Dashboard Plan A Breakdown of Sales & Profit

INTRODUCTION

This dashboard plan aims to contribute to answering targeted questions for an executive in a medium to large size organization in the United States.

The plan focuses on five separate questions that address the overarching theme; a **Breakdown of Sales and Profit** for the organization.

In terms of the overall design, the dashboard will connect the questions through visualization design methods and principles. Tableau's (Tableau Team, 2018) 'Interactivity Actions' will be the link in doing so by using filters, highlights and tooltips to create connections between the domain tasks.

In order to strategically align with the target audience, and to answer the questions through effective dashboard design, the plan will align the scenario questions in a way that lends itself to telling a story with the data.

DATA ANALYSIS

The Data Source in this Dashboard Plan (store.xlsx), includes three sheets, that will be joined using a Left Join on the data sets, although the plan focuses predominantly on the 'Orders' sheet. When connecting to the data source, Tableau's Data Interpreter is used.

In some circumstances it is necessary to use parameters, and calculated fields to transform parts of the original data for answers that require it.

Table 1. below provides meta data on attributes that will be used in the dashboard. Details on any calculated fields used will be included within the plan:

Table 1. Attribute Meta Data

Variable	*General Type*	*Description*	*Data Type*
Sales	Numeric	Dollar Value of Sum of Sales	Continuous
Profit	Numeric	Dollar Value of Sum of Sales	Continuous
Region	Nominal - Categorical	Geographic	String
State	Spatial	Geographic	Geographic
Ordered Quantity	Numeric	Sum of Units Ordered	Continuous
Product Category	Nominal – Categorical	Item Category	String
Product Sub-Category	Nominal – Categorical	Item Sub-Category	String

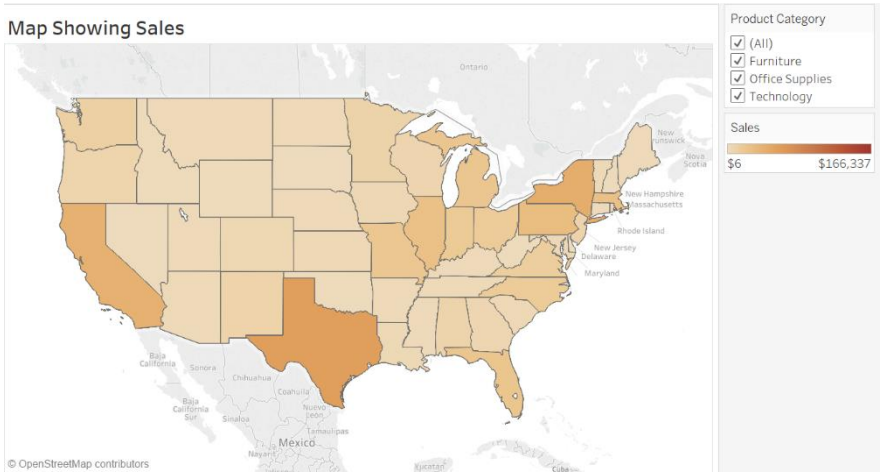
Note: Further description on Calculated Fields are detailed in the plan.

For the dashboard, data grouping, filtering, and relationships will be used to show data trends from the questions asked. Any missing values will be removed if contained in a key categorical attribute. Any missing numerical data will be dealt with by imputing the calculated mean for the attribute.

Sales data visualizations will use an **Orange** color theme, and Profit visualizations will use a **Blue** theme chosen from a color blind friendly palette. The reason for this is to create clarity for the Target Audience in the focus of the data.

Q1: Which states had the best Sales performance?

The first visualization sets the tone for the data story. It will answer the question and point the target audience in the right direction. Utilizing this visualization as a starting platform, we create a link to the subsequent answer.



Viz. 1

The map will be positioned in the top left of the Dashboard and will serve as the trigger for Filter Actions that will drive the dashboard.

Chart: (Viz. 1) is a Map that identifies which states in the USA had a high sales performance, categorized by state and measured by dollar amount.

Marks: Individual States, with luminance as an indication of measured value. Product Category can be used as a filter.

Magnitude Channels: Gradient scale for sales performance, Color luminance.

Identity Channels: Geospatial, Product Category filter.

Interactivity: The product category filter offers interactivity. In addition, the heat map will use State, Region and Product Subcategory as 'Details' in Tableau to enable interactivity between the subsequent visualizations.

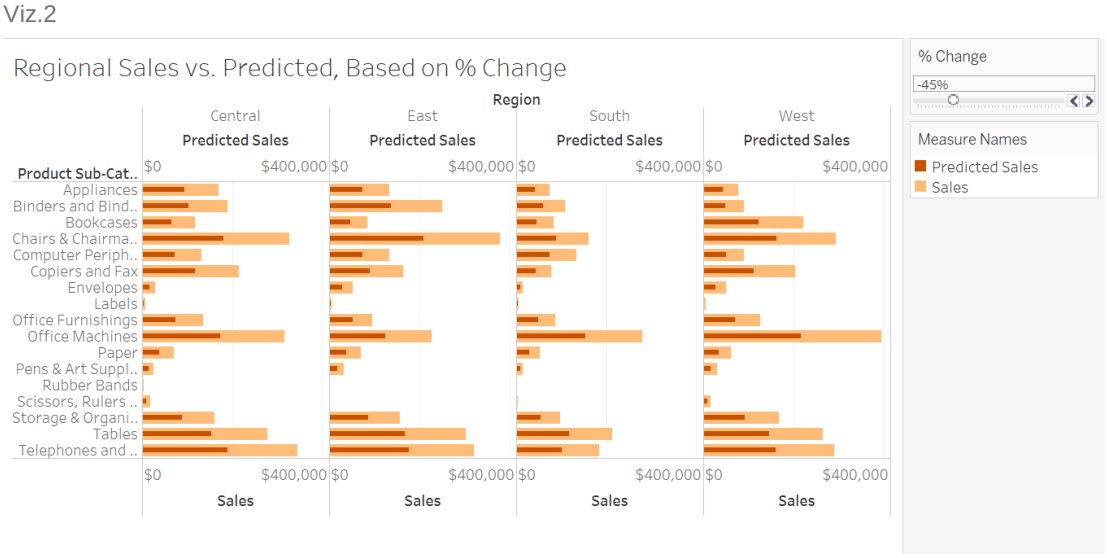
By analyzing the map, we will be able to discover which states had the best sales performance in the USA. We can also see which states contributed the least to sales performance.

We gain a holistic understanding of which parts of the country we should focus on, and in which Product Category. This answer will lead the target audience to the next question of, what was performance on the Sub-Category level like?

Q2. How did Product Sub-Categories perform regionally?

In order to compare between which product categories performed well in terms of sales per-region, (Viz.2) separates the geospatial data into regional categories of Central, East, South and West. We are then able to identify regional sales performance, through individual horizontal bar charts for each region, measuring total sales for each Product Sub-Category.

Viz.2



(Viz.2) will be positioned to the right, in the same container, adjacent to the Map.

Chart: (Viz 2.) uses bar charts to show Product Sub-Category/Regional sales data. An interactive slider is used to show predicted Sales based on a percentage change. A legend is also included for the measured values. This design aims to drill down further into Sales on a Sub-Category level (Munzer, Tamara, Maguire, & Eamon, 2015).

Marks: Bars are used to indicate a measurement.

Magnitude Channels: Length, and position on a common scale.

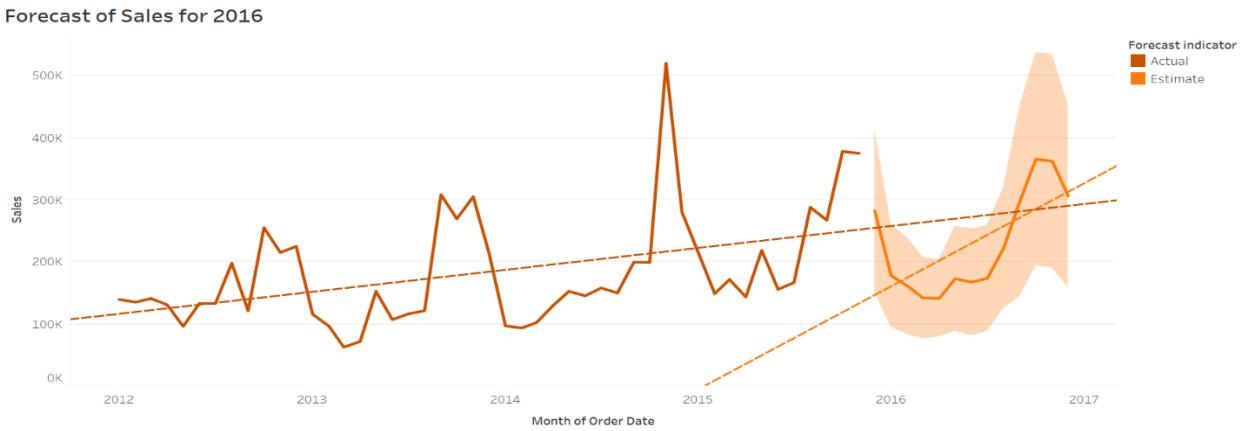
Identity Channels: Color Hue, and Size categorizes Predicted-Sales and Sales

Interactivity: Filter on Regions/ Product Categories/ Percentage Change Slider. By moving the slider backwards or forwards, it applies the percentage change to the Actual Sales values and represents it as Predicted Sales on the common scale. This enables the Target Audience to make a comparison between Sales and Change in Sales (Munzer, Tamara, Maguire, & Eamon, 2015).

Parameters will be used to Create the Calculated Field of 'Predicted Sales'. In order to create a Dual Axis chart, the data is interpreted as Numerical – Discrete, and set as a Custom Currency. By selecting a Region in (Viz. 2), a filter action will be applied to the Map to indicate the Regional Sales. (Viz.3) will not be included in this action, and instead it will still be connected through the filter action that is applied in (Viz.1) which filters on State.

Q3. What can we expect for Sales in the following year?

Using Tableau's Forecasting Analysis tool, we are able to visualize a forecast for Sales performance between 2016 and 2017 that would include confidence bands.



(Viz. 3)

(Viz. 3) will be positioned below the Map and Bar charts. The entire width of the dashboard will be used to ensure that detail in performance is more identifiable.

Chart: (Viz. 3) plots the historical monthly sales data from 2012 to 2016. Based on past performance, a forecast line is then added, confidence bands are also included.

Marks: Line and Area

Magnitude Channels: Position on a common scale

Identity Channels: Color Luminance

Interactivity: The design of the Dashboard will allow the target audience to select a state in the Map (Viz.1), which will then be applied as a Filter Action to the Line and Forecast Line. The result being a Sales forecast for a selected state.

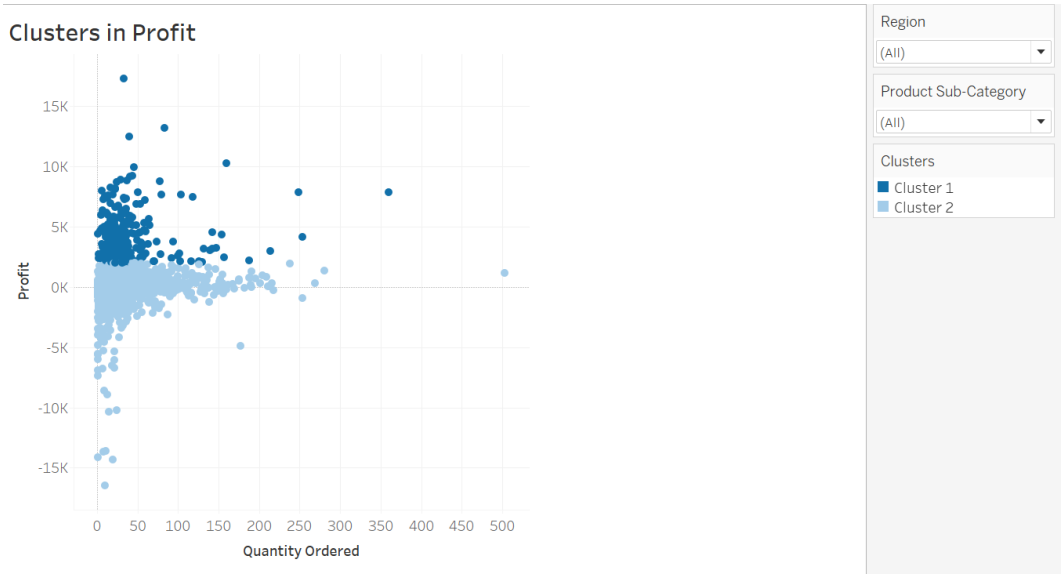
This answer will support more informed strategic decision making for executives and provide an opportunity to perform a trend analysis for Sales performance in 2016.

Based on the forecast, the Target Audience will be able to identify an overall trend in sales for the coming year. We can also anticipate any potential drop in Sales throughout 2016, as well as any peak performance periods.

Q4. Are there outliers in profit and loss?

Sales gives us an idea on Revenue, however in order to gain a better understanding of the organizations performance we need to take a closer look at profit as well.

(Viz. 4)



The Cluster Analysis will be positioned to the left of the Dashboard and below (Vis.3).

Chart: When using Tableau to create a Cluster Analysis (Viz.4), Profit is separated into clusters, Cluster1: Profit, and Cluster2: Low Profit/Loss. The majority of the marks should be distributed within a range, and outliers should be identifiable within each cluster. *Marks*: Circles *Magnitude Channels*: Position on a common scale *Identity Channels*: Color Luminance, categorizes clusters.

Interactivity: Using Tableau's Highlight Action, (Vis1.) will connect to the Cluster Analysis by highlighting clusters and marks based on the State selected. It is important to note that the Cluster Analysis will not be connected with any Actions performed through (Viz.3). The answer to Q4. requires that Profit be the key component to the visualization, and a distinct separation needs to be represented in the flow of the dashboard. This is where the change from an Orange (Sales) to a Blue (Profit) color scheme, acts as an Identity Channel for the entire dashboard.

The outliers are where the Target Audience will focus their attention, and therefore will be the key in communicating the answer for this question. Tooltips will also be used to provide further detail on any selected marks. By using tooltips, the Target Audience is able to find more information about a specific mark without cluttering the visualization and detracting from communicating the answer.

Q5. Which Product Sub-Categories should be focused on?

After answering Q.4 through a Cluster Analysis, we would require a more detailed understanding of Profit based on findings (Outliers), which leads the Target audience to the final visualization.

(Viz. 5)

Heat Table Showing Profit per Product Sub-Category

Product Cat..	Product Sub-Category	Region: Central	East	South	West
Furniture	Bookcases	-21,335	-3,120	8,698	8,049
	Chairs & Chairmats	65,017	55,151	8,730	36,451
	Office Furnishings	28,795	19,403	10,771	33,241
	Tables	-17,255	-45,218	-11,216	1,194
Office Supplies	Appliances	57,125	21,907	27,399	15,220
	Binders and Binder Acces..	83,273	90,413	17,237	35,650
	Envelopes	12,226	16,990	382	16,534
	Labels	2,829	2,469	10,201	2,276
	Paper	12,641	8,136	7,079	7,506
	Pens & Art Supplies	3,018	3,185	-6,982	1,975
	Rubber Bands	334	-14	-3,140	-21
	Scissors, Rulers and Trim..	-4,027	-1,214	3,266	39
	Storage & Organization	-234	921	3,010	4,383
Technology	Computer Peripherals	26,020	20,517	24,814	16,567
	Copiers and Fax	46,449	44,957	1,883	35,868
	Office Machines	100,916	60,783	6,954	-580
	Telephones and Communi..	124,035	82,300	-4,881	96,497

Profit: -50,000 125,000

(Viz.5) will be positioned adjacent to the Cluster Analysis on the right of the Dashboard.

Chart: A Product Sub-Category Heat Table (Viz.5) will indicate the individual profits/losses for each Product Sub-Category per Region, this will enable the Target Audience to dive deeper into profitability. This summarizes performance and also allows us to see individual values.

Marks: Cells, Individual cell values

Magnitude Channels: Color luminance, cell value

Identity Channels: Color luminance, categorizes into low and high profit.

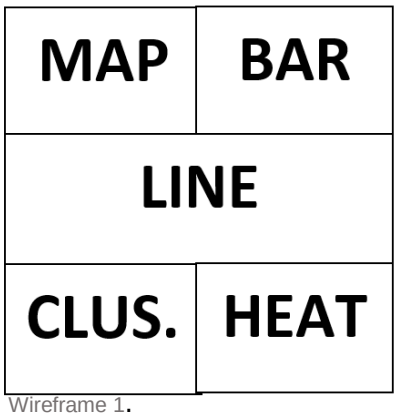
Interactivity*:* By selecting a state in the Map, a Filter Action is applied to the table, the result being the Profit for each Subcategory based on the state selected. The 'Region' field will exclude any region that does not include the state.

By looking at the Sub-Categories within Product Categories it is possible to see which Product Category has the most profitable Sub-Categories, and as well as which has the least profitable across all Regions. We would then be able identify which Categories/Sub-Categories may be responsible for the outliers in the previous cluster analysis.

Being the final sheet in the dashboard, the detail in the Heat Table will provide an in-depth answer to the targeted question, and also represent a finale to the story being told.

CONCLUSION

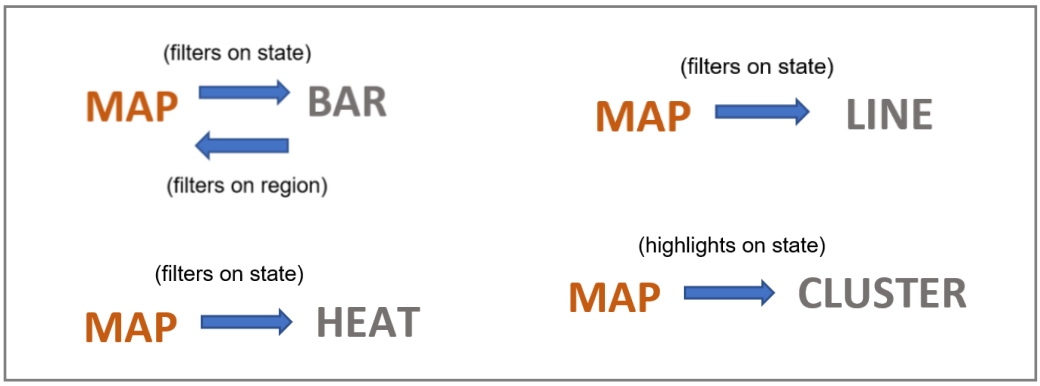
The overall design plan of the dashboard is represented in the wireframe below:



Wireframe 1.

The Dashboard Actions will guide the Target Audience through the Dashboard moving in a natural 'Z' pattern across the page and through the answers (Munzer, Tamara, Maguire, & Eamon, 2015).

To represent the design of the Actions driving the dashboard, an outline is provided below:



Dashboard Actions

In the implementation of the Dashboard, filters may be removed, and instead, Tableau's 'Actions' will be used to drive the dashboard. Legends will be made floating and positioned close to the corresponding Sheet.

The structure of the actions are as follows; the Map will apply a Filter Action to the Bar, Line and Heat sheets, and will apply a Highlight Action to the Cluster. In summary, each visualization will strategically align with the Target Audience, and connect with one another to tell a story with the data that not only provides a break down of Profit and Sales, but also effectively answers the targeted questions directly.

REFERENCES

Munzer, Tamara, Maguire, & Eamonn (2015) Visualization Analysis and Design. Boca Raton, AK: Florida. Tableau Team (2018).

Tableau Public: Tableau Software., Inc. Seattle, WA, URL http://www.tableau.com/ip