

DATA VISUALIZATION

Assignment 2

Interactive Web-Based Visualization

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STORY

I started this by first taking the dataset and analyzing it. I found several issues: values were incorrectly placed in wrong columns, multiple missing values existed, and field values lacked consistent formatting. Also, there were duplicated fields with minor differences in naming, such as “Compost”, “compost” and “Other”, “Others”.

To clean the data, I first dropped rows with multiple missing values. Since my analysis was focused on cost and category, I kept only the relevant fields and removed the rest. I then corrected misaligned values, standardized the data types for each column, and merged fields with inconsistent naming. For the “Vendor” column, I filled missing values by cross-referencing existing values in the “Category,” “Material Type,” and “Vendor” fields, ensuring logical consistency across the dataset. Where discrepancies existed, I made sure that the “Material Type” was consistently assigned to the correct vendor throughout the data.

Once the data was cleaned, I went to create a html page first I created a general page and divided it into 3 parts where part 1- 70% and part 2&3 were on top of each other in the remaining 30% with part 2 being 60% and part 3 being 40%. I decided that I would be doing a time-based visualization in part 3 and in part 2 I would be displaying my story. I titled Part 2 as “FROM MESS TO MESSAGE: WHAT SCU’S WASTE DATA REALLY TELLS US.” I initially hardcoded sample text to set up the layout. My main goal was to demonstrate how SCU’s waste management costs are distributed, and which areas are the most financially impactful. Essentially, I approached this project as a cost analysis exercise.

Once the structure got fixed, I moved on to Part 3, “Waste Cost Evolution Over Time.” I began with a simple bar chart to get the correct dimensions, then changed into a "Bar Chart Race" chart format, referencing examples from D3.js but modifying and enhancing it extensively. I assigned colors based on ranking rather than specific categories — Red for the top position, Blue for second, Purple for third, and Green for fourth — regardless of which category occupied that rank. I added a Replay button to restart the animation, along with Pause and Play buttons. I added a year clock to the bottom-right to indicate the current year during the animation. This visualization, based on “Cost,” “Year,” and “Category,” effectively shows how SCU’s waste management costs evolved over the years and which waste types became more dominant over time.

The primary focus of the page is Part 1, “BREAKING DOWN SCU’S WASTE MANAGEMENT COSTS.” I designed it to be interactive, controlled by a single “Waste” button. When clicked, two key charts appear on either side of the button, and a “Back” button becomes available to reset the layout to its initial state.

The first chart, “Spending Distribution Across Waste Categories,” is a donut chart that appears interactively when the user hovers over it. I assigned different colors to each waste category, with Red representing the highest cost and Green the lowest. From this chart, I found that Landfill (\$849k-34.7%) and Recycling (\$839k-34.3%) were the most dominant categories, together accounting for nearly 70% of SCU’s total waste management spend. Which gives the feedback that we should be reducing the landfill waste and improving recycling Efficiency. Compost (\$642k-26.3%) costs were also high, indicating that SCU’s composting operations may not be optimized. The Reuse(\$117k-4.8%) is the least costing category, but this could be used to reduce what ends in Landfill and Recycling by improving the Reuse efforts and SCU could save much on waste disposal and improve sustainability.

The second chart, “Concentrated Risk and Cost Overdependence,” is an improvised bar chart showing vendor-wise total waste management costs, arranged from highest to lowest. In this visualization, it is evident that Mission Trail is by far the dominant vendor SCU relies upon for waste disposal, far exceeding all other vendors. This heavy reliance poses a significant operational and financial risk. A recommended strategy would be to renegotiate terms with Mission Trail or explore alternative vendors to diversify SCU’s vendor base. If Mission Trail increases the price, then SCU has no other option than facing substantial impacts.