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	Used as primary key for the table
ad_id	Links to ads table	Join with ads → get ad_platform, ad_type
user_id	Links to users table	Join with users → get demographics
timestamp	Exact time of event	Build date hierarchy (Day, Week, Month)
day_of_week	Derived field: day of the week	To compare weekday vs weekend performance
time_of_day	Derived field: segment of day	See when users engage most
event_type	Type of event: Impression, Click, Share, Comment, Purchase	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	Primary key; joins to ad_events
campaign_id	Campaign association	Join to campaigns table
ad_platform	Platform where ad runs (Facebook, Instagram, Messenger, Audience Network)	Compare platform performance
ad_type	Creative format (Image, Video, Carousel, Story)	Performance by creative type
target_gender	Gender targeted	Check targeting efficiency
target_age_group	Age group targeted	Compare target vs actual engagement
target_interests	Topics/interests targeted	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	Primary key; joins to ads
name	Campaign name	Reporting, filtering
start_date	Campaign launch date	Track active campaigns
end_date	Campaign end date	Campaign duration analysis
duration_days	Derived: campaign length	Compare pacing & performance
total_budget	Budget allocated for campaign	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	Primary key; joins to ad_events
user_gender	Gender of user	Gender-based performance
user_age	Age of user	Basis for custom segmentation
age_group	Grouped age bucket (18–24, 25–34, etc.)	Compare audience engagement by age
country	User's country	Country-level reach analysis
location	More specific location (city/state)	Geo-targeting
interests	User's interests	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