

Analyzing Chocolate Sales with Excel

1. Business Problem Statement:

In the competitive world of confectionery, chocolate brands are constantly seeking ways to optimize their sales strategies and better understand consumer preferences. As our fictional chocolate company expands its product line, we face the challenge of identifying which chocolate types and formats are most popular among customers, how seasonal trends affect sales, and what factors contribute to higher sales performance.

Our goal is to dive deep into the sales data, unraveling the patterns and insights hidden within. By analyzing this data, we aim to develop a clear strategy that will enable the company to optimize its product offerings, improve customer satisfaction, and ultimately drive higher revenue.

2. Project Goal:

To address the business challenges, we will conduct a comprehensive analysis of the chocolate sales data using Excel. Our approach will include data cleaning, transformation, and visualization, followed by in-depth analysis through advanced Excel functions. We will create interactive dashboards to present our findings, enabling stakeholders to make informed decisions.

3. Data Collection and Exploration :

In our quest to decode the intricacies of chocolate sales, we begin by delving into the raw data that forms the backbone of our analysis. This dataset, meticulously collected from our fictional chocolate company, comprises three vital components: "orders", "products", and "customers". Each of these sheets offers unique insights into the transactions, products, and people that drive our business.

Orders Sheet:

The orders sheet serves as the transaction log of our business, capturing every sale made across various product lines. Each row in this sheet represents an individual order, identified by a unique Order ID. Here, we also find details such as

the Order Date, Customer ID, Product ID, and Quantity purchased. This sheet is critical, as it ties together the products sold with the customers who bought them.

Products Sheet:

The products sheet is our catalog of offerings, listing each chocolate type and its specific attributes. This includes the Product ID, Chocolate Type (such as Dark Chocolate, Milk Chocolate), and Form, which we've repurposed to represent the form of the chocolate (like Bars, Chips). Additionally, this sheet provides financial details like the Unit Price, Price per 100g, and the associated Profit for each product. These data points will be crucial when calculating total sales and profitability.

Customers Sheet:

The customers sheet offers a glimpse into who our buyers are, containing essential demographic and contact information. Each customer is identified by a Customer ID, and the sheet includes fields such as Customer Name, Email, Phone Number, Address, and whether the customer holds a Loyalty Card. This data will enable us to segment our customers and analyze their purchasing behavior in greater detail.


4. Data Collection and Integration

With the dataset in place, the next step was to enrich the Orders sheet by integrating key details from both the Customers and Products sheets. This process involved extracting customer and product information to provide a comprehensive view of each order.

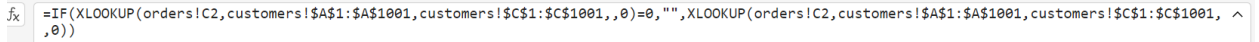
Customer Data Integration :

To enhance the Orders sheet, we used XLOOKUP to pull in customer-related details such as Customer Name, Email, and Country. This allowed us to connect each order to its respective customer.

Customer Name: We applied the following formula to match the Customer ID in the Orders sheet and retrieve the corresponding name from the Customers sheet:

 `=XLOOKUP(C2,customers!A1:A1001,customers!B1:B1001,,0)`

Email: To ensure accurate email retrieval and handle missing data, we applied this formula:

 `=IF(XLOOKUP(orders!C2,customers!A1:A1001,customers!C1:C1001,,0)=0,"",XLOOKUP(orders!C2,customers!A1:A1001,customers!C1:C1001,^,0))`

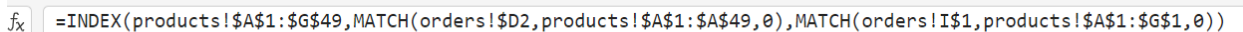
Country: The country information was also retrieved using **XLOOKUP** with the following formula:

 `=XLOOKUP(C2,customers!A1:A1001,customers!G1:G1001,,0)`

Product Data Integration :

Next, we incorporated product details such as Chocolate Type, Form Type, Size, and Unit Price into the Orders sheet. Here, we opted for the INDEX MATCH function for its dynamic capabilities, allowing us to use one formula and drag it across columns for automatic updates.

Chocolate Type (and additional product attributes): This formula matches the Product ID in the Orders sheet with the Products sheet and retrieves the corresponding product details:

 `=INDEX(products!A1:G49,MATCH(orders!$D2,products!$A$1:$A$49,0),MATCH(orders!I$1,products!A1:G1,0))`

With these steps, the Orders sheet now reflects a more complete picture by integrating essential customer and product data.

5. Data Preprocessing

Before diving into data analysis, we ensured that the dataset was properly formatted and prepared for further analysis. This process involved several crucial steps to enhance data readability and consistency.

Date Formatting :

To ensure clarity and avoid confusion, the date column was formatted to the dd-mmm-yy format, with the month displayed as a full abbreviation. This helped standardize the date entries across the dataset.

Size Formatting :

The Size column was reformatted to display values in kilograms (kg). This made it easier to interpret product sizes and maintain uniformity in the dataset.

Unit Price and Sales Price Conversion :

Both the Unit Price and Sales Price columns were converted to display values in US dollars (\$). This conversion was essential to maintain consistency in currency representation across all sales data.

Converting Range to Table :

To facilitate more efficient analysis, the entire dataset was converted into an Excel Table. This step enabled structured referencing and made future data manipulations, such as pivot table creation, more straightforward.

	B	C	D	E	F	G	H	I	J	K	L
1	Order Date	Customer ID	Product ID	Quantity	Customer Name	Email	Country	Chocolate Type	Form Type	Size	Unit Price
2	05-Sep-19	17670-51384-MA	R-M-1	2	Aloisia Allner	aallner0@lulu.com	United States	Milk Chocolate	Chips	1.0 kg	\$ 9.95
3	05-Sep-19	17670-51384-MA	E-M-0.5	5	Aloisia Allner	aallner0@lulu.com	United States	Ruby Chocolate	Chips	0.5 kg	\$ 8.25
4	17-Jun-21	21125-22134-PX	A-L-1	1	Jami Redholes	jredholes2@tmall.com	United States	Dark Chocolate	Bars	1.0 kg	\$ 12.95
5	15-Jul-21	23806-46781-OU	E-M-1	2	Christoffer O' Shea		Ireland	Ruby Chocolate	Chips	1.0 kg	\$ 13.75
6	15-Jul-21	23806-46781-OU	R-L-2.5	2	Christoffer O' Shea		Ireland	Milk Chocolate	Bars	2.5 kg	\$ 27.49
7	04-Aug-21	86561-91660-RB	L-D-1	3	Beryle Cottier		United States	White Chocolate	Powder	1.0 kg	\$ 12.95
8	21-Jan-22	65223-29612-CB	E-D-0.5	3	Shaylynn Lobe	slobe6@nifty.com	United States	Ruby Chocolate	Powder	0.5 kg	\$ 7.29
9	20-May-22	21134-81676-FR	L-L-0.2	1	Melvin Wharfe		Ireland	White Chocolate	Bars	0.2 kg	\$ 4.76
10	02-Jan-19	03396-68805-ZC	R-M-0.5	3	Guthrey Petracci	gpetracci8@livejournal.com	United States	Milk Chocolate	Chips	0.5 kg	\$ 5.97
11	05-Sep-19	61021-27840-ZN	R-M-0.5	1	Rodger Raven	rraven9@ed.gov	United States	Milk Chocolate	Chips	0.5 kg	\$ 5.97
12	08-Mar-21	76239-90137-UQ	A-D-1	4	Ferrell Ferber	fferbera@businesswire.com	United States	Dark Chocolate	Powder	1.0 kg	\$ 9.95
13	28-Oct-20	49315-21985-BB	E-L-2.5	5	Duky Phizackerly	dphizackerlyb@utexas.edu	United States	Ruby Chocolate	Bars	2.5 kg	\$ 34.16
14	02-Jul-22	34136-36674-OM	R-M-1	5	Rosaleen Scholar	rscholarc@nyu.edu	United States	Milk Chocolate	Chips	1.0 kg	\$ 9.95
15	22-May-20	39396-12890-PE	R-D-2.5	2	Terence Vanyutin	tvanyutind@wix.com	United States	Milk Chocolate	Powder	2.5 kg	\$ 20.59
16	05-Apr-22	95875-73336-RG	L-D-0.2	3	Patrice Trobe	ptrobee@wunderground.com	United States	White Chocolate	Powder	0.2 kg	\$ 3.89
17	07-Jun-22	25473-43727-BY	R-M-2.5	5	Llywellyn Oscroft	loscroftf@ebay.co.uk	United States	Milk Chocolate	Chips	2.5 kg	\$ 22.89
18	20-Mar-19	99643-51048-IQ	A-M-0.2	6	Minni Alabaster	malabasterg@hexun.com	United States	Dark Chocolate	Chips	0.2 kg	\$ 3.38
19	19-Oct-19	62173-15287-CU	A-L-1	6	Rhianon Broxup	rbroxuph@jimdo.com	United States	Dark Chocolate	Bars	1.0 kg	\$ 12.95
20	13-Jan-19	57611-05522-ST	R-D-2.5	4	Pall Redford	predfordi@ow.ly	Ireland	Milk Chocolate	Powder	2.5 kg	\$ 20.59
21	04-Dec-20	76664-37050-DT	A-M-0.2	5	Aurea Corradino	acorradinoj@harvard.edu	United States	Dark Chocolate	Chips	0.2 kg	\$ 3.38
22	04-Dec-20	76664-37050-DT	E-D-0.2	4	Aurea Corradino	acorradinoj@harvard.edu	United States	Ruby Chocolate	Powder	0.2 kg	\$ 3.65
23	04-Dec-20	03090-88267-BQ	A-D-0.2	6	Avrit Davidowsky	adavidowskyl@netvibes.com	United States	Dark Chocolate	Powder	0.2 kg	\$ 2.99
24	22-Jan-21	37651-47492-NC	R-M-2.5	4	Annabel Antuk	aanutkm@kickstarter.com	United States	Milk Chocolate	Chips	2.5 kg	\$ 22.89

6. Data Analysis

After converting the dataset to a table, we proceeded to create several Pivot Tables to explore the data and gain meaningful insights.

Total Sales Over Time :

We created a Pivot Table in a new sheet named "Totalsales" to visualize sales over time. The Order Date was grouped monthly, and we dragged the Chocolate Type and Sales into the columns to see how sales varied for different types of

chocolate over time. A line chart was created from this Pivot Table to visualize the Total Sales Over Time.

Sales by Country :

In a new sheet, we copied the original Pivot Table and modified it to show sales by country. The Pivot Table was adjusted to display Country and Sum of Sales, which allowed us to analyze which country had the highest sales. A bar chart was created to visualize this, showing that the United States had the highest sales at \$35,639, followed by Ireland at \$6,697, and the United Kingdom at \$2,799.

Top 5 Customers :

In another sheet, we again copied the original Pivot Table and adjusted it to show Top 5 Customers by sales. The Pivot Table was modified to include Customer Name and Sum of Sales, and a bar chart was created to highlight the top 5 customers. Allis Wilmore was the top customer with \$317 in sales, followed by Brenn Dundredge at \$307, and Terri Farra at \$289.

Slicers for Additional Filtering :

To make the dashboard more interactive, we added three slicers for filtering data by:

- Form Type (Bars, Chips, Powder)
- Size (0.2kg, 0.5kg, 1.0kg, 2.5kg)
- Loyalty Card (Yes/No)

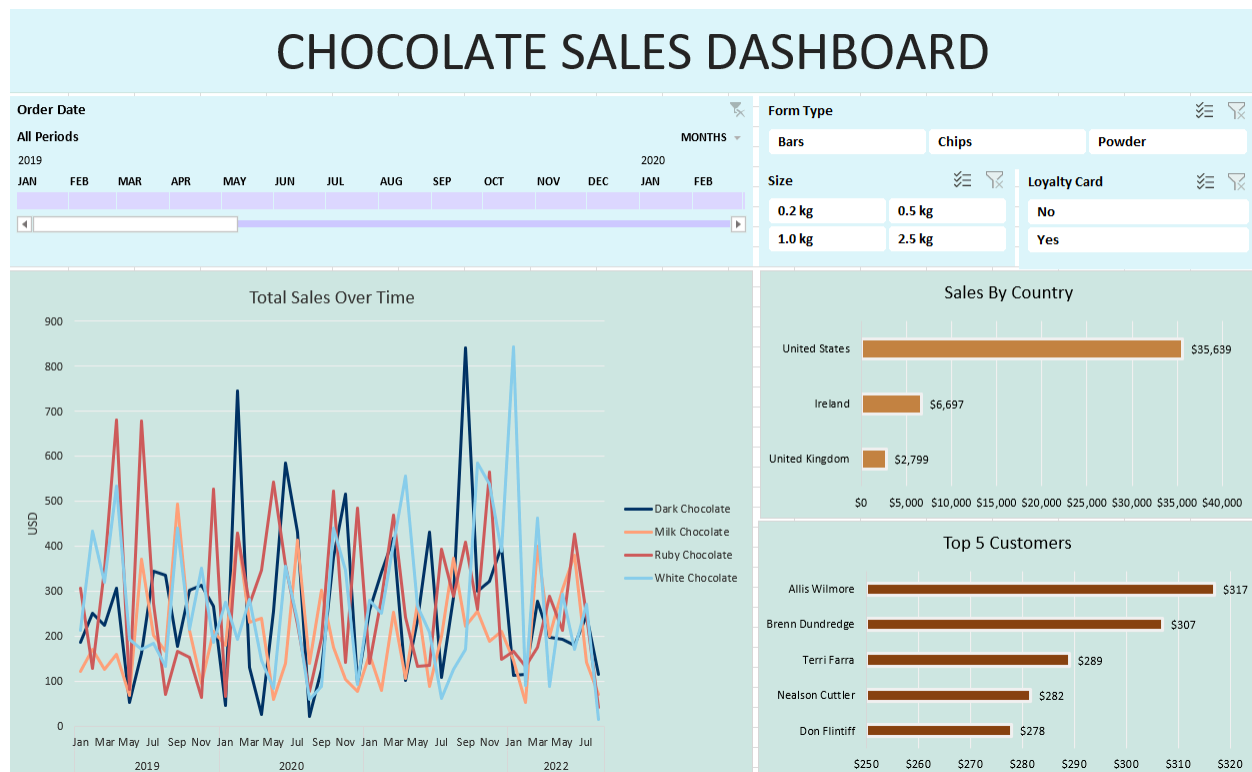
These slicers enable users to filter the data dynamically, allowing for a deeper exploration of how various factors influence sales.

7. Data Visualization and Dashboard

Finally, we combined all the Pivot Charts, Slicers, and the Timeline into a single, interactive Dashboard.

- The Total Sales Over Time line chart displays sales trends across different chocolate types over the selected time range.

- The Sales by Country bar chart shows the top-performing countries, highlighting the United States as the highest-grossing region.
- The Top 5 Customers bar chart provides insights into which customers are generating the most revenue for the business.
- The Timeline and Slicers allow for dynamic filtering, making it easier to drill down into specific time periods, product forms, sizes, and customer loyalty.



8. Results and Conclusion

From the analysis, it is clear that Dark Chocolate consistently performs well across all time periods, with spikes during specific months. The United States dominates in terms of total sales, contributing significantly to overall revenue. Our top customers are frequent buyers, and offering targeted loyalty rewards to these individuals could enhance customer retention.

In conclusion, by analyzing the chocolate sales data, we identified key trends that will allow the company to refine its sales strategy. The dashboard not only provides a comprehensive overview of sales performance but also offers an

interactive tool to explore data across various dimensions. Moving forward, these insights will help the company optimize its product offerings, target high-performing regions, and focus on customer retention strategies to drive further growth.