Question 1

Report on database recommendations

The Database I recommend is the NoSQL database

According to IBM (2022), “NoSQL, sometimes known as "not only SQL" or "non-SQL," is a database design methodology that lets data to be stored and accessed outside of the usual structures seen in relational databases.”

Detailed motivation for choosing the NoSQL

Scalability- By adding more common hardware, NoSQL databases are capable of handling high data volumes and user traffic because they are made to grow horizontally. Without requiring major adjustments to the underlying infrastructure, this makes it simpler to manage the growing needs of contemporary applications. Geeks for Geeks (2023).

Performance - NoSQL databases can provide faster performance than traditional relational databases since they have been built to handle huge amounts of data. Applications that need low latency and real-time data access should pay special attention to this. Geeks for Geeks (2023).

Flexibility – according to Geeks for Geeks (2023). “NoSQL databases are schema-less, meaning that they can handle unstructured and semi-structured data in addition to structured data.” Documents, graphs, and key-value pairs are just a few of the many data kinds that may be stored and managed more easily with flexibility. Geeks for Geeks (2023).

Cost-effectiveness- NoSQL databases tend to be less expensive than traditional relational databases, which may need expensive hardware and software licenses, because they are made to run on standard hardware. Geeks for Geeks (2023).

Availability - according to geeks for geeks, “NoSQL databases are designed to handle high levels of traffic and data throughput, which means that they can provide high availability and fault tolerance.” For mission-critical systems that need little disruption and continuous uptime, this is particularly important. Geeks for Geeks (2023).

All things considered, NoSQL databases have multiple benefits that make them a desirable choice for businesses that must handle massive volumes of data, rapid performance, and high traffic volumes. Geeks for Geeks (2023).

The kinds of data stored in NoSQL Databases

Nayak (2023) says, In the social media platform's setting, a NoSQL database would hold:

Huge Data Volumes- NoSQL databases, such as column-family stores like Cassandra and HBase, are renowned for their effective handling of massive data volumes. Platforms that need data distribution and scalability can benefit from this. Nayak (2023).

Variable Schema Data – According to Nayak (2023).“Without a strict, defined schema, document databases offer the flexibility to handle changes in your data's schema over time or when you have several entities with varied properties.”

Text and Full-Text Search -NoSQL databases frequently incorporate full-text search features, which are helpful for social media platforms for content management systems that need text search etc. Nayak (2023).

Interaction Logs - Data capturing every user interaction (e.g., timestamps, likes, reactions, shares) for real-time analytics. Nayak (2023).

Types of NoSQL Databases

According to Geeks for Geeks (2025). “NoSQL databases can be classified into four main types, based on their data storage and retrieval methods:”

1. Documented – Oriented Databases

According to Geeks for Geeks (2025). “The document-based database is a nonrelational database.”

The documents are used to store the data in the database rather than rows and columns (tables). Data is stored in XML, BSON, or JSON documents in a document database. (Geeks for Geeks, 2025).

Less translation is needed to use these data in applications because documents may be saved and accessed in a format that is much more like the data objects used in applications. For quicker querying, the assigned index value in the Document database can be used to retrieve the specific elements. (Geeks for Geeks, 2025).

2. Key- value stores

A key-value store is the most basic type of NoSQL database. Key-value pairs are used to store each piece of data in the database. Each database element has a unique key that may be used to retrieve the data. The values may be complex objects or simple data types like texts and numbers. Similar to a relational database, a key-value store has just two columns: the key and the value. (Geeks for Geeks, 2025).

3. Column Oriented Databases

Stores data in columns rather than rows. This means that when we want to perform analytics on a small number of columns, we can read those columns directly without using up memory with unnecessary data. Column-oriented databases are used to store a lot of data and are made to read data fast. (Geeks for Geeks, 2025).

4. Graph Based Databases

According to Geeks for Geeks (2025). “The link between the elements is the primary focus of graph-based databases.” It keeps the information in the database as nodes. They are ideal for detailed relationship-based inquiries since the connections between the nodes are referred to as links or relationships.

Nodes, or objects, and edges, or connections, are used to represent data.

Relationships can be swiftly retrieved with the aid of fast graph traversal methods.

utilized in situations when connections are just as important as the information itself. (Geeks for Geeks, 2025).

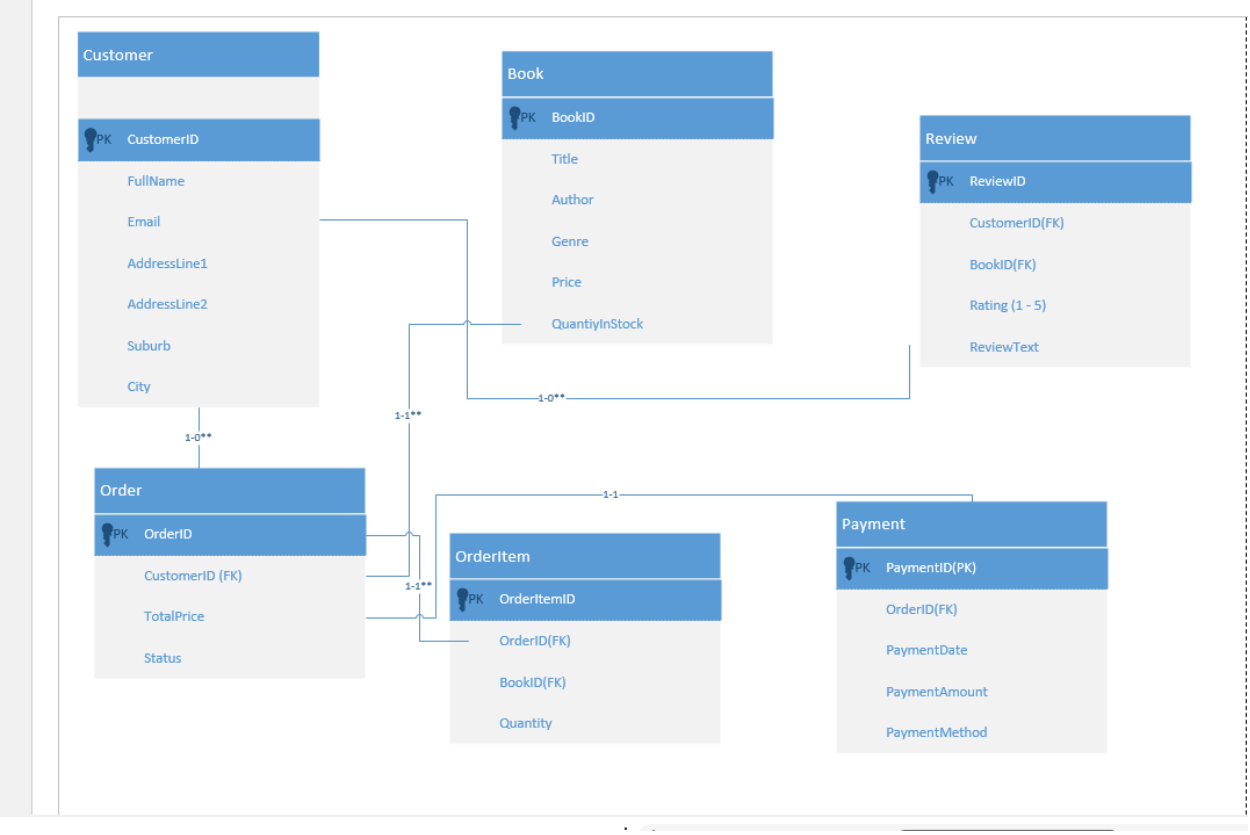
The three Vs of Big Data in the Scenario

1. Volume - Every day, the network handles massive volumes of data, including user posts, photos, videos, live broadcasts, and more. Scalable infrastructure that can handle petabytes (PB) of data is needed because of the large volume of material produced by millions of users. Lutkevich (2023).

2. Velocity - Information is made and accessed quickly, particularly when it comes to real-time comments, likes, shares, and views. To ensure accurate feeds, on point notifications, and trending topics, the platform must continuously take in, process, and analyze this data. Lutkevich (2023).

3. Variety - The platform deals with a range of data forms, such as unstructured videos, photos, and VR content etc., semi-structured (e.g. JSON post data), and structured user details. A flexible data system, such as NoSQL, that is not compelled by a single data model is needed to support all these kinds. Lutkevich (2023).

Question 2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