Domain Knowledge Document

Meta Ad Performance Dataset

1. About the Data

This dataset represents **Meta Ads Performance Data**, covering campaigns, ads, user demographics, and ad interaction events. It is modelled after how **Facebook/Instagram (Meta)** ad platforms capture data.

The purpose of this dataset is to **analyse advertising performance**, optimize targeting, and measure **ROI (Return on Investment)** through KPIs such as:

- Impressions (how often ads are seen)
- Clicks (engagement with ads)
- Purchases (conversions)
- CPM, CPC, CTR, and ROAS (efficiency metrics)
- Audience insights (demographics, location, interests)

This dataset is ideal for building a **Power BI Dashboard** to evaluate campaign effectiveness, budget utilization, and user engagement patterns.

2. Use of Each Table Table 1: ad_events

- Stores **event-level logs** (like impressions, clicks, purchases).
- This is the **fact table** in the model because all KPIs are derived from events.
- Used to analyze **when and how users interact with ads**.

Table 2: ads

- Contains details of each ad creative.
- Defines targeting criteria and which campaign an ad belongs to.
- Used for **platform-level** and **creative-type-level analysis** (e.g., Facebook Video Ads vs Instagram Image Ads).

Table 3: campaigns

- High-level campaign strategy and budget allocation.
- Provides **timeframe** and **budget** for ads.
- Used to calculate cost-based KPIs (CPC, CPM, ROAS).

Table 4: users

- Stores demographic and interest information of users who interact with ads.
- Used for **audience segmentation** (gender, age, country, location, interests).
- Helps analyze **targeting efficiency** (are ads reaching the right audience?).

3. Table and Field Details Table 1: ad_events

Purpose: Captures every interaction (event) between a user and an ad.

Field	Description	Example	Use in Analysis
event_id	Unique identifier for each event	100234	Used as primary key for the table
ad_id	Links to ads table	501	Join with ads → get ad_platform, ad_type
user_id	Links to users table	U_1204	Join with users → get demographics
timestamp	Exact time of event	2025-03-12 14:30:00	Build date hierarchy (Day, Week, Month)
day_of_week	Derived field: day of the week	Tuesday	To compare weekday vs weekend performance
time_of_day	Derived field: segment of day	Afternoon	See when users engage most
event_type	Type of event: Impression, Click, Share, Comment, Purchase	Click	Funnel analysis (Impressions → Clicks → Purchases)

Usage: This is the 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 to ad_events
campaign_id	Campaign association	C_101	Join to campaigns table

ad_platform	Platform where ad runs (Facebook, Instagram, Messenger, Audience Network)	Instagram	Compare platform performance
ad_type	Creative format (Image, Video, Carousel, Story)	Video	Performance by creative type
target_gender	Gender targeted	Female	Check targeting efficiency
target_age_group	Age group targeted	25–34	Compare target vs actual engagement
target_interests	Topics/interests targeted	Travel, Fashion	Check match with actual user interests

Usage: Helps identify **which platform + ad type combination works best**, and whether targeting matches actual user engagement.

Table 3: campaigns

Purpose: Contains campaign-level information (budget, duration, strategy).

Field	**Description**	**Example**	**Use in Analysis**
campaign_id	Unique campaign ID	C_101	Primary key; joins to ads
name	Campaign name	"Spring Promo 2025"	Reporting, filtering
start_date	Campaign launch date	2025-03-01	Track active campaigns
end_date	Campaign end date	2025-03-31	Campaign duration analysis
Field	**Description**	**Example**	**Use in Analysis**
duration_days	Derived: campaign length	30	Compare pacing & performance
total_budget	Budget allocated for campaign	$50,000	Basis for CPM, CPC, ROAS

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

Table 4: users

Purpose: Demographic and interest details of users engaging 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 user	Male	Gender-based performance
user_age	Age of user	27	Basis for custom segmentation
age_group	Grouped age bucket (18–24, 25–34, etc.)	25–34	Compare audience engagement by age
country	User's country	India	Country-level reach analysis
location	More specific location (city/state)	Bangalore	Geo-targeting
interests	User's interests	Tech, Travel	Match vs targeting interests

Usage: Helps measure **audience targeting accuracy** (e.g., Ads targeted at women 18–24 vs actual engagement from men 25–34).

4. How the Tables Work Together

- **ad_events → ads** → Links events to ad details (platform, type, targeting).
- **ads → campaigns** → Links ads to campaign metadata (budget, duration).
- **ad_events → users** → Links user engagement events to demographic data.

This creates a **star schema**:

- **Fact Table**: ad_events
- **Dimension Tables**: ads, campaigns, users