



WelTec

Te Whare Wānanga o te Awakairangi



西安科技大学高新学院
XI'AN KEDAGAOXIN UNIVERSITY

IT5507 Fundamentals of Data Science

Chapter 15 Database Connectivity and Web Technologies

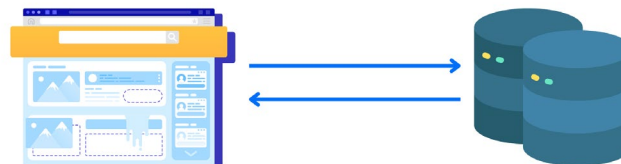


Database Connectivity and Web Technologies

1.Introduction: Today, we're diving into the topic of Database Connectivity and Web Technologies. We'll be focusing on the role of databases in building web applications.

2.Access the Article: Click on the following link to access the article we'll be discussing: [The Role of Database in Web Application Development](#). Take your time to read through it carefully.

3.Reading and Understanding: As you read the article, pay attention to key ideas and examples. Make sure you understand the role databases play in web app development, as explained in the article.





Database Connectivity and Web Technologies

Answering the Questions: After reading the blog's article, I'd like you to answer five basic questions related to the article's content:

- a. What does the article say is the main purpose of databases in web app development?
- b. Can you name a few types of databases mentioned in the article, and how are they different?;
- c. Why does the article suggest we should consider factors like scalability and performance when choosing a database for a web app?
- d. Think of a scenario where MySQL might be a better choice than MongoDB, according to the article.
- e. How does the article suggest we can use databases effectively to create strong, scalable web applications?



Database Connectivity and Web Technologies

Discussion and Reflection: Once you've answered the questions, we'll have a class discussion. Share your answers and thoughts, and feel free to ask questions or share any confusion you may have. Let's reflect on what we've learned and how it applies to real-world web development.



Case: Online Bookstore

- Here's a simple real-world case for web development that can help you understand the role of databases:

Case: Online Bookstore

- Imagine you are tasked with building an online bookstore where users can browse, search for, and purchase books. The website needs to store information about books, such as title, author, genre, and price. Additionally, it should keep track of user accounts, orders, and inventory.





Case: Online Bookstore

- **Role of Databases:**

- 1. Data Storage:** Databases play a crucial role in storing all the information about books, users, orders, and inventory. Each type of data (books, users, orders) will have its own table in the database, with rows representing individual records and columns representing different attributes (e.g., book title, user ID, order date).
- 2. Data Retrieval:** When a user searches for a book or views their order history, the web application needs to retrieve relevant information from the database. This involves writing SQL queries to select and fetch data based on specified criteria.
- 3. Data Management:** Databases help manage the integrity and consistency of data. For example, the database can enforce constraints to ensure that each book has a unique ISBN number and that users cannot place orders for out-of-stock items.
- 4. User Authentication:** The website needs to authenticate users when they log in and manage their account information securely. User credentials (such as usernames and passwords) are stored in the database, and the web application verifies this information during the login process.
- 5. Order Processing:** When a user places an order, the web application needs to update the database to reflect the transaction. This involves inserting a new order record into the database and updating the inventory to reflect the items that have been purchased.



Case: Online Bookstore

- Hence, considering the role of database you can understand how databases are essential for storing, retrieving, and managing data in web applications.
- They can also see how databases facilitate key features such as user authentication, order processing, and data integrity. This case provides a practical example of the role of databases in web development and sets the stage for further exploration of the topic.
- In the context of web development, database connectivity refers to the ability of a web application to interact with a database to retrieve, store, and manipulate data dynamically. The relationship between web development and database connectivity is fundamental, as databases serve as the backbone for storing and managing the vast amount of data that web applications rely on.



Case: Online Bookstore

- Here's how the two are interconnected:
- 1. Data Storage:** Web applications often require storing various types of data, such as user information, product details, and transaction records. Databases provide a structured and efficient way to store this data, ensuring that it can be easily accessed and managed by the web application.
 - 2. Data Retrieval:** When users interact with a web application, they often need to retrieve specific information from the database. For example, when a user logs in, the web application needs to verify their credentials by querying the database. Database connectivity enables the web application to execute SQL queries to fetch the required data dynamically.
 - 3. Data Manipulation:** Web applications frequently need to modify or update data in the database based on user actions. For instance, when a user adds an item to their shopping cart, the web application needs to update the corresponding record in the database. Database connectivity allows the web application to execute SQL commands to insert, update, or delete data as needed.



Case: Online Bookstore

- 1. Dynamic Content Generation:** Many web applications generate dynamic content based on data stored in the database. For example, an e-commerce website might display personalized product recommendations based on a user's browsing history. Database connectivity enables the web application to retrieve relevant data from the database and dynamically generate content to be displayed to the user.
- 2. User Authentication and Authorization:** Web applications often require user authentication and authorization to control access to certain features or data. User credentials and access permissions are typically stored in the database, and database connectivity enables the web application to authenticate users and enforce access controls.

Overall, database connectivity is essential for web development as it enables web applications to interact with databases effectively, allowing for dynamic data-driven functionality and personalized user experiences. The seamless integration between web development and database connectivity is critical for building robust and scalable web applications.