

POWERBI PROJECT

FINANCIAL EXPENSE OPTIMIZATION

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Class: III B.E CSE-C

1. PROBLEM STATEMENT:

A mid-size enterprise tracks expenses across departments such as HR, IT, Finance, and Operations. Despite stable revenue, operational costs are rising, causing profit margins to shrink.

Finance leadership wants better visibility into:

- Department-wise expense distribution
- Monthly spending patterns
- Expense categories contributing to overspending

Your role is to prepare a financial monitoring dashboard that helps management:

- Control unnecessary expenses
- Detect cost overruns early
- Support budgeting decisions

2. PROJECT OBJECTIVES

As a Business Intelligence Analyst, the scope of this project involves:

- **Data Transformation:** Cleaning and preparing financial expense data using Power Query.
 - **Expense Analysis:** Identifying spending patterns across departments and expense categories.
 - **Metric Calculation:** Creating DAX measures to calculate Total Expenses and Monthly Average Expenses.
 - **Dashboarding:** Designing an interactive Power BI dashboard to support financial decision-making.
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3. TOOLS & TECHNOLOGIES USED

- **Microsoft Power BI Desktop:** For data visualization and dashboard creation.
 - **Power Query:** For ETL (Extract, Transform, Load) and data cleaning.
 - **DAX (Data Analysis Expressions):** For calculating KPIs and custom measures.
 - **Dataset:** Organizational financial expense dataset (department-wise and category-wise expenses).
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4. DATA PREPARATION & MODELLING

Before analysis, the raw dataset was cleaned to ensure accuracy:

- **Data Cleaning:** Removed missing values, duplicates, and corrected data types for expense amounts and dates.
 - **Data Structuring:** Created Date, Department, and Expense Category fields for better analysis.
 - **Measure Creation:** Custom DAX measures were created:
 - **Total Expenses = SUM(Expense Amount)**
 - **Monthly Average Expense = Average of monthly total expenses**
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5. EXECUTIVE SUMMARY (KPIs)

- **Total Expenses:** ₹XX,XX,XXX
 - **Average Monthly Expense:** ₹X,XX,XXX
 - **Highest Spending Department:** Operations / IT
 - **Insight:** A few departments and expense categories contribute most of the total expenses, indicating areas for cost control.
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6. ANALYSIS: DEPARTMENT & EXPENSE CATEGORY

Department Analysis:

- Certain departments incur significantly higher expenses compared to others.

- Overspending departments can be clearly identified using visuals.

Expense Category Analysis:

- Categories such as Travel, Salary, and Marketing contribute the highest share of expenses.
 - Variable expenses show higher fluctuations than fixed expenses.
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7. MONTHLY EXPENSE TREND ANALYSIS

- Monthly expenses show noticeable fluctuations over time.
 - Expense spikes are observed during specific months, indicating possible seasonal or operational impacts.
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8. STRATEGIC RECOMMENDATIONS

Based on the analysis, the following actions are recommended:

1. Control High-Cost Categories:

- Set spending limits for major expense categories like travel and marketing.

2. Monitor Department Budgets:

- Closely track departments that consistently exceed budget limits.

3. Improve Budget Planning:

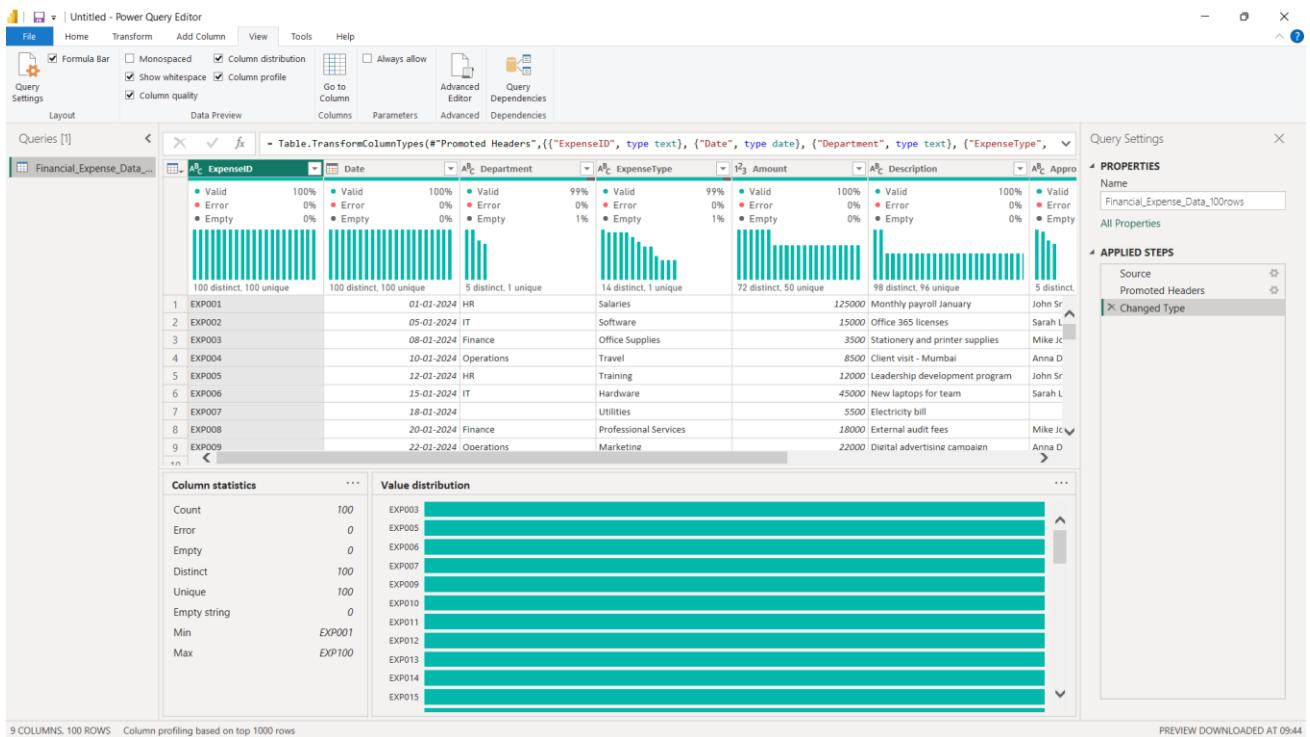
- Use historical expense trends to forecast and plan future budgets more accurately.

4. Regular Expense Reviews:

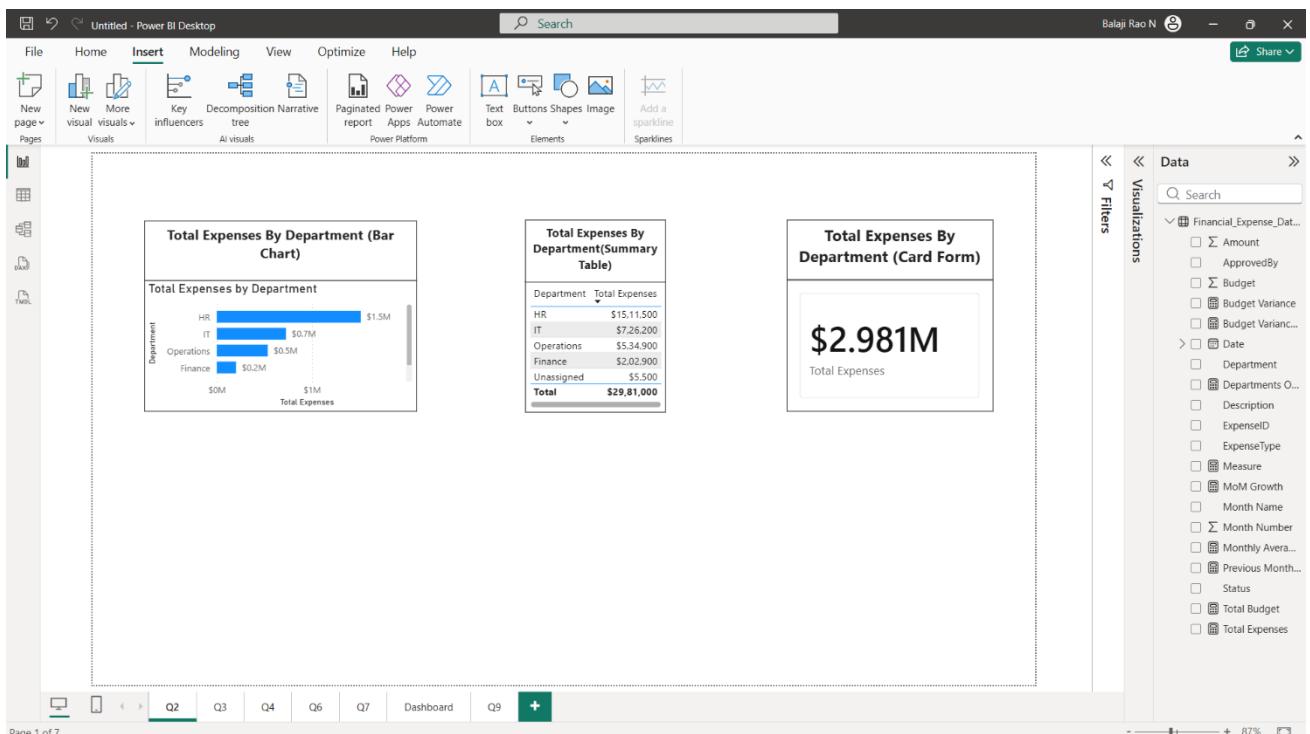
- Conduct monthly expense reviews to detect cost overruns early.
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9. TASKS PERFORMED:

1. Identify missing or inconsistent expense data.



2. Which departments incur the highest total expenses?



3. Analyze expense distribution across expense types.

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Untitled - Power BI Desktop

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Total Expense By Expense Type(Donut Chart)

Total Expenses by ExpenseType

ExpenseType... Salaries Hardw... Marketing Software Travel Profess... Cloud ...

\$1.3M \$1.4M \$1.3M \$1.3M \$1.3M \$1.3M \$1.3M

Total Expense By Expense Type(Clustered Column Chart)

Total Expenses by ExpenseType

ExpenseType

Total Expenses by Expense Type (Matrix Table)

ExpenseType	Finance	HR	IT
Cloud Services	\$1.3M	\$1.3M	\$1.3M
Employee Benefits	\$70,000	\$70,000	\$70,000
Hardware	\$1.3M	\$1.3M	\$1.3M
Marketing	\$1.3M	\$1.3M	\$1.3M
Office Supplies	\$31,200	\$31,200	\$31,200
Professional Services	\$137,500	\$137,500	\$137,500
Salaries	\$13,24,500	\$13,24,500	\$13,24,500
Software	\$1.3M	\$1.3M	\$1.3M
Total	\$2,02,900	\$15,11,500	\$15,11,500

Total Expense By Expense Type (Tree Map)

Total Expenses by ExpenseType and Department

Financial_Expense_Dat...

Search

Filters

Data

Visualizations

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4. How do monthly expenses trend over time?

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Total Monthly Expenses By Months(Line Chart)

Total Expenses by Month Number and Month Name

Month Name January February March April May June July August September October

Month Number 1 2 3 4 5 6 7 8 9 10

Total Expenses

Total Monthly Expenses By Months(Area Chart)

Total Expenses by Month Number and Department

Department Finance HR Operations Unassigned

Month Number 0 5 10

Total Monthly Expenses By Months(Table)

Month Name	Total Expenses	Previous Month Expense	MoM Growth	Month Number
January	\$2,64,000		0.00%	1
February	\$2,51,700		0.00%	2
March	\$3,09,300		0.00%	3
April	\$2,78,000		0.00%	4
May	\$2,93,700		0.00%	5
June	\$2,99,200		0.00%	6
July	\$3,18,900		0.00%	7
August	\$3,02,400		0.00%	8
September	\$3,29,000		0.00%	9
October	\$3,34,800		0.00%	10
Total	\$29,81,000	2646200	12.65%	

Total Monthly Expenses By Months(Clustered Bar Chart)

Total Expenses and MoM Growth by Month Name

Month Name October September July March August June May

Total Expenses MoM Growth

Financial_Expense_Dat...

Search

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5. Create DAX measures for Total Expenses and Monthly Average Expense.

Screenshot of Power BI Desktop showing the creation of a DAX measure named "Total Expenses". The formula is set to `SUM(Financial_Expense_Data_100rows[Amount])`. The Data pane shows the "Financial_Expense_Data_100rows" table with columns: ExpenseID, Date, Department, ExpenseType, Amount, Description, ApprovedBy, Status, Budget, Month Name, Month. The table contains 100 rows of expense data. The Power BI ribbon is visible at the top.

6. Compare actual expenses against budget using visuals.

Screenshot of Power BI Desktop showing four visualizations comparing actual expenses against budget:

- Actual Expenses Against Budget Using Visuals(Clustered Column Chart)**: A clustered bar chart showing Total Expenses and Sum of Budget by Department. The Y-axis ranges from \$0M to \$1.5M. Departments include HR, IT, Operations, Finance, and Unassigned.
- Actual Expenses Against Budget Using Visuals(Waterfall Chart)**: A waterfall chart showing the Variance of Budget by Department. It highlights increases (green) and decreases (red) from the total budget. The Y-axis ranges from -4bn to 4bn. Departments include HR, IT, Operations, Finance, and Unassigned.
- Actual Expenses Against Budget Using Visuals(Clustered Bar Chart)**: A clustered bar chart showing the Variance of Budget by Department. The Y-axis ranges from -4bn to 4bn. Departments include HR, IT, Operations, Finance, and Unassigned.
- Actual Expenses Against Budget Using Visuals(Gauge Chart)**: A gauge chart showing Total Expenses and Sum of Budget. The value is 2.98M.

The Power BI ribbon is visible at the top, and the Data pane on the right lists various columns and measures available for selection.

7. Identify departments exceeding budget limits.

The screenshot shows a Power BI Desktop interface with the following details:

- Dashboard Overview:** The dashboard contains three main visualizations:
 - A card titled "Department Over budget" showing "1 Departments Over...".
 - A table titled "Departments Exceeding Budget Limits(Table)" with columns: Total Budget, Total Expenses, Budget Variance, and Budget Variance %. The data shows 10500, \$11,700, 1200, and 0.11 respectively.
 - A matrix titled "Departments Exceeding Budget Limits(Matrix)" showing monthly expense data for Finance, HR, IT, Operations, and Unassigned departments across February through September.
- Visualizations Panel:** On the right, the "Visualizations" pane lists various chart and table types.
- Data Panel:** The "Data" pane shows the schema for "Financial_Expense_Data_100rows" with fields like Amount, ApprovedBy, Budget, etc.
- Page Navigation:** At the bottom, it shows "Page 1" and a navigation bar with Q2, Q3, Q4, Q5.

8. Design a financial monitoring dashboard.

The dashboard is titled "FINANCIAL EXPENSE OPTIMIZATION MONITORING DASHBOARD". It consists of several key components:

- Summary Metrics:**
 - Total Budget: \$3M
 - Total Expenses: \$2.981M
 - Budget Variance %: 0.09%
 - Budget Variance: 256K
 - Monthly Average Expenses: \$298.1K
- Detail Charts:**
 - Department Total Expenses vs Budget:** A bar chart comparing total expenses against budget for HR, IT, Oper., Finan., and Unas... departments.
 - Expense Distribution by Expense Type:** A donut chart showing the distribution of expenses by type: Salaries (14.09%), Hardw... (14.09%), Marke... (14.09%), Softwa... (14.09%), Travel (14.09%), and Profes... (14.09%).
 - Monthly Expense Trend Line:** A line chart showing total expenses over time from January to October.
 - Total Expenses By Month Wise:** A table showing monthly expenses and previous month values.
- Filters:** A section at the bottom with dropdown filters for Department, Month Name, and Expense Type.

9. What cost-control actions can be recommended?

The screenshot shows a Power BI Desktop interface with a dashboard titled "Cost Control Recommendations". The dashboard contains eight cards, each listing recommendations for cost control:

- IT Hardware Spending:**
 - Implement approval threshold of ₹40,000
 - Review all hardware purchases > ₹30,000
 - Consider lease options instead of outright purchase
 - Expected savings: 15-20%
- Travel Policy Enforcement:**
 - Set maximum per-trip limits by destination
 - Require advance booking (14+ days)
 - Use economy class for domestic travel
 - Expected savings: 10-15%
- Marketing Spend Review:**
 - Pause campaigns with low ROI
 - Consolidate vendors for better rates
 - Implement quarterly budget reviews
 - Expected savings: 12-18%
- HR Recruitment Optimization:**
 - Reduce external agency fees
 - Strengthen internal referral program
 - Negotiate annual contracts with job portals
 - Expected savings: 20-25%
- Software License Audit:**
 - Review all software subscriptions
 - Eliminate redundant tools
 - Negotiate volume discounts
 - Expected savings: 10-15%
- Cloud Services Optimization:**
 - Right-size cloud resources
 - Use reserved instances where possible
 - Implement auto-scaling
 - Expected savings: 15-20%
- Budget Process Improvement:**
 - Implement zero-based budgeting
 - Monthly budget review meetings
 - Department accountability dashboard
 - Rolling forecasts (quarterly updates)
- Expense Approval Workflow:**
 - Automate expense approval system
 - Multi-level approval for high-value items
 - Real-time budget vs. actual tracking
- Vendor Management:**
 - Consolidate vendors where possible
 - Annual contract negotiations
 - Payment term optimization
 - Master service agreements

The Power BI interface includes a ribbon bar with tabs like File, Home, Insert, Modeling, View, Optimize, Help, and a search bar. On the right side, there are sections for Data, Visualizations, and Filters, along with a visualizations pane showing a hierarchical tree of data fields.

10. CONCLUSION

This project successfully provides clear visibility into organizational expenses across departments, categories, and time. The Financial Expense Optimization Dashboard helps management control unnecessary expenses, detect cost overruns early, and make data-driven budgeting decisions.