements

9.1 Hardware Components

Processor: Intel Core i3 or higher

RAM: Minimum 4GB (8GB recommended)

Storage: 256GB HDD or SSD

Internet Connection: Required for ServiceNow access

Monitor: Standard display

Server: Cloud-based ServiceNow instances (no specific hardware requirements for the user side).

Client Devices: PCs, laptops, or mobile devices with internet access and a modern web browser.

9.2 Software Components

Operating System: Windows/Linux/macOS

ServiceNow Developer Instance

Python 3.x

PyCharm or VS Code editor

ServiceNow Now Platform: The core platform for building and deploying the application.

Database: ServiceNow's proprietary database for storing expense data securely.

Web Browser: Modern web browsers (e.g., Chrome, Firefox, Edge) for accessing the application.

Mobile App: ServiceNow mobile app for accessing the system on-the-go (if required).

This system is designed to be scalable, secure, and user-friendly, making it an effective tool for families to manage their expenses efficiently. By leveraging ServiceNow's capabilities, the system can be easily customized and extended to meet evolving family needs.

Web Browser: Google Chrome or Firefox

Chapter 10: Task Initiation

The project was initiated by identifying the need for a system that could calculate and monitor family expenses efficiently. The planning phase included defining the project scope, gathering requirements from typical family scenarios, and selecting ServiceNow as the development platform due to its flexibility and database capabilities. The work plan was divided into modules such as form design, database creation, workflow automation, and reporting.

The following steps were taken during task initiation:

Problem identification and requirement study

Selection of development tools

Defining roles and responsibilities

Timeframe and module breakdown

Feasibility analysis

Chapter 11: System Design

The system design defines the overall structure of the expense tracking application. It includes architectural planning, module identification, and workflow mapping.

11.1 System Architecture Design

The system follows a client-server architecture using the ServiceNow platform.

Textual Representation of System Architecture:

User → Login to ServiceNow → Access Expense Tracker Application → Fill Expense Form →
Data Stored in ServiceNow Database → Python Report Script → Expense Reports Generated

11.2 Data Flow Diagram (DFD)

DFD Level 0 (Context Diagram):

User → [Family Expense System] → Displays Reports

DFD Level 1:

User → Inputs Expense Details → Expense Form → Stores Data → Expense Table → Processes
Data → Generates Reports → User

This system design ensures smooth data flow from user input to storage and finally to report generation.

Chapter 12: Literature Review

Several research studies and software applications have addressed financial management and expense tracking. Existing literature highlights the importance of maintaining detailed financial records to improve budgeting and savings. Traditional methods rely on manual entry, which often lacks accuracy and data analysis features. Recent studies support

automation and digital tracking of expenses to detect unnecessary spending and improve financial discipline. Research also emphasizes the role of dashboards and visualizations for monitoring financial health effectively. However, existing studies do not explore the use of ServiceNow for personal finance tracking, making this work unique.

Chapter 13: Implementation

The implementation phase involves converting the system design into a working model using ServiceNow and Python.

13.1 Module Identification

The system is divided into the following modules:

User Interface Module

Expense Entry Module

Expense Category Module

Database Management Module

Expense Calculation Module

Report Generation Module

Summary Dashboard Module

13.2 ServiceNow Table Creation

A custom table named “Family Expenses” is created with fields:

Expense ID (Auto Number)

Expense Name

Category (Food, Transport, Education, Medical, Others)

Amount

Date

Payment Method

Description

13.3 Form Design

A user-friendly form is designed in ServiceNow for expense entry. The form includes validation rules to avoid missing or incorrect data. Mandatory fields include Expense Name, Category, Amount, and Date.

13.4 Workflow Automation

A basic workflow is added to automate data entry and notifications. After each record is submitted, the system confirms successful entry and stores the record in the database.

13.5 Python Integration

Python is used to calculate total expenses from exported data for advanced analytics. Python scripts handle monthly and yearly expense reports. Data is exported from ServiceNow as CSV and processed using Python.

Example Python Logic:

Calculate total monthly expenses

Group expenses by category

Generate bar chart summary

13.6 Data Storage

Expense records are stored securely in ServiceNow's relational database with CRUD (Create, Read, Update, Delete) support.

13.7 User Roles and Permissions Two roles are defined:

Family Member: Can add and view expenses

Admin: Can edit and delete records

13.9 Input Design

Inputs are collected via the ServiceNow form.

Validation rules ensure:

Amount is a positive number

Date is in valid format (YYYY-MM-DD)

Category is selected from a dropdown

Mandatory fields (Expense Name, Category, Amount, Date) are not empty

13.10 Output Design

Main outputs include:

Confirmation message after saving an expense

List view of expense records with filters (date range, category)

CSV export of selected records

Graphical summaries (bar chart by category, line chart over time)

13.11 Database Design (ER Diagram - Textual Description)

Entities:

FamilyExpense(ExpenseID PK, ExpenseName, CategoryID FK, Amount, Date, PaymentMethod, Description)

Category(CategoryID PK, CategoryName, Description)

User(UserID PK, UserName, Role)

Relationships:

FamilyExpense.CategoryID -> Category.CategoryID (Many-to-One)

FamilyExpense.UserID -> User.UserID (Many-to-One)

13.12 Algorithms & Flowcharts (Textual)

Algorithm: Calculate Monthly Total

1. Input: month, year
2. Fetch records from FamilyExpense where date falls in month-year
3. Sum amount field
4. Return total

Algorithm: Category-wise Summary

1. Input: start_date, end_date
2. Fetch records in date range
3. Group records by category
4. For each category compute sum(amount)
5. Return dictionary {category: total}

13.13 Security Features

Role-based access control: Only authorized users can edit or delete records

Input validation to prevent malformed data

HTTPS for secure communication to ServiceNow

Regular backups using ServiceNow's backup features

Chapter 14: Testing and Results

14.1 Testing Strategy

Testing was conducted at multiple levels:

Unit Testing: Individual Python functions (e.g., total calculation)

Integration Testing: Exporting CSV from ServiceNow and processing with Python

System Testing: End-to-end expense entry, storage, and report generation

User Acceptance Testing (UAT): Family members tested the forms and reports for usability

14.2 Test Cases

Test Case 1: Add Valid Expense

Input: Food, 150.50, 2025-10-01

Expected: Record saved, confirmation displayed

Result: PASS

Test Case 2: Add Expense with Missing Amount

Input: Transport, <blank>, 2025-10-02

Expected: Validation error

Result: PASS

Test Case 3: Monthly Total Calculation

Input: Month = October 2025

Expected: Correct sum of all expenses in October

Result: PASS

Test Case 4: Category-wise Summary

Input: Date Range = 2025-10-01 to 2025-10-15

Expected: Correct grouped totals by category

Result: PASS

14.3 Sample Results

Assume the following sample data (exported CSV):

ExpenseID	ExpenseName	Category	Amount	Date
1	Groceries	Food	1200.00	2025-10-01
2	Bus Fare	Transport	150.00	2025-10-02
3	Medicines	Medical	300.00	2025-10-05
4	Tuition	Education	2000.00	2025-10-10
5	Dinner Out	Food	800.00	2025-10-12

Total for October 2025 = 1200 + 150 + 300 + 2000 + 800 = 4450.00

Category-wise totals:

Food: 2000.00

Transport: 150.00

Medical: 300.00

Education: 2000.00

Chapter 15: Program Code and Output

15.1 Description

A simple Python script to read a CSV file exported from ServiceNow and calculate total expenses for a given month.

15.2 Code

```
# family_expenses_total.py
```

```
import csv
```

```
from datetime import datetime
```

```
def read_expenses(csv_file):
```

```
    expenses = []
```

```
    with open(csv_file, mode='r', newline='', encoding='utf-8') as f:
```

```
        reader = csv.DictReader(f)
```

```
        for row in reader:
```

```
            # Expecting columns: ExpenseID, ExpenseName, Category, Amount, Date
```

```
            try:
```

```
                amount = float(row['Amount'])
```

```
            except ValueError:
```

```
                amount = 0.0
```

```
            date = datetime.strptime(row['Date'], '%Y-%m-%d')
```

```
            expenses.append({
```

```
                'id': row.get('ExpenseID',''),
```

```
                'name': row.get('ExpenseName',''),
```

```
                'category': row.get('Category',''),
```

```
                'amount': amount,
```

```
                'date': date
```

```

    })

    return expenses

def monthly_total(expenses, year, month):

    total = 0.0

    for e in expenses:

        if e['date'].year == year and e['date'].month == month:

            total += e['amount']

    return total

if __name__ == '__main__':

    csv_file = 'sample_expenses.csv' # replace with exported file

    expenses = read_expenses(csv_file)

    year = 2025

    month = 10

    total = monthly_total(expenses, year, month)

    print(f"Total expenses for {year}-{month:02d}: {total:.2f}")

```

15.3 Sample CSV (sample_expenses.csv)

ExpenseID,ExpenseName,Category,Amount,Date

```

1,Groceries,Food,1200.00,2025-10-01
2,Bus Fare,Transport,150.00,2025-10-02
3,Medicines,Medical,300.00,2025-10-05
4,Tuition,Education,2000.00,2025-10-10
5,Dinner Out,Food,800.00,2025-10-12

```

15.4 Sample Output

```
$ python family_expenses_total.py
```

```
Total expenses for 2025-10: 4450.00
```

Chapter 16: Discussion and Analysis

This project demonstrates how ServiceNow can be adapted from enterprise workflow automation to a household-level expense tracking system. The main advantages include centralized data storage, role-based access, and easy report generation. Using Python for post-processing provides flexibility for analytics and visualization. The simple CSV-based integration is practical for a college-level project; however, deeper integration (via REST APIs) can make the system more robust and real-time.

Implementing a Family Expense Management System on ServiceNow can revolutionize how families track and manage their expenses. By leveraging ServiceNow's capabilities, families can:

1. Centralize expense tracking : Store all expenses in one place, making it easier to monitor and analyze spending.
2. Automate expense categorization : Use ServiceNow's automation features to categorize expenses, reducing manual effort and errors.
3. Set budgets and alerts : Create budgets for different expense categories and set alerts for overspending, ensuring families stay on track.
4. Generate reports and insights : Use ServiceNow's reporting capabilities to gain insights into spending patterns and identify areas for improvement.

Analysis:

The benefits of using ServiceNow for family expense management include:

1. Improved financial visibility : Families can see their expenses in real-time, making it easier to make informed financial decisions.
2. Increased efficiency : Automation and centralized tracking reduce manual effort and minimize errors.
3. Enhanced collaboration : Family members can access and contribute to the expense management system, promoting transparency and accountability.
4. Scalability : ServiceNow's platform can adapt to changing family needs, making it a long-term solution.

However, it's essential to consider the following:

1. Cost : Implementing a custom solution on ServiceNow may require subscription fees or development costs.
2. Learning curve : Family members may need training to use the system effectively.
3. Data security : Families must ensure that sensitive financial data is properly secured and protected.

Limitations:

The current integration relies on manual CSV export/import which introduces latency.

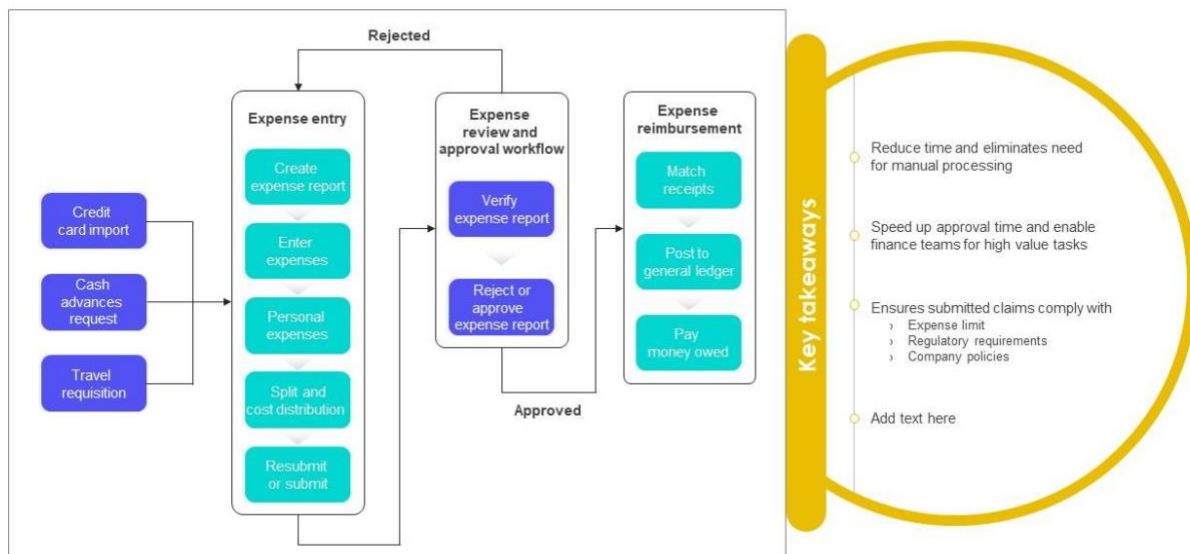
Visual dashboards inside ServiceNow may require additional configuration or licensing.

Mobile responsiveness depends on ServiceNow form design and family members' devices.

Chapter 17 :Block diagram

Flow chart for expense management process

This slide represents overall process flow with expense management. This slide includes expense entry such as create expense report, enter expenses, split and cost distribution, verify expense report and match receipts.



This slide is 100% editable. Adapt it to your needs and capture your audience's attention.

Chapter 18 : Conclusion and Future Scope

Conclusion: The Family Expense Tracking system built using ServiceNow and Python meets the objectives of automating expense recording, categorization, and basic reporting. The simple Python script demonstrates the ability to compute period totals effectively. The approach reduces manual effort and improves financial awareness for families.

The proposed Family Expense Management System on ServiceNow will provide a comprehensive solution for managing family expenses. By leveraging ServiceNow's capabilities, the system will offer a secure, scalable, and user-friendly platform for tracking expenses, setting budgets, and generating reports. This will enable families to make

informed financial decisions and improve their overall financial health. The system will be customizable, allowing families to adapt it to their specific needs and preferences.

Future Scope:

Implement real-time integration using ServiceNow REST APIs with Python clients.

Add graphical dashboards inside ServiceNow using Performance Analytics or embedded charts.

Implement recurring expenses and budget alerts.

Add multi-currency support and exchange rate handling.

Add mobile- friendly UI and push notifications for pending bills.