

Financial KPI Analysis for a Startup

Objective:

Analyse the key financial performance indicators (KPIs) for an early-stage startup, including Revenue, CAC, LTV, Burn Rate, Runway, and Cohort Retention. This analysis supports better strategic decision-making and investor reporting.

Tools Used:

- Python (Pandas, Matplotlib, Seaborn)
 - Power BI (Dashboarding and Visualization)
 - Excel (Model template and data export)
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Step-by-Step Process:

1. Data Cleaning and Preparation:

- Loaded the startup financial dataset using Pandas.
- Cleaned column names (removed symbols, standardized formats).
- Converted date columns to datetime and extracted Month-Year format.
- Removed duplicates and handled missing values by replacing them with 0.

2. Exploratory Data Analysis (EDA):

- Checked for nulls, duplicates, and outliers.
- Explored trends in Revenue, Customer Growth, Expenses.
- Visualized revenue and customer trends using matplotlib and seaborn.

3. KPI Calculations:

- $CAC \text{ (Customer Acquisition Cost)} = \text{Marketing Expenses} / \text{New Customers}$
- $ARPU \text{ (Avg Revenue per User)} = \text{Revenue} / \text{Total Customers}$
- $\text{Lost Customers} = \text{Last Month Total Customers} + \text{New Customers this Month} - \text{Current Month Total Customers}$
- $\text{Churn Rate} = \text{Customers Lost in a Period} / \text{Customers at the Start of the Period (Previous Month Total Customers)}$
- $\text{Average Lifespan} = 1 / \text{Churn Rate}$
- $LTV \text{ (Lifetime Value)} = ARPU \times \text{Average Lifespan (based on Churn)}$

- $\text{Burn Rate} = \text{Marketing} + \text{Operating Expenses} - \text{Revenue}$
- $\text{Runway Months} = \text{Cash on Hand} / \text{Burn Rate}$
- $\text{LTV:CAC Ratio} = \text{LTV} / \text{CAC}$
- Segmented customers based on LTV vs CAC into High, Breakeven, Low Value

4. Visualization in Power BI:

- Line charts for Revenue, CAC, LTV, Burn Rate over time
- KPI cards for CAC, LTV, Runway, LTV:CAC Ratio
- Interactive slicers for Month-Year, Revenue, Burn Rate
- Scatter plots and column charts for segment analysis

5. Cohort Analysis:

- Grouped customers by signup month (Cohort_Month)
- Simulated 12-month retention using decayed retention logic
- Created a retention matrix and visualized with a heatmap (matplotlib + seaborn)
- Converted the heatmap to a percentage view
- Saved the matrix to CSV and imported into Power BI for dashboard use
- Added bookmark and summary card (e.g. Avg Month 3 Retention) to dashboard

Key Insights:

- Revenue and customer base showed consistent growth over time.
- LTV consistently exceeded CAC in later months, indicating healthy customer acquisition strategy.
- Burn Rate decreased over time, extending Runway.
- Cohort analysis revealed stronger retention in recent cohorts, likely due to improved onboarding or product-market fit.

Deliverables:

- Python Notebook(Financial KPI Analysis.ipynb) :-
 - Financial KPI Analysis
 - Cohort Retention Matrix with CSV(cohort_retention_percentage.xlsx) + Visualization)
- Cleaned CSV Dataset (cleaned_startup_data.csv)

- Power BI Dashboard (Startup.pbix)
- PDF Report
- Excel Model Template (Startup_KPI_Model_Template.xlsx)

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Internship Project: Financial KPI Analysis for Startups

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