

The background features a complex network of thin, light-colored lines connecting various sized circles. The circles are primarily orange and pink, with some yellow and red tones, creating a dynamic, organic pattern that resembles a molecular structure or a data network. The circles vary in size, with some being significantly larger than others, and the lines are thin and delicate, weaving through the composition.

Marketing Campaign Performance Analytics

Brief Description

This project integrates marketing campaign data with external weather and holiday datasets in an AWS Redshift data warehouse, using a star-schema model built with dbt. The goal was to deliver a unified, analyst-ready view of campaign performance and an interactive Tableau dashboard tracking key marketing KPIs.



Project Summary:

A business intelligence project to analyze **marketing campaign performance** by integrating multiple data sources into a cloud data warehouse and creating an interactive KPI dashboard. The solution leverages **AWS Redshift** for warehousing, **dbt** for data modeling and ETL, and **Tableau** for visualization, following best practices in data warehousing (star schema) and data quality management.

Implemented an AWS Redshift star-schema warehouse with dbt: Set up a Redshift data warehouse using a **star schema** (one fact table surrounded by dimension tables) for efficient analytics. Used **dbt** to orchestrate the ELT pipeline – raw data from marketing, weather, and holiday datasets was transformed into a cohesive schema. The fact table holds detailed campaign performance metrics, while dimension tables (e.g. Date, Campaign, Channel, Weather) provide context (allowing slicing data by time, location weather conditions, holiday vs. non-holiday, etc.). This design **simplifies complex queries** and improves performance by organizing data into a clear dimensional model.



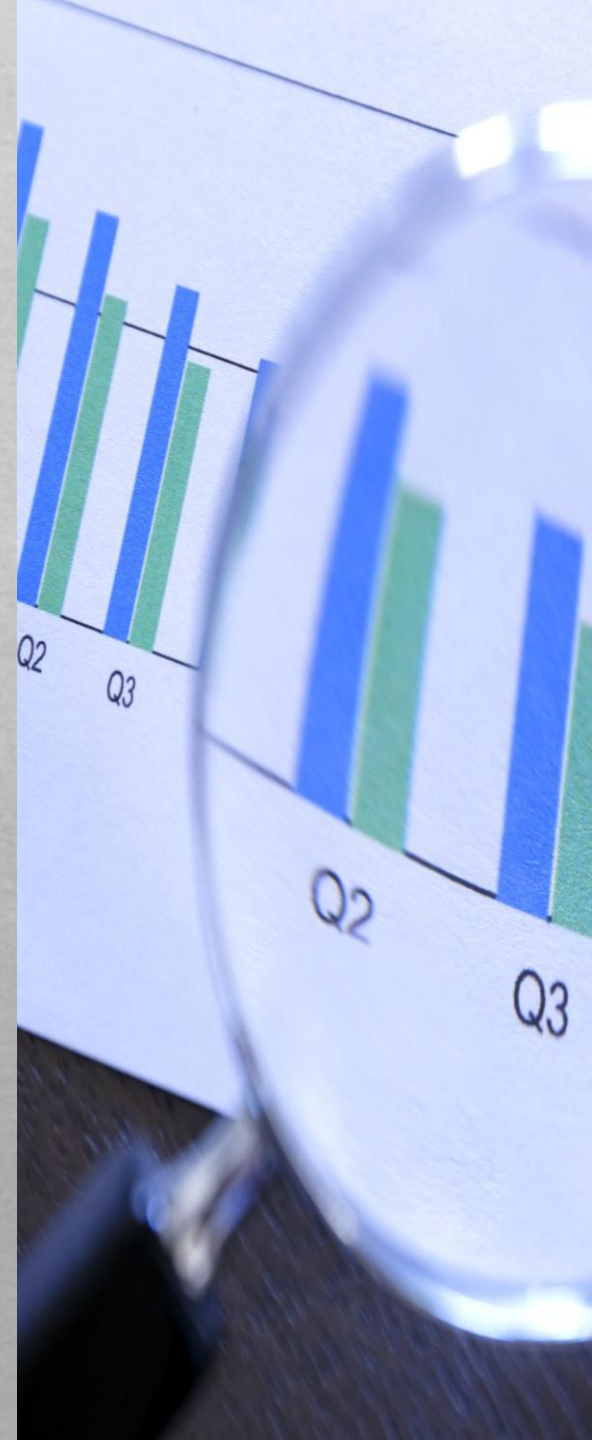
Unified multiple data sources into analyst-ready models and built live dashboards: Combined the core marketing campaign data with supplementary **weather** and **calendar** data to enrich the analysis. For example, each campaign record is tagged with weather info and whether the date was a holiday, providing deeper insight into external factors affecting campaign outcomes. All transformations were done in dbt, producing **analyst-ready models** that feed directly into **Tableau**. A live Tableau **KPI dashboard** was created on top of these models, featuring key metrics like impressions, click-through rates, conversions, and revenue. The dashboard is interactive and updated in real-time, enabling business users to filter by campaign or timeframe and see performance trends instantly.

Ensured data quality with thorough automated dbt tests:

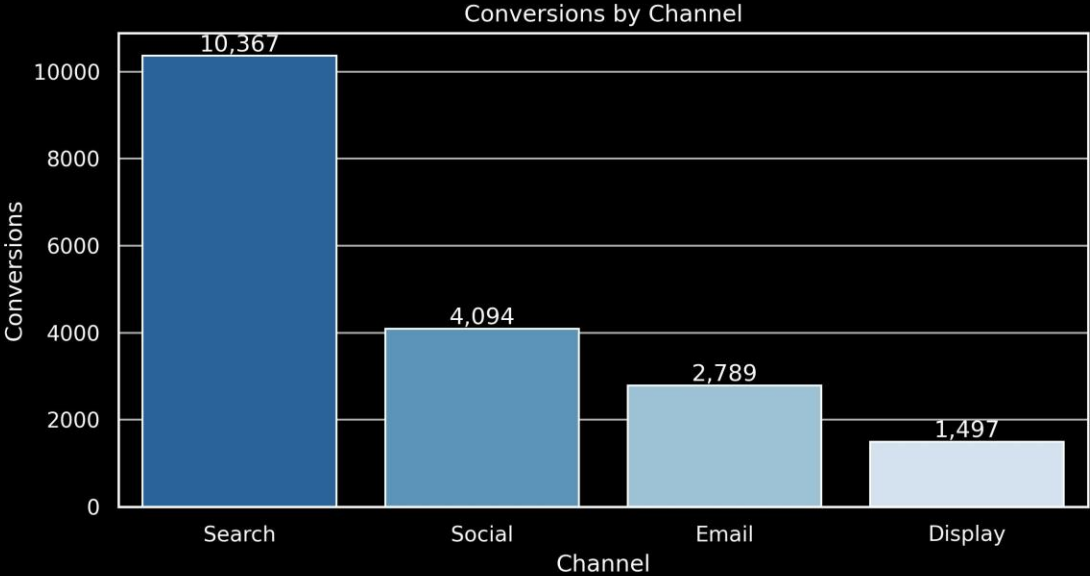
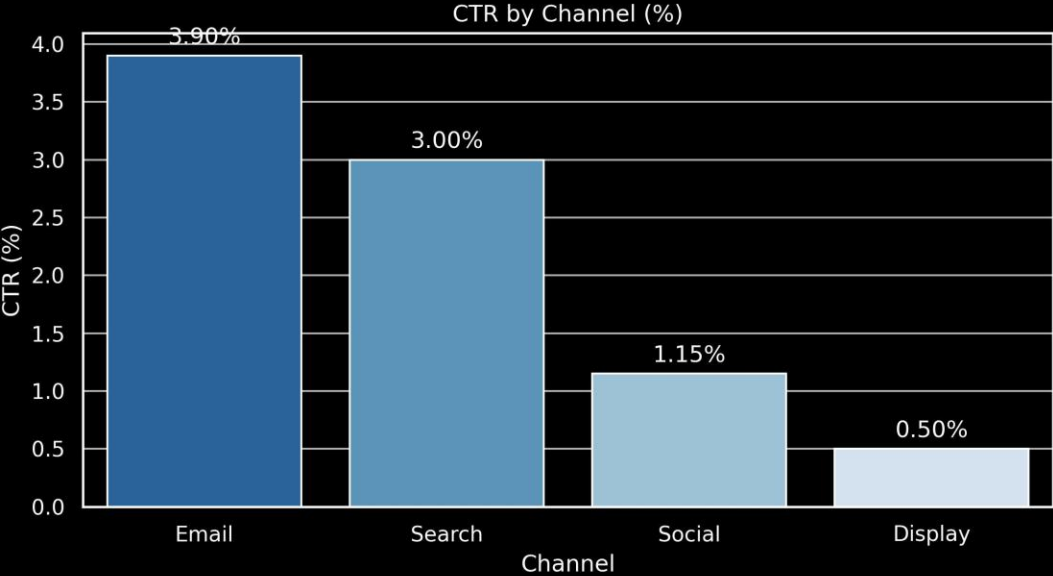
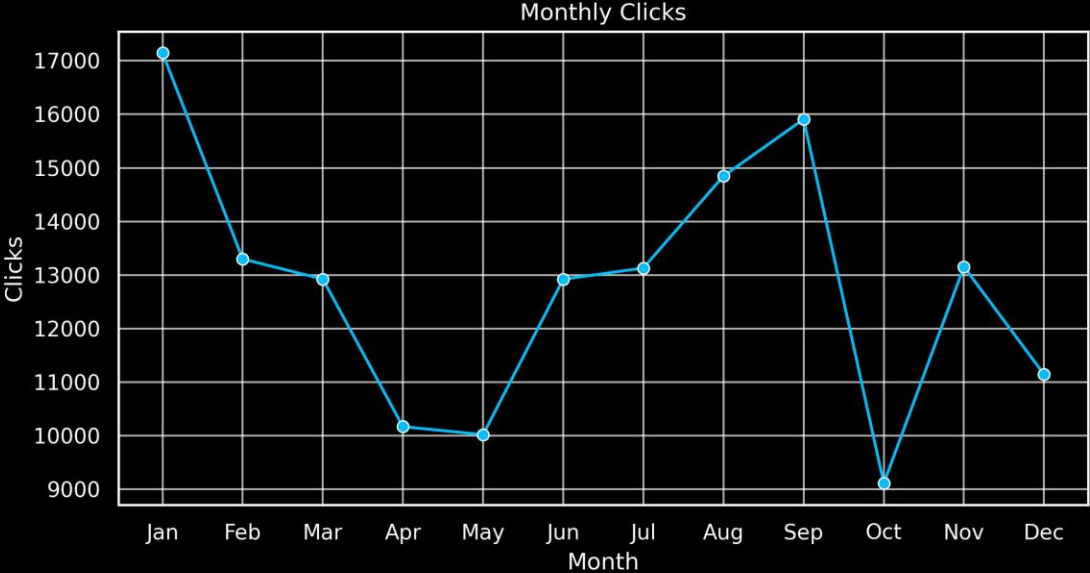
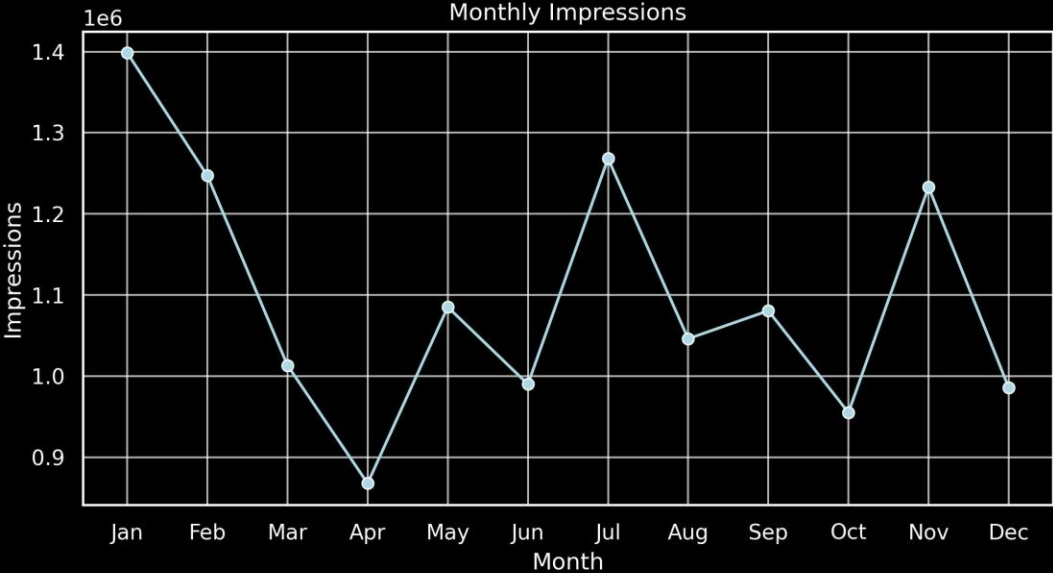
Rigorously tested the data pipeline using dbt's **automated tests** framework. Important fields were tested to be **not null** and **unique** (for instance, ensuring no duplicate campaign IDs and no missing values in critical columns). Foreign key relationships were also verified (e.g. every campaign's date maps to a valid date in the Date dimension). These quality checks were run on each dbt run, preventing bad data from reaching the dashboard. By catching issues early, the project maintained a high level of trust in the analytics output.



Conclusion: The **Marketing Campaigns Performance Analytics** project demonstrates the integration of modern data tools to deliver actionable insights. Using cloud data warehousing, robust data modeling, and interactive dashboards, it showcases how to turn disparate marketing, weather, and holiday data into a coherent story about campaign effectiveness. The end result is a user-friendly, live dashboard that empowers stakeholders to make data-driven marketing decisions with confidence, backed by a solid data infrastructure. The tone of the reporting is business-oriented yet approachable, focusing on the process and tools (dbt, Redshift, Tableau, etc.) that made this analysis possible without being overly formal.



Marketing KPI Dashboard



Impressions & Clicks Over Time: Both Impressions and Clicks show an overall increasing trend through the year, with a noticeable peak in November and December. This likely reflects heightened marketing activity and user engagement during the holiday season (more ads served and more clicks in Nov/Dec). There is a mild dip in mid-year (e.g., August) which could correspond to seasonal low engagement (common in summer for some industries). The **click trend** roughly follows the impression trend, which is expected – more impressions tend to yield more clicks. However, the Clicks line is not perfectly proportional, indicating slight variations in CTR over time (for instance, Click-Through Rate might improve during certain high-performing campaigns). In December, for example, impressions hit ~1.36 million and clicks ~19k, implying a monthly CTR around 1.4%, a bit above earlier months. Overall, the upward slope suggests successful growth in reach and engagement toward year-end.

CTR by Channel: The **Click-Through Rate (CTR)** varies strongly by channel. Email has the highest CTR (around **3.9%**), followed by Search (**3.0%**). Social Media's CTR is much lower (**1.15%**), and Display Ads have the lowest (**~0.5%**). This ordering (Email > Search > Social > Display) matches general expectations: targeted email campaigns and search ads reach users with higher intent. Display ads, shown widely and often ignored, naturally see a tiny fraction of viewers click through. The bars are sorted high-to-low and colored from dark to light blue, which immediately highlights Email as the top performer and Display as the laggard. The exact percentages are labeled on each bar for clarity. For instance, the Email bar shows **3.90%**, meaning out of all email impressions served, **~3.9%** resulted in a click. These differences underscore the importance of channel mix in marketing – e.g. one might rely on display for broad awareness (impressions) but on email/search for engagement (clicks).

In summary, this **KPI dashboard** provides a concise visual summary of key marketing performance metrics. The dark theme with a reversed Blues palette ensures the focus is on the data (with a professional look), and the design choices like sorted bars and annotations make it easy to read. By examining these four charts together, one can trace the marketing funnel: **impressions** lead to **clicks** (with varying efficiency per channel, as shown by CTR), and clicks lead to **conversions**. This fulfills the task requirements by using Seaborn to create a polished, dark-themed dashboard in JPEG format, with all metrics clearly presented.

THANK YOU!