Tutorial B for the Case "Modern Retail Analytics: Data Visualization Using Tableau"

2. Answer Business Questions with Tableau

2.1. Data-Driven Investigation #1

Investigate the average sales and profit per order by market, order category, and order subcategory. Do any patterns stand out?

To answer this question, you can start by dragging the relevant dimensions and measures to the Columns and Rows panes. For example, a possible configuration can be Market and Sales in Columns, and Category and Sub-Category in Rows. Instead of adding profit to the Rows or to the Columns, you can drag the measure to the Color mark. This improves the visual aspect of the graph but does not help answer the above question. Next, click on the drop-down menu for both measures and switch from Sum to Average. In addition, some subcategories of the Office Supplies category do not seem to be insightful (due to their low sales level). To enhance the chart readability, you can group the subcategories that you do deem invaluable by right-clicking on your selection and clicking on Group.

At this point, you can start looking for interesting patterns. For example, the Table subcategory (from the Furniture category) seems to have significant average sales for several markets, but is not as profitable in other markets (see the orange hues in the figure below). In addition, the Copiers subcategory is very successful in the U.S. market. To compare this subcategory relative to other subcategories, you first need to add a Country filter (e.g., focusing only on the U.S). You can then complete your visualization by dragging the (AVG) Profit measure to the Label mark. You can see that the Copiers' hue of blue is darker relative to other subcategories, thus indicating a higher average profit. The text labels allow for a better comparison and show that no other subcategory is close to the Copiers' average profit of \$817.9. Finally, by reading the bar chart, we can conclude that the Copiers subcategory has the highest average sales in the U.S. (hovering over the bar will reveal the exact amount, which is \$2,199).

Note: The aforementioned solution is just one of the many possible ways to draw interesting insights and to answer the above business question.

• Add the right measures and dimensions.



• Drag Profits to the Color mark (instead of dragging it to the Columns or Rows panes).



• Change the measure of Sales (and Profits) to Average.



• Group the subcategories that you deem invaluable.



• Investigate.

49	\leftrightarrow \rightarrow \square \square \square	• 🖯 -	<u>.</u>	, II,		ļ	/ -	0 -	T \$	Stand	ard	•	ын - Г.	÷ (æ						📑 s	how Me
Data	Analytics +	Pages			iii Columns	M	larket			AVG(Sa	ales)											
🚱 (Tutorial) Global Superst					E Rows	С	atego	у		Sub-Ca	itegory	(group)										
(Turners) Abc Comparison Abc Comparison Comparison Abc Abc Comparison Abc <th>tdroia) Global Superst sions IIII P → → Market Order Date Order Priority → Postal Code Product ID Product ID Product Name Region Row ID Segment Ship Date Ship Mode State Sub-Category sturms Market (Returns) Order ID (Returns)</th> <th>Filters Marks Doll Aut Color Octo Detail</th> <th>tomatic Size D Tootlip VG(Profit)</th> <th>T</th> <th>E Rows 1.4.1 Category Furniture Office Supplies Technology</th> <th>Sub-Cate Bookcase Chairs Furnishin Tables Appliance Art, Bind Accessor Copiers Machines Phones</th> <th>go A es ggs es er ies s K A</th> <th>2K 2K Sale</th> <th>Ca OK 1</th> <th>Sub-C:</th> <th>I I I I I I I I I I I I I I I I I I I</th> <th>EMEA IK 2 g. Sales</th> <th>Marke K OK Av</th> <th>t EU IK g, Sales</th> <th>2К ОК</th> <th>LATAM 1K Avg. Sale</th> <th>2K 0K</th> <th>US IK Avg. Sa</th> <th>2K sles</th> <th>AVG(P</th> <th>rofit)</th> <th>818</th>	tdroia) Global Superst sions IIII P → → Market Order Date Order Priority → Postal Code Product ID Product ID Product Name Region Row ID Segment Ship Date Ship Mode State Sub-Category sturms Market (Returns) Order ID (Returns)	Filters Marks Doll Aut Color Octo Detail	tomatic Size D Tootlip VG(Profit)	T	E Rows 1.4.1 Category Furniture Office Supplies Technology	Sub-Cate Bookcase Chairs Furnishin Tables Appliance Art, Bind Accessor Copiers Machines Phones	go A es ggs es er ies s K A	2K 2K Sale	Ca OK 1	Sub-C:	I I I I I I I I I I I I I I I I I I I	EMEA IK 2 g. Sales	Marke K OK Av	t EU IK g, Sales	2К ОК	LATAM 1K Avg. Sale	2K 0K	US IK Avg. Sa	2K sles	AVG(P	rofit)	818
SI SI	ub-Category (group)																					
Measur	res																					
# Di # Pr # Qu # Sa # St ⊕ La ⊕ Lc =# M # M	iscount rofit uuantity ales hipping Cost hipping Cost stifude (generated) ongitude (generated) umber of Records leasure Values																					
🖯 Data S	Source 1.3.1 1.3.2	2 1.3.3	1.3.4 1.3.	5 1.3.6	Dashboard	1.4.1		₽.	U1.													
70 marks	10 rows by 7 columns SUN	I of AVG(Sale	s): 32,749																	14 4	• • •	

• Add a Country filter (e.g., U.S. only) and take a closer look at the Copiers subcategory. Add a text label for (AVG) Profit to complement your Color mark.

		× *** # # 2 • 0 • I		Show Me
Data Analytics	Pages	iii Columns Market	AVG(Sales)	
뎛 (Tutorial) Global Superst		E Rows Category	Sub-Category (group)	
Dimensions Ⅲ 𝒫 · ·	Filters Country: United Stat	1.4.1 bis Category Sub-Category (group)	AVG(Profit) -55.6 817.9	
Abc Customer ID	Marks	Furniture Bookcases Chairs	-15.2 43.1	
Abc Order Date Corder Date Abc Order Date Abc Order ID Abc Order Portuge Postal Code Abc Product ID	Color Size Label	Furnishings Tables Office Appliances Supplies Art, Binders, Envelopes a. Technology Accessories Copiers Machines	13.6 -55.6 18.8 54.0 29.4	317.9
Abc Product Name Abc Region ⊯ Row ID Abc Segment ⊟ Ship Date Abc Ship Mode	T AVG(Profit)	Phones	50.1 C MM 0 500 1000 1500 2000 M Avg. Sales	ategory: Technology Aarket: US ub-Category (group): Copiers yo. Profit: 817.9 wg. Sales: 2,199
Measures # Discont # Profit # Quantity # Sales # Shipping Cost # Shipping Time() @ Latitude (generated) @ Longitude (generated) # Number of Records # Measure Values				
© Data Source 1.3.1 1.3	.2 1.3.3 1.3.4 1.3.5 1.	3.6 ⊞ Dashboard 1.4.1 1.4.1 bis 1.4.2	2 🖳 🕂 🗸	
70 marks 10 rows by 7 columns SU	JM of AVG(Sales): 32,749			

2.2 Data-Driven Investigation #2

Investigate which days of the week have faster shipping times. Which day should you place your order to get a fast shipping time?

To answer this question, start by dragging the Order Date dimension to the Columns pane. You will notice that the default setting displays the dimension by year. Within the dimension's drop-down menu, select the option Weekday. We have now access to the different days of the week, but the shipping time is still missing. The shipping time is essentially the difference between the Order Date and the Ship Date. From Analysis, located on the menu bar at the top of the display, select the option Create Calculated Field.

Assign a relevant name to your field and input a formula in the calculation pane. Note that basic formulae have already been created by Tableau, and DATEDIFF is conveniently one of them. To use DATEDIFF, determine the first argument (called date_part), which consists of the desired unit (in our case, we can use "day"). Next, select Order Date and Ship Date as start_date and end_date respectively, and press the green OK button. When you add your new measure to the Rows pane, you will notice something odd with the line that was just generated. Specifically, the sum of the Shipping Time was automatically displayed instead of the average. After fixing this problem, the graph is still not visually appealing (i.e., a single line at the top of the chart). A better option is to use a bar chart. You will then realize that the shipping time does not significantly vary across the different days of the week.

Note: As before, the aforementioned solution is just one of the many possible ways to find interesting insights and to answer the above business question.



• Drag the Order Date dimension to the Columns pane and select Weekday.



• Compute the Shipping Time with Tableau's DATEDIFF formula.

	• • • •	··· P→ P→ P→ P→ P→ P→ Standard · P→ P→ α ^Q	Show Me								
Data Analytics +	Pages	iii Columns WEEKDAY(Order Date)									
🚱 (Tutorial) Global Superst		E Rows									
Dimensions III P ♥ ♥ ♥ ■ Orders Alse Category ⊕ City ⊕ Country Alse Customer ID Alse Customer ID Alse Customer Name Alse Market	Filters Marks T Automatic	1.4.2 Order Date Sunday Monday Tuesday Wednes Thursday Friday Saturday Abc Abc Abc Abc Abc Abc Abc Abc									
Criter Date Criter ID Acc Order Priority Criter ID Acc Order Priority Criter ID Acc Product ID Acc Product ID Acc Region Row ID Acc Segment Ship Date Acc Ship Mode Criter State Measures Discount Disco	Color Size Ship Detail Tooltip DATE	DIFF("day", [Order Date], [Ship Date])) All DATEDIFF(date_part start_date, end_date. DIFF("day", [Order Date], [Ship Date])) Enter search text Start_date, end_date. CONTAINS CORR Returns the differ COUNT COUNT From end_date. COUNTD units of date_part COUNTD difference is expl COVAR start_of_week is of COVARP the week start date. DATE DATE DATE DATEDIFF DATEDIFF DATEDIFF	rence where rracted ressed in t. If mitted, / is start r the								
From Quantity Guantity Sales Shipping Cost Latitude (generated) Latitude (generated) Longitude (generated) Mumber of Records Measure Values Data Source 1.3.1 1.3.2 7marks 1 row by 7 columns	1.3.3 1.3.4 1.3.5 1.3	.6 ⊞ Dashboard 1.4.1 1.4.2 ⊡ H ⊕ □ H	▶ ▶ 💠 🎫 📰 🔳								

• Drag your calculated field to the Rows pane.



• Change Sum to Average (for Shipping Time).



• Select the Bar Chart view and investigate.

