

1. List 2 types of **non-relational** databases from the video that you would like to do some additional research on:

I am choosing Object Oriented from NoSQL database type and Realtime from the Specialty database type.

2. Give a high-level description of the 2 types of databases that you chose - How do they work?

A. Object Oriented - Object Oriented Databases are designed to bridge the gap between programming languages and databases. Allows data to no longer be confined to just rows and columns but instead represented as objects with behaviors and properties. Utilizing object-oriented principles and preserving data relationships offers enhanced flexibility, performance, and integration capabilities.

B. Realtime – A database that can ingest, process, and analyze data in real-time rather than on a delay or in batches. Often designed to function in a highly distributed environment.

- Two sub-definitions of real-time

1. Hard Real-Time

- Transactions are guaranteed to be completed within a specific time, and missed deadlines are system failures.

2. Soft/streaming real-time

- transaction and processing deadlines are more flexible, and some data staleness is acceptable in favor of higher throughput and graceful degradation. Where speed is important not critical.

3. Identify where these databases would be used - who/what types of businesses would use them?

A. Object Oriented

- Enterprise application facilitates the storage and retrieval of complex business objects.

- The gaming industry leverages object-oriented databases in several aspects to provide seamless gaming experience.
- Scientific Research is used in applications, handling complex data structures and computational modeling.
- Empowers content management systems to store and manage diverse multimedia content.

## B. Realtime

Can power financial application that require updating the users accounts in real time.

Internet of Things solutions store values from different components like sensors as soon as new readings become available.

AI, real-time automation, and programmatic decision-making industries, which rely on real-time signals to identify the best course of action.

The gaming industry, especially with its online multiplayers, heavily relies on real-time data transferring substantial portions of data to many users in quick succession so all are experiencing similar moments.

## 4. Make a short comparison between your chosen database types and a relational database.

### A. Object Oriented Vs Operational Databases

#### - Data Representation

Operational databases store data in tables while Object-Oriented stores data as an object.

#### - Modeling Paradigm

Operational databases follow a relational model, emphasizing relationships between distinct data entities, while an object-oriented model emphasizes encapsulation and object relationships.

- Application of Suitability

Operational databases are well-suited for transactional systems requiring high throughput and data integrity. Object-Oriented are often preferred for applications with complex data structures and a strong alignment with object-oriented programming principles.

## B. Realtime

- Focus

Hierarchical databases focus on the structure of data organization, while real-time databases focus on the speed and immediacy of data access and synchronization.

- Data Model

Hierarchical databases use a specific tree-like model, whereas real-time databases can employ various data models, prioritizing real-time capabilities.

- Flexibility

Hierarchical databases are less flexible in adapting to changes, while real-time databases often offer more adaptability in handling dynamic data.

- Use Cases

Hierarchical databases are suitable for structured, stable data, while real-time databases excel in applications requiring live data updates and collaboration.

## 5. Share 2 additional resources that you used in your research (Website URL)

["Object-Oriented Databases: Unleashing the Power of Objects in Data Management" by Dezarea Byran - https://medium.com/@dezsays/object-oriented-databases-unleashing-the-power-of-objects-in-data-management-a7a73887ea66](https://medium.com/@dezsays/object-oriented-databases-unleashing-the-power-of-objects-in-data-management-a7a73887ea66)

"What is a Real-Time Database?" By blog entry by Aerospike in their own glossary page - <https://aerospike.com/glossary/real-time-database/>