Database Design for Marketing Campaign

Marketing campaign effectiveness measurement system

1. Conceptual Map

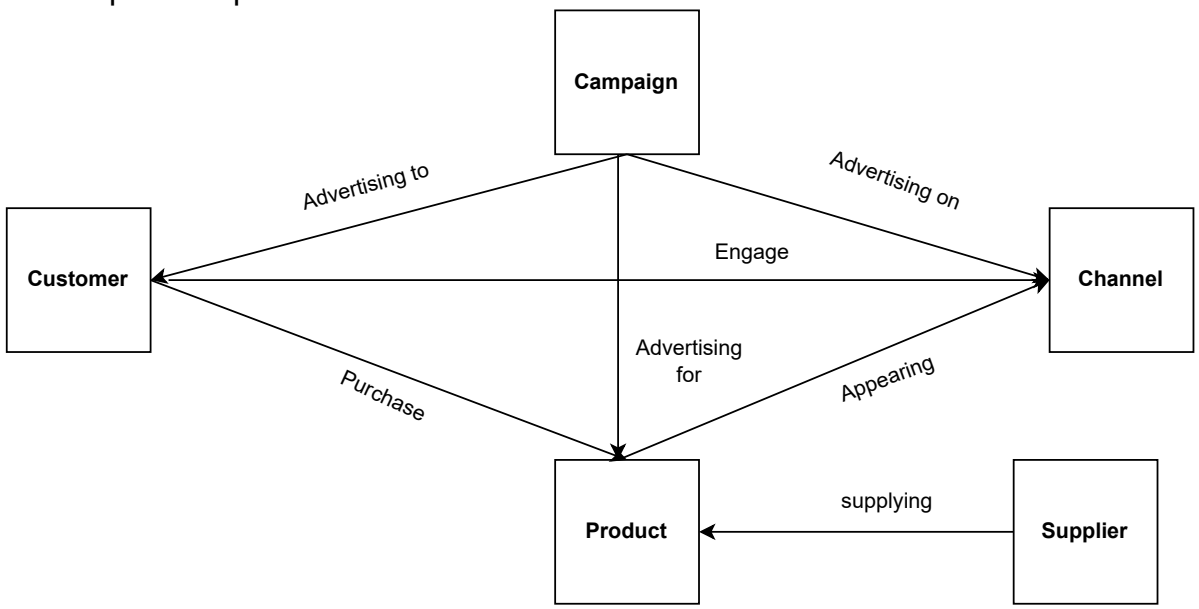
1.1. Business analysis:

The **Marketing Campaign Effectiveness Management System** is designed to support the marketing team in planning, executing, and evaluating campaigns across multiple digital channels. Its primary goal is to measure **conversion rates** and **customer engagement rates** effectively, enabling the marketing team to understand campaign performance and optimize future efforts for maximum impact.

Goals:

- **Measure Conversion Rate**: Track the percentage of customers who complete a desired action (such as making a purchase) after interacting with a campaign. This will help determine which channels, products, and campaigns are most effective in driving sales.
- **Monitor Customer Engagement Rate**: Capture and analyze customer interactions with each campaign (e.g., clicks, likes, shares) to gauge engagement across different channels. Understanding engagement patterns will allow for more targeted and responsive marketing strategies.

1.2. Conceptual Map



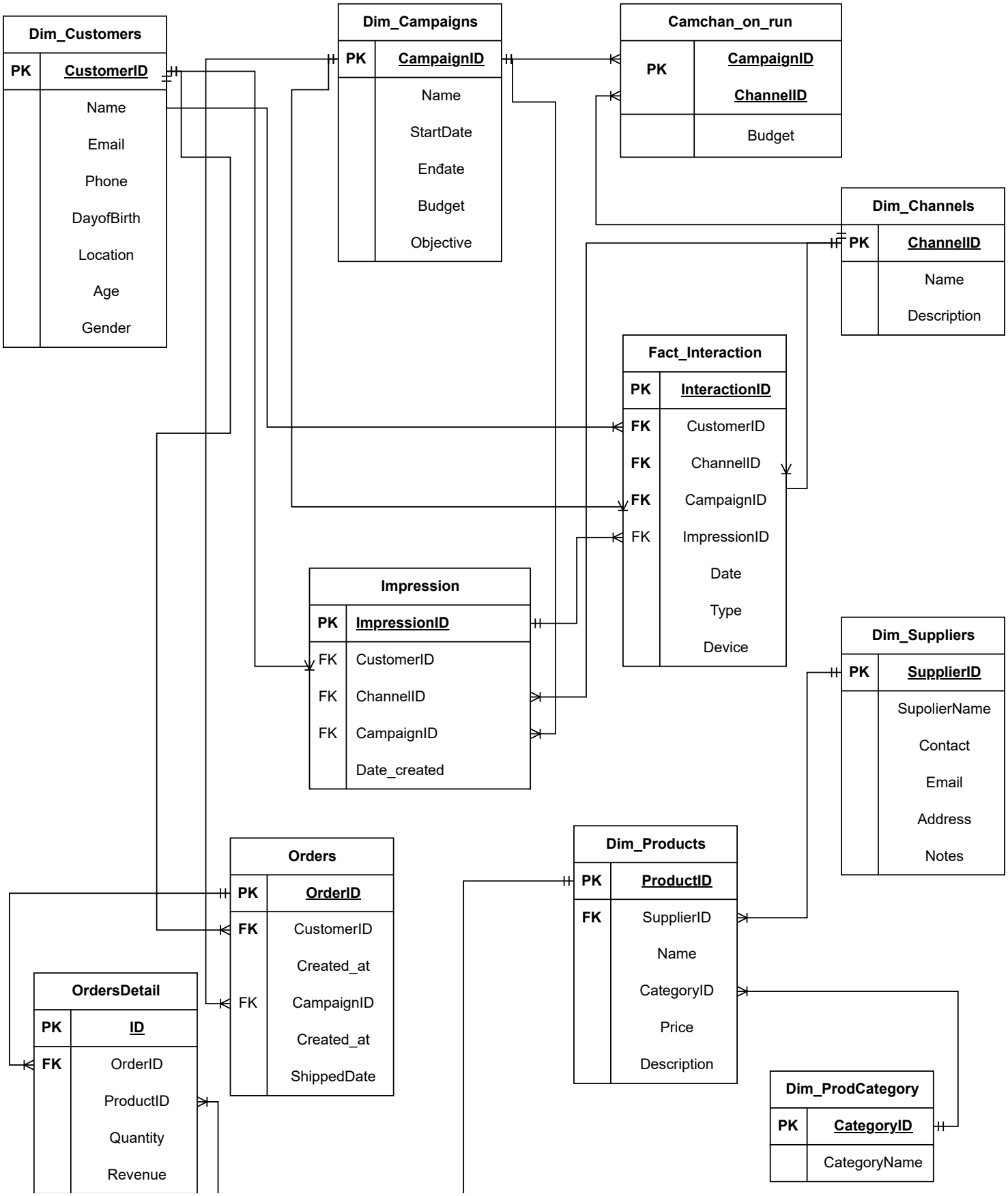
Key Processes

- **Customer Engagement on Multiple Channels**: Customers interact with various social media and digital platforms such as Facebook, TikTok, and Instagram. These platforms are leveraged to reach different customer segments and drive awareness.
- **Campaign Execution and Product Promotion:** Marketing campaigns are designed to promote specific products across selected channels. Each campaign targets customers browsing on these platforms, utilizing tailored messaging to increase the relevance of advertisements.
- **Conversion from Engagement to Purchase:** When the promoted products align with customer needs and interests, customers are more likely to make a purchase. The system will track these conversions to assess campaign effectiveness and

identify successful products, channels, and customer segments.

2. ERD Diagram

2.1 ERD Diagram



Entity Descriptions: For a thorough description of each entity, please click this link

2.2. Data Flow and Key Processes

- **Campaign Execution**: `Dim_Campaigns` stores information about each campaign. The `Campaign_on_run` table specifies which channels each campaign is running on, allowing for budget allocation per channel.
- **Customer Engagement Tracking**: Engagement with campaigns is recorded in the `Fact_Interaction` table, tracking which customers interacted with which campaigns on specific channels.
- **Order Processing**: Orders are stored in the `Orders` table, with details of each ordered product in the `OrderDetail` table. This structure supports multi-item orders.

2.3. Data Sample: LIMIT by 2

Table: `dim_customers`

CustomerID	Name	Email	Phone	DateOfBirth	Location	Age	Gender
1	Nguyen Van A	nva@example.com	0123456789	1990-05-15	Hanoi	33	Male
2	Tran Thi B	ttb@example.com	0987654321	1985-10-22	Ho Chi Minh City	38	Female

Table: `dim_campaigns`

CampaignID	Name	StartDate	EndDate	Budget	Objective
1	Summer Sale 2024	2024-06-01	2024-08-31	5000000.00	Increase Sales
2	Back to School 2024	2024-08-01	2024-09-30	3000000.00	Engage Students

Table: `dim_channels`

ChannelID	Name	Description
1	Facebook Ads	Advertising on Facebook
2	Google Ads	Advertising on Google

Table: `dim_suppliers`

SupplierID	SupplierName	Contact	Email	Address Notes
1	ABC Supplies	Mr. Le	contact@abc.com	123 ABC Street, Hanoi Reliable supplier
2	XYZ Co.	Ms. Pham	info@xyz.com	456 XYZ Avenue, Ho Chi Minh City Fast delivery

Table: `dim_products`

ProductID	SupplierID	Name	CategoryID	Price	Description
1	1	Laptop	1	15000000.00	High-end laptop
2	2	Smartphone	2	7000000.00	Latest model smartphone

Table: `dim_prodcategory`

CategoryID	CategoryName
1	Electronics
2	Mobiles

Table: `orders`

OrderID	CustomerID	Created_at	CampaignID	ShippedDate
1	1	2024-07-10 14:30:00	1	2024-07-15
2	2	2024-09-05 10:00:00	2	2024-09-10

Table: `orderdetail`

ID	OrderID	ProductID	Quantity	Revenue
1	1	1	2	30000000.00
2	2	2	1	7000000.00

Table: `fact_interaction`

InteractionID	CustomerID	ChannelID	CampaignID	Date	Type
1	1	1	1	2024-07-05	Click
2	2	2	2	2024-09-02	View

Table: `camchan_on_run`

CampaignID	ChannelID	Budget
1	1	1000000.00
2	2	500000.00

Table: `impression:`

ImpressionID	CustomerID	ChannelID	CampaignID	Date_created
1	1	1	2	2024-01-01 10:00:00
2	2	2	23	2024-01-02 11:30:00

3. Practical Application

3.1. Use case examples:

From the built database, business could use data collected to evaluate many aspects of their marketing campaigns, such as:

- **Campaign Performance Analysis**: Using `Fact_Interaction`, calculate engagements for each campaign by channel to determine which channels drive the most interaction.
- **Conversion Tracking**: Link `Orders` data with campaigns to identify which campaigns have the highest conversion .
- **Customer Segmentation**: Use demographic data from `Dim_Customers` to segment audiences based on location, age, and gender for targeted campaigns.

3.2. Some Queries for Key Insights:

Calculate engagements for each campaign by channel

```
select cam.name as campaign_name,
          c.name as channel_name,
          count(i.interactionID) as engagement
   from fact_interaction i
   join dim_campaigns cam
       on i.campaignID = cam.campaignID
   join dim_channels c
       on i.channelId = c.channelID
   group by cam.name, c.name
```

	campaign_name	channel_name	engagement
1	Summer Sale 2024	Facebook Ads	6
2	Summer Sale 2024	Google Ads	4
3	Summer Sale 2024	Email Marketing	1
4	Back to School 2024	Google Ads	6
5	Back to School 2024	Instagram Ads	4
6	Holiday Sale 2024	Instagram Ads	6
7	Holiday Sale 2024	Email Marketing	4
8	New Year Promotion 2025	Email Marketing	6
9	New Year Promotion 2025	Facebook Ads	4

Calculate the conversion of each campaign based on orders table

```
select cam.name,
        count(*) as total_conversion
from orders o
join dim_campaigns cam
on o.campaignID=cam.campaignID
group by cam.name;
```

	name	total_conversion
1	Summer Sale 2024	7
2	Back to School 2024	10
3	Holiday Sale 2024	11
4	New Year Promotion 2025	8

Basic customer segmentation based on age:

```
select
gender,
count(*) as Number
from dim_customers
group by gender;
```

	gender	Number
1	Male	3
2	Female	2