

# REPORT ON MINI PROJECT

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Project Title : Digital Advertising Campaign Performance  
Analysis

Project Domain : Sales & E-commerce

Submission Date: 10-11-2025

Mentor Name : Kumaran. M

Raw Data Link : [https://docs.google.com/spreadsheets/d/1qdfxmHlfIMRF6VH-UFJJD09vyx74\\_3b2W8VN9o8n4AM/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1qdfxmHlfIMRF6VH-UFJJD09vyx74_3b2W8VN9o8n4AM/edit?usp=sharing)

CleanDataLink:

<https://docs.google.com/spreadsheets/d/18E6ND0IKe3VurALyEF0UsvPCcpjAxzq2H-YEkFBmY1c/edit?usp=sharing>

# Purpose of the Dataset

The purpose of this dataset is to analyse the performance of digital marketing campaigns across different platforms, devices, and keywords. It captures key advertising metrics such as clicks, impressions, cost, conversions, and revenue generated.

This dataset allows us to:

- Evaluate the effectiveness of each advertisement.
- Identify high-performing devices, dates, and keywords.
- Measure return on investment (ROI) using cost and sale amount data.
- Detect trends and patterns that help improve future marketing decisions.
- Build dashboards to visually track campaign performance.

Overall, the dataset provides a structured foundation for understanding marketing efficiency and optimizing advertising strategies.

# Objectives of the Project

1. **To clean and preprocess the dataset** by identifying and handling missing values, formatting inconsistencies, and transforming raw data into a usable structure.
2. **To standardize key numerical columns** such as Cost and Conversions using Excel formulas (MEDIAN, IF, ISNUMBER, etc.) for accurate analysis.
3. **To create calculated insights** including Conversion Rate, Total Sale Amount, and other performance indicators.

- 4. To analyse marketing performance** across different dimensions such as
  - Ad Date
  - Device Type
  - Keywords
  - Campaign Name
- 5. To build an interactive Power BI dashboard** that visually represents campaign metrics using charts, slicers, and KPIs.
- 6. To understand the contribution of each category** (device, keyword, date) to total campaign performance.
- 7. To provide actionable insights** that help in decision-making, such as improving ad strategies, optimizing cost, and increasing conversions.
- 8. To document the entire process**—from data cleaning to visualization—providing a clear workflow of applied techniques and tools.

## Problem Statement

- 9.** The dataset contains digital marketing campaign information, including clicks, impressions, cost, conversions, sale amount, device type, and keywords. However, the raw data includes issues such as missing values, inconsistent formatting, and unprocessed numerical fields.

Due to these data quality problems, it is difficult to assess campaign performance accurately.

10. Therefore, the main problem is to **clean, structure, and analyse the dataset** so that meaningful insights can be generated.

This includes identifying trends, evaluating marketing effectiveness, understanding device and keyword performance, and creating an interactive dashboard for decision-making.

## Tools Used

### 1. Microsoft Excel

- Data cleaning and preprocessing
- Handling missing values using formulas (IF, MEDIAN, ISNUMBER, etc.)
- Standardization of numerical columns
- Creating helper columns
- Validating cleaned data

### 2. Microsoft Power BI

- Data transformation (Power Query)
- Creating calculated measures (DAX)
- Designing interactive dashboards

- Using slicers for filtering
- Visualizing insights using charts, KPIs, and treemaps

### **3. PowerPoint / Word (for documentation)**

- Report preparation
- Final presentation of workflow and findings

## **Scope of the Project**

- This project covers the complete data analysis workflow—from raw data cleaning to visualization. It involves identifying inconsistencies, handling null values, transforming data types, and creating calculated fields using Excel. The scope further includes importing the cleaned dataset into Power BI, developing a dynamic dashboard, applying filters and slicers, and constructing KPIs and charts for decision-making. The project focuses on analysing campaign efficiency across devices, dates, and keywords to aid in performance optimization.

# DATA CLEANING IN EXCEL

## Convert Range Into Table

The entire dataset was first converted into a structured **Excel Table** for smooth formatting, easy filtering, and consistent formula application.

This was done by selecting the full data range and pressing **Ctrl + T**.

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Ad_ID	Campaign_Name	Clicks	Impressions	Cost	Leads	Conversions	Conversion Rate	Sale_Amount	Ad_Date	Location	Device	Keyword
2	A1000	DataAnalyticsCourse	104	4498	\$216.84	14	7	0.058	\$1892	16-11-2024	hyderabad	desktop	learn data analytics
3	A1001	DataAnalyticsCourse	173	5107	\$203.66	10	8	0.046	\$1679	20-11-2024	hyderabad	mobile	data analytics course
4	A1002	Data Analytics Corse	90	4544	\$203.66	26	9		\$1624	16-11-2024	hyderabad	Desktop	data analitics online
5	A1003	Data Analytics Course	142	3185	\$237.66	17	6		\$1225	26-11-2024	HYDERABAD	tablet	data anaytics training
6	A1004	Data Analytics Corse	156	3361	\$195.9	30	8		\$1091	22-11-2024	hyderabad	desktop	online data analytic
7	A1005	DataAnalyticsCourse	195	3776	\$243.57	10	8		\$1315	16-11-2024	hyderabad	MOBILE	data anaytics training
8	A1006	Data Analytics Corse	116	4480	\$237.79	17	5	0.043	\$1640	06-11-2024	hyderabad	TABLET	data analytics course
9	A1007	Data Analytics Corse	184	5060	\$229.61	23	3	0.016	\$1509	24-11-2024	Hyderabad	TABLET	analytics for data
10	A1008	Data Analytics Corse	113	5434		27	4	0.058	\$1362	24-11-2024	Hyderabad	Tablet	data anaytics training
11	A1009	Data Analytics Course	166	3355	\$186.78	24	9	0.054	\$1029	12-11-2024	Hyderabad	Mobile	online data analytic
12	A1010	DataAnalyticsCourse	101	5399	\$236.79	20	6	0.059	\$1900	14-11-2024	HYDERABAD	DESKTOP	learn data analytics
13	A1011	Data Analytics Corse	101	3613	\$208.12	24	5	0.05	\$1130	22-11-2024	hyderabad	Desktop	online data analytic
14	A1012	Data Analytics Course	125	3259	\$191.3	18	3	0.024	\$1959	27-11-2024	hyderabad	DESKTOP	data analitics online
15	A1013	Data Analytics Corse	196	3742	\$207.46	10	7	0.038	\$1623	12-11-2024	hyderabad	mobile	data anaytics training
16	A1014	Data Analytics Course	181	4311	\$185.09	11	9	0.05	\$1538	04-11-2024	Hyderabad	Desktop	data anaytics training
17	A1015	Data Analytics Course	102	5461	\$201.69	22	8	0.078	\$1755	29-11-2024	hyderabad	desktop	data analytics course
18	A1016	Data Analytics Course	193	5159		15	9	0.047	\$1614	10-11-2024	hyderabad	Mobile	learn data analytics
19	A1017	Data Analytics Corse	149	4431	\$207.4	19	9	0.06	\$1693	12-11-2024	HYDERABAD	mobile	learn data analytics
20	A1018	Data Analytics Corse	150	3113	\$217.41	20	5		\$1785	07-11-2024	hyderabad	Mobile	analytics for data
21	A1019	Data Analytics Course	145	5278		25	6	0.041	\$1516	05-11-2024	hyderabad	DESKTOP	data analytics course
22	A1020	Data Analytics Corse	184	4143	\$223.3	10	10	0.044	\$1735	21-11-2024	Hyderabad	TABLET	learn data analytics
23	A1021	Data Analytics Corse	171	4154	\$184.23	30	7	0.041	\$1803	08-11-2024	hyderabad	tablet	data anaytics online
24	A1022	Data Analytics Courses	122	5107	\$214.24	27	6	0.040	\$1222	20-11-2024	HYDERABAD	Desktop	online data analytic

## Result:

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Ad_ID	Campaign_Name	Clicks	Impressions	Cost	Leads	Conversions	Conversion Rate	Sale_Amount	Ad_Date	Location	Device	Keyword
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16	A1014	Data Analytics Course	181	4311	\$185.09	11	9	0.05	\$1538	04-11-2024	Hyderabad	Desktop	data anaytics training
17	A1015	Data Analytics Course	102	5461	\$201.69	22	8	0.078	\$1755	29-11-2024	hyderabad	desktop	data analytics course
18	A1016	Data Analytics Course	193	5159		15	9	0.047	\$1614	10-11-2024	hyderabad	Mobile	learn data analytics
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23	A1021	Data Analytics Corse	171	4154	\$184.23	30	7	0.041	\$1803	08-11-2024	hyderabad	tablet	data anaytics online
24	A1022	Data Analytics Courses	122	5107	\$214.24	27	6	0.040	\$1222	20-11-2024	HYDERABAD	Desktop	online data analytic

## COLUMN 1 — Ad\_ID

## **Problem Identified:**

No major issues found; column had clean, unique identifiers.

## **Action Taken:**

Verified consistency and ensured the field remains as text format.

## **Steps Followed:**

- Checked for duplicates
- Ensured no missing values
- Confirmed text formatting

## **Formula Used:**

*No formula required*

# **COLUMN 2 — Campaign\_Name**

## **• Problem Identified:**

- Inconsistent spacing (“DataAnalyticsCourse” vs “Data Analytics Course”).
- And spelling Mistakes(“Dataanalutscouse”)

## **Action Taken:**

Standardized all names to one consistent format.

## **Steps Followed:**

1. Removed extra spaces
2. Applied proper case formatting
3. Replaced inconsistent text with uniform naming
4. Used F7 key to correct spelling

## **Formula Used:**

=PROPER(TRIM(B2))

## Original data:

## **Standardized:**

# COLUMN 3 – Clicks

## **Problem Identified:**

No structural issues, only needed numeric validation.

## Action Taken:

Converted to numeric and checked for blanks.

## **Steps Followed:**

- Validated numeric column
  - Filled missing values (if any) using median

## Formula Used:

```
=IF(C2="", MEDIAN($C:$C), C2)
```

### Original data:

Clicks
113
166
101
101
125
196
181
102
193
149
150
145
184
171
122
188
87
88
119
128
86
188
113

### Standardized:

Clicks
116
184
113
166
101
101
125
196
181
102
193
149
150
145
184
171
122
188
87
88
119
138
128
86
188
113

## COLUMN 4 — Impressions

### Problem Identified:

Column was clean but some rows had small inconsistencies.

### Action Taken:

Cleaned data and filled blanks.

### Steps Followed:

1. Converted all values to number
2. Filled missing values using median
3. Ensured no negative values

## Formula Used:

```
=IF(D2="", MEDIAN($D:$D), D2)
```

Original data:

Impressions
4498
5107
4544
3185
3361
3776
4480
5060
5434
5399
3613
3259
3742
4311
5461
5159
4431
3113
5278
4143
4154
5187

Standardized:

Impressions
4498
5107
4544
3185
3361
3776
4480
5060
5434
3355
5399
3613
3259
3742
4311
5461
5159
4431
3113
5278
4143
4154
5187
5798
3718

## COLUMN 5 — Cost

### Problem Identified:

Currency symbols (\$) and blanks created errors.

### Action Taken:

Removed symbols, converted to number, filled missing values.

### Steps Followed:

1. Removed “\$” using SUBSTITUTE
2. Converted text to number
3. Replaced blanks using median stored in helper cell

### Formula Used:

```
=IF(F2="", $Z$1, VALUE(SUBSTITUTE(F2,"$","")))
```

Original data:

Cost
\$ 215.55
\$ 216.84
\$ 203.66
\$ 237.66
\$ 195.90
\$ 243.57
\$ 237.79
\$ 229.61
\$ 215.55
\$ 186.78
\$ 236.79
\$ 208.12
\$ 191.30
\$ 207.46
\$ 185.09
\$ 201.69
\$ 215.55
\$ 207.40
\$ 217.41
\$ 215.55
\$ 223.30
\$ 184.23
\$ 211.24
\$ 230.17
\$ 215.55

Standardized:

Cost
n
\$216.84
\$203.66
\$237.66
\$195.9
\$243.57
\$237.79
\$229.61
\$186.78
\$236.79
\$208.12
\$191.3
\$207.46
\$185.09
\$201.69
\$207.4
\$217.41
\$223.3
\$184.23
\$211.24

## COLUMN 6 — Leads

### Problem Identified:

Few missing values.

### Action Taken:

Filled missing values using average/median.

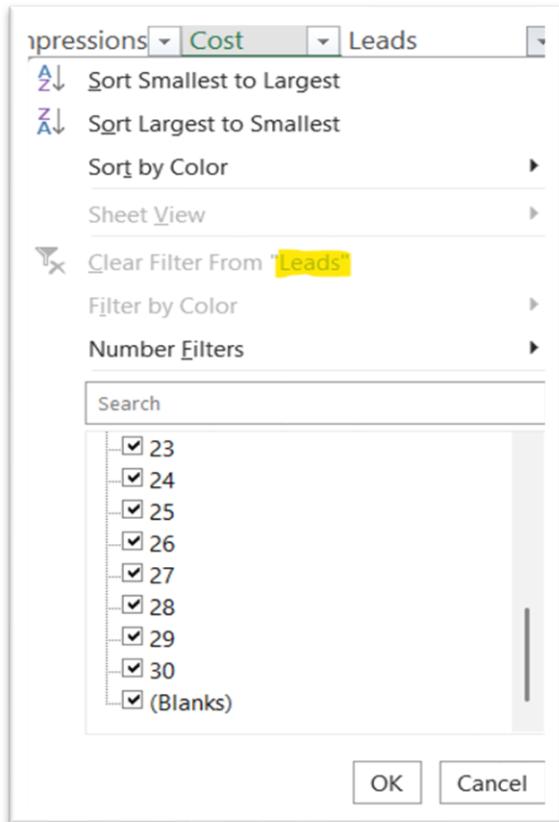
### Steps Followed:

1. Validated numeric data
2. Replaced blanks with average value

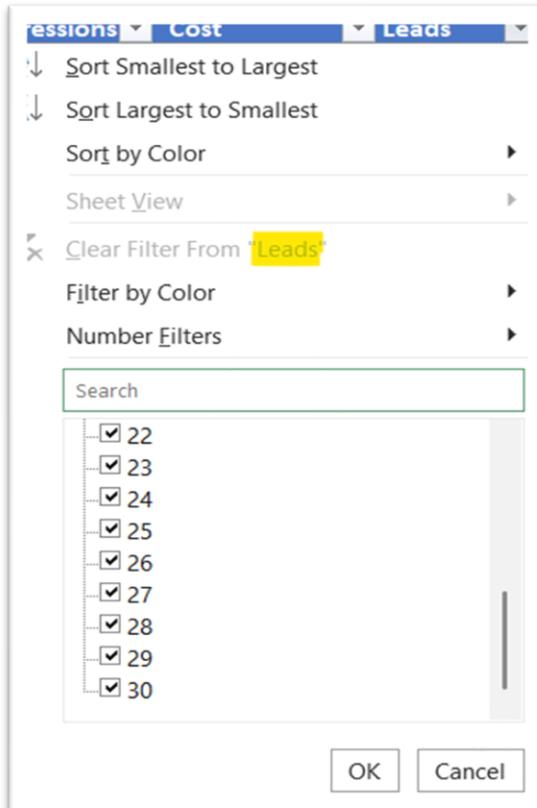
### Formula Used:

```
=IF(G2="", AVERAGE($G:$G), G2)
```

## Original data:



## Standardized:



## COLUMN 7 — Conversions

### Problem Identified:

Missing values impacted further calculations.

### Action Taken:

Filled missing values using average.

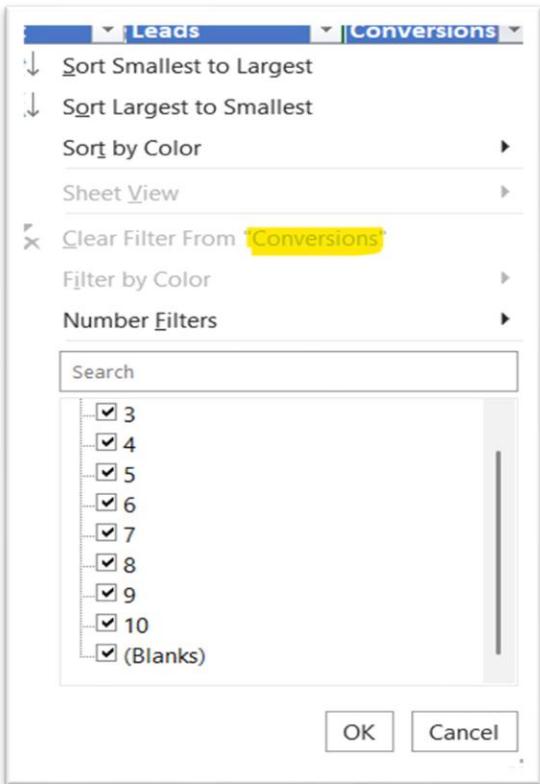
### Steps Followed:

1. Checked missing rows
2. Applied average replacement formula

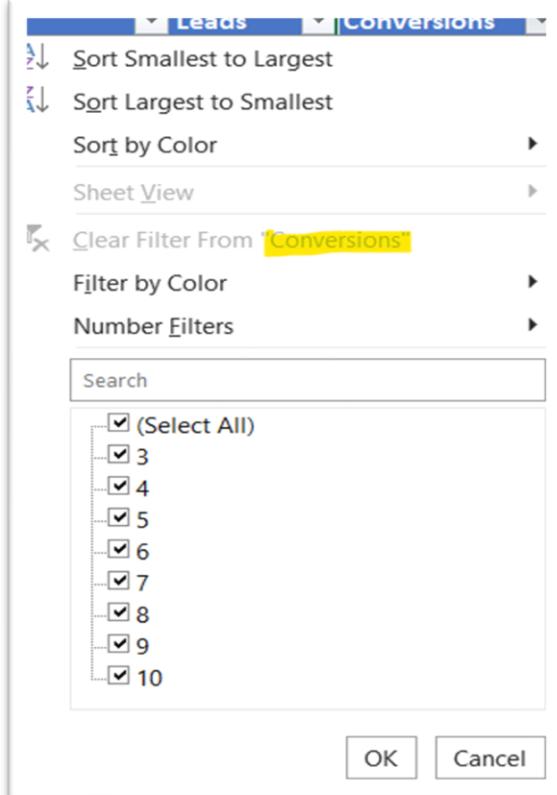
### Formula Used:

```
=IF(H2="", AVERAGE($H:$H), H2)
```

## Original data:



## Standardized:



## COLUMN 8 — Conversion Rate

### Problem Identified:

Incorrect or blank conversion percentages.

### Action Taken:

Recalculated Conversion Rate based on Clicks & Conversions.

### Steps Followed:

1. Used formula = Conversions / Clicks
2. Applied percentage formatting
3. Fixed zeros

### Formula Used:

```
=IF(C2=0,0,H2/C2)
```

### Original data:

Conversion Rate
0.058
0.046
0.043
0.016
0.058
0.054
0.059
0.05
0.024
0.038
0.05
0.078
0.047
0.06
0.041
0.044
0.041
0.049

### Standardized:

Conversion Rate
0.058
0.046
0.002
0.002
0.002
0.043
0.016
0.058
0.054
0.059
0.050
0.024
0.038
0.050
0.078
0.047
0.060
0.002
0.041
0.044
0.041
0.049
0.047
0.034

## COLUMN 9 — Sale\_Amount

### Problem Identified:

Missing values and formatting issues.

### Action Taken:

Filled blanks using median and cleaned numeric values.

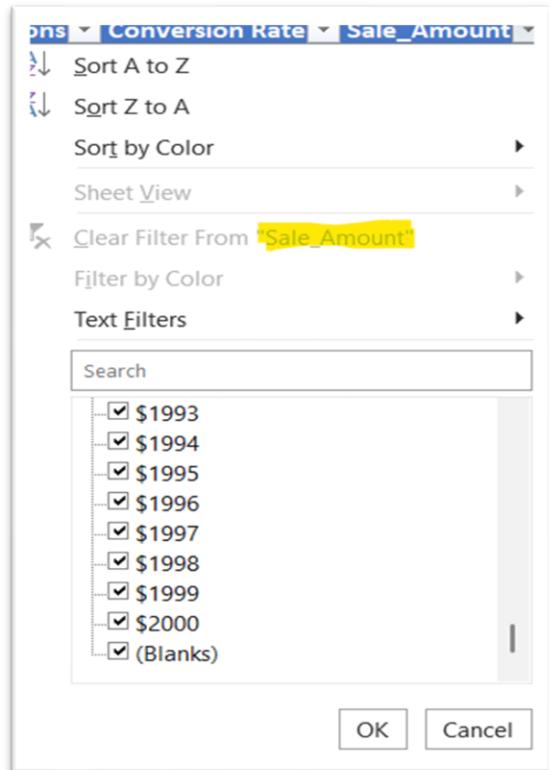
### Steps Followed:

1. Converted values to number
2. Filled missing entries
3. Ensured positive values

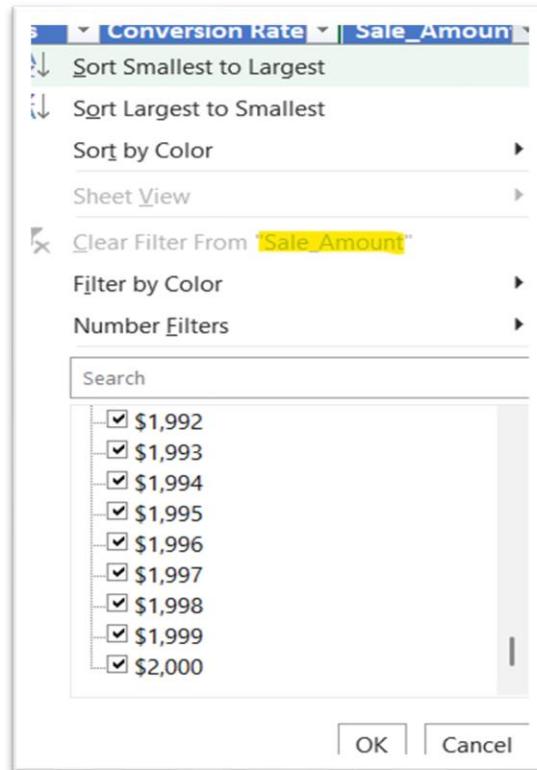
### Formula Used:

```
=IF(I2="", MEDIAN($I:$I), I2)
```

## Original data:



## Standardized:



## COLUMN 10 — Ad\_Date

### Problem Identified:

Some dates not recognized due to text format.

### Action Taken:

Converted text to proper date type.

### Steps Followed:

1. Used DATEVALUE()
2. Applied date formatting
3. Removed blanks

### Formula Used:

```
=IFERROR(DATEVALUE(J2), J2)
```

# COLUMN 11 — Location

## Problem Identified:

Unnecessary spaces and inconsistent names.

## Action Taken:

Cleaned up using TRIM.

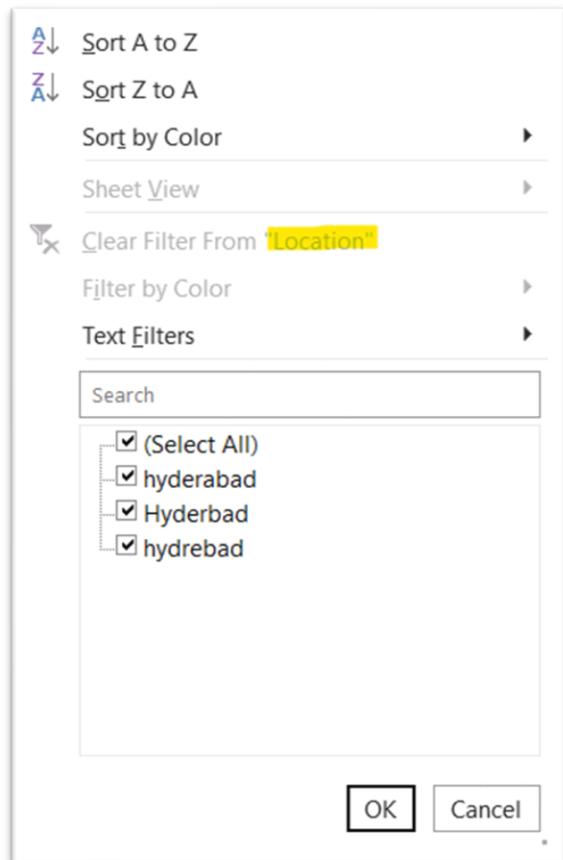
## Steps Followed:

1. Removed spaces
2. Standardized city names

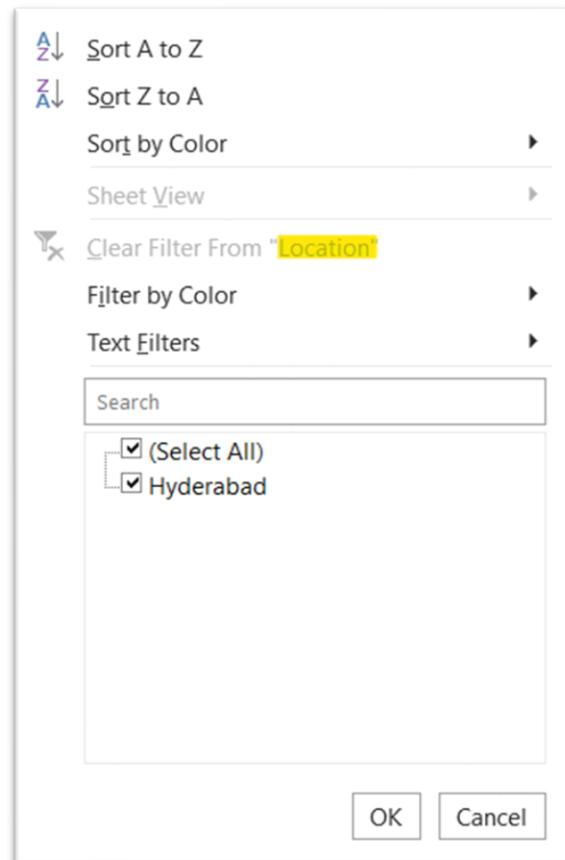
## Formula Used:

=TRIM(K2)

### Original data:



### Standardized:



## COLUMN 12 — Device

### Problem Identified:

Capitalization inconsistent.

### Action Taken:

Standardized device names.

### Steps Followed:

- Applied proper case
- Removed trailing spaces

### Formula Used:

=PROPER(TRIM(L2))

### Original data

Device
desktop
mobile
Desktop
tablet
desktop
MOBILE
TABLET
TABLET
Tablet
Mobile
DESKTOP
Desktop
DESKTOP
mobile
Desktop
desktop
Mobile
mobile
Mobile
DESKTOP
TABLET
tablet
Desktop

### Standardized:

Device
Desktop
Mobile
Desktop
Tablet
Desktop
Mobile
Tablet
Tablet
Mobile
Desktop
Desktop
Desktop
Mobile
Desktop
Desktop
Mobile
Mobile
Mobile
Desktop
Tablet
Tablet
Desktop
Tablet
Tablet

# COLUMN 13 — Keyword

## Problem Identified:

Different variations of same keyword (spacing issues).

## Action Taken:

Standardized keywords.

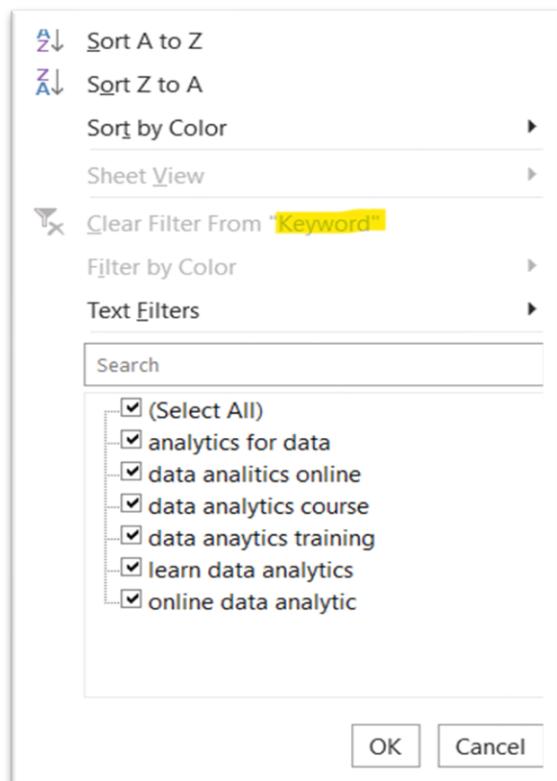
## Steps Followed:

1. TRIM
2. PROPER
3. Checked duplicates

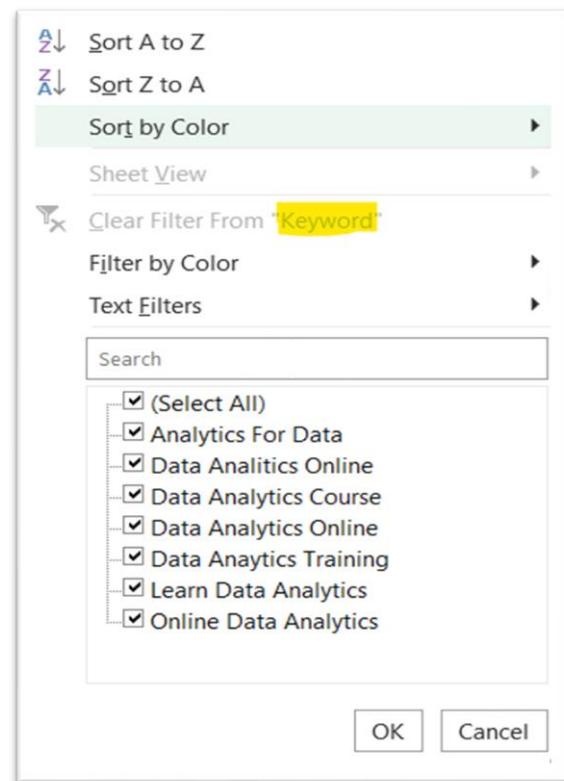
## Formula Used:

```
=PROPER(TRIM(M2))
```

## Original data:



## Standardized:



# POWER-BI VISUALISATION/DASHBOARD

## 1. Action Taken

### a) Data Import & Modeling

- Imported the cleaned Excel dataset into Power BI.
- Ensured correct data types (Date, Whole Number, Currency).
- Built proper relationships between tables (if any).

### b) Created Necessary Measures

- Developed DAX measures such as:
  - **Sum of Total Clicks**
  - **Sum of Total Cost**
  - **Sum of Total Impressions**
  - **Sum of Sale Amount**
  - Other aggregations for visualizations.

### c) Built Interactive Visuals

- Designed KPIs, donut charts, bar charts, treemap, and trend visuals.
- Added slicers (Ad\_Date, Keywords, Device) for filtering.
- Formatted visuals with consistent colors, shadows, titles, and spacing.

### d) Enhanced User Experience

- Structured dashboard into clear sections:
  - **Performance KPIs**
  - **Keyword Analysis**
  - **Device Analysis**
  - **Daily Sales Trend**
  - **Cost Comparison**
- Ensured layout clarity & removed empty white spaces.

## 2. Steps Followed

### Step 1: Load Data

Home → Get Data → Excel → Select file → Load.

### Step 2: Data Cleaning (in Power BI)

- Checked column data types.
- Removed unnecessary fields.
- Renamed columns for clarity.

### Step 3: Create Measures

Modeling → New Measure

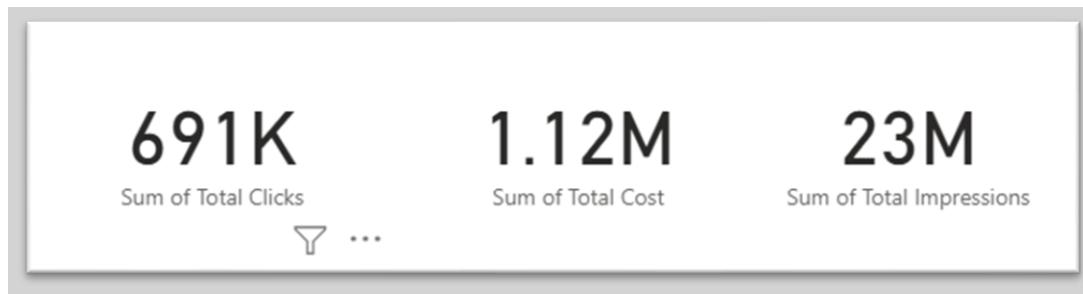
Examples:

Total Clicks = SUM(Table[Total Clicks])

Total Cost = SUM(Table[Total Cost])

Total Impressions = SUM(Table[Total Impressions])

Sale Amount = SUM(Table[Sale Amount])



### Step 4: Add Visuals

- KPI cards for Totals
- Treemap for **Daily Sale Amount**
- Bar Chart for **Sum of Cost by Keywords**
- Waterfall Chart for **Sale Amount by Keywords**
- Donut Chart for **Conversions by Device**
- Pie Chart for **Sale Amount by Conversions**

## Step 5: Add Slicers

Insert → Slicer

Used fields:

- **Ad\_Date**
- **Keywords**
- **Device**



## Step 6: Format the Dashboard

- Adjusted colors
- Aligned visuals using **Snap to Grid**
- Added readable titles
- Removed white empty areas

### 3. What Each Visual Conveys

#### 👉 KPI Cards (Clicks, Cost, Impressions, Sale Amount)

Shows overall marketing performance at a glance.

#### 👉 Treemap – Daily Sale Amount

Shows which days are performing well vs low.

Identifies daily fluctuations in sales.

#### 👉 Waterfall – Sale Amount by Keywords

Shows how each keyword increases/decreases total sale amount.

#### 👉 Donut Chart – Conversions by Device

Shows which device (Desktop / Mobile / Tablet) brings the most conversions.

#### 👉 Bar Chart – Cost by Keywords

Shows which keyword consumes more ad spend.

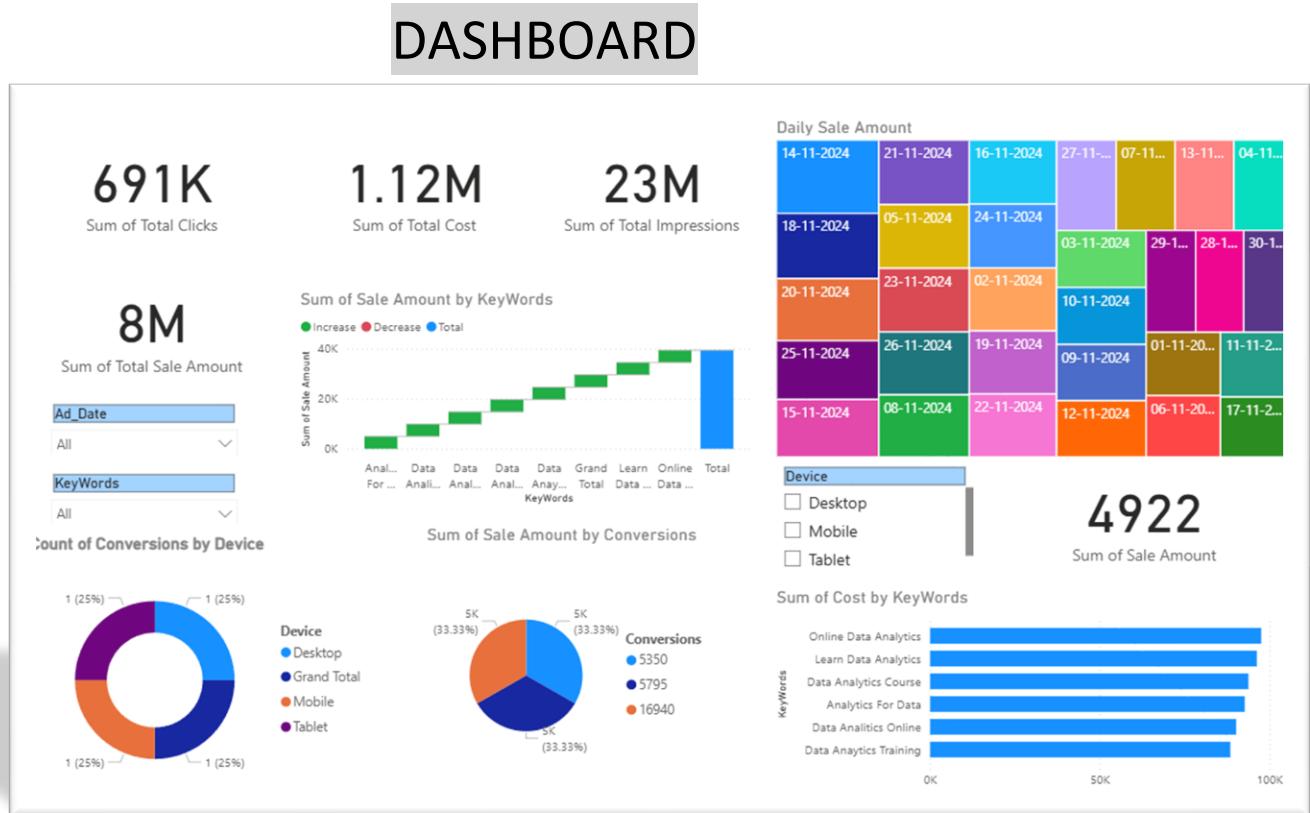
## Pie Chart – Sale Amount by Conversions

Compares sale amount across different conversion groups.

## Slicers

Allow users to filter dashboard by:

- Date
- Keyword
- Device type



## Final Insights

### Key Insights from the Dashboard

- Total Clicks = **691K**, showing strong engagement.
- Total Cost = **1.12M**, indicating high marketing investment.
- Total Impressions = **23M**, meaning high visibility across platforms.
- Total Sale Amount = **8M**, showing good revenue generation.

- Device analysis shows **Desktop, Mobile & Tablet** contribute evenly, each around **25%** conversions.
- Certain keywords significantly increase sale amount, while a few decrease it (visible in waterfall chart).
- Daily sales trend highlights fluctuations, helping identify high-performing dates for running ads.
- Cost distribution shows which campaigns consume higher budgets.

## Conclusion

The project successfully demonstrated the complete workflow of **data cleaning, analysis, and visualization** using both **Excel** and **Power BI**.

Through systematic cleaning techniques in Excel—such as handling missing values, standardizing columns, applying formulas, and converting ranges into structured tables—the dataset was prepared for accurate analysis.

Power BI further enhanced the insights by transforming the cleaned data into **interactive dashboards**, allowing dynamic filtering and deeper exploration of trends.

The visualizations clearly revealed patterns in clicks, cost, impressions, conversions, device usage, keyword performance, and daily sales behaviour.

Overall, this project strengthened practical skills in:

- Data preparation
- Analytical thinking
- Visualization design
- Insight extraction

The final dashboards provide a comprehensive understanding of business performance and support better decision-making for marketing and sales teams.