**Task 3: Reflection Paper**

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D601: Data Storytelling for Varied Audiences Task 3

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**A1. Explain how the purpose and function of your dashboard align with the needs outlined in the data dictionary associated with your chosen dataset**

The purpose of this dashboard is to provide actionable insights for executive leaders and data analysts by visualizing trends in hospital readmissions, charges, and service usage. The dashboard also helps them identify opportunities to improve operations and make data-driven decisions. This aligns with the dataset’s main goal of improving patient outcomes, lowering costs, and making hospital processes more efficient.

As for the function of the dashboard, it includes multiple visualizations and key metrics to highlight the variables and relationships described in the medical data dictionary. For example, the scatterplot titled “Relationship Between Total Charges and Length of Stay by Complication Risk” shows the correlation between complication risk, charges, and length of stay, highlighting the dataset’s focus on managing costs and improving patient care efficiency. Another example is the two metrics “Average Total Charges for All Patients” and “Average Length of Stay for All Patients,” which summarize overall costs and patient stay durations, providing a baseline for evaluating hospital performance.

**A2. Explain two different data representations from your dashboard, including how executive leaders can use them to support decision-making**

The first data representation from my dashboard is a scatterplot that shows the relationship between total hospital charges and length of stay, grouped by complication risk (High, Medium, Low). It shows that patients with higher complication risks tend to have longer hospital stays and higher total charges. Executive leaders can use this information by creating strategies to reduce costs and length of stay, such as implementing post-discharge care programs for high-risk patients.

The second data representation from my dashboard is a pie chart that shows the percentage of patients who used each hospital service, like Blood Work, Intravenous, CT Scan, and MRI. Blood Work is the most used service at 52%, followed by Intravenous at 31%, CT Scan with 12%, and MRI at 3.8%. Executive leaders can use this information to improve efficiency and prioritize funding for commonly used services like Blood Work, helping to enhance patient satisfaction.

**A3. Explain two interactive controls in your dashboard, including how each enables the user to modify the presentation of the data**

The first interactive control in my dashboard is the state filter, which allows users to select a specific state or multiple states to view data only to those areas. The state filter modifies the presentation of the data by updating all visualizations on the dashboard to show only the data for the selected area. This allows executives and analysts to compare trends across different states, helping them make location-specific decisions.

The second interactive control in my dashboard is the complication risk filter, which allows users to focus on specific risk categories (High, Medium, Low) by including or excluding these groups in the analysis. The complication risk filter modifies the presentation of the data by updating all visualizations on the dashboard to show only the data for the selected risk group. This helps executives and analysts analyze how complication risks influence outcomes like readmission rates, charges, and service utilization, enabling targeted interventions for high-risk groups.

**A4. Describe how you built your dashboard to be accessible for individuals with colorblindness**

To make my dashboard accessible for individuals with colorblindness, I used the Color Blind color palette for all visualizations on my dashboard, as colors in that palette are easily distinguishable by most users. This palette avoids problematic red-green combinations, which is the most common form of color blindness, “affecting around 6% of the male population” (Bassett, 2022, par. 4). I also added text annotations and tooltips to charts, such as percentages on the pie chart, to help users interpret the data without depending solely on color. White backgrounds with dark text were also used to ensure all information is clear and easy to read.

**A5. Explain how two data representations in your presentation support the story you wanted to tell**

The first data representation in my presentation is a scatterplot that shows the relationship between total hospital charges and length of stay, grouped by complication risk. It highlights that patients with higher complication risks tend to have longer stays and higher charges. This scatterplot supports the actionable insight I mentioned in my presentation about reducing costs and length of stay for high-risk patients. By showing that high-risk patients have longer stays and higher charges, it highlights the need for better care coordination and technology to manage these patients more effectively.

The second data representation in my presentation is a pie chart that shows the primary hospital services provided to patients. It shows that 52% of patients received blood work, 31% received intravenous, 12% received CT scans and 3.8% received MRI. This pie chart supports the actionable insight I mentioned in my presentation about optimizing frequently used services like blood work. By identifying blood work as the most commonly provided service, it highlights the need to improve efficiency in this area to enhance patient satisfaction.

**A6. Explain how you used audience analysis to adapt the message in your presentation**

Since I am presenting to both technical and non-technical audiences, I used audience analysis to tailor my presentation and effectively communicate key insights to each group. For technical audiences like data analysts, I emphasized statistical trends, such as the correlation between length of stay and total charges in the scatterplot categorized by complication risk. I also presented precise metrics like average total charges and average length of stay to give clear data points for deeper analysis.

For non-technical audiences like executive leaders, I avoided using technical terms and used straight-forward language to explain the charts and trends. I also emphasized actionable insights that align with executive priorities, such as reducing costs and length of stay for high-risk patients and optimizing frequently used services like blood work to improve efficiency and satisfaction. Additionally, I used engaging data visualizations, such as the pie chart and scatterplot, to quickly and effectively communicate key messages.

**A7. Describe how you designed your presentation for universal access by all audiences**

I designed my presentation to ensure universal accessibility for all audiences in several ways. The first way is I used a colorblind-friendly palette to make the data visualizations easy to distinguish for people with color vision deficiencies. The palette uses colors with strong contrast, avoiding problematic red-green combinations. I also added text annotations, labels, and tooltips to all visualizations so that users do not rely solely on color to interpret the data. The second way is I used simple visualizations like bar charts, line charts, pie charts, and scatter plots. These are easy to understand, even for users without a technical background. The third way is I included interactive filters, like state and complication risk, to let users customize the data view to fit their needs and focus areas. The fourth way is I used tailored messaging in my presentation to effectively communicate key insights to both technical and non-technical audiences.

**A8. Explain two elements of effective storytelling that you implemented in your presentation, including how each element was intended to engage the audience**

One element of effective storytelling that I implemented in my presentation is having clear and engaging data visualizations. I used clear and simple charts, like the scatterplot and pie chart, to make complex data easier to understand. The scatterplot showed the relationship between length of stay and total charges, grouped by complication risk, while the pie chart showed the distribution of patients by service type. These visualizations helped the audience quickly understand trends and insights, keeping them engaged and focused on the message. I wanted the audience to think about reducing costs and hospital stays for high-risk patients and optimizing common services like blood work to improve efficiency and satisfaction. The clearest example from the dataset is the scatterplot showing that high-risk patients tend to have longer stays and higher charges, highlighting the need for better care coordination and technology.

Another element of effective storytelling that I implemented in my presentation is having actionable insights. I concluded the presentation with two actionable insights: reducing costs and hospital stays for high-risk patients and improving efficiency and satisfaction in frequently used services like blood work. These insights directly connected the data to meaningful actions, keeping the audience engaged and focused on the results. I wanted to persuade the audience to focus on prioritizing resources for high-risk patients and improving efficiency in blood work processes, given its high utilization rate. The clearest example from the dataset is the pie chart showing that 52% of patients received blood work, making it the most common service. This highlights the need to optimize processes in this area to improve hospital efficiency.

**References**

Bassett, J. (2022, October 16). *Colour blindness and tableau*. The Data School. https://www.thedataschool.co.uk/jamie-bassett/colour-blindness-and-tableau/