Walmart Sales Insights Copilot

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ABSTRACT

The Walmart Sales Insights Copilot is an environment intended to deliver a comprehensive study of Walmart's sales data, encompassing weekly sales trends, holiday effects, economic connections, and seasonal patterns. It enables users to obtain actionable insights via an interactive and visual analysis of data, facilitating data-driven decision-making. This Copilot provides a complete analysis of Walmart's sales performance by enabling users to observe weekly sales variations, evaluate the impact of holidays on sales, examine connections with economic indicators (such as CPI and unemployment rates), and discover seasonal sales trends. Users can readily obtain these insights by entering trigger phrases, which produce visual representations such as line and bar charts, so rendering complex data accessible and comprehensible. This tool is a helpful resource for stakeholders seeking to enhance sales tactics informed by historical trends and economic factors.

KEYWORDS

Walmart Sales Insights, Copilot, weekly sales trends, holiday effect, economic connections, seasonal patterns, data visualization, trigger phrases, interactive analysis, data-driven decisions.

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1 INTRODUCTION

This assignment examines the structure and operation of Topics, Actions, and Flows in the Walmart Sales Insights Copilot. Topics serve as the fundamental components of a copilot, delineating its capabilities and shaping the trajectories of dialogue. Each topic directs users through particular facets of the Copilot's functionalities, such as examining weekly sales insights or assessing the impact of holidays on sales, so rendering the interaction seamless and coherent. Topics may encompass trigger phrases—specific phrases or keywords that assist users in navigating the copilot. A user query such as "Show weekly sales trends" triggers the pertinent topic to exhibit sales patterns.

Conversation nodes represent the actionable steps associated with each subject. These nodes instruct the copilot on subsequent actions following a topic activation, like posing follow-up enquiries, creating visualisations, or invoking cloud flows. Cloud flows in Power Automate are essential for enhancing a copilot's capabilities, allowing it to retrieve external data in response to user enquiries.

The Walmart Sales Insights Copilot offers a streamlined and dynamic experience through its framework of Topics, Actions, and Flows, enabling users to intuitively and effectively examine and analyse sales data.

2 DATASET

This Walmart sales dataset comprises 6,435 records, documenting weekly sales data from several stores along with other features. The dataset has details on Store number, Date of each entry, Weekly Sales figures, Holiday Flag denoting the presence of a holiday during the week, Temperature, Fuel Price, CPI (Consumer Price Index), and Unemployment rate. These variables offer a thorough examination of elements that may affect Walmart's weekly sales, facilitating an analysis of sales trends and relationships with economic indicators and seasonal influences.

2.1 EDA: Data Analysis and Insights

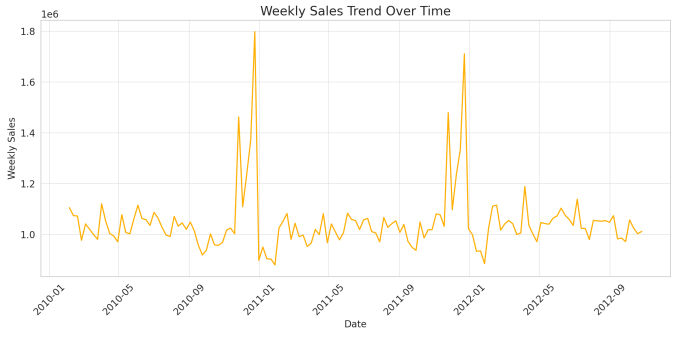

Figure 1: Weekly Sales Trend Over Time

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The line plot illustrates variations in Walmart's weekly sales over time, featuring significant peaks and troughs. The trends indicate that specific periods of the year exhibit elevated sales, potentially affected by seasonal demand and holidays.

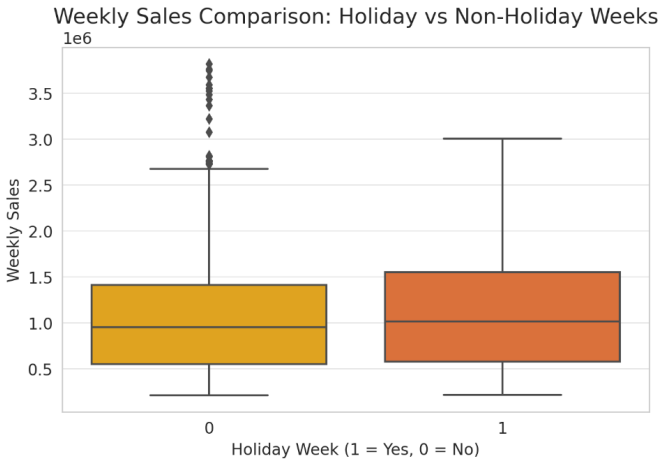

Figure 2: Holiday vs Non-Holiday Sales

The box plot contrasting holiday and non-holiday weeks demonstrates that Walmart's sales are generally elevated during holiday weeks. This indicates that holidays probably enhance consumer expenditure, possibly influenced by holiday shopping and promotional sales.

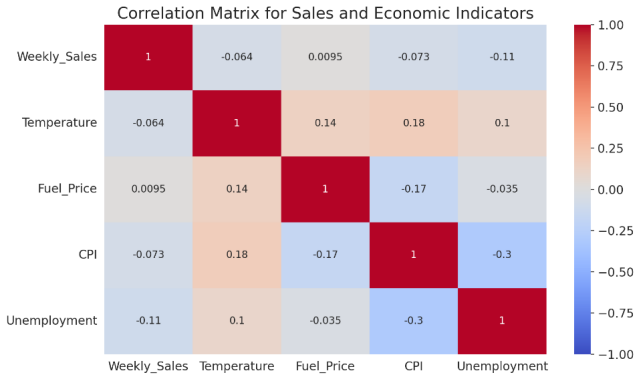

Figure 3: Correlation Between Variables

The correlation heatmap reveals some interesting relationships:

- **Weekly Sales and CPI**: A slight positive correlation suggests that sales increase somewhat with the CPI, possibly reflecting general economic conditions.
- **Weekly Sales and Unemployment**: There is a weak negative correlation, indicating that higher unemployment might slightly reduce sales, although the relationship is not strong.
- **Fuel Price and Temperature**: These factors show a low correlation with sales, implying limited direct impact on weekly sales.

These observations indicate that whereas holidays significantly influence sales, other economic variables, such as the Consumer Price Index and unemployment, also exert influence, albeit in a more nuanced manner. This analysis underscores the intricate relationship between seasonality, holidays, and economic situations affecting Walmart's sales success.

3 OUR COPILOT

- Power Automate Flow for Walmart Weekly Sales
- Power Automate Flow for Walmart Holiday Effect on Sales
- Power Automate Flow for Seasonal Effect on Sales
- Power Automate Flow for Send an email

3.1 Power Automate Flow for Walmart Weekly Sales

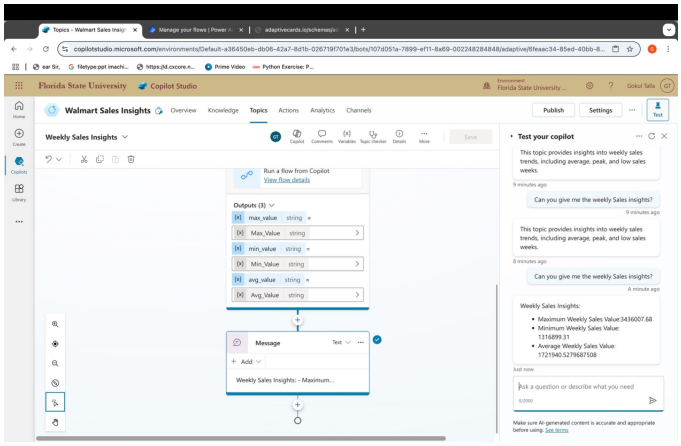

Figure 4: Demo Fig

The "Weekly Sales Insights Flow" is designed to operate in conjunction with Copilot, facilitating a straightforward and engaging data engagement. Below is a detailed analysis of each step:

- **Start a New *Flow* in Power Automate:** Commence by establishing an Automated Cloud Flow in Power Automate, selecting the **trigger** "When a flow is triggered from Copilot." This trigger enables the flow to initiate when Copilot gets a user prompt or trigger phrase pertaining to weekly sales insights.
- **Retrieve Weekly Sales Data:** Utilise the "List rows present in a table" action to establish a connection to the source file, such as Walmart's sales data in Excel, located on OneDrive or SharePoint. This action enables the flow to retrieve data rows, with the flexibility to pick certain columns as necessary, so optimising data processing.
- **Initialize Variables for Data Storage and Calculations:** Set up an array variable, ***WeeklySalesArray***, to store individual weekly sales values for further calculations. Define a float variable, ***TotalWeeklySales***, initialized to zero, which will hold the cumulative total of all weekly sales as each entry is processed.

- **Process Each Row of Data with a Loop**: A **Compose action** converts the weekly sales value to a numeric format if it's not already, ensuring accurate calculations. The converted value is then appended to the ***WeeklySalesArray*** using an "Append to array variable" action, which creates a collection of sales data points. The flow updates ***TotalWeeklySales*** by adding each week's sales value, building a cumulative sum to be used later for average calculation.
- **Calculate Maximum, Minimum, and Average Sales:** Use Compose actions to find the maximum and minimum values in ***WeeklySalesArray***, representing the highest and lowest weekly sales, respectively. Calculate the average weekly sales by dividing ***TotalWeeklySales*** by the number of entries in ***WeeklySalesArray***. This average value provides insight into overall sales performance trends.
- **Respond to Copilot with Sales Insights:** Finally, add a "**Respond to Copilot**" action to relay the calculated values back to the Copilot. By returning these insights—maximum, minimum, and average weekly sales—the Copilot can present the results to users in a clear, conversational format.

Figure 5: Grafana Visualization

3.2 Power Automate Flow for Send an email

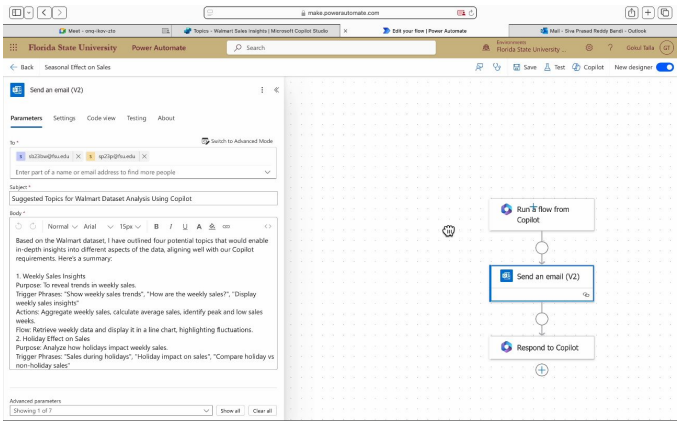

Figure 6: Caption

- **Actions: Set Up Email** this step gathers essential information such as the recipient's email address, the subject line, and the message content. This setup ensures that all required fields are ready for the user's input. A preview option provides users the ability to review the email's content, layout, and attachments, ensuring accuracy before sending.Once the email is confirmed, the "Send" action dispatches the email and completes the communication loop.
- **Flow: Input Fields** step captures the recipient's email, subject, and body text, as well as any attachments if needed. Before sending, a preview of the email is shown to the user, allowing them to make any last-minute edits or confirm that the email is ready to be sent. After confirmation, the email is sent, and the user is notified of the successful action with a confirmation message.
- **Representation:** A modal or popup displays the email preview and prompts for final confirmation, making the process user-friendly. After sending, a success message reassures the user that the email was successfully dispatched.

3.3 Power Automate Flow for Walmart Holiday Effect on Sales

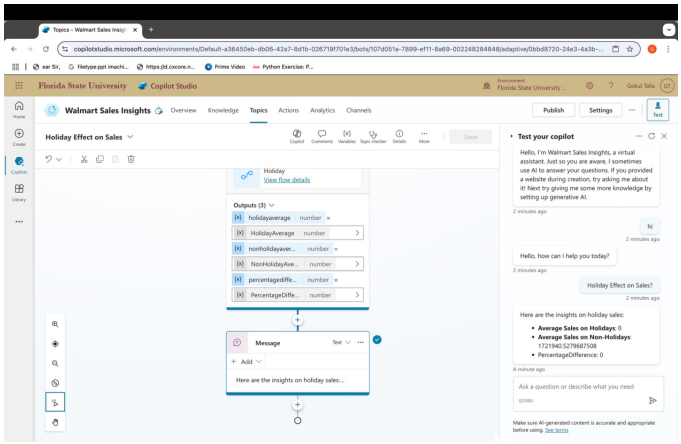

Figure 7: Caption

This flow is intended to automate the analysis of the influence of holiday periods on weekly sales. Here's a breakdown of the main steps:

- **Flow Initialization and Data Retrieval:** Utilise the "List rows present in a table" action to extract data from an Excel file or analogous source. The data must encompass weekly sales statistics and a "Holiday_Flag" field to denote holiday periods.
- **Variable Initialization:** Establish variables to retain totals for holiday and non-holiday sales, along with counters for holiday and non-holiday weeks. This encompasses the specification of variables such as ***HolidaySalesTotal***, ***NonHolidaySalesTotal***, ***HolidayWeeksCount***, and ***NonHolidayWeeksCount***.

- **Looping Through Each Row:** Within the loop, add a Condition action to check if a row corresponds to a holiday week (Holiday_Flag = 1). Based on the condition result, separate logic is applied:For holiday weeks, increment the holiday sales total and count.
- For non-holiday weeks, increment the non-holiday sales total and count.
- **Calculating Averages:** Upon iterating over all rows, compute the average weekly sales for both holiday and non-holiday periods utilising Compose operations. This step incorporates error handling to prevent division by zero when there are no holiday or non-holiday weeks.
- **Computing Percentage Difference:** Compute the percentage difference between the holiday and non-holiday averages to illustrate the relative effect of holiday periods on sales. A fallback is incorporated to address instances where one of the averages is zero.
- **Responding to Copilot:** Finally, use the **Respond to PowerApp** or flow action to send the computed averages and percentage difference back to Copilot. This allows users to see the results directly in Copilot without additional steps.

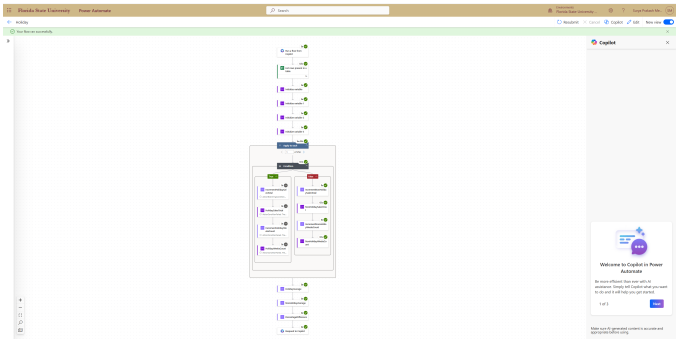

Figure 8: Caption

This Power Automate flow is intended to evaluate and contrast sales data between holiday and non-holiday weeks. Let us examine the procedures meticulously to comprehend its functionality.

- **Run a Flow from Copilot:** The flow is triggered by Copilot, signifying that the user has commenced a command or request that Copilot identifies as pertinent to this analytical process.
- **List Rows Present in a Table:** This action retrieves the rows of data from a specified table, likely containing weekly sales data.
- **Initialize Variables:** Four variables are established to store cumulative totals and counts: **HolidaySalesTotal** Represents the aggregate sales figure during holiday weeks, **NonHolidaySalesTotal** Represents the cumulative sales figure for non-holiday weeks, **HolidayWeeksCount** Enumerates the quantity of holiday weeks, **NonHolidayWeeksCount** Enumerates the quantity of weeks that are not designated as holidays.
- **Condition (Holiday or Non-Holiday Check):** Inside the loop, there is a condition to check whether the week is a holiday. This check allows the flow to differentiate between holiday and non-holiday weeks.
- **Holiday and Non-Holiday Averages: HolidayAverage**: The average holiday sales, calculated by dividing ***HolidaySalesTotal*** by ***HolidayWeeksCount***. NonHolidayAverage: The average non-holiday sales, calculated by dividing ***NonHolidaySalesTotal*** by ***NonHolidayWeeksCount***.
- **Respond to Copilot:** Finally, the flow sends a response back to Copilot, including the calculated values: Holiday average sales Non-holiday average sales, and Percentage difference between holiday and non-holiday sales.

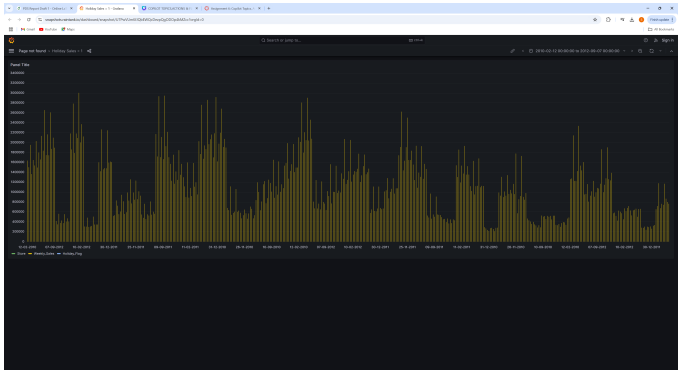

Figure 9: Grafana Visualization

3.4 Power Automate Flow for Seasonal Effect on Sales

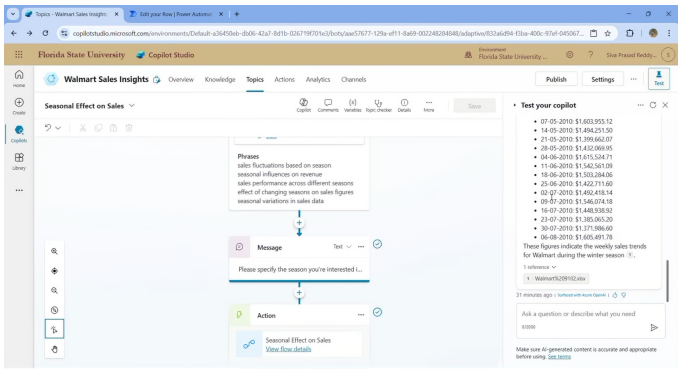

Figure 10: Caption

The "Seasonal Effect on Sales" topic in Power Automate seeks to elucidate Walmart's sales patterns during several seasons, enabling users to make informed decisions on inventories and promotions.

- **Key Actions in the Flow:** Users are asked, "Which season's impact on sales would you like to explore? (Spring, Summer, Fall, Winter)". Users can select from Spring, Summer, Fall, or Winter and then the selected season is saved to personalize the analysis.

- **Choose Visualization Type:** Next, users are prompted to choose their preferred chart type with the question, "Would you prefer a line chart or a bar graph for seasonal sales insights?". Line Chart or Bar Graph then this choice is saved to customize how the data will be displayed, making it more user-friendly.
- **Provide Seasonal Insight Summary:** This step gives users a clear summary of what the data shows, helping them understand the practical implications of the seasonal trends.

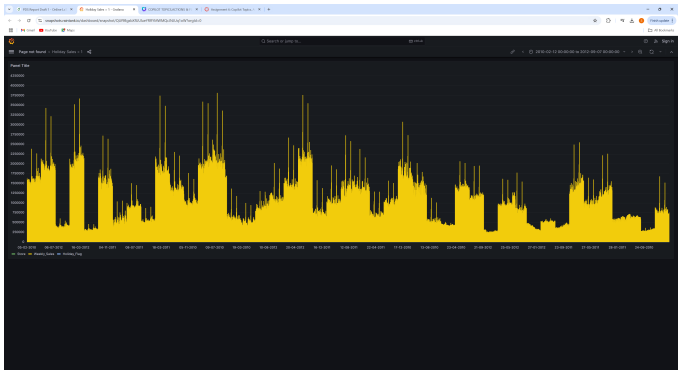

Figure 11: Grafana Visualization