

NEU Baja Budget

Shaun Khundker*

Brandon Archbald†

Yevhen Horban‡

ABSTRACT

For this project, we used financial data from the Northeastern Motorsports Club to visualize a breakdown of their yearly budget by funding sources and show where they are spending the most money by budget category. We used three different bar chart variations to display a budget summary for the NU Motorsports Club. For technology, we mainly used D3 to create our visualizations. Our web page url is hosted in this repository.

1 INTRODUCTION

The NU Motorsports Club needs to monitor their annual budget performance to observe club spending habits and present the club's financial performance to future sponsors. The account and expense logs are currently recorded in a Google spreadsheet that can be challenging to interpret unless you are a treasurer or already familiar with financial information. This project aims to simplify the data comprehension for the club's leadership and create presentable visualizations for sponsors. Here you can find links to the web page, the GitHub Repository, a video demonstration, and our presentation slides.

2 RELATED WORK

- “Data Visualization Literacy” [1] introduces a framework that supports visualizing temporal, geospatial, topical, and network analyses. This contributes to the overall effectiveness of the visualizations we may be creating on this project.
- “Data Visualization: A Practical Introduction.” [2] gives us insights on a more practical approach to visualizing our data especially since we're using real world data that affects people.
- “On visualisation of statistical data” [3] discusses the implications and usefulness of expressing data using quadratic models rather than your normal linear settings, and their visual benefits.
- “Challenges in Visual Data Analysis” [4] gives insight into some of the challenges that we face technologically in creating data visualizations and offers some solutions and tips to overcoming those hurdles.
- “Methods and Techniques in Data Visualization Model” [5] relates to how we are able to improve our visualizations and design them with a more methodical approach.
- “Visualization of financial information” [6] gives a broad overview of data visualizations that are involved in visualizing financial information and gives readers some tips and tricks that may help them create their own financial visuals.

- “Time-Pie visualization: Providing Contextual Information for Energy Consumption Data” [7] describes how to provide context for time-pie visualizations which is something we were hoping to take advantage of for this financial data.
- “Visualizing financial data” [8] shows a different approach to make sense of raw data through visualizations in the context of financial data.
- “Financial Visualization Case Study: Correlating Financial Time Series and Discrete Events to Support Investment Decisions” [9] addresses the implementation of visualizations to suit the user's needs in a financial context. This is specifically applicable to investment decisions which relates to how the club would invest their money.
- “Applying Animation to the Visual Analysis of Financial Time-Dependent Data” [10] this document provides some tips and tricks to working with unorthodox methods of visualizing financial data as we are aiming to make an animated visualization.

3 PARTNER

Our partner for this project is the leadership cabinet of the Northeastern Motorsports Club, also known as the Baja Club. Throughout the semester, we have had meetings with them to receive data, discuss expectations, and share our ideas about the final product. We are pleased to see that strong communication has led to a very successful development process.

3.1 Interview Reflection

The interview was very successful. It was nice to meet the captain of the club, Emily. We learned more details about Emily's goals with the visualizations and were surprised that the whole team might use them during the design process. We used this time to also make sure and set clear expectations for the work of this project and what we may be able to accomplish throughout the semester. The interview helped us to hone in on what visualizations were possible with Emily's data and focus on her needs. Emily was also able to walk us through the data which gave us all a much better understanding of the fields of the data and what they represented.

4 DATA

The data we are using is the purchase records for the Northeastern Motorsports Club. It was collected and transferred into an Excel sheet during the 2019-2020 season. This data includes the purchases made by the club from July 2019 until March 2020. We will be investigating some significant areas like Amount Spent, Budget Category, and Funding Sources. Upon receiving the data, we created our own CSV version so the data would be easier to analyze. In our CSV, we included Purchase Name, Budget Category, Budget Source, Amount Spent, and Total Amount categories to help us create the graphs we needed. A link to the sheet can be found here.

*e-mail: khundker.s@northeastern.edu

†e-mail: archbald.b@northeastern.edu

‡e-mail: horban.y@northeastern.edu

5 TASK ANALYSIS

Task ID#	Domain Task	Analytics Task (low-level, "query")	Search Task (mid-level)	Analyze Task (high-level)
1	Determine how much money is left in the budget for the year.	Summarize	Lookup	Present
2	Examine which funding sources are being used.	Compare	Lookup	Present
3	Examine which categories each funding source contributes to.	Summarize	Browse	Discover

Our visualization was developed to present the available data. During our interview, we were informed that the NU Motorsports leadership intends to use our visualizations to present summarized budget information to the team during the season and to sponsors during future budget pitches. Our goal is to allow them to interpret to which areas they are allocating the most resources. By having visual representations of the current and past budget breakdowns, we want to help the club make spending decisions both during and after their season.

To accomplish those goals we have laid out 3 main tasks to accomplish. The tasks are to determine how much money is left in the budget for the year, examine which funding sources are being used, and examine which categories each funding source is contributing to. We created a graph to address each of these tasks on our web page. These graphs all link to provide information on the total budget, Individual funding sources, and their contribution to the budget categories.

The primary users for our visualization will be the members of the NU Motorsports Club. Per our interview, we found that their main objective was to use our visualizations as a summary tool to help influence club spending decisions and present information in budget pitches.

6 EXECUTION AND DESIGN PROCESS

Figure 1: Horizontal bar chart sketch

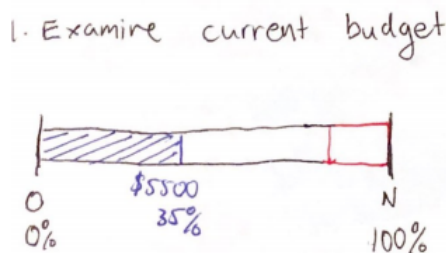


Figure 2: Proportional bar chart sketch

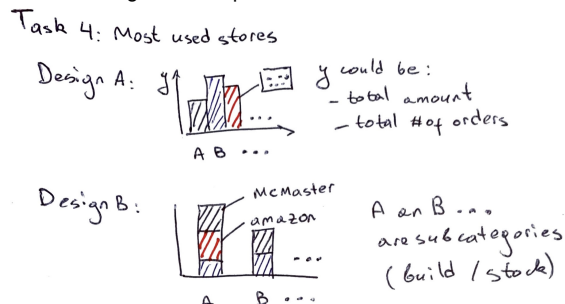
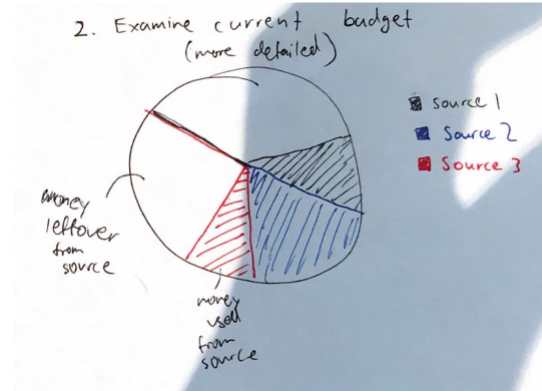


Figure 3: Pie chart sketch



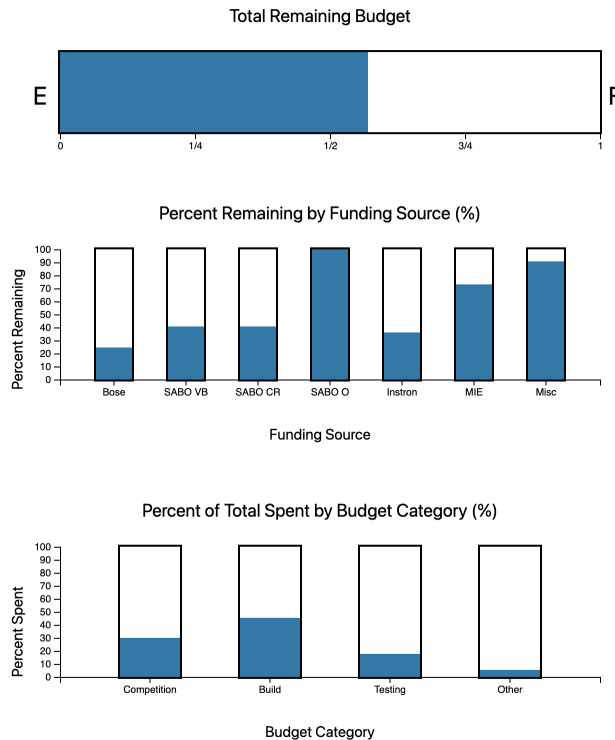
We created a webpage using JavaScript, HTML, and CSS. The webpage holds our interactive visualizations using a JavaScript library called D3. These tools allowed us to make the visualizations accessible and interactive through brushing, linking, and adding details on demand.

The first visualization is a 'fuel gauge' bar (horizontal stacked bar chart) representing the total budget. The second visualization is several smaller fuel gauges (proportional bar chart) representing each of the budget's funding sources. The third visualization is a proportional bar chart representing what budget categories the money from the selected funding sources was spent on. Notice that we have altered our original plan in the sketches and changed the third chart to a bar chart because we needed a way to represent that no money was spent in a budget category. Showing no data was possible using an empty bar with an outline in the third chart rather than a pie chart. The second visualization is linked to the first visualization and the third to allow for further data exploration.

The user can select each bar by clicking on them and unselect data by either clicking on the outside of the bars or clicking on the total budget. Some bars will change color if hovered over with a mouse to hint at clickability. They will also change color to represent the selection after a click to indicate to users what data is currently selected. The selection of bars in the second visualization updates the first visualization to show how much of the current budget is being used by the selected funding sources. We added this feature so that, upon further inspection, users could see how much of the budget was contributed by a funding source or multiple funding sources.

Selecting bars in the second visualization updates the third visualization and displays the proportion of the money spent in each budget category. If more than one funding source is selected, the resulting visualization will show the budget category breakdown for multiple funding sources together. Again, the goal here was to allow for a detailed exploration of the data. For example, users can see that all of the money spent from the MIE and MISC categories was spent on competition-related purchases, which is much less apparent at first glance. Our visualization has tooltips (details on demand) for each bar to show exact numbers and percentages.

7 VISUALIZATION DESIGN



Our visualization is compiled of 3 different major components. The first visualization is a 'fuel gauge' bar (horizontal stacked bar chart) representing the total budget. The second visualization is several smaller fuel gauges (proportional bar charts) representing each of the budget's funding sources. The third visualization is a couple of bar charts (proportional bar charts) representing what budget categories the money from the selected funding sources was spent on.

We have included multiple features to make the charts more interactive. Firstly, hovering over any of the bars reveals a tooltip that provides additional information for the specific bar users are hovering over. We thought that offering details on demand would be a quick way to give readers the details on specific areas of the visualizations. Secondly, clicking on the bars in the "Funding Sources" chart selects the data that was clicked on. Shift + clicking on the bars allows users to select multiple funding sources simultaneously for collective comparison if needed. When a funding source is selected, the associated bar remains blue while non-selected sources change to a grey color. We did this so users could identify which sources are selected and which aren't. The second visualization is linked to the first visualization as well as the third. The selection of bars in the second visualization updates the first visualization to show how much of the current budget is being used by the selected funding sources. This is visually apparent because the money in the budget contributed by the selected funding sources is highlighted in blue. Simultaneously, the rest of the bar turns grey to make it visually apparent to users. Selecting bars in the second visualization updates the third visualization and displays the proportion of the money spent in each budget category. If more than one funding source is selected, the resulting visualization will show the budget category breakdown for multiple funding sources together.

When creating the visualizations, we needed to make specific choices about what to include in the visualizations. We changed our mind about using a pie chart to represent the budget categories and used a percentage bar chart for the last chart because we needed to indicate when no purchases were made in a particular budget

category. One of the most important ones we made was that we did not use multicolored bars in order to avoid the complexity of the visualization. Since we are mainly focused on bars, we were wary that having them be multicolored may confuse users and make them think there is a correlation between color and the bars that would not have been there. We also added small animations so that, when data is selected, users can see the visualizations move up and down like fuel gauges.

8 DISCUSSION

Throughout this project, we learned a lot about visualizing data, working with our partner, and their budget's critical elements. When we started, we were thinking of various ways to visualize their data before we interviewed our partner to get an idea of what tasks we needed to complete. Still, our thoughts formed into actual designs after we were able to formulate concrete tasks. We learned about how, for this project, the visual encodings should be duplicated to simplify comprehension without making our visualization too complex. A big lesson was also working with our partner to create something they needed rather than make something cool to look at. In terms of the project itself, we were also able to learn about their budget and its key elements. For example, we learned that most of their budget was coming from the Bose funding source, and most of it was being spent on the Build category. The money spent on the build itself was something we expected.

9 CONCLUSION

This project aimed to help our partner visualize their budget, and we were able to successfully do that through the visualization that we created. The visualization consists of three bar charts for our partner based on the three tasks we formulated after interviewing them. The three bar charts were linked together and show the three main parts of our partner's budget, which includes overall budget, sources of funding, and budget categories, which is where the funds go. For future work, if the partner wanted to add more features, there is more data that the partner had that we could use to create more detailed visualizations that could be used for budget analysis. Furthermore, we could link their data source, which was from Google Sheets, to the visualization to update every time they made changes to it dynamically.

10 ACKNOWLEDGEMENTS

Thanks to our professor Cody Dunne, our TA's David Saffo and Megha Rao, and our partner Emily Kerr.

REFERENCES

- [1] K. Börner. Data visualization literacy. In *Proceedings of the 27th ACM Conference on Hypertext and Social Media*, HT '16, p. 1. Association for Computing Machinery, New York, NY, USA, 2016. doi: 10.1145/2914586.2914604
- [2] K. Healy. *Data Visualization: A Practical Introduction*. Princeton University Press, 2018.
- [3] F. Hussain and M. Sarfraz. On visualisation of statistical data. In *Proceedings. 1997 IEEE Conference on Information Visualization (Cat. No. 97TB100165)*, pp. 343–346, 1997.
- [4] D. A. Keim, F. Mansmann, J. Schneidewind, and H. Ziegler. Challenges in visual data analysis. In *Tenth International Conference on Information Visualisation (IV'06)*, pp. 9–16, July 2006. doi: 10.1109/IV.2006.31
- [5] Y. Li and S. Hou. Methods and techniques in data visualization model. In *2017 International Conference on Computer Technology, Electronics and Communication (ICCTEC)*, pp. 71–74, 2017.
- [6] M. Lux. Visualization of financial information. In *Proceedings of the 1997 Workshop on New Paradigms in Information Visualization and Manipulation*, NPIV '97, p. 58–61. Association for Computing Machinery, New York, NY, USA, 1997. doi: 10.1145/275519.275532

- [7] M. Masoodian, B. Endrass, R. Bühling, P. Ermolin, and E. André. Time-pie visualization: Providing contextual information for energy consumption data. In *2013 17th International Conference on Information Visualisation*, pp. 102–107, 2013.
- [8] J. Rodriguez and P. Kaczmarek. *Visualizing Financial Data*. Wiley Publishing, 1st ed., 2016.
- [9] E. Sorenson and R. Brath. Financial visualization case study: Correlating financial timeseries and discrete events to support investment decisions. In *2013 17th International Conference on Information Visualisation*, pp. 232–238, 2013.
- [10] T. Tekusova and J. Kohlhammer. Applying animation to the visual analysis of financial time-dependent data. In *2007 11th International Conference Information Visualization (IV '07)*, pp. 101–108, 2007.

11 GROUP CHARTER

11.1 Group Purpose

The primary focus of our project is to visualize the financial data for the Northeastern Motorsports Club from 2019 – 2020 such that it is useful in analyzing budgets for clubs in the future. Their expectations are to have a way to visualize their data to run their club more efficiently.

11.2 Group Goals

At a high level, the team wants to create three primary visualizations for our final product:

- A graph in the shape of a gas tank that shows the club's budget usage.
- An interactive pie or bar chart that shows the current expense breakdown of the club's funding sources.
- If the data allows, a historical analysis of how the club's expenses have changed/not changed over time.

Our process is informal but organized. We have set meetings and assigned work to each member but also work in an informal environment without hard deadlines unless there is a deliverable. We want this project to showcase our best work and to be of high quality such that our partner can reliably use it. We are aiming for an A for this course project.

11.3 Group Member Roles

Everyone is responsible for:

- Getting their assigned share of work done before due dates or on an agreed-upon deadline.
- Providing input and helping design the visualizations.
- Contributing to each written deliverable.

Everyone is responsible for:

- Getting their assigned share of work done before due dates or on an agreed upon deadline.
- Providing input and helping design the visualizations.
- Contributing to each written deliverable.

Yevhen Horban's roles are:

- Communications director: responsible for all communication between this group and the partner.
- Business analyst: responsible for understanding user needs and translating them into project requirements.

Shaun Khundker's roles are:

- Meeting facilitator: responsible for facilitating and organizing meetings as well as creating meeting plans.
- Technical lead: responsible for making sure the code is clean and any new technology that is introduced for the project.

Brandon Archbald's roles are:

- Information manager: Information manager: responsible for making sure everyone gets the necessary information to do their work and to coordinate with group members if something in the project has an issue.
- Quality assurance analyst: responsible for making sure everyone's work is up to standard and testing it if applicable.

11.4 Ground Rules

This group will be meeting once a week on Tuesday's at 8 pm on Zoom to discuss individual objectives for the week and any issues we have run into. If anything urgent comes up, members should immediately message the iMessage group chat to discuss how to deal with the situation. Discussions will be based on group deliverable that are due during the week and will be facilitated by the meeting facilitator. Decisions are final only if all three members are okay with it. If there were to be any dissenting views, the meeting facilitator will make sure it is being discussed in a reasonable manner. Each member is expected to put a significant/necessary amount of time into the project to excel at deliverable. This will vary based on roles and the deliverable each week.

11.5 Potential Barriers and Coping Strategies

We may face some challenges revolving around our data and the first visualization we are trying to accomplish. First, our data is rather limited right now so, depending on how much more we end up getting from our partner, it may limit what visualizations we may end up being able to create. Secondly, the first visualization we are trying to do is a moving gas meter. It may be hard to implement something animated into the final product as we have not had much experience doing something like that yet. We are looking into it and everyone is figuring out how to do something similar currently.

11.6 Group Charter Revisited

Our group has been working well over the last couple of weeks. We have not had any issues so far, and we enjoy working with each other. Everyone has been putting in their fair share of work and has been abiding by the agreed-upon guidelines. Each of us is comfortable with our roles, and we are willing to help each other out. At first, we had some grammar issues for this paper, but we solved it by making sure each group member proofreads the paper. Currently, we have a problem with working with the data straight from the Google sheet. We will need to figure out the best way to import and clean the data to be used. Our current solution is doing it by importing it as an Excel file and converting it to a CSV file.

12 APPENDIX A: INTERVIEW

12.1 Interview 1 Notes

Actual questions:

7. What is your goal with this data?
 - Visualize as they proceed throughout the season how much of their budget has been used and how much is available at a given point. (by source / category)
 - 1. Show How much of the budget is remaining
 - 2. What categories of Budget are drawing from the Budget
 - Their budget is categorized on what then can spend it on. (Transport, Tools, Outsourcing, Etc...)
 - We clarified that real time updating is going to be a secondary goal, but they want to be able to throw in different spreadsheet as needed
 - They have 2 years of data for use to work with (2019 -2020)
8. Who is going to be viewing the data, what for?
 - The entire team would be using it to interpret what/when they can spend their budget on.
9. What kind of data do you have? What are you keeping track of and how often?
 - a. See spreadsheet
10. What kind of information do you think will be able to help you plan out your budget?
 - a. Source of where you spent the money (i.e. McMaster, Home Depot etc.)
 - i. Where does the money go?
 - ii. Which ones are used most frequently?
11. Is there anything in your data that you could compare?
12. Is there anything you'd like to just view overall and give you an idea of your budget (or anything else)? (Is there anything you'd like to summarize overall?)

General Notes:

- Input everything they spend money on (Money in and out) into the sheet.
- Budget category is what we will break down
- Budget page has summarized stats
- Amount allocated is the planned amount to spend not the actual amount spent
- 2 Account they pay out of COE (College of Eng) and SABO

Use the data on the summarized spreadsheet in order to answer those original questions that we have specified in the question 1 column.

13 APPENDIX B: DATA EXPLORATION

13.1 Data types

The dataset includes the following variables: ordinal - date; quantitative - amount; categorical - supplier, budget category, account, shipped to, purchaser, and reimbursement; a mix of ordinal and categorical: receipt category. We will be working with most of the categorical and quantitative variables in the dataset for this project. More specifically, we will focus on the distribution of the total amount spent within subcategories of the budget and the frequency of purchases from specific suppliers. The data was generated manually after each purchase during the Baja season last year.

13.2 Potential issues

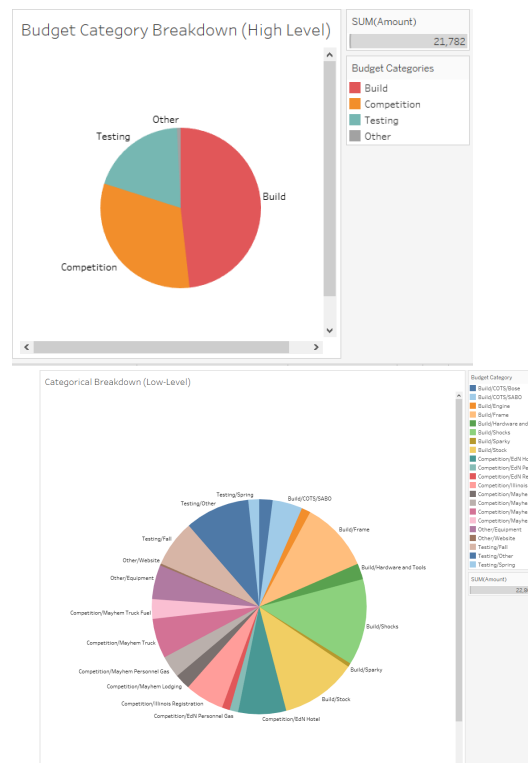
Potential issues with the dataset include a relatively frequent not assigned value in the categorical variables. The categories for which this occurs are not essential to our partner's visualization goals, but we will need to remember that these values exist when working with the data.

13.3 Insights

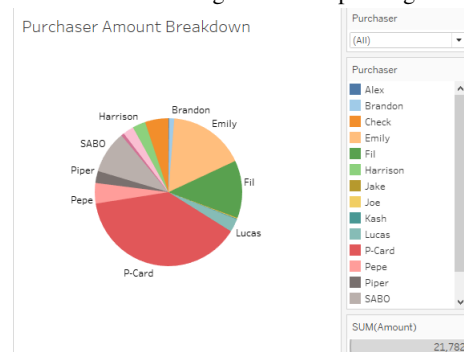
While looking at the data, we were pleased to find that our data is very clean and comfortable to manipulate. We used a couple of tools to explore the limits of our data, such as Tableau and Excel. We used software to create a couple of pie charts for the total amount spent by each budget category, the total amount spent by each purchaser, and the proportion of purchases that the club received reimbursements on. We noticed that most of our data fields are categorical, except for one important quantitative variable. The "Amount Spent" column is one of the only quantitative fields in the data, but also one of the most important as many of our visualizations will revolve around this variable. One major trend that we noticed is that the "Builds" category makes up almost half of the total spending in the budget. We thought this was interesting because, at first, we thought gas

costs would be the largest area of spending but have since observed that we were wrong about that. As we move forward, we expect to continue making categorical breakdowns that we may include in our final product because our partner had asked us to create such visualizations. Secondly, we need to think of a way to incorporate the "Budget" sheet included in the data to create a summary section that displays how much money remains in the budget.

13.4 Screenshots

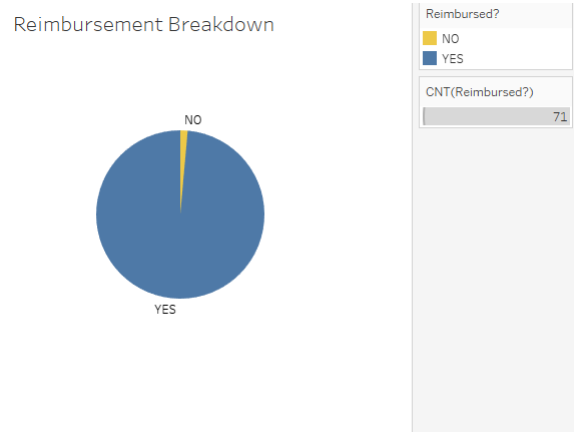


Amount spent by budget category: These two visualizations represent the total amount of money spent broken down into budget categories. We were able to gather this information from the "Purchase" section of our data. We decided to use pie charts to visualize the different categories because it helps display the proportion of spending that goes into each category. One interesting observation that we made was that the "Build" category is where most of the money was spent. We originally thought that gas spending would have been a huge cost, so we thought that the "competition" category would have been the largest area of spending.

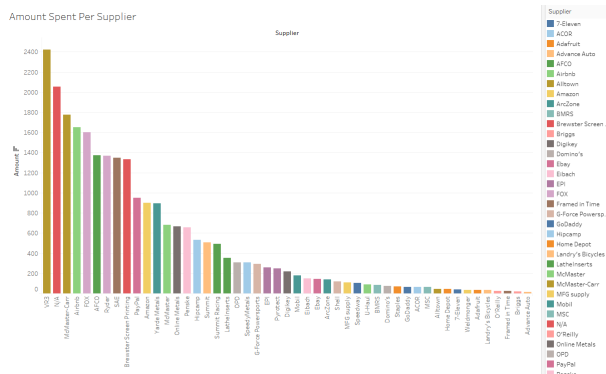


Amount spent by club member: Sometimes one of the club members fronts the money needed for purchases and is reimbursed afterward. We thought it would be interesting to see if any club members are usually shouldering the majority of this responsibility. Again we used a pie chart because we were trying to display

proportions. We also continued using the purchase data for this visualization. As we can see here, most of the spending for the club is charged on the club card, but Emily and Fil also front a sizable amount of the club spending needs.



Proportion of purchases reimbursed: As stated before the purchases are to be reimbursed to club members. We took a look at how many of those purchases the club reimbursed its members for. We used a pie chart to represent the proportion of the purchases the club members were reimbursed for since it showed the proportion clearly. We found that the club reimbursed the vast majority of the purchases that its members made. (Important to note that these reimbursements are accounted for in the total amount of money spent by the club)



Amount spent per supplier: This bar chart is looking at the amount of money spent per supplier. We were able to determine the supplier and the amount spent on each of them from the purchase data. Using bars helps visualize how much money was spent on each supplier (or no supplier at all in the case of the N/A category) relative to other suppliers, and color encoding helps us differentiate each supplier. One interesting observation is the "N/A" category made up a lot of the money spent by the club, meaning there was either not a supplier specified or they were from companies not considered suppliers.

14 APPENDIX C: DESIGN SKETCHES

Task 4: Most used stores

Design A: y y could be:
- total amount
- total # of orders

Design B: A and B ... are subcategories (build / stock)

Favorite. Yevhen Horban, sketches 1-2. These visualizations are using areas and colors as marks and bars as channels. Colors in the bar graphs are supposed to differentiate the bars or the subcategories within the bars. The height of the bars can represent either the total amount or percentage of a budget left. The visualization is marked with the task it is addressing.

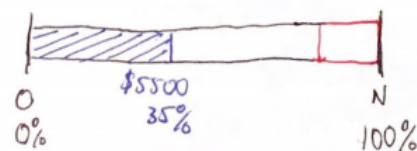
Task 1: Budget remaining

General overview + split into subcategories

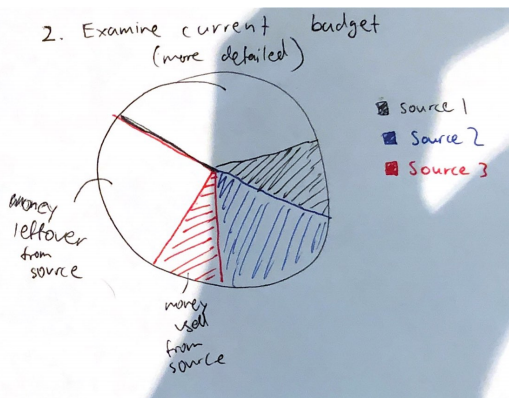
Design A: Design B: Design C:
Color encodes the amount left in each category.

Yevhen Horban, sketches 3-5. Color in the fuel gauge on the left highlights the viewers' attention to the state of the remaining budget. The two right visualizations color encodes the relative percentage of subcategories contributing to the total amount left as if different colored paint was mixed. The visualization is marked with the task it is addressing.

1. Examine current budget

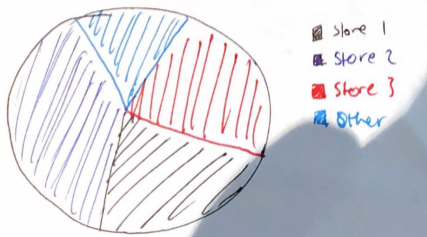


Shaun Khundker's Sketch 1: I chose to use a horizontal bar to represent the full budget and labeled it both in terms of the actual dollars and percentage of total budget. I used length as the mark. I also used horizontal position and length as the channels. The reason for these marks and channels is because length is the easiest for people to differentiate and it gives a clear idea of exactly how much of the total budget is used.

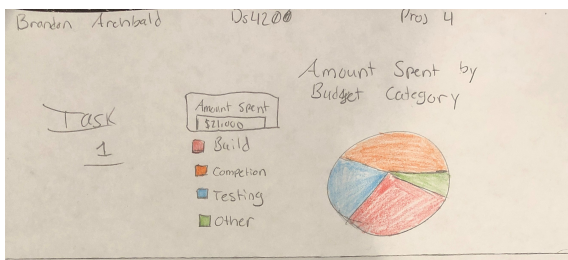


Favorite. Shaun Khundker's Sketch 2: I chose to use a pie chart to show exactly where the money is coming from and how much is left. I used the area as the mark. I also used area, color and tilt as the channels. The reason for these marks and channels is because this shows parts of a whole and using tilt and color easily distinguishes which source the money is coming from and how much of the budget has been used. It also easily shows the percentage of money used as a whole. This sketch addresses the first task in the task analysis which is examining the current budget in more detail than the first sketch.

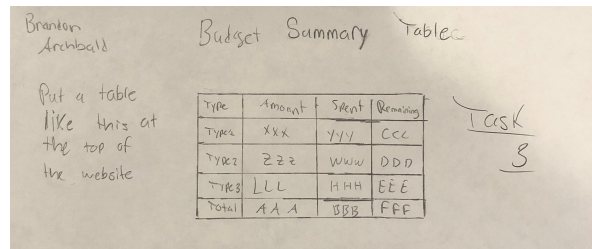
3. Which store is being used?



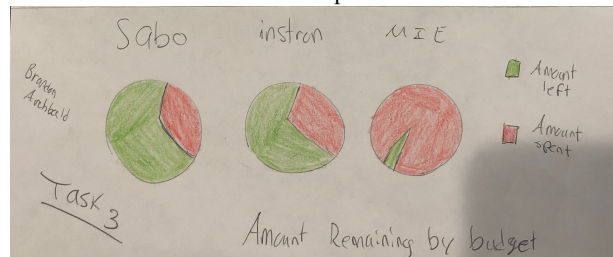
Shaun Khundker's Sketch 3: I chose to use a pie chart again to show what percentage of the expenses are coming from each store. I used the area as the mark. I also used area, color, and tilt as the channels. The reason for these marks and channels is because this also shows parts of a whole and the color is used to distinguish the different stores. This combination of marks and channels works well for showing parts of a whole. This sketch addresses the fourth task in the task analysis which is to determine which stores are being used the most often.



Brandon Archbald Sketch 1: This sketch includes a pie chart that breaks down the amount of money spent broken down by Budget Category. Part of Task 1 is to determine where the money is being spent so I thought representing that by Budget Category would be an effective method. As for my choices within the visualization, I used the size of the slices to represent the amount of the money spent, the colors to differentiate the categories, and included a total in the upper left to give users a sense of how much money is being represented in the pie chart.



Brandon Archbald Sketch 2: This is a table that breaks down the funding sources and shows how much money they got from each source and the amount they have spent out of all the sources. This directly touches on task 3 because it helps breakdown how much money is left in not only the total budget but each of their sources of funding. For encodings, I used different rows to represent each type of funding and the columns to represent the amount of funding, the amount spent, and the amount remaining in each source. At the bottom included a total row to help summarize the table.

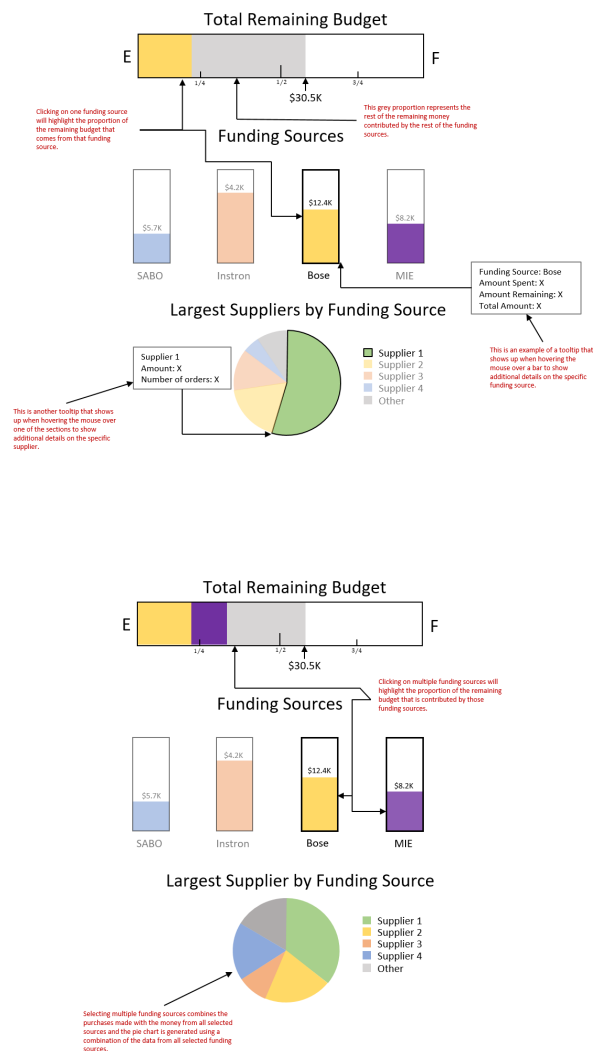
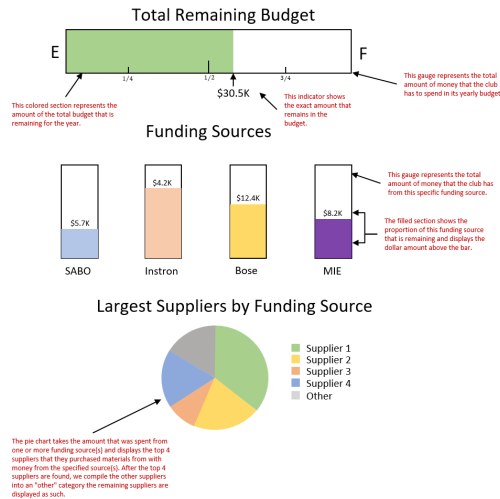


Favorite. Brandon Archbald Sketch 3: This visualization is a collection of pie charts that represents the amount of money left in each of the funding categories. This directly touches on task 3 as it would help us visually see how much money remains in each funding source. For my encodings, I used green to represent the amount of money left in each source and red to show the proportion of money spent. To represent the size of each proportion I used the size of each pie slice.

For our favorite visualizations, we selected them because we thought they were all viable explanations of how to represent the same information in different ways. The bar chart and both variations of pie charts are both effective methods of displaying the remaining budget. The one we end up choosing as the final design depends on our partner's feedback and the desired complexity of the visualizations. These three charts help us to see the trade-offs of choosing a certain design. Despite the fact that they have similar goals they also have different encodings that are effective in different ways.

For the bar charts, we have the added benefit of being able to see each funding source as its own individual bar and compare them side by side, but at the same time, we lose the direct display of the proportion of each budget we have left in each source. On the other hand, we can see the proportion of each budget source that is left very well in the pie chart designs, but we lose the side by side comparison aspect in this case. Perhaps using a stacked bar chart would help combine all three ideas a bit by allowing us to still have a side by side comparison of each funding source while also being able to see the proportion of each source that is left.

15 APPENDIX D: DIGITAL SKETCHES



Our setup for the visualizations we will create is mainly targeted at accomplishing tasks one, three, and four from our task analysis table. We prioritized tasks three and four because our partner is most interested in seeing how much money they spend from each of their funding sources and discovering the most frequent suppliers. With these goals in mind, we decided to create visualizations representing these aspects of the club budget. Our first visualization is a large horizontal bar at the top of the page that displays the total remaining budget., which addresses task three by visualizing the proportion and the number of remaining funds. The second visualization will use proportionally stacked bar charts for each club's funding sources, addressing task one by breaking down the budget into a more granular form and displaying how much money from each source remains. Finally, a pie chart will display the four most frequent suppliers for selected funding source(s) and shows the proportion and the amount of the money paid to each supplier. This third visualization directly links to the second one and changes depending on the selected bars. As our project has progressed, we have shifted our focus from more of a general analysis to focus on two specific areas of the budget per our partner's request. Otherwise, our final project goals remained unchanged.

16 APPENDIX E: REFLECTIONS

Brandon: Throughout the semester, communication has been an area that our group excelled at, and it made the entire process much easier. We generally communicated over a text group chat where we set weekly meeting times, talked about new ideas, and cleared up any misconceptions from other meetings. This made it so that when we met, we would get to work right away. Communicating with our partner was also a relatively seamless process. We would schedule Zoom meetings to talk about where we were in our approach and clarify their wants and needs for the project. The meetings were always quick and cleared up exactly what they wanted to be created and what was expected. Overall I was very pleased with the communication process between both our group and our partner.

Jake: This project has been one of my best experiences in terms of communication. My partners and I were very prompt in responding to the group chat messages and consistently met over zoom to work on the project. Having good communication allowed us to productively work together and stay on top of the project deliverables. I would not have changed anything about the communication with my team. The meetings we had with the partner were very concise and productive too. The only improvement I could think of is sticking to the official recurring meetings rather than email or text communication about our project's progress.

Shaun: Communication was excellent throughout the project. We used iMessage to talk to each other in a group chat for group members, and everyone was swift in responding. We also chose to have weekly meetings to work on the project together regularly and set up extra times if we needed to. Communication with our partner also went smoothly. Jake was the one who kept in contact with our partner. We set up meetings over Zoom, and there were no issues when we needed to talk about something. The meetings we've had were also productive as we planned. There isn't anything to improve in terms of how well we could communicate with each other and our partner. Still, we could have made it more seamless by using calendar invites that automatically updated if we needed to instead of planning them through text.

17 APPENDIX F: SLIDES

Our project presentation slides can be found here.