Data, Information, and Metadata in the Event Management Scenario (3NF Schema)

We can define these concepts by looking directly at the rows and columns in the final, normalized tables.

A. Data (Raw Facts)

Data consists of the raw, unorganized facts that are stored in the database. In our scenario, data are the specific values in the cells of the tables.

Examples of Data:

- The raw number 1000 in the BasePrice column.
- The string CDO in the VenueCity column.
- The ID 3 in the Organizer_ID column.

B. Information (Processed Data)

Information is data that has been processed, organized, and presented in a meaningful context. It allows users to make decisions.

Examples of Information:

- "The organizer Kassandra Liza (Organizer ID 3) is hosting the Music Fest (Event ID 2) at the Limketkai Mall (Venue ID 3)." (This is processed by joining three tables).
- "Jose Ramirez paid 1000 on 2025-09-30 using GCash for his VIP ticket."

C. Metadata (Data about Data)

Metadata describes the structure, characteristics, and constraints of the data. It is the "schema" or blueprint of the database.

Examples of Metadata (from our 3NF design):

- The Event_ID column is the Primary Key (PK) for the Events table.
- The Venue_ID column must contain a value that exists in the Venues table (Foreign Key constraint).
- The BasePrice column has a data type of currency/numeric.

Basic Database Environment Components

The database environment is the entire system that supports and manages the database. Here are the core components for our Event Management system:

A. Database Management System (DBMS)

The DBMS is the software (like MySQL, SQL Server, or PostgreSQL) that manages the database structure and controls access to the data.

Role in Scenario: The DBMS enforces the 3NF rules (like ensuring Ticket_ID is unique), handles complex relational algebra queries (like the 15 we created), and manages user security.

B. Database (The Data Repository)

This is the collection of all the organized data and the schema (metadata).

Role in Scenario: This is the actual physical repository holding all the tables (Events, Attendees, Tickets, etc.) and all the rows of data.

C. Users/End-Users

These are the people who interact with the database to retrieve, input, or update data. They are typically divided by their role.

Types in Scenario:

- **Event Organizer Staff:** Uses an application interface to add new events, check ticket sales, and view attendee lists.
- **Website/App Users (Attendees):** Interact with the database indirectly by buying tickets, registering, and making payments.
- **Finance/Accounting Staff:** Queries the Payments table to reconcile cash and GCash transactions.

D. Application Programs

These are the software tools used to access and manipulate the data stored in the database.

Examples in Scenario:

- A Web Booking Form that allows attendees to create a new Attendee record and insert a new Ticket record.
- An Organizer Dashboard that runs queries like "Find payments for all my events."

E. Database Administrators (DBA)

The DBA is the person or team responsible for the management, security, and maintenance of the entire database system.

Role in Scenario:

- Setting up user accounts and permissions.
- Ensuring data backups are run regularly.
- Tuning the database to make complex queries (like the relational algebra queries) run faster.

F. Hardware

Hardware consists of the physical devices that the database environment runs on, stores data on, and communicates through.

Server (The Core): This is the powerful computer that runs the DBMS and stores the actual data files (the database).

Role in Scenario: The server processes all the heavy SQL/relational algebra queries (like finding all attendees who bought a VIP ticket) and provides secure access to the Event Management application.

Storage (The Memory): High-speed hard drives (SSDs/HDDs) used to physically hold all the tables, indexes, and payment records.

Networking: The infrastructure (routers, cables, network cards) that connects the server to the organizers' offices and the attendees accessing the website from the internet.

G. Software

Software encompasses all the programs and routines used to operate the system, including the DBMS itself, the operating system, and application programs.

Operating System (OS): The fundamental software (like Windows Server, Linux, or macOS) that manages the server's resources.

Role in Scenario: The OS manages memory, file storage, and processes, allowing the DBMS to run efficiently.

Database Management System (DBMS): (As defined before) The main software (e.g., MySQL) that interprets the commands and manages the data integrity (like enforcing the foreign key link between an Event and its Venue).

Application Software: The custom programs (e.g., the website or internal dashboard) that facilitate specific user tasks.

Role in Scenario: The ticket purchase application uses the database to insert new Ticket rows and retrieve the correct BasePrice from the TicketTypePricing table.