CS 313 - Assignment 1

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1 Some information about:

1.1 E.F. Codd -

Edgar Frank Codd, (born August 19, 1923, Portland, Dorset, England—died April 18, 2003, Williams Island, Florida, U.S.), British-born American computer scientist and mathematician who devised the "relational" data model. He wrote thesis about self-replication in cellular automata, working on von Neumann he showed that for universal computation and construction set of eight states are sufficient. His theory on relational model known as codd's theorem equates the expressive power of relational algebra and relational calculus. He wrote the "twelve laws of online analytical processing" on Online analytical processing (OLAP).

Source: Wikipedia

1.2 Data Model -

A data model can be thought of as a flowchart that illustrates data entities, their attributes and the relationships between entities. It enables data management and analytics teams to document data requirements for applications and identify errors in development plans before any code is written. Data models provide a blueprint for designing a new database. Data models are typically specified by a data specialist, data librarian, or a digital humanities scholar in a data modeling notation.

Source: Wikipedia

2 Ten large digital applications

Digital applications(Indian web or mobile applications) that have a huge database size and large number of transactions:

Payments: PhonePe, Paytm, BHIM
Bookings: RedBus, MakeMyTrip, OYO, Goibibo, IRCTC
Others: Dream11, UpStox

Source: Payment Booking

3 OLTP & OLAP

OLTP

Online transactional processing (OLTP) enables the real-time execution of large numbers of database transactions by large numbers of people, typically over the Internet. OLTP systems are behind many of our everyday transactions, from ATMs to in-store purchases to hotel reservations. OLTP can also drive non-financial transactions, including password changes and text messages.

OLTP systems Process a large number of relatively simple transactions — usually insertions, updates and deletions to data.It also Enables multi-user access to the same data, while ensuring data integrity.

OLAP

Online analytical processing (OLAP) is a system for performing multi-dimensional analysis at high speeds on large volumes of data. Typically, this data is from a data warehouse, data mart or some other centralized data store. OLAP is ideal for data mining, business intelligence and complex analytical calculations, as well as business reporting functions like financial analysis, budgeting and sales forecasting.

The core of most OLAP databases is the OLAP cube, which allows you to quickly query, report on and analyze multidimensional data.

Difference between OLTP & OLAP

Focus: OLAP systems allow you to extract data for complex analysis. To drive business decisions, the queries often involve large numbers of records. In contrast, OLTP systems are ideal for making simple updates, insertions and deletions in databases. The queries typically involve just one or a few records.

Data source: OLAP consists of historical data from various Databases. In other words, different OLTP databases are used as data sources for OLAP. In contrast OLTP consists of only of operational current data. In other words, the original data source is OLTP and its transactions.

Availability: Since they don't modify current data, OLAP systems can be backed up less frequently. However, OLTP systems modify data frequently, since this is the nature of transactional processing. They require frequent or concurrent back-ups to help maintain data integrity.

Method used: OLAP makes use of a data warehouse, while OLTP makes use of a standard database management system.

Source: GeeksForGeeks
