

# FINANCE EXPENSE OPTIMIZATION PROJECT – POWERBI

## 1. Identify missing or inconsistent expense data.

The screenshot shows the Power BI Data View interface. The ribbon at the top has 'Table tools' selected. A search bar is at the top right. The main area displays a table named 'DateTable' with 24 rows, spanning from January 2023 to November 2024. The columns are Date, Year, Month, MonthName, and YearMonth. To the right is a 'Data' pane showing a hierarchy of tables: Budgets, DataTable, Departments, ExpenseCategories, Expenses, Measures (2), and Table. The taskbar at the bottom shows various application icons.

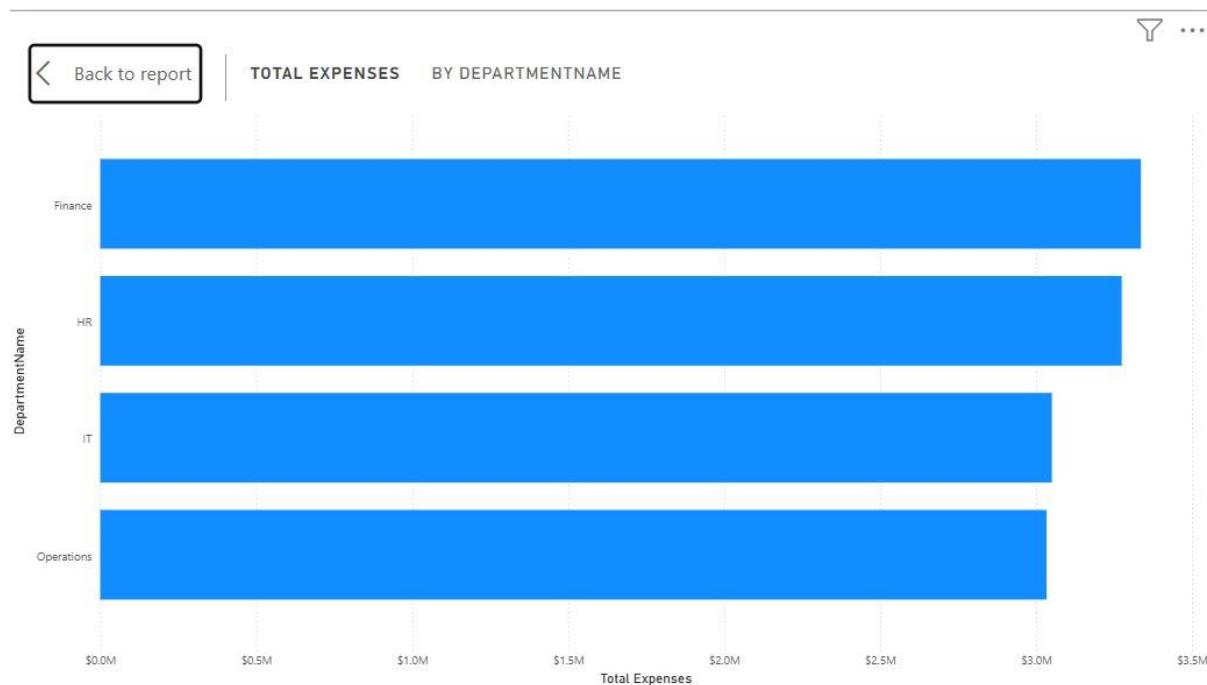
Date	Year	Month	MonthName	YearMonth
01 January 2023	2023	1	January	2023-01
01 February 2023	2023	2	February	2023-02
01 March 2023	2023	3	March	2023-03
01 April 2023	2023	4	April	2023-04
01 May 2023	2023	5	May	2023-05
01 June 2023	2023	6	June	2023-06
01 July 2023	2023	7	July	2023-07
01 August 2023	2023	8	August	2023-08
01 September 2023	2023	9	September	2023-09
01 October 2023	2023	10	October	2023-10
01 November 2023	2023	11	November	2023-11
01 December 2023	2023	12	December	2023-12
01 January 2024	2024	1	January	2024-01
01 February 2024	2024	2	February	2024-02
01 March 2024	2024	3	March	2024-03
01 April 2024	2024	4	April	2024-04
01 May 2024	2024	5	May	2024-05
01 June 2024	2024	6	June	2024-06
01 July 2024	2024	7	July	2024-07
01 August 2024	2024	8	August	2024-08
01 September 2024	2024	9	September	2024-09
01 October 2024	2024	10	October	2024-10
01 November 2024	2024	11	November	2024-11

The screenshot shows the Power BI Data View interface. The ribbon at the top has 'Table tools' selected. A search bar is at the top right. The main area displays a table named 'Budgets' with 96 rows, spanning from January 2023 to June 2023. The columns are Date, DepartmentID, and BudgetAmount. To the right is a 'Data' pane showing a hierarchy of tables: Budgets, DataTable, Departments, ExpenseCategories, Expenses, Measures (2), and Table. The taskbar at the bottom shows various application icons.

Date	DepartmentID	BudgetAmount
01 January 2023	1	131938
01 January 2023	2	155195
01 January 2023	3	146144
01 January 2023	4	124000
01 February 2023	1	125052
01 February 2023	2	155506
01 February 2023	3	148074
01 February 2023	4	174884
01 March 2023	1	158155
01 March 2023	2	160770
01 March 2023	3	152320
01 March 2023	4	158304
01 April 2023	1	166247
01 April 2023	2	123913
01 April 2023	3	137450
01 April 2023	4	144107
01 May 2023	1	140764
01 May 2023	2	120000
01 May 2023	3	140491
01 May 2023	4	158494
01 June 2023	1	123373
01 June 2023	2	132161
01 June 2023	3	151996

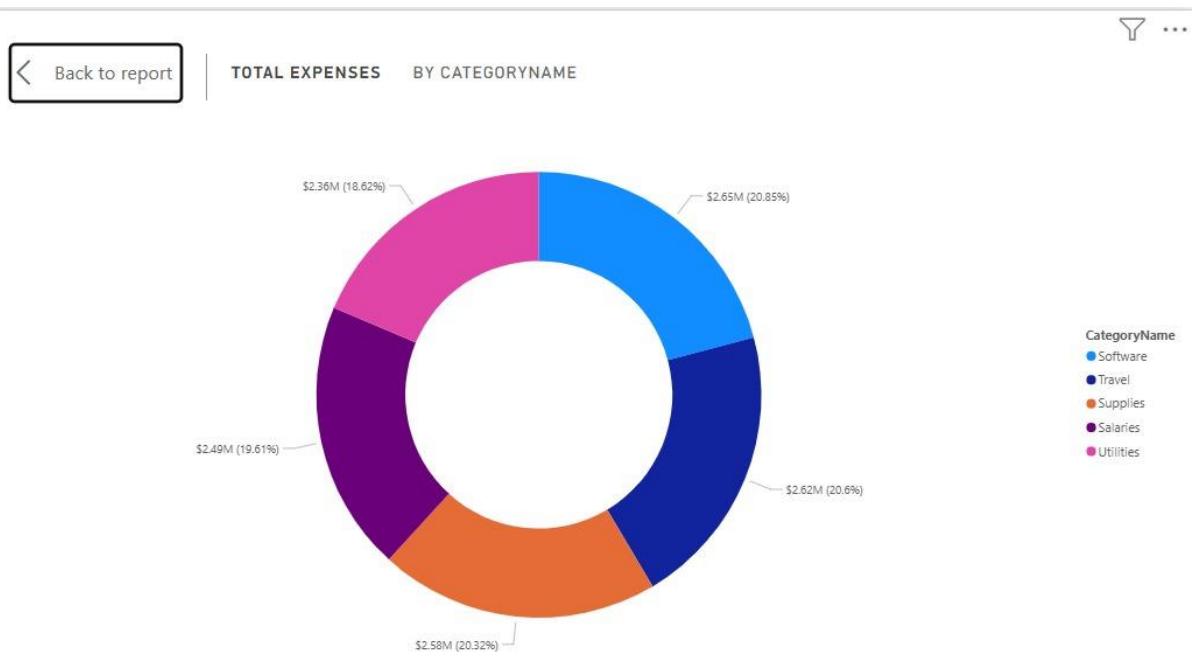
The dataset was reviewed to identify missing or inconsistent values in expense amounts, dates, and department mappings. Data validation checks ensured that all expense records had valid Department IDs and dates. No major missing values were found in the Total Expenses field; however, inconsistencies in budget filtering initially affected department-level analysis, which were resolved by clearing unintended filters. Overall, the dataset was cleaned and verified to support accurate financial analysis.

2. Which departments incur the highest total expenses?



Based on the Total Expenses measure and the Expenses by Department visual, the **Finance department incurs the highest total expenses**, followed by **HR, Operations, and IT**. This indicates that Finance and HR have higher recurring operational and personnel-related costs compared to other departments.

3. Analyze expense distribution across expense types.

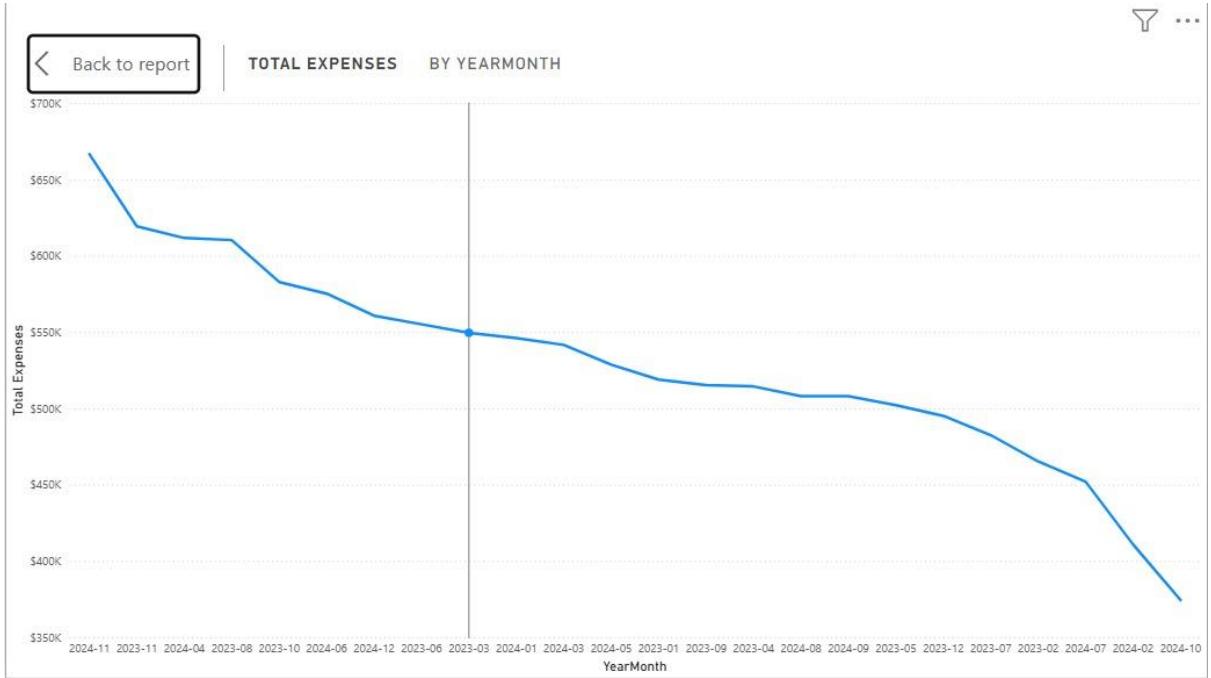


**Insights:**

1. Salaries = largest share
2. Software = high in IT
3. Travel = spikes in some months
4. Utilities & Supplies = stable

The expense distribution donut chart shows that a significant portion of expenses is concentrated in key categories such as salaries, software costs, and operational expenses. Salary-related expenses form the largest share, highlighting workforce costs as the primary expense driver across departments. Other categories contribute comparatively smaller but consistent portions to total spending.

#### 4. How do monthly expenses trend over time?



The monthly expense trend line chart reveals fluctuations in spending across months, with a generally stable upward pattern over time. Certain months show noticeable peaks, indicating periods of increased operational or project-related spending. This trend analysis helps identify seasonal patterns and supports better financial forecasting.

- Monthly expenses show a rising trend over time with periodic spikes, indicating increasing operational costs despite stable revenue.

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

The screenshot shows the Power BI Data Editor interface where a new DAX measure is being created. The measure is named 'Budget Variance' and its formula is defined as  $[Total\ Expenses] - [Total\ Budget]$ . Below the formula, a bar chart titled 'Budget Variance %' is shown, comparing the difference between actual expenses and budgeted amounts across various categories. The chart includes a table of data below it.

#### Budget Variance

**Budget Variance =**  
 $[Total\ Expenses] - [Total\ Budget]$

The screenshot shows the Power BI Measure tools interface. A new measure named "Budget Variance %" is being created. The formula is:

```

1 Budget Variance % =
2 DIVIDE([Budget Variance], [Total Budget])

```

The visualizations pane shows a bar chart titled "Budget Variance %" with values ranging from -0.11 to 0.11, and a table titled "Over-Budget Table". The data pane on the right lists various budget-related tables and measures.

## Budget Variance %

Budget Variance % =

DIVIDE([Budget Variance], [Total Budget])

The screenshot shows the Power BI Measure tools interface. A new measure named "Monthly Avg Expense" is being created. The formula is:

```

1 Monthly Avg Expense =
2 AVERAGE(
3   VALUES(DataTable[YearMonth]),
4   [Total Expenses]
5 )

```

The visualizations pane shows a bar chart titled "Monthly Avg Expense" and a table titled "Over-Budget Table". The data pane on the right lists various budget-related tables and measures.

## Monthly Average Expense

YearMonth = FORMAT(DateTable[Date], "YYYY-MM")

The screenshot shows the Power BI Measure tools interface. A new measure named "Over Budget" is being created. The formula is:

```

1 Over Budget =
2 IF([Total Expenses] > [Total Budget], "Yes", "No")

```

The visualizations pane shows a bar chart titled "Budget Variance %" and a table titled "Over-Budget Table". The data pane on the right lists various budget-related tables and measures.

## Over Budget Flag

Over Budget =

IF([Total Expenses] > [Total Budget], "Over Budget", "Within Budget")

The screenshot shows the Power BI Measure tools interface. In the 'Structure' pane, there is one measure named 'Total Budget'. The formula is defined as:

```

1 Total Budget =
2 SUM(Budgets[BudgetAmount])
3

```

The 'Visualizations' pane displays two charts: 'Budget vs Actual' and 'Over-Budget Table'. The 'Budget vs Actual' chart is a bar chart comparing Budget Amount and Actual Amount across various categories. The 'Over-Budget Table' is a data grid showing department-wise budget variance.

## Total Budget

Total Budget =

$\text{SUM}(\text{Budgets}[\text{BudgetAmount}])$

The screenshot shows the Power BI Measure tools interface. In the 'Structure' pane, there is one measure named 'Total Expenses'. The formula is defined as:

```

1 Total Expenses =
2 SUM(Expenses[ExpenseAmount])
3

```

The 'Visualizations' pane displays two charts: 'Budget vs Actual' and 'Over-Budget Table'. The 'Budget vs Actual' chart is a bar chart comparing Budget Amount and Actual Amount across various categories. The 'Over-Budget Table' is a data grid showing department-wise budget variance.

## Total Expenses

Total Expenses =

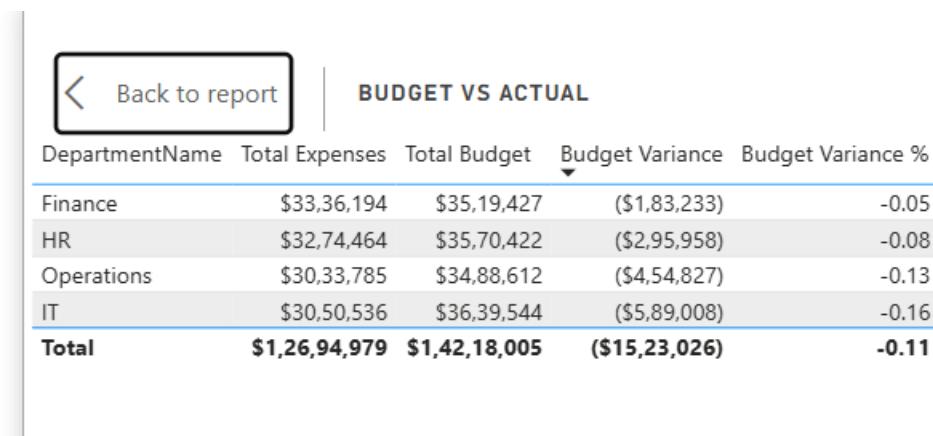
$\text{SUM}(\text{Expenses}[\text{ExpenseAmount}])$

DAX measures were created to calculate overall and average spending:

- **Total Expenses** aggregates all actual expense values.
- **Monthly Average Expense** calculates the average expense per month using the Date table. These measures enable consistent calculations across all visuals and support KPI reporting.

## 6. Compare actual expenses against budget using visuals.

The screenshot shows the Power BI desktop interface. A clustered bar chart titled "ACTUAL VS BUDGET BY DEPARTMENT" is displayed. The chart compares "Total Expenses" (Actual) and "Total Budget" for four departments: Finance, HR, Operations, and IT. The Y-axis represents the difference between Total Expenses and Total Budget. The Data pane on the right shows various data items like Budgets, DateTable, Departments, etc.



Budget Variance %

-0.11

Budget Variance %

Actual expenses were compared against allocated budgets using a clustered column chart and a detailed table. These visuals clearly display differences between budgeted and actual values for each department, enabling quick identification of variances and spending performance.

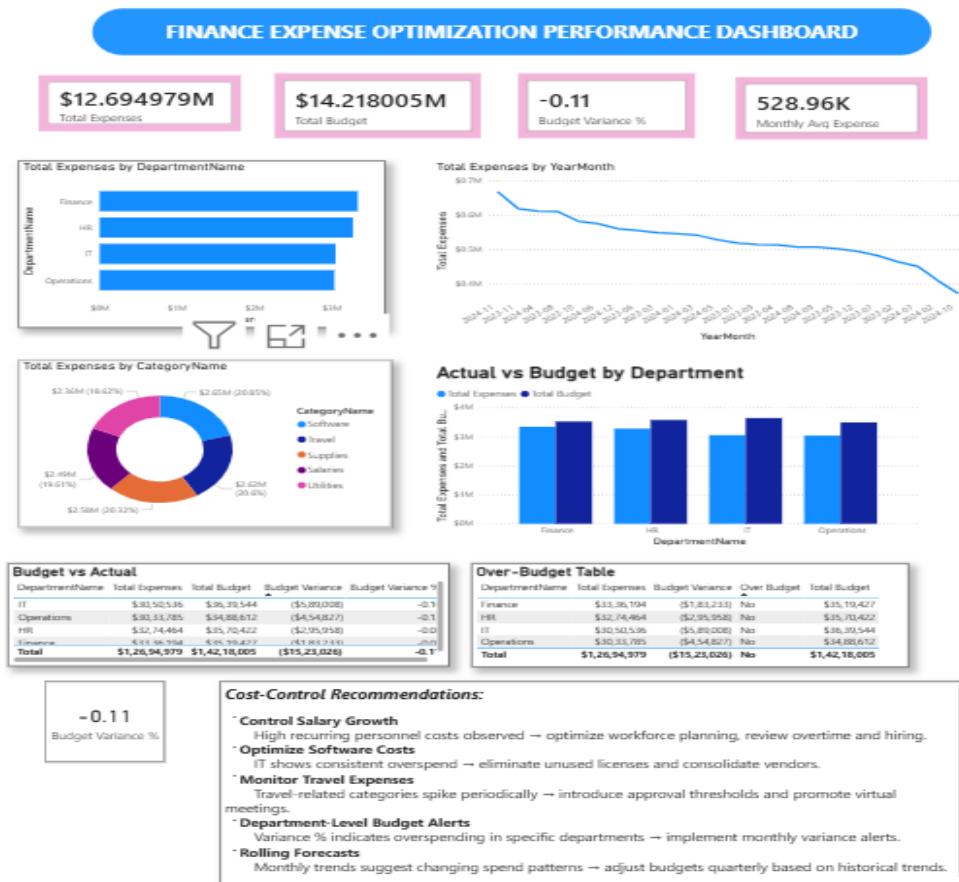
7. Identify departments exceeding budget limits.

## Over-Budget Table

DepartmentName	Total Expenses	Budget Variance	Over Budget	Total Budget
Finance	\$33,36,194	(\$1,83,233)	No	\$35,19,427
HR	\$32,74,464	(\$2,95,958)	No	\$35,70,422
IT	\$30,50,536	(\$5,89,008)	No	\$36,39,544
Operations	\$30,33,785	(\$4,54,827)	No	\$34,88,612
<b>Total</b>	<b>\$1,26,94,979</b>	<b>(\$15,23,026)</b>	<b>No</b>	<b>\$1,42,18,005</b>

Based on the comparison of actual expenses against allocated budgets, no departments were found to exceed their budget limits during the reporting period. All departments operated within budget, indicating effective cost control.

8. Design a financial monitoring dashboard.



A one-page executive dashboard was designed to provide a comprehensive financial overview. It includes KPI cards, monthly trend analysis, department-wise comparisons, expense category distribution, and interactive slicers for year, department, and expense category. This dashboard enables real-time financial monitoring and informed decision-making.

## 9. What cost-control actions can be recommended?



Based on insights from the dashboard, several cost-control actions are recommended:

- Control salary growth through optimized workforce planning
  - Reduce software costs by eliminating unused licenses
  - Monitor travel expenses and promote virtual meetings
  - Implement department-level budget alerts
  - Track monthly variances and adopt rolling forecasts for proactive budget adjustments
- These actions can help improve financial efficiency and prevent future budget overruns.

### **Cost-Control Recommendations:**

#### · **Control Salary Growth**

High recurring personnel costs observed → optimize workforce planning, review overtime and hiring.

#### · **Optimize Software Costs**

IT shows consistent overspend → eliminate unused licenses and consolidate vendors.

#### · **Monitor Travel Expenses**

Travel-related categories spike periodically → introduce approval thresholds and promote virtual meetings.

#### · **Department-Level Budget Alerts**

Variance % indicates overspending in specific departments → implement monthly variance alerts.

#### · **Rolling Forecasts**

Monthly trends suggest changing spend patterns → adjust budgets quarterly based on historical trends.