**Data Warehousing and Data Mining.**

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### **Aim :**

Case Study: Building a Data Warehouse for an **Online Food Delivery System**

### **Introduction :**

This case study discusses the design and implementation of a **data warehouse** for an **online food delivery system**. The goal is to consolidate data from users, restaurants, orders, payments, and deliveries to support business intelligence, improve customer experience, and optimize logistics.

### **Background :**

FoodFast, a leading food delivery platform, faced challenges in generating timely reports, analyzing delivery performance, and understanding customer behavior. Data was scattered across operational databases for users, orders, delivery partners, and restaurants. To resolve these issues and enable deep analytics, FoodFast initiated a data warehousing project.

### **Objectives :**

1. **Data Integration:** Merge data from ordering systems, restaurant partners, delivery tracking, and customer support into a single analytical platform.
2. **Unified Reporting:** Provide dashboards for real-time order analytics, delivery performance, customer retention, and top-performing restaurants.
3. **Scalability:** Handle large-scale transactions and scale with seasonal spikes like festivals or marketing campaigns.
4. **Data Quality:** Ensure accurate and deduplicated data for insights into customer preferences and operational metrics.

### **Data Warehouse Implementation :**

* **Entities Identified:**
  + Users
  + Orders
  + Restaurants
  + Dishes
  + Delivery Partners
  + Payment Transactions
* **Infrastructure:**
  + A hybrid model combining **cloud-based warehouse tools** (e.g., Snowflake, Redshift) with ETL pipelines using **Apache Airflow**.
* **Data Marts and Cubes:**
  + Created data marts for:  
    - **User Behavior Analytics**
    - **Restaurant Performance**
    - **Delivery Time Optimization**
    - **Revenue Tracking**

### **Reporting and Analytics :**

* **BI Tools:**
  + Power BI and Tableau dashboards for:  
    - Hourly order trends
    - Avg delivery time by area
    - Cancellation reasons
    - Top dishes and ratings
    - Peak order hours and days
* **Ad-hoc Queries:**
  + OLAP cubes allow slicing/dicing by city, cuisine type, payment method, and day of the week.

### **Conclusion :**

By centralizing data into a warehouse, FoodFast improved delivery reliability, customer engagement, and business forecasting. The project enabled advanced analytics like churn prediction and delivery ETA optimization, becoming a core asset in strategic decisions.