TYPES OF DATABASES

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Abstract: This article provides detailed information about databases, which play a key role in modern information technology, and their types. It discusses the descriptions, advantages, and disadvantages of various databases as well as their application areas. This research helps to select the most suitable system for effective management and storage of information.

Keywords: Database, types of databases, relational database, NoSQL, object-oriented database, database management systems, data analysis.

Introduction

With the advancement of modern technologies, methods of storing and managing information have also developed. Databases are of significant importance in various fields today, offering possibilities for organizing, storing, and searching information. Databases are one of the essential tools for improving the efficiency of programs and systems. This article provides detailed information about the types of databases, their features, and application areas.

Theoretical Part

Definition of a Database

A database (DB) is a system for collecting, storing, and managing large volumes of information in one place. It enables fast and efficient search, analysis, and utilization of information. Databases are managed through software and hardware tools, with their management system referred to as a DBMS (Database Management System).

Types of Databases

Hierarchical Databases

Hierarchical databases organize data in a tree-like structure. Each node has parent-child relationships. These databases are simple in structure and excel in fast data retrieval. An example is IBM Information Management System (IMS).

Network Databases

Network databases are similar to hierarchical ones but allow each node to have multiple parent nodes. This enables the representation of complex data structures. The network model is efficient for managing interrelated data sets.

Relational Databases

Relational databases store data in tables consisting of rows and columns interconnected with each other. They are among the most widely used types of databases. Examples: MySQL, PostgreSQL, Oracle Database.

Object-Oriented Databases

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These databases are compatible with object-oriented programming languages and store data as objects. Each object has its properties and methods. They are convenient for integration with software environments. Examples: ObjectDB, db4o.

NoSQL Databases

NoSQL databases are designed to handle large volumes of data and, unlike relational databases, do not have a rigid structure. They are distinguished by their speed and scalability. Examples: MongoDB, Cassandra, Couchbase.

Data Warehouses

These are used to store large volumes of historical and statistical data. They are often applied in business analytics and decision-making systems. Examples: Amazon Redshift, Google BigQuery.

Big Data and Cloud Databases

Systems designed for analyzing and managing large volumes of data. Cloud-based databases are managed through remote services. Examples: Amazon DynamoDB, Microsoft Azure Cosmos DB.

Schema Types
Star Schema

This schema consists of a central fact table connected to dimension tables, used in sales data analysis.

Snowflake Schema

Similar to the star schema but has additional normalized tables, resulting in a more complex structure.

Network   Schema

Used to represent complex relationships, consisting of multiple nodes and connecting edges.

Hierarchical Schema

Arranges data in a tree-like structure, for instance, in organizational management hierarchies.

Each connection schema serves specific purposes and offers solutions tailored to user requirements.

Conclusion

Databases are a vital component of modern information technology. Their types and characteristics stand out due to their applications in various fields. Each type of database is designed to address specific tasks and meet user requirements. With technological advancements, new types of databases are emerging and continuously improving.

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