

## **EDA Using Power BI**

### **Project Title: Marketing Campaign Effectiveness**

#### **Problem Statement:**

The marketing team runs campaigns across email, social media, TV, and Search Ads. Although marketing spend is increasing, management is unsure whether campaigns are delivering a good return on investment (ROI).

The leadership team wants to know:

- Which channels generate the highest revenue
- Which campaigns underperform
- How efficiently marketing money is spent

You are responsible for building a campaign performance analytics solution to support smarter marketing investments.

#### **Questions:**

- Identify missing or inconsistent marketing data.
- Which marketing channels generate the highest revenue?
- Calculate ROI for each campaign using DAX.
- Analyze conversion rates across channels.
- Perform univariate analysis on campaign spend.
- Identify underperforming campaigns.
- Design a campaign performance dashboard.
- Which channels should receive increased investment?
- How can insights improve future marketing strategy?

## Identify missing or inconsistent marketing data:

The screenshot shows the Power Query Editor interface with a query named "Campaign Effectiveness Marketing". The main area displays a table with four columns: CampaignID, CampaignName, Channel, and CampaignType. Below the table are two sections: "Column statistics" and "Value distribution".

**Column statistics:**

Statistic	Value
Count	360
Error	0
Empty	0
Distinct	360
Unique	360
Empty string	0
Min	Campaign_1
Max	Campaign_15

**Value distribution:**

Value	Count
Campaign_3	1
Campaign_5	1
Campaign_6	1
Campaign_7	1
Campaign_9	1
Campaign_10	1
Campaign_11	1
Campaign_12	1
Campaign_13	1
Campaign_14	1
Campaign_15	1

On the right side, the "Properties" pane shows the name "Campaign Effectiveness Marketing" and the "Applied Steps" pane lists "Changed Type" under the "Promoted Headers" step.

- There will be no error, missing or inconsistent marketing data

## Which marketing channels generate the highest revenue?

The screenshot shows the Power BI desktop interface with a report page titled "Project POWERBI". The main visual is a bar chart titled "Total Revenue by Channel" showing revenue for four channels: Search Ads, Email, TV, and Social Media. A callout box highlights "Search Ads generates the highest revenue".

**Total Revenue by Channel**

Channel	Total Revenue
Search Ads	€11.5M
Email	€10.3M
TV	€9.2M
Social Media	€5.1M

The "Visualizations" pane on the right lists various chart and report types, and the "Data" pane shows the fields used in the report, including CampaignID, CampaignName, Channel, and Revenue.

- Search Ads generates the highest revenue

## Calculate ROI (Return on Investment) for each campaign using DAX:

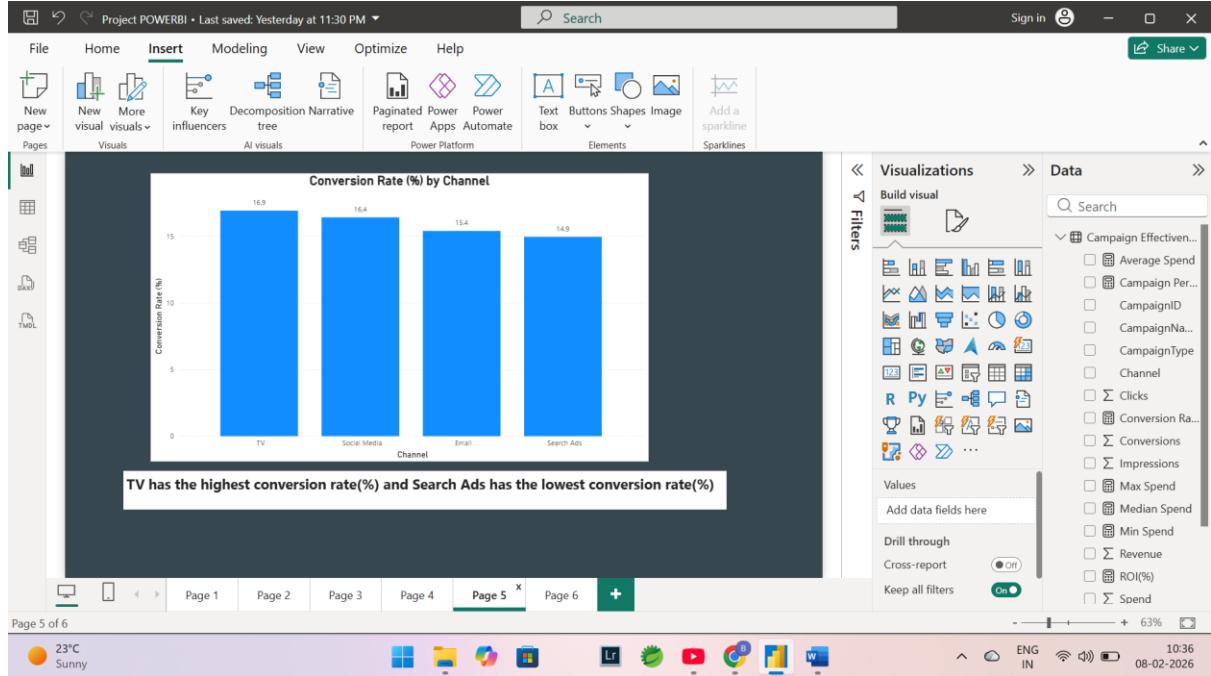
Screenshot of Power BI Desktop showing the Measure tools ribbon tab selected. A measure named "ROI(%)" is being defined with the formula: `ROI(%) = DIVIDE([Total Revenue]-[Total Spend],[Total Spend])*100`. The Data pane on the right shows various metrics and measures available for selection.

CampaignID	CampaignName	Channel	CampaignType	StartTime	Spend	Impressions	Clicks	Conversions	Revenue	Spend (bins)
P1000	Campaign_1	TV	Seasonal Offer	45292	₹ 11,833.00	413704	21993	4157	₹ 62,326.00	10000
P1010	Campaign_11	TV	Seasonal Offer	45302	₹ 37,320.00	145504	11553	759	₹ 61,047.00	35000
P1011	Campaign_12	TV	Seasonal Offer	45303	₹ 43,304.00	105257	22616	3776	₹ 81,626.00	40000
P1013	Campaign_14	TV	Seasonal Offer	45305	₹ 22,450.00	220176	3917	4043	₹ 1,90,858.00	20000
P1015	Campaign_16	Email	Seasonal Offer	45307	₹ 25,764.00	399744	15255	96	₹ 1,27,832.00	25000
P1016	Campaign_17	Search Ads	Seasonal Offer	45308	₹ 48,404.00	482930	26281	3409	₹ 1,40,406.00	45000
P1020	Campaign_21	Social Media	Seasonal Offer	45312	₹ 17,161.00	485774	2354	4040	₹ 1,70,326.00	15000
P1022	Campaign_23	Social Media	Seasonal Offer	45314	₹ 32,122.00	121317	5162	4395	₹ 1,12,215.00	30000
P1025	Campaign_26	Social Media	Seasonal Offer	45317	₹ 32,472.00	300843	3208	4480	₹ 1,66,755.00	30000
P1032	Campaign_33	Search Ads	Seasonal Offer	45324	₹ 5,417.00	276765	4712	1550	₹ 1,08,511.00	5000
P1033	Campaign_34	Social Media	Seasonal Offer	45325	₹ 46,576.00	156108	13724	3344	₹ 21,653.00	45000
P1035	Campaign_36	Email	Seasonal Offer	45327	₹ 8,267.00	408342	25650	984	₹ 91,941.00	5000
P1036	Campaign_37	Search Ads	Seasonal Offer	45328	₹ 22,209.00	146194	17420	3092	₹ 43,662.00	20000
P1038	Campaign_39	Email	Seasonal Offer	45330	₹ 43,513.00	354982	10814	1516	₹ 1,97,518.00	40000
P1040	Campaign_41	TV	Seasonal Offer	45332	₹ 16,338.00	458874	9077	664	₹ 1,05,081.00	15000
P1041	Campaign_42	TV	Seasonal Offer	45333	₹ 5,412.00	48638	8570	1232	₹ 46,877.00	5000
P1044	Campaign_45	Search Ads	Seasonal Offer	45336	₹ 38,496.00	115977	25493	180	₹ 82,715.00	35000
P1045	Campaign_46	Search Ads	Seasonal Offer	45337	₹ 28,548.00	98869	23374	3033	₹ 1,51,398.00	25000
P1047	Campaign_48	TV	Seasonal Offer	45339	₹ 49,425.00	306818	7283	4509	₹ 1,42,632.00	45000
P1048	Campaign_49	Social Media	Seasonal Offer	45340	₹ 43,756.00	176926	13726	88	₹ 89,148.00	40000

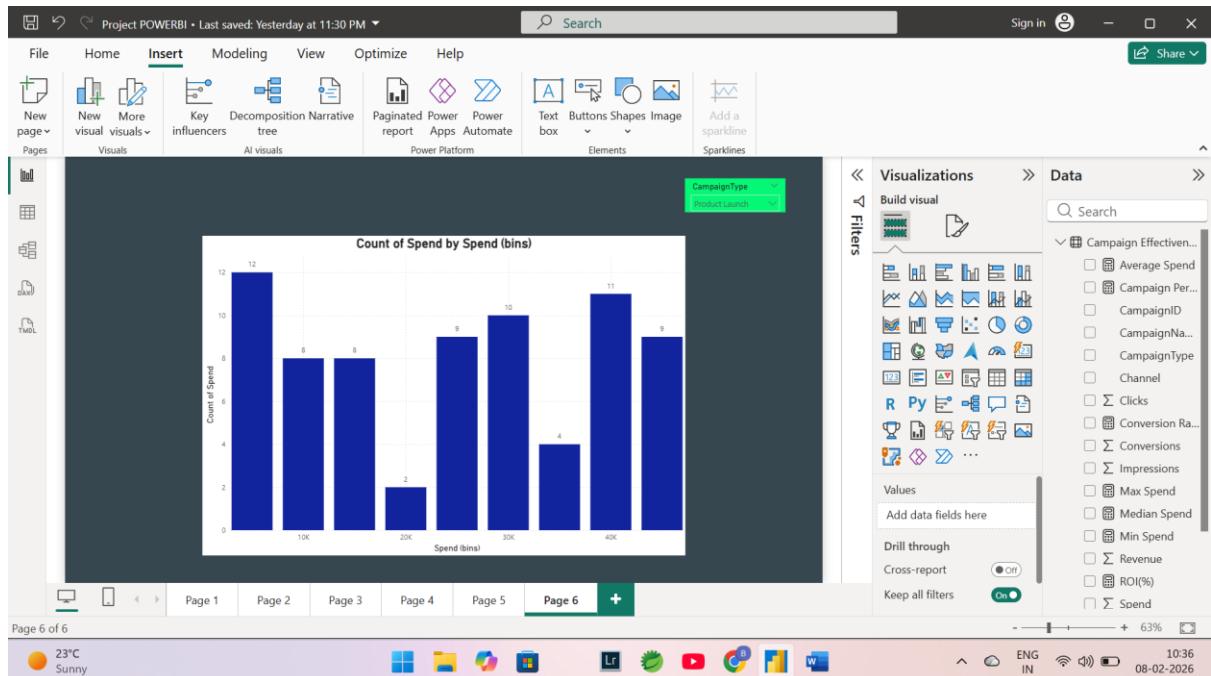
Screenshot of Power BI Desktop showing the Insert ribbon tab selected. A table visual is displayed on the canvas, showing the same data as the previous screenshot. The Data pane on the right shows various metrics and measures available for selection.

CampaignName	Total Revenue	Total Spend	ROI(%)
Campaign_68	12,920.00	49,912.00	-74.11
Campaign_211	11,969.00	42,732.00	-71.99
Campaign_292	16,471.00	42,441.00	-61.19
Campaign_70	18,946.00	46,555.00	-59.30
Campaign_20	30,151.00	45,912.00	-64.64
Campaign_34	21,653.00	46,576.00	-33.51
Campaign_249	13,654.00	28,061.00	-51.24
Campaign_205	22,115.00	41,487.00	-46.69
Campaign_65	26,082.00	48,286.00	-45.98
Campaign_338	22,289.00	41,034.00	-45.68
Campaign_203	19,110.00	34,703.00	-44.93
Campaign_201	16,570.00	28,959.00	-42.78
Campaign_8	19,078.00	33,074.00	-42.32
Campaign_155	17,951.00	23,611.00	-39.79
Campaign_165	19,847.00	33,011.00	-39.69
Campaign_299	11,177.00	18,051.00	-58.08
Campaign_178	10,281.00	16,035.00	-35.76
Campaign_219	23,669.00	36,471.00	-35.10
Campaign_163	25,563.00	38,982.00	-34.42
Campaign_298	31,636.00	47,288.00	-33.10
Campaign_357	22,149.00	31,329.00	-29.30
Campaign_310	34,596.00	48,086.00	-28.08
Campaign_202	35,350.00	46,251.00	-27.85
Campaign_207	32,911.00	45,251.00	-27.27
Campaign_274	37,723.00	48,125.00	-21.61
<b>Total</b>	<b>3,90,04,659.00</b>	<b>1,02,53,614.00</b>	<b>280.40</b>

## Analyse conversion rates across channels:



## Perform univariate analysis on campaign spend:



## Identify underperforming campaigns:

The screenshot shows the Microsoft Power BI desktop interface. The main area displays a table titled "Campaign Performance" with the following data:

CampaignName	Channel	Conversion Rate (%)	ROI(%)	Campaign Effectiveness
Campaign_68	Email	7.92	-74.11	Underperforming
Campaign_211	TV	12.87	-71.99	Underperforming
Campaign_11	TV	21.12	-35.76	Underperforming
Campaign_70	Social Media	34.20	-59.20	Underperforming
Campaign_215	TV	19.09	-55.14	Underperforming
Campaign_34	Social Media	24.37	-53.81	Underperforming
Campaign_349	Search Ads	15.55	-51.34	Underperforming
Campaign_205	Search Ads	7.22	-46.65	Underperforming
Campaign_65	TV	8.34	-45.89	Underperforming
Campaign_338	TV	0.97	-45.63	Underperforming
Campaign_203	TV	46.03	-38.86	Underperforming
Campaign_201	TV	256.94	-42.79	Underperforming
Campaign_9	Email	20.51	-42.32	Underperforming
Campaign_227	TV	2.86	-41.29	Underperforming
Campaign_165	Social Media	15.67	-39.98	Underperforming
Campaign_295	Social Media	11.85	-38.04	Underperforming
Campaign_178	TV	13.23	-35.74	Underperforming
Campaign_219	Search Ads	15.52	-35.51	Underperforming
Campaign_163	Search Ads	17.82	-34.62	Underperforming
Campaign_209	TV	7.08	-33.83	Underperforming
Campaign_337	Social Media	16.94	-33.00	Underperforming
Total		14.89	-33.22	Underperforming

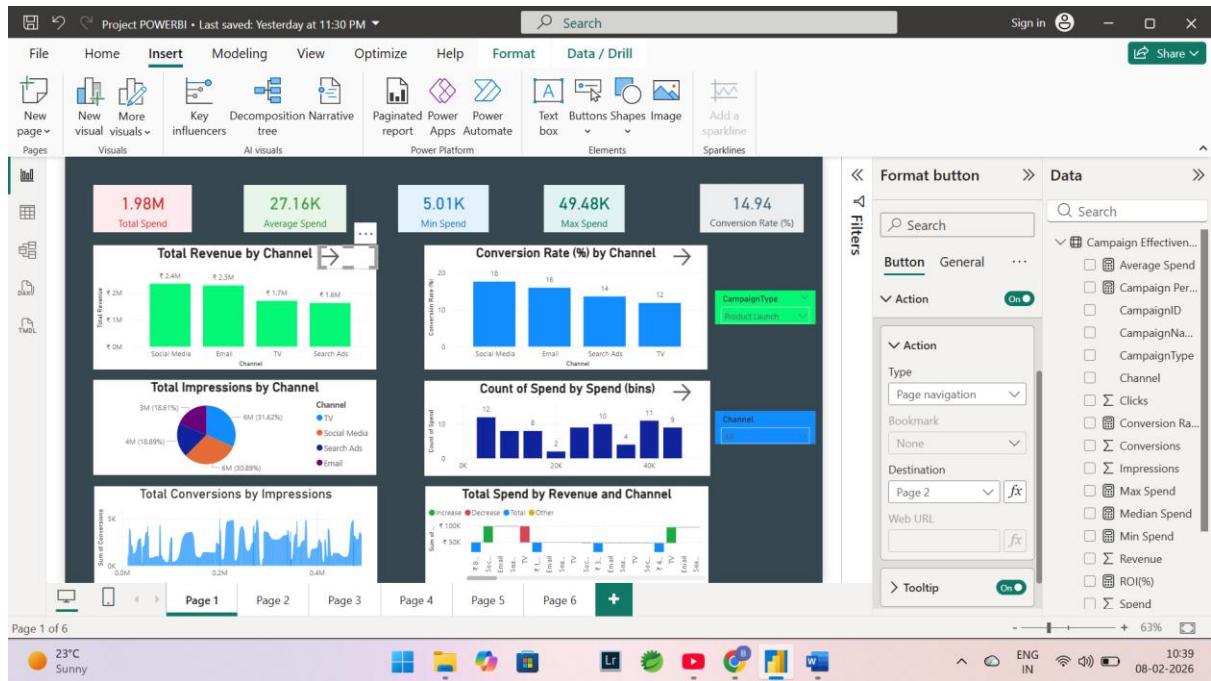
A callout box highlights "Campaign\_68 is the most underperforming campaign".

The Power BI ribbon is visible at the top, showing tabs like File, Home, Insert, Modeling, View, Optimize, and Help. The Insert tab is selected. The Visualizations pane on the right lists various chart and report types. The Data pane on the right shows a hierarchical list of fields related to campaign effectiveness.

The screenshot shows the Microsoft Power BI desktop interface, identical to the one above. The main area displays the same "Campaign Performance" table with the same data and highlighting for Campaign\_68.

The Power BI ribbon, Visualizations pane, and Data pane are also identical to the first screenshot.

## Design a campaign performance dashboard with page navigation:



## Which channels should receive increased investment?

**Social Media and Email** marketing should receive increased investment due to their higher conversion rates and positive ROI. **TV campaigns** show lower efficiency and should be optimized or allocated a reduced budget.

## How can insights improve future marketing strategy?

Campaign performance insights enable data-driven budget allocation, identification of inefficient campaigns, improved targeting, and ongoing performance monitoring. These actions help **maximize ROI** and support more effective marketing strategies in the future.