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D601 – Data Storytelling for Varied Audiences

Task 3: Reflection Paper

10/23/2024

Report: Data Representation and Reporting

The goal of the data analysis is to investigate the data surrounding readmissions for a national hospital group and provide this information on a data dashboard so that stakeholders may easily explore the data, identify trends, compare key metrics, and ultimately make informed business decisions towards reducing readmissions. The dashboard features four data representations: two maps showing the percentages of readmission and average number of comorbidities by state, as well as a bar graph showing readmission by complication level and days admitted, with a fourth visualization represented by a line graph showing the percent readmission versus dietary habits. Each of the four visualizations points towards unique possible influences of readmission, which can support decision making, as discussed below.

Executive leadership are interested in implementing new policies and operations to improve patient care and outcomes. Using the dashboard, the Senior Vice President (SVP), the Vice President of Research (VP), and the Panel of Regional Vice Presidents (Regional VPs) can use various data representations from the Tableau dashboard to guide their decisions.

A barcode on a white background

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Figure 1: Readmissions by Complication Level and Days Admitted

Figure 1 shows a side-by-side comparison of the affects of complication levels at admittance and initial days admitted on readmission. While it is clear that complication level has virtually little to no affect on readmission, the graphic does visualize the stark difference in whether or not a patient is readmitted and how long their initial stay was. Patients that are released before 50 days of hospitalization are almost never readmitted. Conversely, patients released after 58 days of hospitalization are almost always readmitted. Overlap of the two possibilities occurs between 52 and 58 days, which could indicate that metrics for hospital release need to be revised as well as support post-hospitalization for extended-stay patients.

A map of the united states

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Figure 2: Map of Percent Readmission by State

Figure 2 displays a map of the United States, with the darkness of the blue hue indicating the relational percentage of readmission for each state. Darker blues mean higher remittance. This can be used by Regional VPs to identify which areas and hospitals need attention and program modifications.

The insights provided by the dashboard’s data representations are enhanced by the presence of two interactive controls. Figure 3 shows sliders that can be used to identify which states are confined between the respective values. Sliders are present for both of the maps.

A screenshot of a graph

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Figure 3: Sliders and Legends for Maps

Seen in Figure 4, further insight can be gleaned from interactive controls that filter the values that are included in the line graph in the bottom right corner of the dashboard. Each box can be either checked or unchecked. Patients of various conditions can be included or excluded from the data included in the line graph.

A screenshot of a survey

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Figure 4: Filters for Line Graph

Individuals with colorblindness represent approximately 4% of the population and there are several forms depending on the type of cone affected. For example, a lack of long-wave cones renders the color red indistinguishable, leading to a condition known as protanopia. Similarly, the absence of medium-wave cones results in deuteranopia, affecting the perception of green. Lastly, the rarest form is tritanopia, which diminishes the ability to see blues due to the absence of short-wave cones (Wexler, 2017). These variations in color vision can significantly impact how data is perceived and interpreted, making it essential to consider accessibility in design and communication.

Several features of the dashboard were designed to be accessible for individuals with colorblindness. Red-green color schemes were avoided and replaced with more accessible orange-blue pairings. Hue was considered as well. As seen in Figure 1, information was also communicated without color by relying on variations in length, size, and orientation. Interactive maps showed regional densities of various dimensions, with geographical borders and text colored light grey, and dimensions displayed in blue with size indicating number of customers fitting the filtered dimension.

The goal of the presentation was to communicate key insights derived from the data surrounding hospital readmission for executive leadership to utilize to implement new policies and operations to improve patient care and outcomes. Figures 1 and 2 support this goal. As previously explained, Figure 1 demonstrates the relationship between initial days of admission and readmission. Figure 2, demonstrates readmission geographically. In conjunction with other visualizations, these figures point towards how and where hospital executives need to make changes to reduce readmission.

Audience analysis involves understanding the characteristics, needs, and expectations of an audience to effectively tailor communication. First, the audience needs to be identified. For a data analyst, the audience will be compromised of key stakeholders. For this task, the key stakeholders are the Senior Vice President (SVP), the Vice President of Research (VP), and the Panel of Regional Vice Presidents (Regional VPs). While they ultimately work towards similar broad goals, their priorities may differ. The SVP is likely focused on overall strategic goals and high-level outcomes. The VP is more interested in data accuracy, research implications, and evidence-based recommendations, whereas the Regional VPs are focused on regional performance, operational efficiency, and localized patient care improvements. The presentation can be tailored to engage with each stakeholder with these priorities in mind and as a results featured high-level observations, regional and geographic insights, and explanations of data and the analysis process to cater to the varying audience.

While the focus of the presentation is primarily designed around hospital executives, several universal communication practices were followed to ensure the most effective communication of data to all audiences. Highly technical jargon was avoided and replaced with simpler terms and explanations. My tone was friendly, excited, and engaging. Attempts to integrate the audience without seeming condescending were demonstrated by asking for comments or input instead of asking if anyone was confused. My posture is open and any gesticulation avoids pointing while assisting in communicating the flow and action within my words. Ultimately, these communication practices should universally aid in effective communication with all audiences.

Effective storytelling is essential to keeping the audience engaged and interested while communicating the possible implications and solutions discovered with data analysis. In my presentation, I do more than simply explain the data. I present a narrative and include context and direction. The narrative, a story about patient journeys, is 22 times more likely to be retained than data alone (Popova, 2016). The context and direction reference the visualizations, communicate which key insights can be derived, and why they are important not only to the story, but to hospital officials’ goals to reduce readmission. The audience is persuaded to think about the risks of inaction as well as how and where changes can effectively be made, motivating them to apply the information derived from the data to reduce readmissions. The clearest example from the dataset is seen in Figure 1, where a stark difference in day admitted and readmission implies that hospital officials need to modify practices surrounding discharge and services post-hospitalization. Ultimately, the use of visualizations and storytelling promote effective communication for stakeholders, the hospital leadership, assisting decision making by providing key insights in an effective manner.

**Sources Cited**

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