



ECAP470: CLOUD COMPUTING

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Learning Outcomes



After this lecture, you will be able to,

- ✓ understand databases and working of databases
- ✓ Know the working of online databases and cloud database
- ✓ Explore and evaluate some of the existing web-based databases

What is Data ?

- A **collection of raw facts & figures.**
- Raw material that can be processed by any computing machine.
- A **collection of facts** from which conclusions may be drawn.



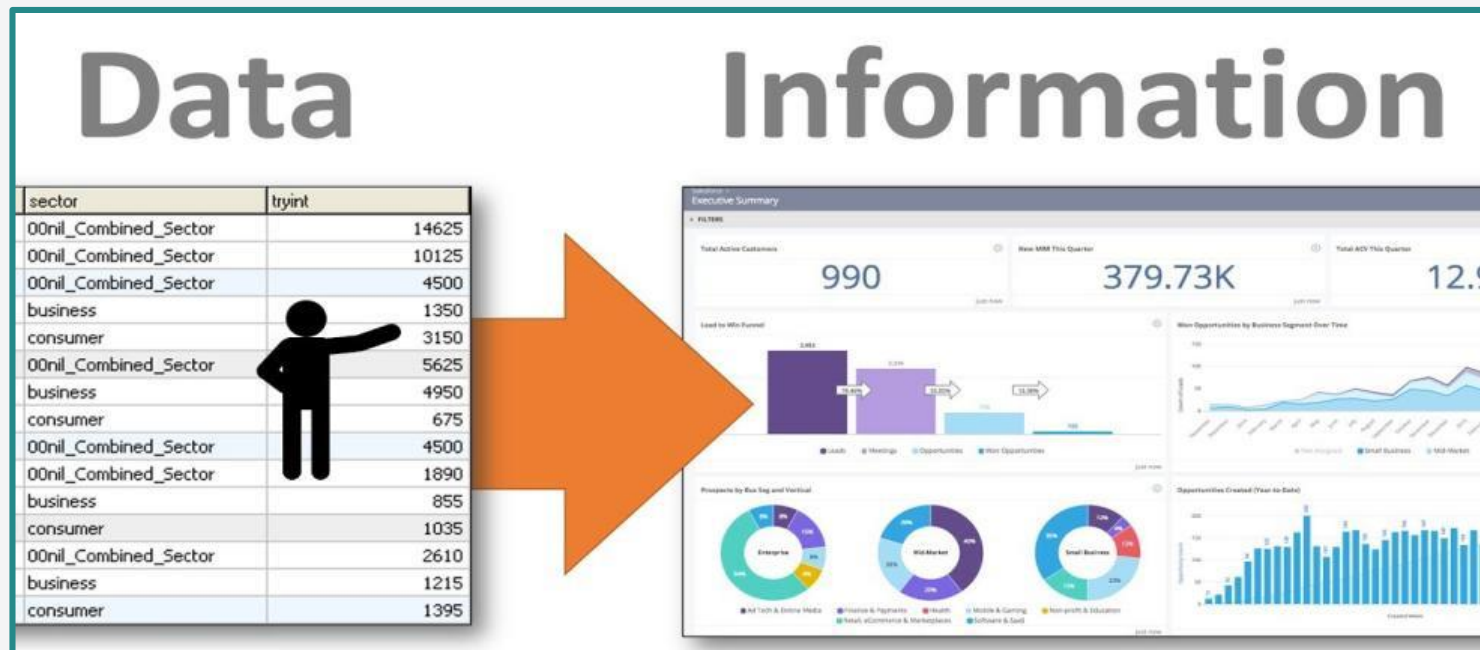
What is Information?

- **Systematic and meaningful** form of data.
- Knowledge acquired through study or experience.
- Information helps human beings in their **decision making**.



Information

Data that have been processed in such a way as to increase the knowledge of the person who uses the data.



Knowledge

- Understanding based on extensive experience dealing with information on a subject.
- Example: Mount Everest.

Data to Database

- Data is encountered in our day-to-day life everyday.
- **Difficult to memorise** all such information for a large number of individuals.
- **Example.**
- **To deal with such problems we construct a database.**
- Arrange all information about students in a tabular form.
- Keep all the records.

What is Database ?

- A safekeeping of logically related and similar data.
- An **organized collection of related information** so that it can easily be accessed, managed and updated.

Database Classification

- Digital databases are managed using database management systems, which store database contents, allowing data creation and maintenance, and search and other access.

Database Classification

- A **collection of information** that is organized so that it **can easily be accessed, managed, and updated.**
- **Databases can be classified** according to types of content: bibliographic, full-text, numeric, and images.

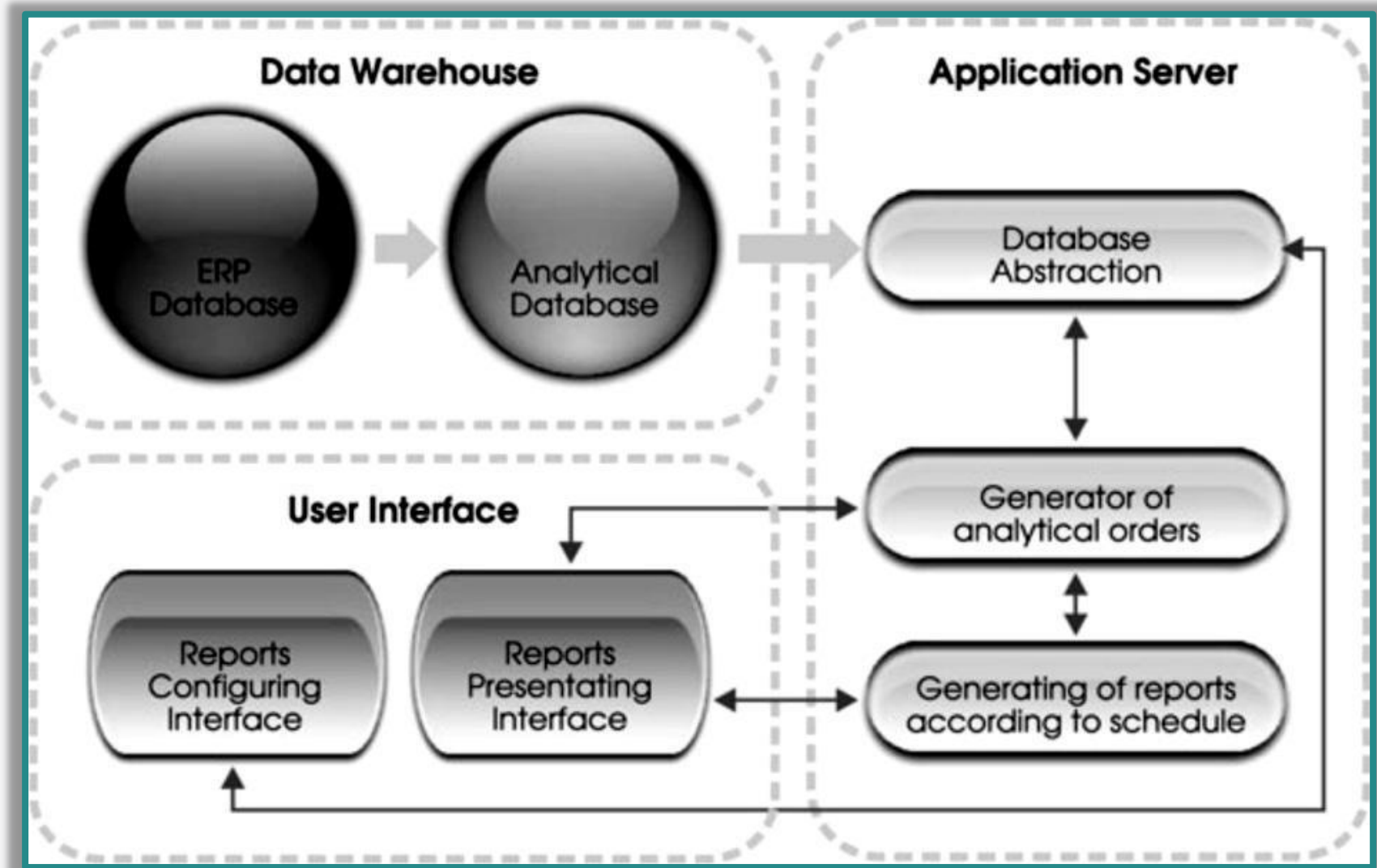
Database Classification

- In computing, databases are sometimes classified according to their organizational approach.
- The most prevalent approach is the relational database, a tabular database in which data is defined so that it can be reorganized and accessed in a number of different ways.

Database Classification

- Distributed database
- Object-oriented programming database
- Computer databases
- Analytical Database

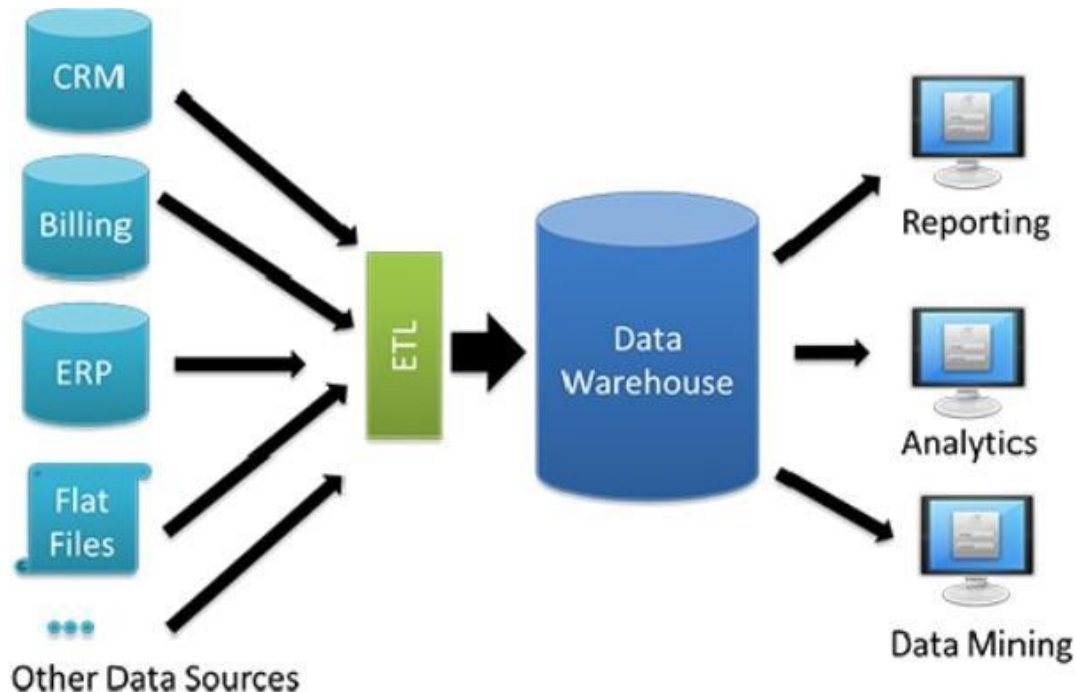
System Architecture of a Database



Types of Database

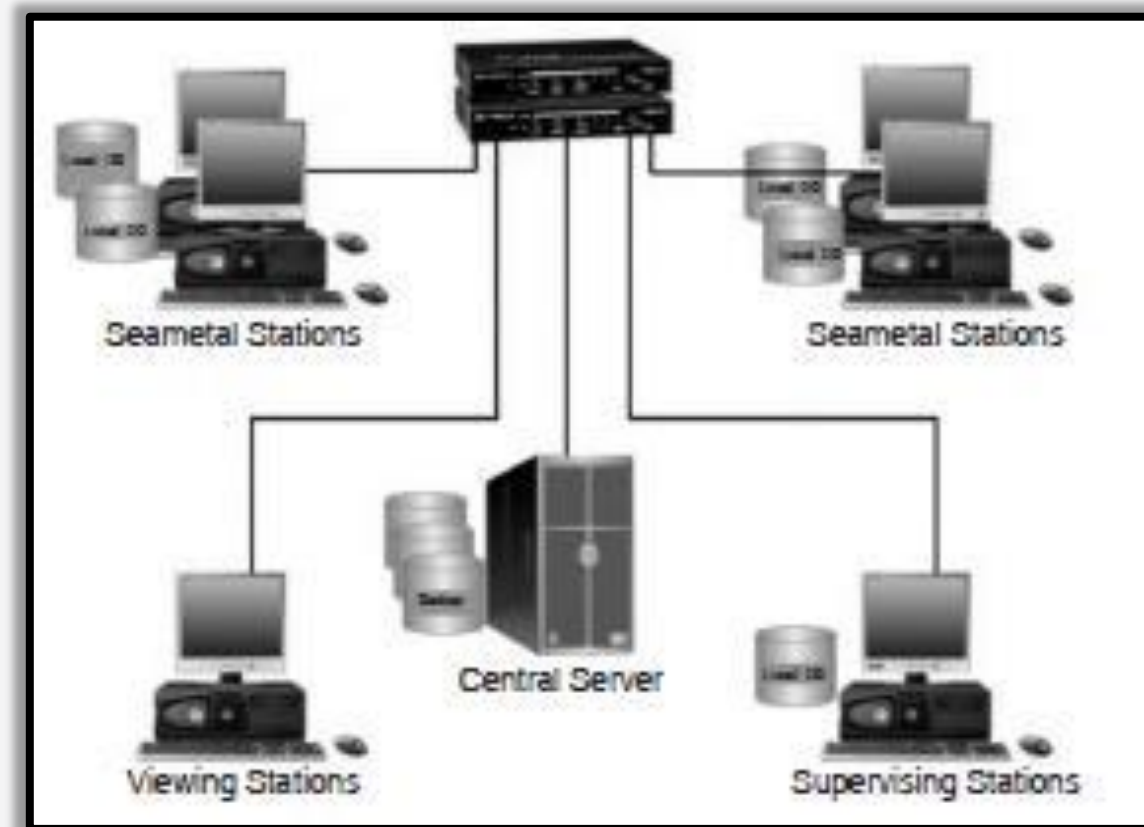
Data Warehouse:

Data Warehouse Architecture



Types of Database

Distributed Database



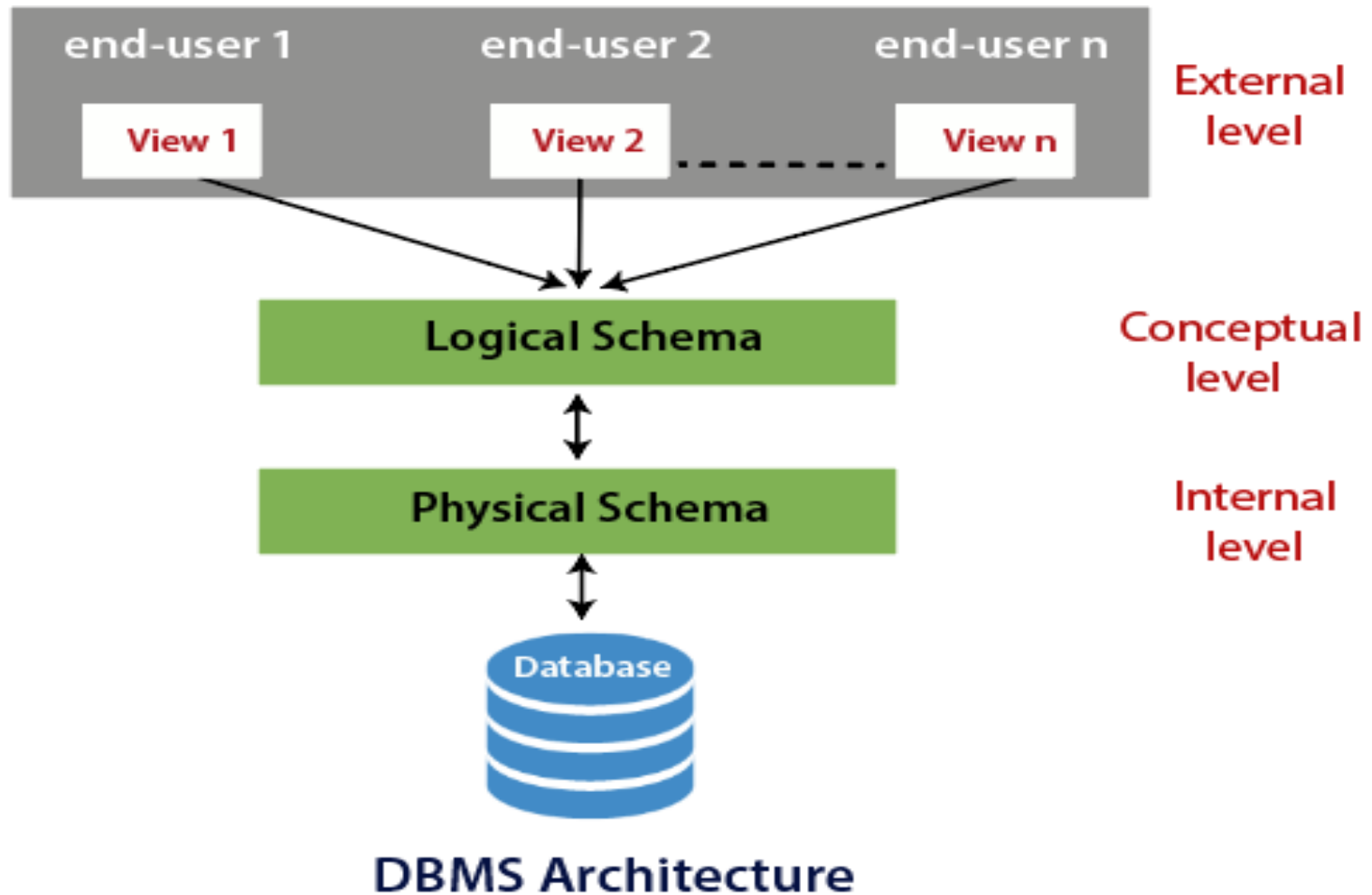
Types of Database

- End-user Database
- External Log Database
- Hypermedia Log Database
- Operational Log Database
- Customer databases
- Personnel databases
- Enterprise resource planning
- Financial databases

Database Managers

- Provides users the capabilities of controlling read/write access, specifying report generation, and analysing usage.
- Are prevalent in large mainframe systems, but are also present in smaller distributed workstation and mid-range systems such as the AS/400 and on personal computers.

Database: Three Level Architecture



Database: Three Level Architecture

- **Internal/physical level:** Shows how data are stored inside the system. It is the closest level to the physical storage.
- **Conceptual/logical level:** Deals with the modeling of the whole database.
- **External level:** Models a user-oriented description of part of the database.

Three Level Architecture Objectives

- Each user should be able to access the same data but have a different customized view of the data.
- User should not have to deal directly with physical database storage detail.
- DBA should be able to change the database storage structure without affecting the users views.

Three Level Architecture Objectives

- The internal structure of the database should be unaffected by changes to the physical aspects of storage.
- DBA should be able to change the conceptual structure of the database without affecting all users.

Why Database?

- Redundancy can be reduced.
- Inconsistency can be avoided.
- The data can be shared.
- Standards can be enforced.
- Security restrictions can be applied; Uniform security, privacy, and integrity controls can be maintained.

Why Database?

- Provision of data independence.
- Ease of application development.
- Data accessibility and responsiveness.
- Reduced program maintenance.

Working of Databases

- Databases have been a staple of business computing from the very beginning of the digital era.
- In fact, the relational database was born in 1970.
- Relational databases have grown in popularity to become the standard.
- Use of Relational Database
- Mathematical relations

Collaborating on Databases

- A database does many of the same things that a spreadsheet does, but in a different and often more efficient manner.
- Many small businesses use spreadsheets for database-like functions.
- Local database
- Networked database
- Online database

Online Database

- An online or web-based database stores data on a cloud of servers somewhere on the Internet, which is accessible by any authorized user with an Internet connection.
- Cloud database is also a type of Online database.

Advantages of Online Databases

- Data can easily be shared
- Users sitting at different location can have easy access.
- Synchronization is not an issue.
- Oriented toward quick information sharing among members of workgroups.
- Simple and intuitive interfaces.

Cloud Database

- **Collection of informational content,**
either structured or unstructured.
- Resides on a private, public or hybrid
cloud computing infrastructure platform.

Cloud Database

- “Cloud database” can be one of two distinct things: a traditional or NoSQL database installed and running on a cloud virtual machine, or a cloud provider’s fully managed database-as-a-service (DBaaS) offering.

Benefits of Using a Cloud Database

- Accessible from anywhere, scalable from day one,
- Offer flexible, affordable, and scalable database management.
- Provides a robust and efficient connection to a database.
- Functional, flexible, and secure database.

Benefits of Using a Cloud Database

Reliability &
Disaster
Recovery

Scalability &
Performance

Ease of Access
& Agility

Benefits of Using a Cloud Database

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Scalability & Performance

Reliability &
Disaster
Recovery

Ease of Access
& Agility

Benefits of Using a Cloud Database

Reliability &
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Example of Cloud Database Service

MongoDB Atlas Cloud Database

Exploring Web-Based Databases

- **Blist**
- Cebase
- Dabble DB
- Lazybase
- MyWebDB
- QuickBase

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Exploring Web-Based Databases

- **TeamDesk**
- Trackvia
- Zoho Creator
- Zoho DB and Reports

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Evaluating Online Databases

- When you're trying to decide which online database to use, it seems as if there's QuickBase and then there's everything else.
- If your needs are more modest, however, a number of the applications discussed above can be explored.

Evaluating Online Databases

- I'm particularly partial to Zoho's two offerings, Creator (for smaller needs) and DB & Reports (for larger databases and more sophisticated applications).
- There are a lot of differences between the web-based database applications available today

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That's all for now...