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PERFORMANCE ASSESSMENT

D211

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Part I: Data Dashboards

A. Dashboards Supporting Executive Decisions

1. Both data sets used for this performance assessment have been included in the submission. A source for my external data source can be found at the end of this paper in the sources section.
2. Step-by-step dashboard installation instructions:
    a. Download Tableau desktop.
    b. Then download the packaged tableau workbook named “D211 Tableau”.
    c. After the download finishes, double-click the file or right-click and select “open with” and choose Tableau desktop.
    d. Tableau desktop should open automatically, and the dashboard and associated worksheets should be visible to the user.
3. Instructions for navigating the “D211 Tableau” dashboard:
    a. After opening the tableau workbook as instructed above, navigate to the tab at the bottom named “ Hospital Readmission Comparison”.
    b. On the left-hand side, you will see WGU hospital information, and on the right Kaggle hospital information.
    c. Clicking on any of the categories will automatically filter results based on your selection. For example, if you click on Observation Admission under WGU initial admissions, you will see each of the WGU worksheets automatically adjust to corresponding readmission numbers. The same goes for Kaggle Hospital.
    d. De-selecting the category you chose will reset the dashboard to default.
4. Copy of SQL code for joining tables from WGU provided data in pgAdmin4.

```
SELECT "patient"."additional_charges" AS "additional_charges",
"admission"."admins_id" AS "admins_id",
"patient"."admis_id" AS "admis_id",
"patient"."age" AS "age",
"patient"."children" AS "children",
"patient"."compl_id" AS "compl_id",
```

```
  "patient"."doc_visits" AS "doc_visits",
  "patient"."full_meals" AS "full_meals",
  CAST("patient"."gender" AS TEXT) AS "gender",
  CAST("patient"."hignblood" AS TEXT) AS "hignblood",
  "patient"."income" AS "income",
  CAST("admission"."initial_admission" AS TEXT) AS "initial_admission",
  "patient"."initial_days" AS "initial_days",
  "patient"."job_id" AS "job_id",
  "patient"."lat" AS "lat",
  "patient"."lng" AS "lng",
  "patient"."location_id" AS "location_id",
  CAST("patient"."marital" AS TEXT) AS "marital",
  CAST("patient"."patient_id" AS TEXT) AS "patient_id",
  "patient"."population" AS "population",
  CAST("patient"."readmis" AS TEXT) AS "readmis",
  CAST("patient"."soft_drink" AS TEXT) AS "soft_drink",
  CAST("patient"."stroke" AS TEXT) AS "stroke",
  "patient"."totalcharge" AS "totalcharge",
  "patient"."vitd_levels" AS "vitd_levels",
  "patient"."vitd_supp" AS "vitd_supp"
FROM "public"."patient" "patient"
 LEFT JOIN "public"."admission" "admission" ON ("patient"."admis_id" =
"admission"."admins_id")
```

Part II: Demonstration

B. Panopto Video

1. Please navigate to the Panopto video link in the submission for a presentation and demonstration of the D211 performance assessment requirements.

Part III: Reflection Paper

C. Outline Report

1. Hospital readmissions are concerning for hospital organization executives. Hospitals that see excessive readmissions are at risk for penalties and fines from the Centers for Medicare and Medicaid Services. For example, in 2017 imposed fines by the CMS for hospital readmissions equated to over half a billion dollars (Upadhyay et al. 2019). Furthermore, according to the data dictionary for the medical data set provided by WGU, as much as 78% of hospitals were fined in fiscal year 2015. Therefore, my tableau dashboard aligns with the needs of the WGU hospital data set by providing statistical visualizations for readmission rates with correlation to patient's initial admission types. This can help the

hospital anticipate or predict patients at high risk for readmission and implement care measures to reduce readmission after initial discharge from the hospital.

2. This performance assessment required the use of Tableau, as the business intelligence tool, for creating a dashboard visual representation that could be presented to stakeholders. Tableau is a very user-friendly and popular data visualization tool for business intelligence. Some justifications that make it beneficial to this project are:
    a) Tableau has an intuitive interface that offers users a great deal of visualization types that can be applied with a few mouse clicks.
    b) Tableau supports a vast range of data sources. Users can connect to Tableau via cloud services, or in the case of this performance assessment, through PostgreSQL.
    c) Tableau is also very effective at analyzing large sets of data and allows users to make informed decisions quickly through immediate feedback from intuitive software (Tableau.com).
3. For this performance assessment, data cleaning was not needed as the data source was exceptional and appeared to have already been cleaned and prepared. I assume that this is because D211 is an extension of D210 and the same data source from D210 is used for D211. If I needed to clean the data, I would utilize Python in a Jupyter Notebook to clean and prepare the data. This would include looking for missing values, duplicates, and other errors in the data source and restructuring the data into a usable source.
4. Below are the steps taken to create the final dashboard:
    a) Import the data into PostgreSQL and create the tables relative to the dataset provided by WGU.
    b) Connect Tableau to the PostgreSQL server so that imported data from Step A can be accessed.
    c) Select tables from the WGU dataset for representation and reporting in Tableau. Create a relationship between those tables using an SQL JOIN statement.

d) Add external dataset as a text file, chosen by myself, to Tableau for dashboard creation. Establish a relationship between both datasets using a UNION on the readmis column from WGU and the readmission column in the external dataset.

e) Create individual worksheets that are to be included in the dashboard creation.

   i. The first worksheet is created using the WGU dataset, named WGU Readmission, on the readmis variable and patient(COUNT) variable. This simple bar graph represents how many patients were or were not readmitted to the hospital.

   ii. The second worksheet is also created with the WGU dataset, named WGU Initial Admission, on the patient(COUNT) variable and the initial admission variable. It uses a simple bar graph to show how many patients were admitted for each initial admission category.

   iii. The third worksheet moves to create a representation from the external dataset from Kaggle, named Kaggle Readmissions. It uses the hospital data analysis(COUNT) variable and the Readmission variable to create a simple bar chart. The worksheet shows the number of patients that had a hospital readmission.

   iv. The final worksheet also comes from the external Kaggle dataset, named Kaggle Medical Conditions. It utilized the hospital data analysis(COUNT) variable and the Condition variable to create another bar chart. The worksheet shows how many patients were diagnosed with each medical condition.

f) After the creation of the separate worksheets, the dashboard can then be created by dragging each worksheet into the dashboard shell. Then filters were enabled on each visualization so that when

users click on a selection, say the Emergency Admission bar from the WGU dataset, the rest of the data will automatically adjust results for other categories.

g) The dashboard design is intended to be a simple visual that is easy to interact with. It is also color-blind friendly as the added tool tips and text allow all users to obtain results in a variety of ways.

5. For WGU hospitals, executives can use the interactive dashboard to gain insight into how many readmissions occur based on a patient's initial admission status. For example, by clicking on emergency admission in the bar chart for WGU, executives would see the bar graph for readmissions update and show that for this initial admission category, 1993 of those patients are readmitted to the hospital after initial discharge. With this information, executives can focus their attention on these emergently admitted patients and what caused the initial admission. Policies or core measures could then be implemented that could improve the patient's initial care and reduce readmission rates.

   For Kaggle hospitals, executives can interact with the dashboard to see which specific medical conditions/procedures are at higher risk for readmission. For example, by clicking on the yes category in the readmission worksheet, executives would be able to see those patients with appendicitis, cancer, diabetes, fractured arm, heart attack, heart disease, and strokes are at higher risk for readmission to the hospital. This could allow executive leaders to implement quality improvement policies that improve the outcome for these types of patients and reduce the risk of readmission.

6. Hospitals tend to see varying degrees of admissions at different times of the year, which can put some limitations on the analysis here. For example, during the winter months when cold and flu season arrives, hospitals see a greater influx in emergency room visits and hospital admissions. Therefore, diligence in collecting data in real-time throughout various seasons can improve accuracy and reporting to stakeholders. In addition, other limitations could be inaccurate diagnoses for some patients, leading to false counts for medical conditions in

the Kaggle data. Therefore, emphasizing quality care and evaluation by providers can help improve the accuracy of the dashboard report.

Sources

Anand, A. (2024, February 2). Hospital patient records dataset. Kaggle. https://www.kaggle.com/datasets/blueblushed/hospital-dataset-for-practice?resource=download

Why choose Tableau?. Tableau. (n.d.). https://www.tableau.com/why-tableau

Upadhyay, S., Stephenson, A. L., & Smith, D. G. (2019). Readmission Rates and Their Impact on Hospital Financial Performance: A Study of Washington Hospitals. Inquiry: a journal of medical care organization, provision, and financing, 56, 46958019860386. https://doi.org/10.1177/0046958019860386