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# **D210 – Predictive Modeling**

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## ***Part 1: Interactive Data Dashboard***

### A – Data Dashboard Document

#### **Interactive Tableau Dashboard:**

A .twbx Tableau file is included with this submission.

#### **Data sets:**

The following data sets have been included with this submission:

churn\_clean.csv (*Data Files and Associated Dictionary Files*, n.d.)

2022 Income by Zip.xlsm (*Income by Zip Code Tabulation Area - Census Bureau Maps*, n.d.)

#### **Step-by-step instructions for dashboard installation:**

After downloading the documents, take the following steps to install the dashboard:

1. Open the file titled “D210 PA v 1.1.twbx”
   1. A close up of a logo

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2. When Tableau opens, navigate to the bottom of the screen and click on “Executive Dashboard”
   1. A close up of a sign

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3. You are not able to navigate the dashboard.
   1. See below for instructions on how to navigate the dashboard.

#### **Instructions to navigate the dashboard:**

This dashboard is composed of 4 primary parts, laid out from top-to-bottom:

1. Heatmap of Delta of Median Income by State (Geospatial Map)
   1. On this heatmap, you will see each state represented, color-coded by the median delta from the median income of the customers in that state.
   2. Below the map is the legend, which shows the range of the medial delta from the median income.
   3. Hovering over a state will give full details in a popup: A screenshot of a phone

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   4. On the left-hand side of the map, there are several control options to explore:

A screenshot of a computer

Description automatically generated

1. Heatmap of Delta from Median Expendable Income (Geospatial Map)
   1. This heatmap shows pins shaped and color-coded by the median delta from the median expendable income of the customers in that zip code.
   2. Below the map is the legend, which shows the range of the medial delta from the median expendable income.
   3. Hovering on a pin will give full details in a popup: A close-up of a white box

      Description automatically generated
   4. On the left-hand side of the map, there are several control options to explore:

A screenshot of a computer

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* 1. Below the map and legend is a drop-down menu to select the subsection of zip codes by their median delta from median expendable income:

A screenshot of a computer

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* 1. There is also a legend which shows the visual shape of each group:



1. Churn Rate and Customer Count by Monthly Charge as a Percentage of Expendable Income (Dual-Axis Area and Line Chart)
   1. The orange dashed line represents the count of customers (Y-axis) whose monthly charge is that specific percentage of their expendable income (x-axis). Hovering over a point on it will show full details:

A close-up of a white background

Description automatically generated

* 1. The blue-shaded area of the chart represents the churn percentage (y-axis) of customers whose monthly charge is that specific percentage of their expendable income (x-axis). Hovering over a point on it will show full details:

A close-up of a folder

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1. Churn Rate by Tenure and Delta from Median Expendable Income (Dual-Axis Bar and Line Chart)
   1. This dual-axis chart shows the churn rate (y-axis) as bars as well as a line for the count of customers (y-axis) relative to the customer’s delta from median expendable income (x-axis) and is broken out by the tenure group of the customers, creating 6 charts.
   2. To the right of the charts, you will find a legend that outlines the color allocation for the Churn Rate and Customers. You will also find a series of drop-down menus that allow you to filter the customer base based on their product offerings:

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## ***Part 2: Storytelling with Data***

### B – Panopto presentation:

A link to the Panopto presentation has been submitted with this document.

## ***Part 3: Reflection Paper***

### C – Write a reflection paper demonstrating an understanding of data representation and reporting

#### **Purpose and function of the dashboard:**

This dashboard aims to provide insight into the current customer base, their financial position, and how it relates to the churn rate, which can be analyzed by the Executive Leaders, providing crucial insights for decision-making.

#### **How variables from the additional dataset enhance insights:**

Key variables from the 2022 Incomes by Zip.xlsm highlight the income and expenses the customers from the churn\_clean.csv expect to face, allowing us to enhance our visibility into the expendable income the customer base has and how that may affect factors such as churn rate and monthly charge totals, as well as location-based trends.

#### **Data representations for executive leaders:**

##### Churn Rate and Customer Count by Monthly Charge as a Percentage of Expendable Income:

Executives can utilize this to visualize the pivot point at which the churn rate starts to increase based on the percentage of expendable income the monthly charge is. In this case, once the percentage hits 20%, the churn rate steadily increases, so it would be prudent to keep clients from overselling above this point of their expendable income.

##### Churn Rate by Tenure and Delta from Median Expendable Income:

Executives can utilize this to visualize the intersections at which tenured customers churn, broken out by their expendable income, allowing for analysis regarding product marketing, pricing, and short vs long-term profit discussions.

#### **Interactive controls to modify the presentation data:**

##### Drop-Down Menu:

Delta from Median Expendable Income includes a drop-down menu for selecting which delta ranges the user would like to visualize, with selections from -250,000 to +250,000. Multiple selections are permitted from this menu.

##### Filters:

Product and Service Offerings can be filtered in the Churn Rate by Tenure and Delta from Median Expendable Income visualization, allowing stakeholders to understand their customers better based on the services they utilize.

#### **Accessibility controls for those with colorblindness:**

To improve distinction for individuals with colorblindness, only unambiguous colors were used. This benefits those with colorblindness as well as those without. (*Color Universal Design (CUD) / Colorblind Barrier Free*, n.d.)

To reduce the reliance on color-only segmentation, varying icons and shapes were used in addition to colors and labels, where appropriate, to reduce the dependence on color-only segmentation. (*Color and Universal Design :: UXmatters*, n.d.)

#### **Data representations supporting the story:**

##### Heatmap of Delta of Median Income by State:

This visualization of the areas of the country where customers are underperforming financially can be easily seen by the color-coding, as well as the symbols utilized for the “buckets” in which customers’ finances fall, which helps to further the main idea of the story that “Our customers are broke… but that’s ok!”

##### Churn Rate and Customer Count by Monthly Charge as a Percentage of Expendable Income:

This visualization pinpoints where the percentage of expendable income at which services start to increase churn rate (20%), meaning that regardless of a customer’s finances, there is a service package that can work for them and keep them as a loyal and tenured customer.

#### **Use of audience analysis in adapting the presentation message:**

Critical aspects of adapting the presentation came about due to the stakeholders utilizing the data. For example, the SVP is interested in the specifics of which of the products customers are using and how that relates to retention and churn; thus, it was imperative to include the Churn Rate by Tenure and Delta from Median Expendable Income chart, which allows for filtering by services as well.

Conversely, the EVP is more interested in the Macro-viewpoint of customers and how customers can be broadly categorized across regions. This allowed for the use of Heatmap visualizations and the categorization of customers’ financial positions across the country. In this situation, these Heatmaps serve a dual purpose as the Regional VPs can also use them to evaluate the customer base within their regions.

When considering my peers, the Churn Rate and Customer Count by Monthly Charge as a Percentage of Expendable Income visualization was implemented to satisfy the desire for a “catch-all” visualization that can be used to interpolate the actionable findings across multiple departments.

#### **Presentation design for universal access by all audiences:**

A single-column style was used for the dashboard layout to accommodate mobile users instead of putting multiple elements horizontally, which would require users to rotate their cell phones when accessing the dashboard.

Features included to make the dashboard accessible to colorblind individuals also improve access for those who are not colorblind as well, including color selection, icons, shapes, and labels as appropriate.

#### **Elements of effective storytelling:**

##### Hook:

Utilizing the hook (NetSuite.com, 2023), ‘Our Customers are Broke…” engages the stakeholders emotionally, gripping them immediately with the question, “What does this mean for us?” regarding many factors: Tenure, Churn, Service Offerings, Monthly Charges, and many more.

##### Macro to Micro:

Going from the Macro view to the Micro (leslie, 2019), the stakeholders are pulled along the story from customers as a whole, viewed by location by state, and then by ZIP, then more narrowly by introducing the monthly charge and corresponding churn rate, and finally breaking down the customer base by tenure and service offerings.

### D – Sources

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