- **Data Model XML**

  The XML data model is a simple, abstract model that provides a baseline for more complex models. The XML data model is described in terms of sequences and items, atomic values, and nodes. The main structure of an XML document is tree-like, with several types of nodes.

  An XML model is a graphical representation of an XML Schema Definition file (. XSD), a Document Type Definition file (. DTD) or an XML-Data Reduced file (. XDR).

  T**ypes of Data Models**

  The three types of data models:

  Conceptual Data Model

  The conceptual data model shows entities and their relationships. The intended audience for a conceptual data model is non-technical users on the business side. It shows entities and relationships as determined by the business.

  Logical Data Model

  The logical data model describes entities and relationships at a more detailed level, but is not associated with a particular database system. The intended audience for a logical data model is technical staff (e.g., database designers, application developers) and used as a basis to create a physical data model.

  Physical Data Model

  The physical data model contains the highest level of technical detail. It outlines how the entities and relationships will be implemented in a particular database system. In a relational database system, the physical data model is used to create the tables and fields that represent entities. It is used by technical staff to create and manage the database itself.

  A tree and a graph

  The main structure of an XML document is tree-like, and most of the lexical structure is devoted to defining that tree, but there is also a way to make connections between arbitrary nodes in a tree. For example, in the following document there is a root node with three children, but one of the children has a link to one of the other children:

```
<p>
<q id="x7">The first q</q>
```

<q id="x8">The second q</q>

<q href="#x7">The third q</q>

</p>

The tree

The tree that an XML document represents has a number of different types of nodes:

- **element**
- **document**
- **processing instruction [not needed?]**
- **comment**
- **data**

- **Character sets**

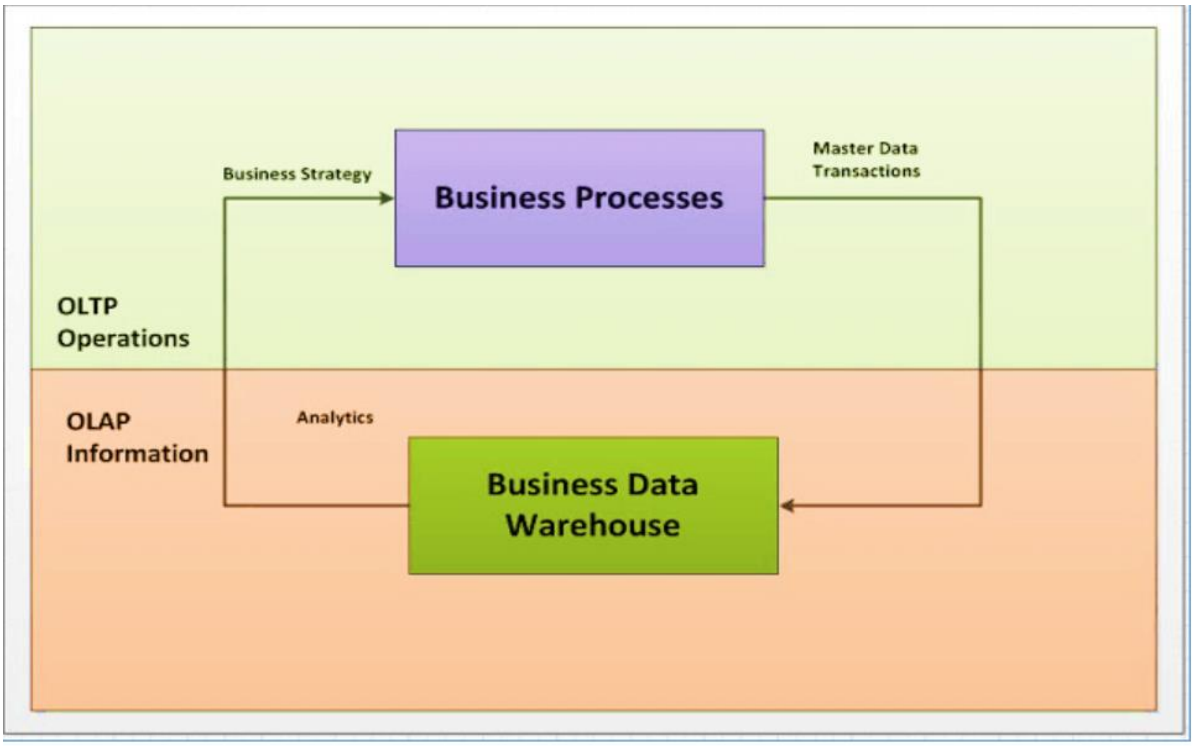
  [UCS2 or any superset of ASCII, UTF8 is default]

  [Uses <?xml encoding...?>]

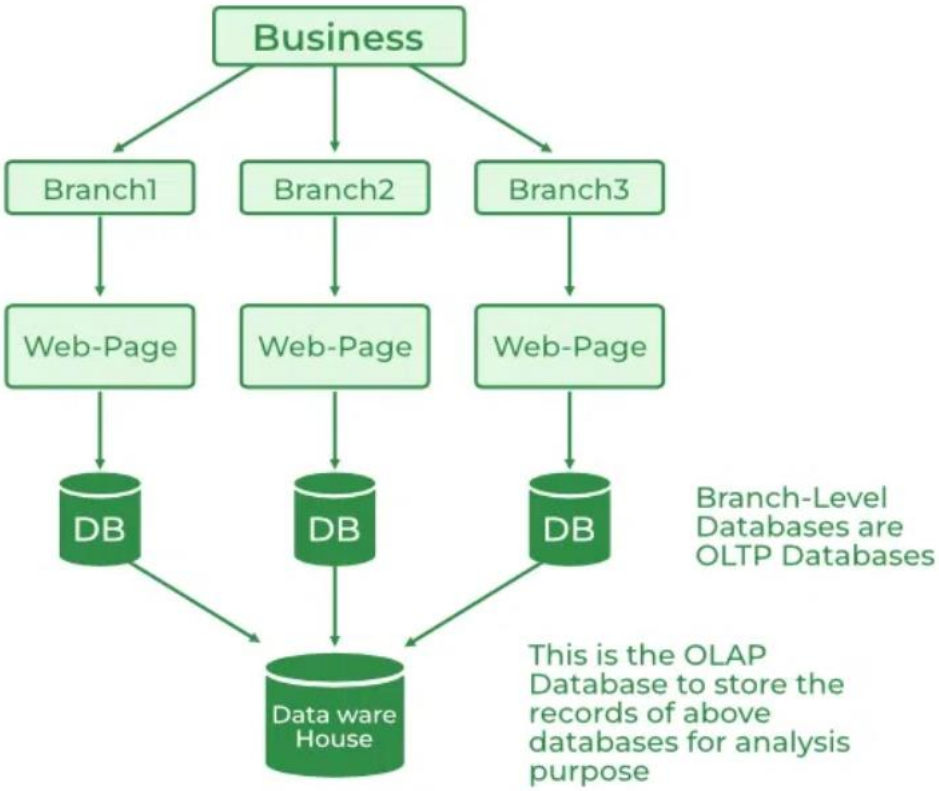
- **Querying and transformation**

- **OLTP and OLAP Tools -**

- Online Analytical Processing (OLAP) is a category of software tools that analyze data stored in a database, whereas Online transaction processing (OLTP) supports transaction-oriented applications in a 3-tier architecture.
- OLAP creates a single platform for all types of business analysis needs which includes planning, budgeting, forecasting, and analysis, while OLTP is useful for administering day-to-day transactions of an organization.
- OLAP is characterized by a large volume of data, while OLTP is characterized by large numbers of short online transactions.
- In OLAP, a data warehouse is created uniquely so that it can integrate different data sources for building a consolidated database, whereas OLTP uses traditional DBMS.



OLTP vs OLAP



OLAP

Example of OLTP system

An example of OLTP system is ATM centre. The key to note here is that OLTP systems are optimized for **transactional superiority instead data analysis.**

OLTP applications are:

- Online banking
- Online airline ticket booking
- Sending a text message
- Order entry
- Add a book to shopping cart

Difference between OLTP and OLAP

Parameters	OLTP	OLAP
Process	It is an online transactional system. It manages database modification.	OLAP is an online analysis and data retrieving process.
Characteristic	It is characterized by large numbers of short online transactions.	It is characterized by a large volume of data.
Functionality	OLTP is an online database modifying system.	OLAP is an online database query management system.
Method	OLTP uses traditional DBMS.	OLAP uses the data warehouse.
Query	Insert, Update, and Delete information from the database.	Mostly select operations
Table	Tables in OLTP database are normalized.	Tables in OLAP database are not normalized.
Source	OLTP and its transactions are the sources of data.	Different OLTP databases become the source of data for OLAP.
Data Integrity	OLTP database must maintain data integrity constraint.	OLAP database does not get frequently modified. Hence, data integrity is not an issue.
Response time	It's response time is in millisecond.	Response time in seconds to minutes.
Data quality	The data in the OLTP database is always detailed and organized.	The data in OLAP process might not be organized.
Usefulness	It helps to control and run fundamental business tasks.	It helps with planning, problem-solving, and decision support.
Operation	Allow read/write operations.	Only read and rarely write.

Parameters	OLTP	OLAP
Audience	It is a market orientated process.	It is a customer orientated process.
Query Type	Queries in this process are standardized and simple.	Complex queries involving aggregations.
Back-up	Complete backup of the data combined with incremental backups.	OLAP only need a backup from time to time. Backup is not important compared to OLTP
Design	DB design is application oriented. Example: Database design changes with industry like Retail, Airline, Banking, etc.	DB design is subject oriented. Example: Database design changes with subjects like sales, marketing, purchasing, etc.
User type	It is used by Data critical users like clerk, DBA & Data Base professionals.	Used by Data knowledge users like workers, managers, and CEO.
Purpose	Designed for real time business operations.	Designed for analysis of business measures by category and attributes.
Performance metric	Transaction throughput is the performance metric	Query throughput is the performance metric.
Number of users	This kind of Database users allows thousands of users.	This kind of Database allows only hundreds of users.
Productivity	It helps to Increase user's self-service and productivity	Help to Increase productivity of the business analysts.
Challenge	Data Warehouses historically have been a development project which may prove costly to build.	An OLAP cube is not an open SQL server data warehouse. Therefore, technical knowledge and experience is essential to manage the OLAP server.
Process	It provides fast result for daily used data.	It ensures that response to the query is quicker consistently.
Characteristic	It is easy to create and maintain.	It lets the user create a view with the help of a spreadsheet.
Style	OLTP is designed to have fast response time, low data redundancy and is normalized.	A data warehouse is created uniquely so that it can integrate different data sources for building a consolidated database

Benefits of using OLAP services

- OLAP creates a single platform for all types of business analytical needs which includes planning, budgeting, forecasting, and analysis.
- The main benefit of OLAP is the consistency of information and calculations.
- Easily apply security restrictions on users and objects to comply with regulations and protect sensitive data.

Benefits of OLTP method

- It administers daily transactions of an organization.
- OLTP widens the customer base of an organization by simplifying individual processes.

Drawbacks of OLAP service

- Implementation and maintenance are dependent on IT professional because the traditional OLAP tools require a complicated modeling procedure.
- OLAP tools need cooperation between people of various departments to be effective which might always be not possible.

Drawbacks of OLTP method

- If OLTP system faces hardware failures, then online transactions get severely affected.
- OLTP systems allow multiple users to access and change the same data at the same time which many times created unprecedented situation.