

# Domain Knowledge Document

## Meta Ad Performance Dataset

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### 1. About the Data

This dataset represents **Meta Ads Performance Data**, covering campaigns, ads, user demographics, and ad interaction events.

It is modeled after how Facebook and Instagram (Meta platforms) capture advertising data.

The main purpose of this dataset is to analyze ad performance, optimize targeting, and measure **Return on Investment (ROI)** using the following key performance indicators (KPIs):

- **Impressions:** Number of times an ad was displayed.
- **Clicks:** User engagement with ads.
- **Purchases (Conversions):** Actual transactions resulting from ads.
- **CPM, CPC, CTR, ROAS:** Efficiency metrics that measure cost-effectiveness.
- **Audience Insights:** User demographics, location, and interests.

This dataset is ideal for building a **Power BI Dashboard** to evaluate campaign performance, budget utilization, and audience engagement trends.

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### 2. Purpose of Each Table

#### Table 1: ad\_events

- Contains event-level logs such as **Impressions, Clicks, Shares, Comments, and Purchases**.
- Serves as the **fact table** in the model since all KPIs are derived from these events.
- Helps analyze when and how users interact with ads.

## Table 2: ads

- Stores details of each ad creative.
- Defines targeting criteria and identifies the campaign each ad belongs to.
- Used for platform-level and creative-type-level performance analysis (e.g., Facebook vs. Instagram, Image vs. Video ads).

## Table 3: campaigns

- Contains high-level campaign strategies and budget allocation details.
- Provides start and end dates, total budget, and duration.
- Used to calculate cost-based KPIs such as **CPC**, **CPM**, and **ROAS**.

## Table 4: users

- Contains demographic and interest information about users interacting with ads.
- Used for **audience segmentation** based on gender, age, country, and interests.
- Helps determine whether ads are reaching the intended audience.

# 3. Table and Field Details

## Table 1: ad\_events

**Purpose:** Captures every interaction between a user and an ad.

Field	Description	Example	Use in Analysis
event_id	Unique identifier for each event	100234	Primary key
ad_id	Links to ads table	501	Join with ads to get ad platform and type
user_id	Links to users table	U_1204	Join with users to get demographic data

Field	Description	Example	Use in Analysis
timestamp	Exact time of event	2025-03-12 14:30:00	Build date hierarchy (Day, Week, Month)
day_of_week	Derived field indicating day name	Tuesday	Compare weekday vs weekend performance
time_of_day	Derived field showing time segment	Afternoon	Determine active user engagement hours
event_type	Type of event (Impression, Click, Purchase, etc.)	Click	Used for funnel analysis (Impression → Click → Purchase)

**Usage:** Foundation for KPIs such as **Impressions, Clicks, CTR, Conversion Rate**, and **ROAS**.

## Table 2: ads

**Purpose:** Defines ad-level metadata.

Field	Description	Example	Use in Analysis
ad_id	Unique ad identifier	501	Primary key; joins with ad_events
campaign_id	Campaign association	C_101	Join to campaigns table
ad_platform	Platform where ad runs (Facebook, Instagram, etc.)	Instagram	Compare performance across platforms
ad_type	Creative format (Image, Video, Story, etc.)	Video	Measure performance by ad type
target_gender	Gender targeted	Female	Evaluate targeting effectiveness
target_age_group	Age group targeted	25–34	Compare targeted vs actual engagement
target_interests	Topics/interests targeted	Travel, Fashion	Match targeting with actual user interests

**Usage:** Identifies effective platform and ad type combinations and validates targeting strategy.

### Table 3: campaigns

**Purpose:** Contains campaign-level data on budgets and duration.

Field	Description	Example	Use in Analysis
campaign_id	Unique campaign identifier	C_101	Primary key; joins to ads
name	Campaign name	"Spring Promo 2025"	Reporting and filtering
start_date	Campaign start date	2025-03-01	Track campaign activation
end_date	Campaign end date	2025-03-31	Duration and scheduling analysis
duration_days	Derived field (end_date - start_date)	30	Compare pacing and performance
total_budget	Total campaign budget	\$50,000	Used to calculate CPM, CPC, and ROAS

**Usage:** Enables **budget tracking**, **ROI measurement**, and **campaign pacing analysis**.

### Table 4: users

**Purpose:** Provides demographic and behavioral data of users interacting with ads.

Field	Description	Example	Use in Analysis
user_id	Unique user identifier	U_1204	Primary key; joins to ad_events
user_gender	Gender of the user	Male	Gender-based performance analysis
user_age	Age of the user	27	Age-based segmentation
age_group	Age range classification (e.g., 18–24, 25–34)	25–34	Compare engagement by age group
country	User's country	India	Country-level reach analysis
location	Specific location (city/state)	Bangalore	Geo-targeting insights

Field	Description	Example	Use in Analysis
interests	User interests	Tech, Travel	Compare actual vs targeted interests

**Usage:** Evaluates audience targeting accuracy and helps identify mismatches between target and actual audiences.

## 4. Data Model Relationships

- **ad\_events → ads:** Links event data with ad details (platform, type, targeting).
- **ads → campaigns:** Connects ads to campaign metadata (budget, duration, objectives).
- **ad\_events → users:** Associates user activity with demographic and behavioral attributes.

### Schema Overview:

- **Fact Table:** ad\_events
- **Dimension Tables:** ads, campaigns, users

### Model Type: Star Schema

This structure supports efficient reporting, drill-down analysis, and KPI computation in tools like Power BI.