

Introduction to Databases

Database Fundamentals

Name of presenter

Date

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Welcome to Introduction to Databases.

What you will learn

At the core of the lesson

You will learn how to:

- Identify different aspects of a database, including the difference between relational databases and nonrelational databases
- Describe the purpose and functions of a database management system (DBMS)
- Identify different ways to interact with relational databases
- Recognize emerging data technologies

Key terms:

- Data
- Database
- Data model
- Relational data model
- Relational databases
- Nonrelational databases
- Database management systems (DBMS)



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In this module, you will learn how to:

- Identify different aspects of a databases, including the difference between relational databases and nonrelational databases
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- Recognize emerging data technologies

Data and databases

What is data?

- Data is raw bits and pieces of information.
 - Images, words, and phone numbers are examples of data.

What is a database?

- A database is a collection of data that is organized into files that are called **tables**.
 - Tables are a logical way of accessing, managing, and updating data.

Sample Table: Preference in Pets			
Dogs	Cats	Horses	Other
17	12	7	4

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aws re/start

Data is raw bits and pieces of information. The bits of information that make up images, words, and phone numbers that you see on mobile phones or computer monitors are examples of data.

What Is a database?

A database is a collection of bits of data that is organized into files, which are called *tables*. Tables are a logical way of accessing, managing, and updating data.

In a database, data can also appear in other formats, such as figures, graphics, images, and audio-video recordings.

Deeper dive: Data models and E.F. Codd

Data models

- Data models are **logical structures** of a database.
- Data models are used to determine how data can be stored and organized.

E.F. Codd relational model

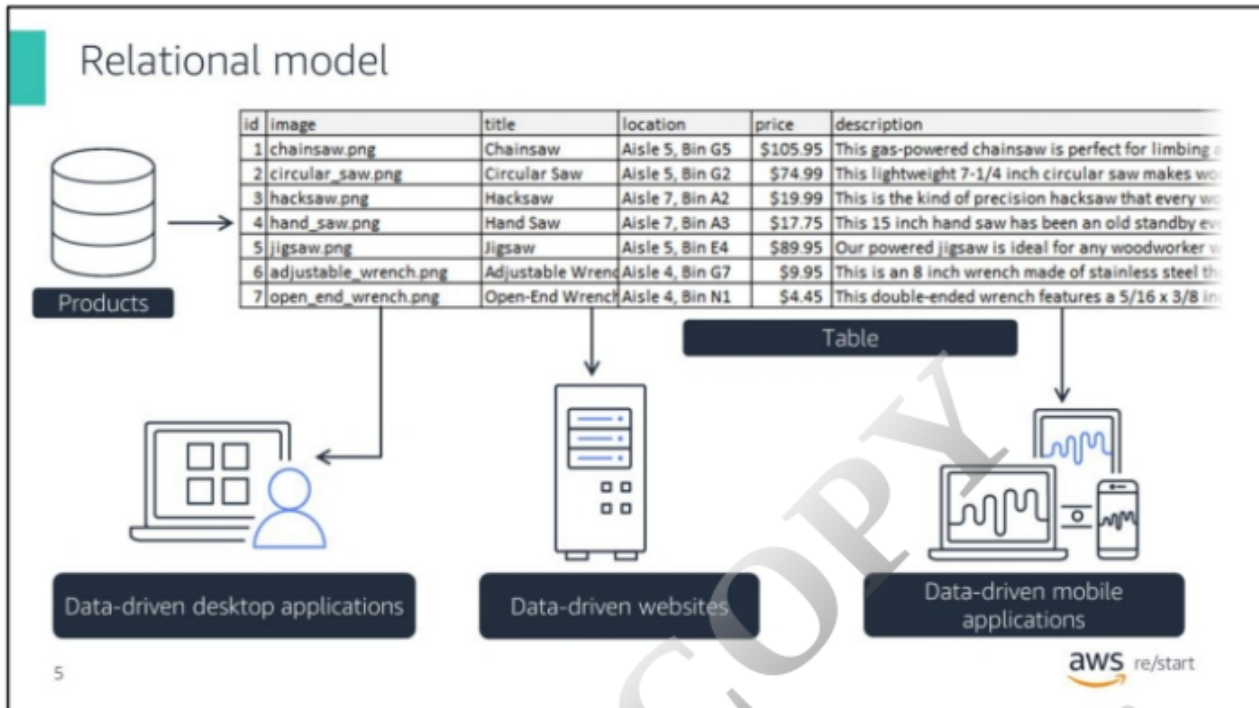
- The **relational model (RM)** is a data model that Dr. Edgar F. Codd, a mathematician at IBM, developed in the late 1960s.
 - Developed to improve handling of large amounts of data
 - Based on a mathematical domain that is called **relational algebra**



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Data models represent **logical structures** of a database. Data models are used to determine how data can be stored and organized.

Relational model is a data model that Dr. Edgar F. Codd, a mathematician at IBM, developed in the late 1960s. It was developed to improve handling large amounts of data. The relational model is based on a mathematical domain that is called relational algebra.

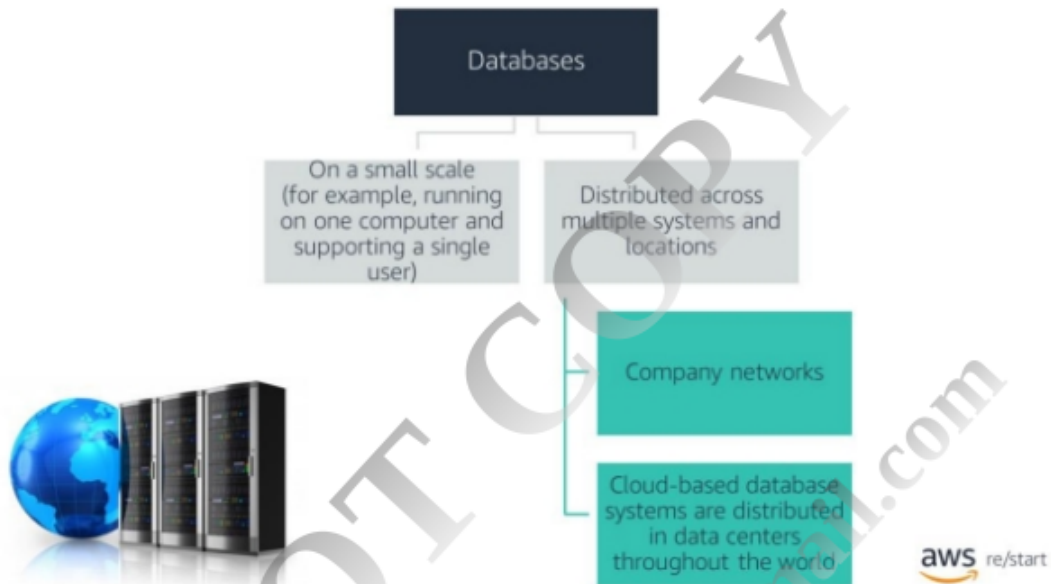


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This example is a relational model. Looking at the model, start with the database that is named *Products*. Inside the *Products* database is a table. The *Products* table can have multiple records (which are also known as rows), and fields (which are also known as *columns*). Each record or row contains information about a product. For example, the row could contain the name of a product, the cost of the product, or the location in the warehouse. It might also contain the stock keeping unit (SKU) or ID, and the stock number for the product.

Databases exist on the *backend*, or behind most data-driven applications, data-driven websites, and data-driven mobile apps.

Small scale or distributed



Databases can operate on a small scale. They might run on one computer and support a single user.

Other databases are distributed across multiple systems and locations across a company's network, or they can be cloud-based databases that support millions of users.

Two types of databases

Relational

- A **relational database** is a collection of data items that have predefined relationships between them.
- It requires a fixed definition of the structure of the data.


Nonrelational

- A **nonrelational database** is a database that **does not** follow the relational model.
- **Nonrelational databases do not** require a fixed definition of the structure of the data.

A **relational database** is a collection of data items with predefined relationships between them. They require a **fixed definition of the structure of the data**.

A **nonrelational database** is a database that does not follow the relational model.

Next, you will learn about some of the differences between these models.



Relational databases

You will now learn more information about relational databases.

Relational databases

In relational database design:

A **relational database**, is often referred to as a **structured query language (SQL) database**. It is a database where the data is spread across multiple tables.

Each table has fields (or columns) that provide quick navigation to a particular record.



Nonrelational databases

You will now learn more information about nonrelational databases.