Midterm Qlik Project Paper
Analysis of Boston Checkbook Expenditures

Group 4

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ALY6070: Communication and Visualization for Data Analytics
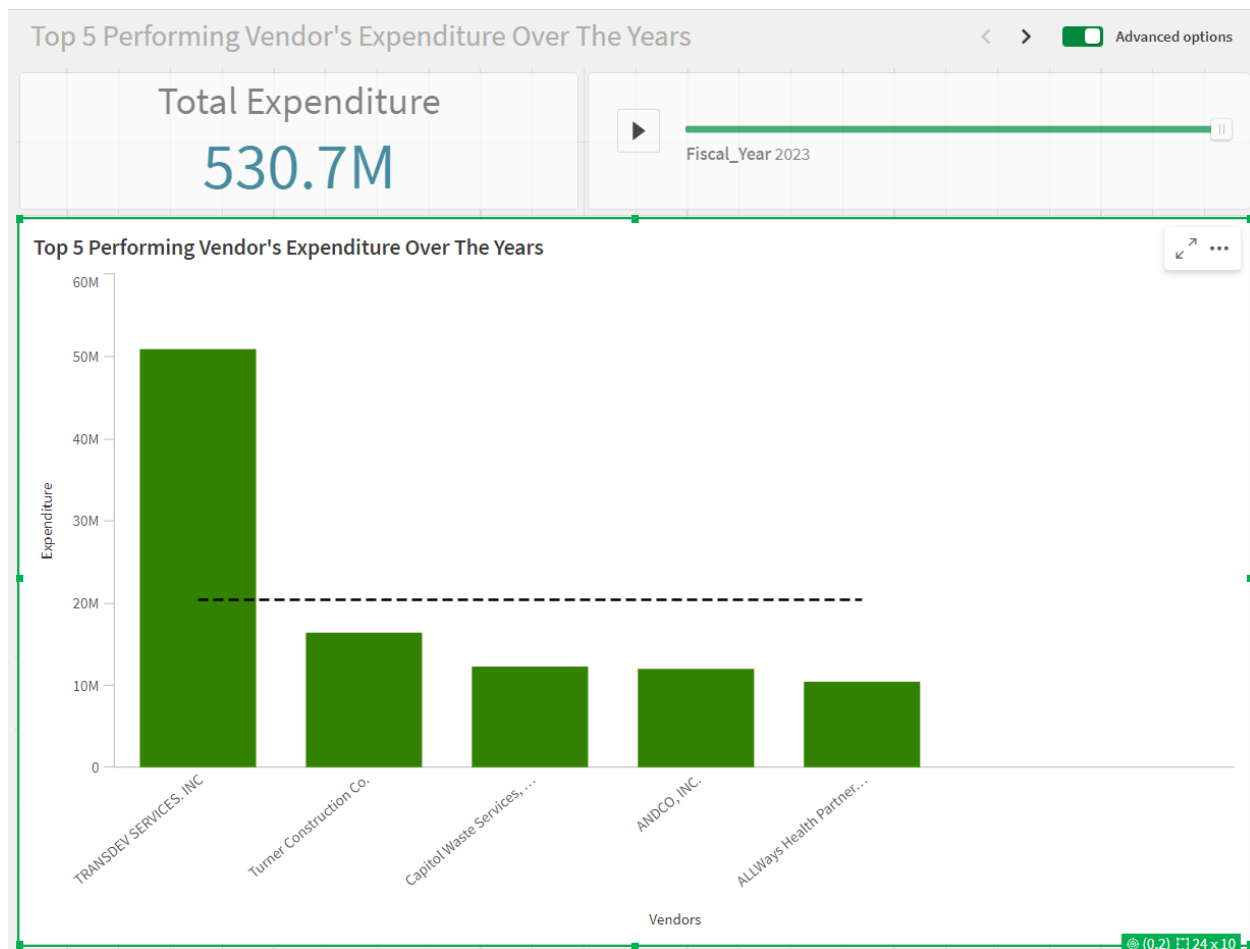Prof. Jack Bergersen
February 09, 2024

Overview:

This paper presents a comprehensive analysis of the Boston Checkbook Dataset, focusing on three pivotal research questions to elucidate the evolving expenditure dynamics of the top 5 performing vendors, departments, and accounts across fiscal years and months. The exploration aims to uncover patterns, trends, and potential influencing factors in expenditure allocation, offering valuable insights for strategic decision-making.

Analysis:

Research Question 1:

How has the expenditure of the top 5 performing vendors evolved over the years, and what factors contribute to the variations in their spending patterns?

Questions we asked about the data:
- What are the top 5 performing vendors in terms of expenditure?
- How much has the total expenditure on these vendors changed over time?
- Is there a relationship between the expenditure on a vendor and their performance?

Variables we used on analysis:
- Vendor_Name
- Fiscal_Year
- Monetory_Amount

Methods we used to analyze the data:
- We created a bar chart to show the total expenditure on each vendor for each fiscal year.
- We calculated the percentage of the total expenditure that each vendor accounted for.
- We analyzed the trends in the data over time.

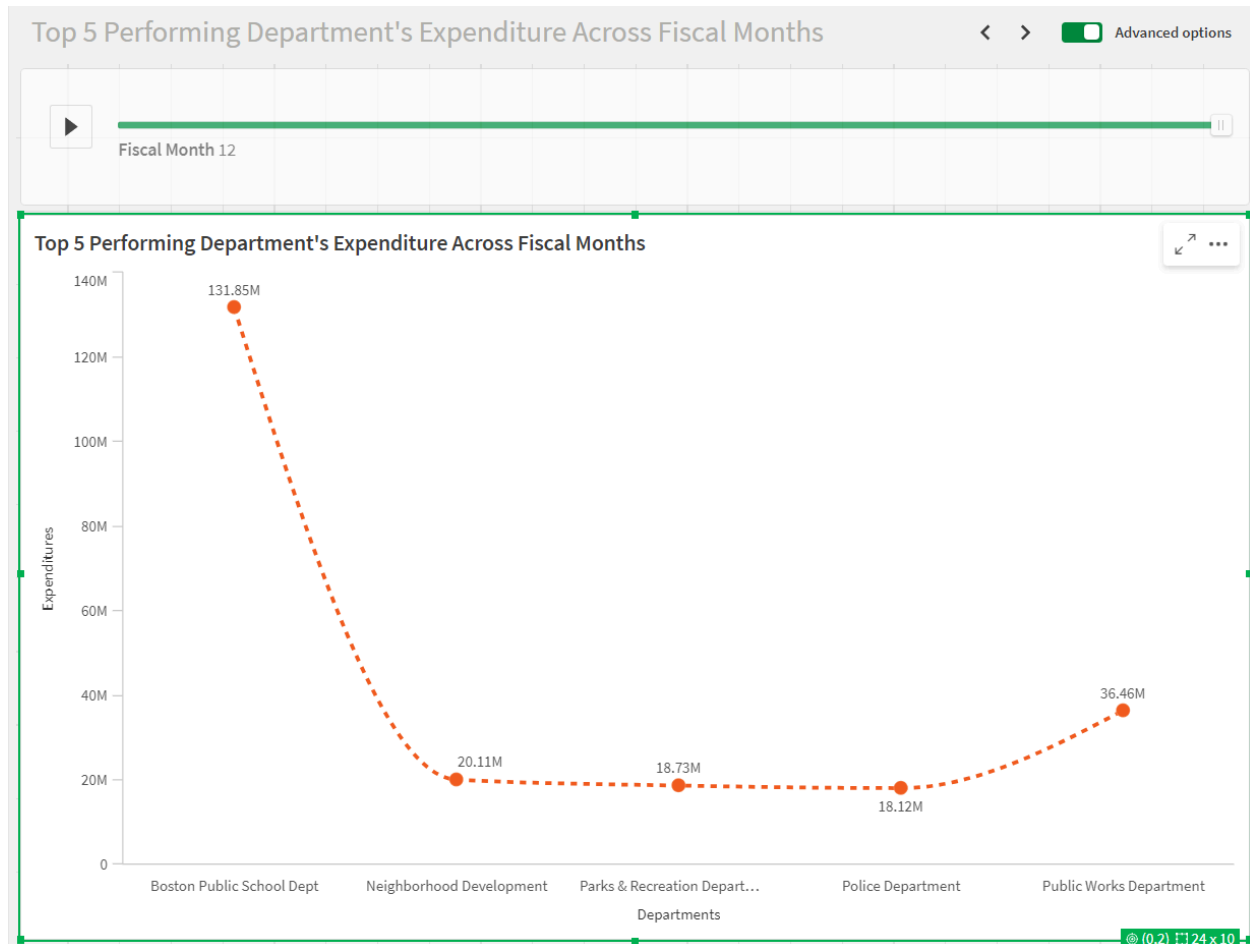**Possible Findings (dashboards and summaries):**
- The top 5 performing vendors in terms of expenditure are Transdev Services Inc., Turner Construction Co, Capitol Waste Services, ANCO, ING, and ALLWays Health Partners.
- The total expenditure on these vendors has been increasing over the years. In fiscal year 2023, the total expenditure was $530.7 million, which is more than double the expenditure in fiscal year 2020.
- The gap between the expenditure on the top vendor and the other vendors is increasing. In fiscal year 2023, Transdev Services Inc. accounted for 38% of the total expenditure, while the other four vendors combined accounted for only 22%.
- It is not possible to say from the graph whether the vendors are performing well or not. The graph only shows the amount of money that was spent on each vendor.

Design decisions we made:
- We chose a bar chart because it is a good way to make comparisons between different categories.
- We used a stacked bar chart to show the total expenditure for all vendors as well as the expenditure for each individual vendor.
- We labeled the axes and the bars clearly so that the graph is easy to understand.
- We limited the number of colors and chart elements to avoid making the graph too busy.

Research Question 2:

How does the expenditure of the top 5 performing departments vary across fiscal months, and what factors contribute to the observed spending patterns throughout the fiscal year?

Questions we asked about the data:

- What are the top 5 performing departments in terms of expenditure, across fiscal months?
- How has their expenditure changed over time?
- Is there a significant difference in expenditure between the departments?

Variables used in the analysis:

- Dept_Name
- Fiscal_Month
- Monetory_Amount

Methods used to analyze the data:

- We created a line graph to visualize the expenditure of each department over the fiscal months.
- We used the "Top 5" filter to focus on the departments with the highest expenditure.
- We sorted the departments by their total expenditure.

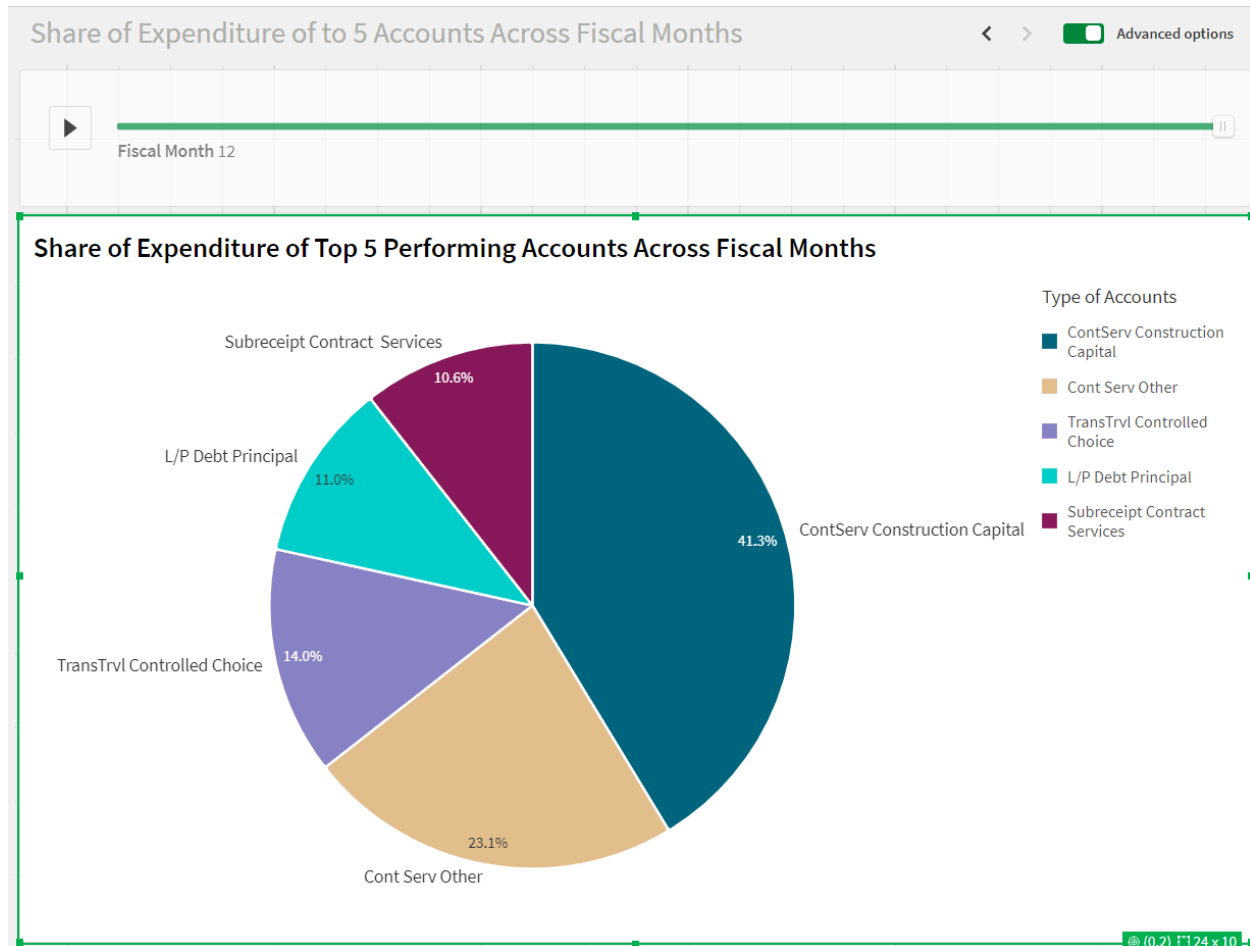**Possible findings (dashboards and summaries):**

- The Boston Public School Department, Neighborhood Development, Parks & Recreation Department, Police Department, and Public Works Department are the top 5 spenders.
- Overall, expenditure has been increasing across all departments over the fiscal months.
- The Boston Public School Department has the highest overall expenditure, followed by the Police Department and Parks & Recreation Department.
- There is a significant difference in expenditure between the top departments and the others.

Design decisions:

- We chose a line graph because it is effective for showing trends over time.
- We used a line for each department to make it easier to compare their expenditure.
- We sorted the departments by their total expenditure to highlight the top spenders.
- We labeled the axes and data points clearly to make the graph easy to understand.

Research Question 3:

What is the distribution of expenditure among the top 5 performing accounts across fiscal months, and how does this share evolve throughout the fiscal year? Additionally, are there any identifiable patterns or factors influencing the allocation of spending across these top accounts?

Share of Expenditure of Top 5 Performing Accounts Across Fiscal Months

Questions we asked about the data:

- What are the top expenditure categories across fiscal months?
- How does the distribution of expenditure change over time?
- Are there any significant trends or patterns in the data?

Variables used in the analysis:

- Account_Descr
- Fiscal_Month
- Monetory_Amount

Methods used to analyze the data:

- We created a pie chart with an animator to visualize the distribution of expenditure across fiscal months.
- We focused on the top expenditure categories throughout the animation.
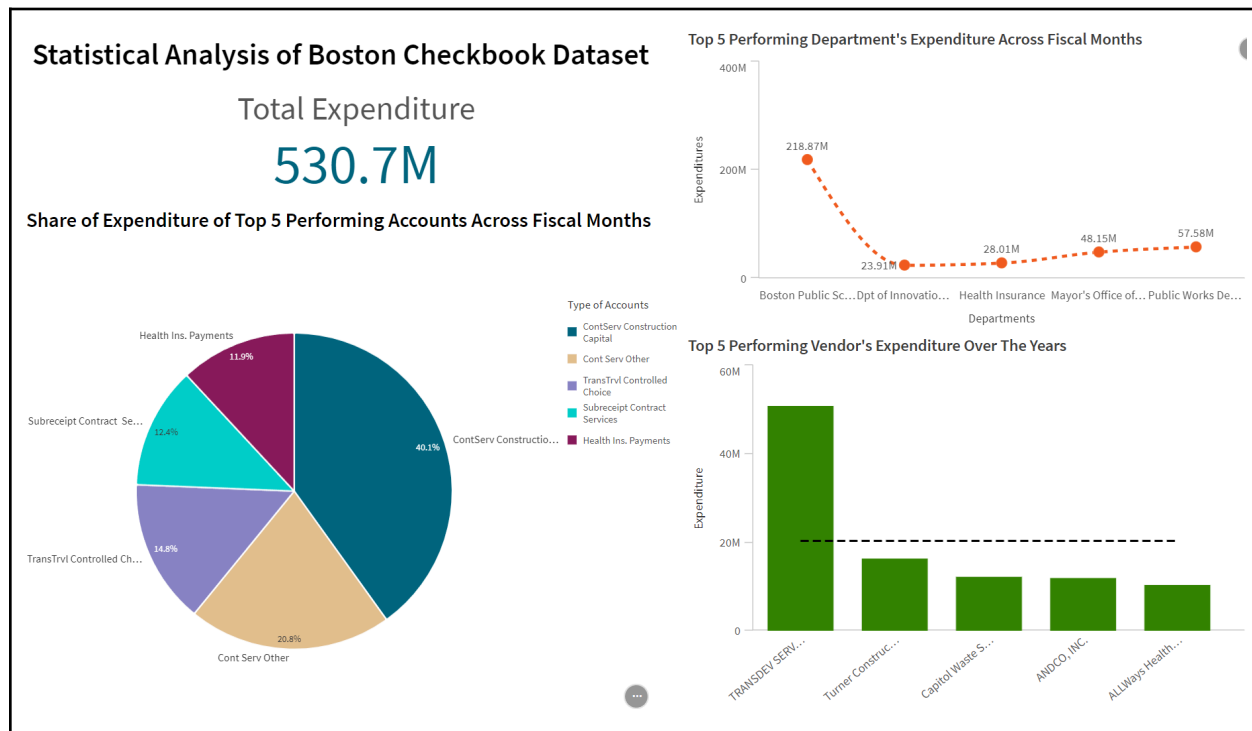- We analyzed the trends and patterns in the data over time.

Possible findings (dashboards and summaries):

- Based on the limited information available, we can identify some general trends:
  - **Capital Gate Services** appears to be the largest expenditure category throughout most fiscal months.
  - **ContServ Construction** and **L/P Debt Principal** seem to have significant expenditure, but their share might fluctuate across months.
  - **ContServ Other**, **TransTrvl Controlled Choice**, and **Subreceipt Contract Services** appear to be smaller expenditure categories.

Design decisions:

- We chose a pie chart because it is effective for showing the proportions of different categories within a whole.
- We used an animator to show the changes in expenditure distribution over time.
- We focused on the top expenditure categories to highlight the major areas of spending.

Dashboard:

Findings:

- In our exploration of the Boston Checkbook Dataset, we delved into three key research questions to unveil insightful patterns. Regarding the top 5 vendors, Transdev Services Inc. emerged as the frontrunner, witnessing a substantial doubling of total expenditure to $530.7 million by fiscal year 2023. The dominance of Transdev was notably pronounced, constituting 38% of the total spending in that year.

- Shifting our focus to the top 5 departments, we identified Boston Public School, Police, and Parks & Recreation as the primary spenders. Expenditure consistently ascended across all major departments, revealing a discernible spending gap between these leaders and others.

- Lastly, in examining the distribution of expenditure among the top 5 accounts, Capital Gate Services consistently claimed a significant share, while categories like ContServ Construction and L/P Debt Principal demonstrated notable fluctuations. Throughout our analysis, we made deliberate design choices, utilizing diverse visualizations, filters, and clear labeling to enhance comprehension and facilitate insights.

Conclusion:

In our analysis of the dataset, key findings illuminate significant shifts in expenditure patterns. Transdev Services Inc. emerged as the dominant vendor, witnessing substantial growth and accounting for a substantial portion of total spending. The top 5 departments, led by Boston Public School, showcased consistent expenditure increases, emphasizing a clear divide in spending between these entities and others. Additionally, our investigation into account distribution revealed consistent dominance of Capital Gate Services, while other categories exhibited noteworthy fluctuations. Design decisions, including the use of varied visualizations and clear labeling, enhanced the clarity of our findings. This comprehensive analysis contributes a nuanced understanding of expenditure dynamics, providing valuable insights for stakeholders and policymakers.

Citations:

- ➢ Dataset: source.
- ➢ Bar - Chart: source.
- ➢ Line - Chart: source.
- ➢ Pie - Chart: source.