Market Flash

Comprehensive Entity Relationship Modeling and Database Implementation

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Introduction

-   Aspiring data analyst with a strong interest in database design, data visualization, and predictive analytics.

-   Currently pursuing an intensive 14-month program in Data Analysis at MasterSchool.
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-   Passionate about transforming data into actionable insights to drive impactful decisions.
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-   Experienced (intermediate) in designing relational models, performing data cleaning, and conducting exploratory data analysis.

Company Overview

Market Flash Marketing Services

- A marketing agency specializing in social media marketing campaigns.
- Works with advertisers, influencers, and platforms to create impactful campaigns.
- Services include campaign management, influencer collaboration, and analytics reporting.
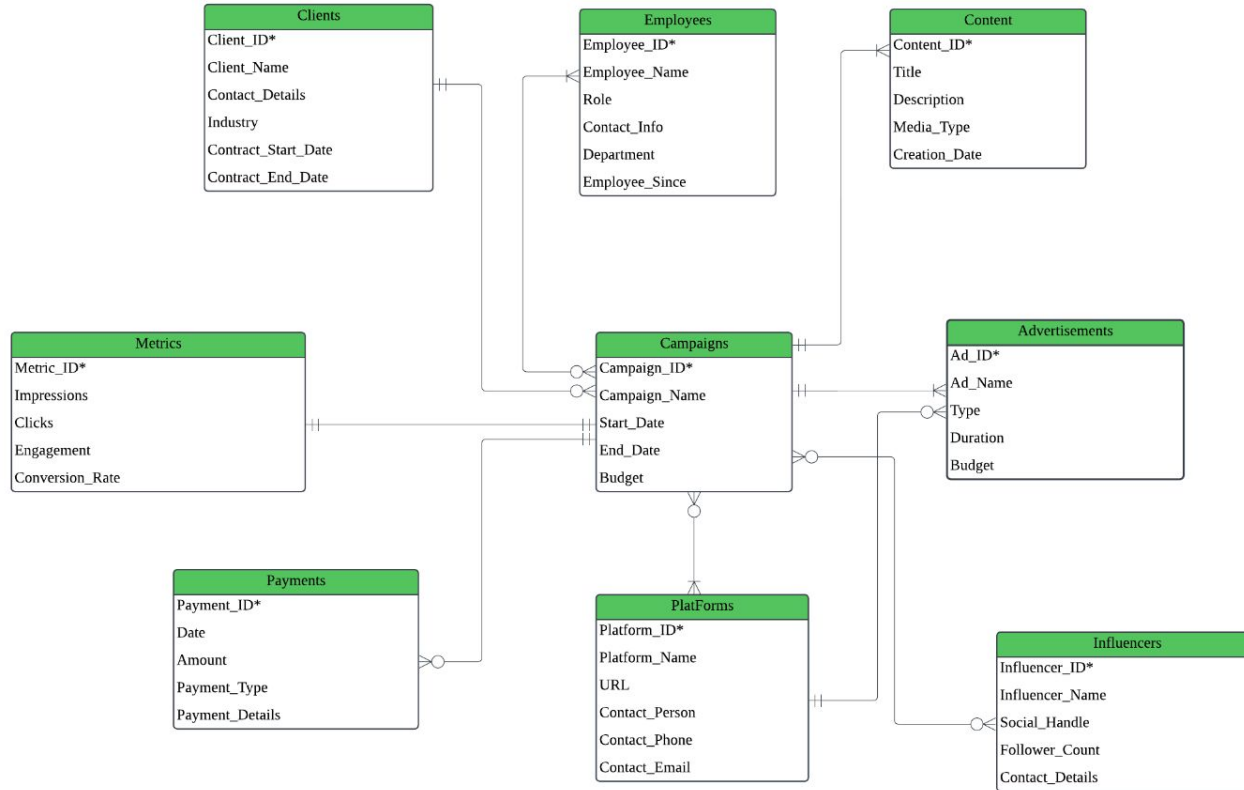
Business Challenges

- Inefficient management of data related to campaigns, clients, influencers, and performance metrics.
- Need for a centralized database to streamline operations, improve data accessibility, and enhance decision-making.

Project Goal:
Develop a relational database to address data redundancy, improve query efficiency, and support analytics for campaign performance.
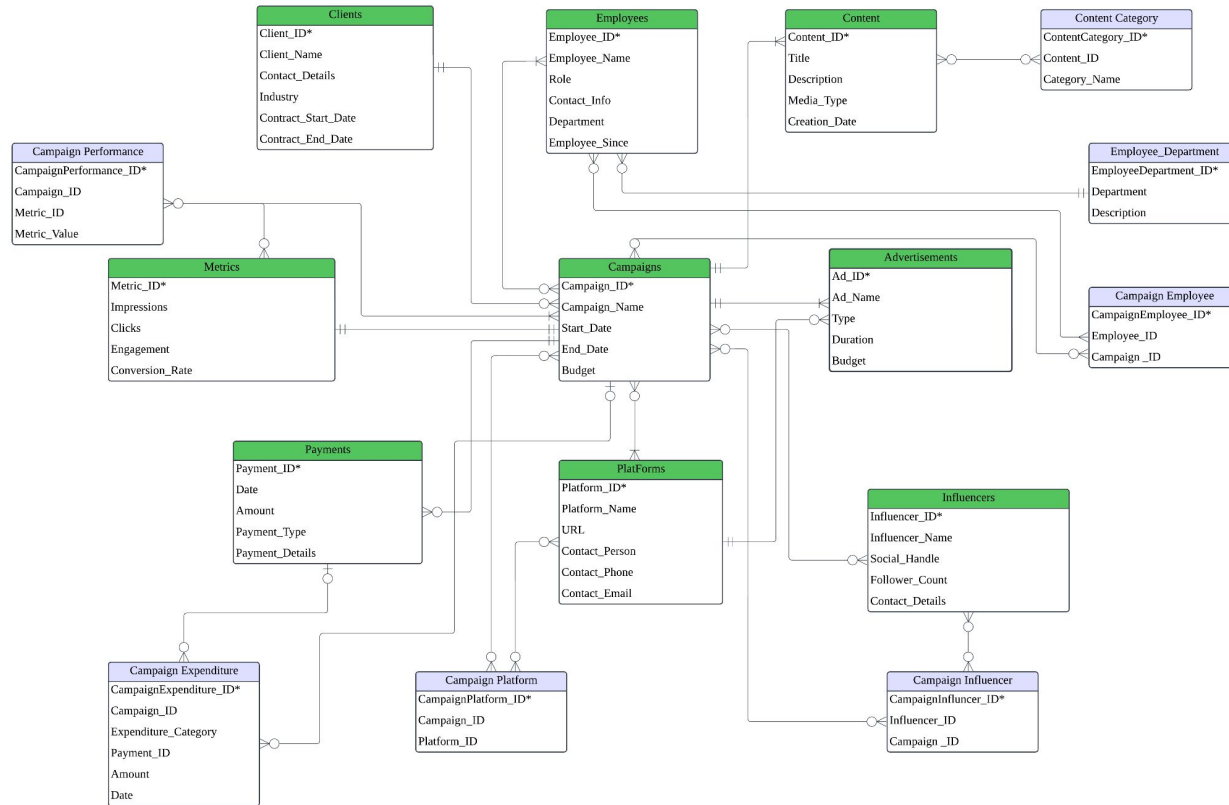
i. Entity Relationship Design

Clients
- Client_ID*
- Client_Name
- Contact_Details
- Industry
- Contract_Start_Date
- Contract_End_Date

Employees
- Employee_ID*
- Employee_Name
- Role
- Contact_Info
- Department
- Employee_Since

Content
- Content_ID*
- Title
- Description
- Media_Type
- Creation_Date

Metrics
- Metric_ID*
- Impressions
- Clicks
- Engagement
- Conversion_Rate

Campaigns
- Campaign_ID*
- Campaign_Name
- Start_Date
- End_Date
- Budget

Advertisements
- Ad_ID*
- Ad_Name
- Type
- Duration
- Budget

Payments
- Payment_ID*
- Date
- Amount
- Payment_Type
- Payment_Details

PlatForms
- Platform_ID*
- Platform_Name
- URL
- Contact_Person
- Contact_Phone
- Contact_Email

Influencers
- Influencer_ID*
- Influencer_Name
- Social_Handle
- Follower_Count
- Contact_Details

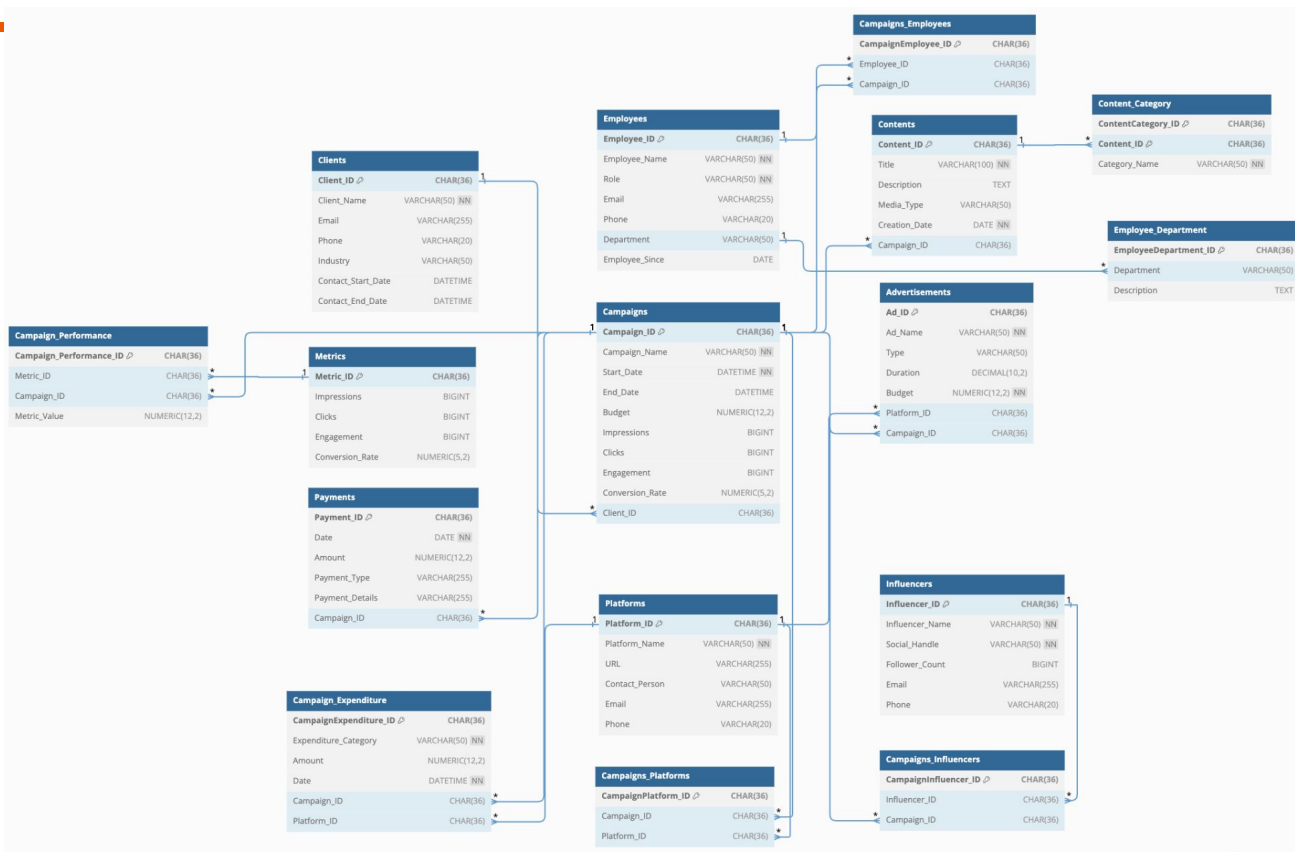*Existing entities as provided by the client*

i. Entity Relationship Design - *with new entities*

New entities added to improve the data model and address potential issues

ii. Functional Entity Relationship Design

ii. Functional Entity Relationship Design - *Key Designs Decisions*

Managing Many-to-Many Relationships

- **Employees and Campaigns:**
- Resolved via Campaigns_Employees junction table.
- **Benefits**: Tracks employee assignments without redundancy.
- **Constraints**: Composite primary key (Campaign_ID, Employee_ID)

- **Platforms and Campaigns:**
- Handled through Campaigns_Platforms table.
- **Purpose**: Tracks platform-specific details like budget allocation

ii. Functional Entity Relationship Design - *Reducing Redundancy*

To streamline the design, normalization principles were applied:

1. **Performance Metrics**:
   - Moved metrics to a separate Campaign_Performance table.
   - **Why?** Isolates campaign insights, avoids clutter.

2. **Advertisements**:
   - Introduced an Advertisements table for ad-level data (e.g., type, content).
   - **Why?** Prevents duplicate entries and simplifies ad-based analysis.

Data Types:
 - IDs as INT for quick indexing IFLOAT for financial and performance metrics.

Constraints:

- Primary Keys: Ensure uniqueness across all tables.
- Foreign Keys: Maintain parent-child relationships.
- Default Values: Set for fields like Status to ensure consistency

iii. Coding on SQL + Testing

/Users/deepshikhachhetri/Documents/Ma:
2024/BI/BI Mini Project - Jan
2025/market_flash_database.db

Filter

ENTITIES 16

> Advertisements
> Campaign_Expenditure
> Campaign_Performance
> Campaigns
> Campaigns_Employees
> Campaigns_Influencers
> Campaigns_Platforms
> Clients
> Content_Category
> Contents
> Employee_Department
> Employees
> Influencers
> Metrics
> Payments
> Platforms

<> Mini Project

```sql
1  CREATE TABLE [Clients] (
2    [Client_ID] CHAR(36) PRIMARY KEY,
3    [Client_Name] VARCHAR(50) NOT NULL,
4    [Email] VARCHAR(255),
5    [Phone] VARCHAR(20),
6    [Industry] VARCHAR(50),
7    [Contact_Start_Date] DATETIME,
8    [Contact_End_Date] DATETIME
9  )
10
11 INSERT INTO Clients (Client_ID, Client_Name, Email, Phone, Industry, Contact_Start_Date, Contact_End_Date)
12 VALUES
13    ('1', 'Acme Corp', 'acme@example.com', '555-1234', 'Technology', '2023-01-01', '2024-12-31'),
14    ('2', 'Global Solutions', 'global@solutions.com', '555-5678', 'Finance', '2022-06-15', '2025-03-31'),
15    ('3', 'Innovatech', 'info@innovatech.com', '555-9012', 'Healthcare', '2023-03-20', NULL),
16    ('4', 'Creative Minds', 'creative@minds.com', '555-4321', 'Marketing', '2024-01-10', '2024-12-31'),
17    ('5', 'Green Energy', 'green@energy.com', '555-7890', 'Energy', '2023-08-05', '2025-06-30');
18
19
20 CREATE TABLE [Campaigns] (
21    [Campaign_ID] CHAR(36) PRIMARY KEY,
22    [Campaign_Name] VARCHAR(50) NOT NULL,
23    [Start_Date] DATETIME NOT NULL,
24    [End_Date] DATETIME,
25    [Budget] NUMERIC(12,2),
26    [Impressions] BIGINT,
27    [Clicks] BIGINT,
28    [Engagement] BIGINT,
29    [Conversion_Rate] NUMERIC(5,2),
```

iii. Coding on SQL + Testing

```
278 3. Get Ad details with Platform and Campaign information
279 LECT a.Ad_Name, a.Type, p.Platform_Name, c.Campaign_Name
280 OM Advertisements a
281 IN Platforms p ON a.Platform_ID = p.Platform_ID
282 IN Campaigns c ON a.Campaign_ID = c.Campaign_ID;
283
```

Ad_Name	Type	Platform_Name	Campaign_Name
Summer Sale Banner	Banner	Facebook	Summer Campaign
Holiday Gift Guide Video	Video	Instagram	Holiday Sale
New Product Launch Ad	Video	Twitter	New Product Launch
Spring Promotion Carousel	Carousel	Facebook	Spring Promotion
Green Energy Initiative Story	Story	Instagram	Green Energy Initiative

a. Tables successfully created with data types and constraints.
b. Connections between tables tested with JOIN statements

iv. Benefit for Market Flash

1. Enhanced Data Management

- Centralized storage for all critical business entities like campaigns, employees, platforms, and advertisements.
- Eliminates redundancy, ensuring clean, structured, and easily accessible data.

2. Improved Campaign Performance Tracking

- Separate Campaign_Performance table provides insights into key metrics like ROI, reach, and engagement.
- Enables MarketFlash to evaluate campaigns efficiently and make data-backed improvements.

3. Scalable Design

- The modular ERD allows for seamless addition of new platforms, campaigns, or business operations.
- Supports future growth and ensures long-term usability.

iv. Benefit for Market Flash

4. Better Relationship Management

- Many-to-many relationships resolved through junction tables (e.g., Campaigns_Employees), providing granular details.
- Tracks employee contributions and platform-specific details effectively.

5. Data Integrity and Consistency

- Implementation of constraints (primary keys, foreign keys) prevents errors and ensures accurate, reliable data.
- Default values and appropriate data types maintain consistency across the database.

6. Simplified Analysis

- Separate tables for advertisements and performance metrics make analytical queries simpler and faster.
- Helps MarketFlash generate actionable insights for targeted marketing strategies.

Thank You