

TRAINING DAY1 REPORT

24 JUNE 2025

WHAT IS DJANGO?

Django is a free and open source web application framework written in Python. A framework is nothing more than a collection of modules that make development easier. They are grouped together, and allow you to create applications or websites from an existing source, instead of from scratch.

When you're building a website, you always need a similar set of components: a way to handle user authentication (signing up, signing in, signing out), a management panel for your website, forms, a way to upload files, etc.

Django offers a big collection of modules which you can use in your own projects. Primarily, frameworks exist to save developers a lot of wasted time and headaches and Django is no different.

FEATURES OF DJANGO

1. MVT Architecture – Separation of concerns into Model (Data), View (Business Logic), and Template (UI).
2. Admin Interface – Auto-generated backend interface for managing models.
3. ORM (Object-Relational Mapper) – Interacts with the database using Python classes instead of SQL queries.
4. Security – Protection against SQL injection, XSS, CSRF, and clickjacking.
5. Scalability – Handles large-scale web applications efficiently.

6. Versatility – Supports everything from content management systems to scientific platforms.
7. Built-in Authentication – Includes login/logout, user groups, and permissions.
8. URL Routing – Clean and manageable URLs.
9. Forms Handling – Automatically generates HTML forms and validates them.
10. Community Support – Large ecosystem of libraries, documentation, and plugins.

DJANGO ARCHITECTURE

MVT : MODEL VIEWS TEMPLATE

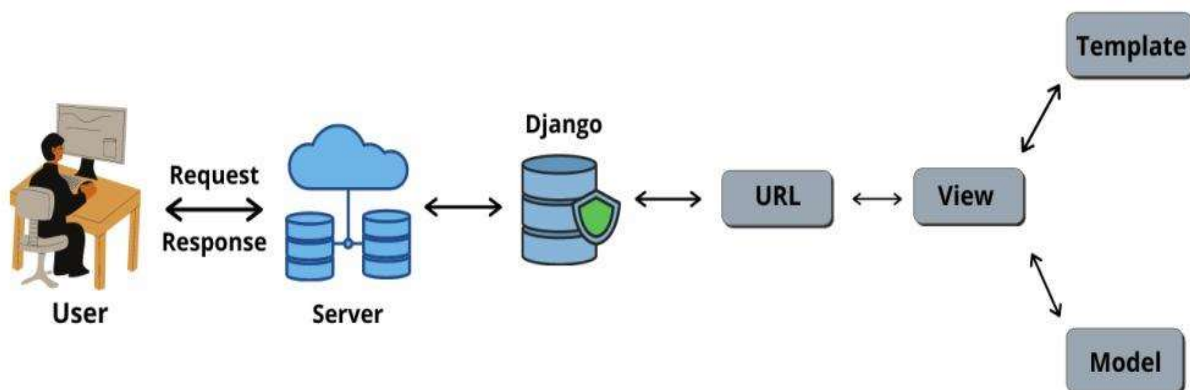


FIGURE 1.1 DJANGO ARCHITECTURE

1. User (Client)

- The user initiates an HTTP request (like typing a URL or submitting a form) through a browser.
- This request is sent to the web server hosting the Django application.

2. Server

- The server receives the request and forwards it to the Django framework.
- It acts as a middleman between the user and the application logic.

3. Django

- Django processes the request internally.
- It includes essential components like middleware, URL dispatcher, views, templates, and models.

4. URL Dispatcher (URLconf)

- Django uses its URL dispatcher to match the incoming request's URL with a defined URL pattern.
- Based on the match, it calls the corresponding view function/class.

5. View

- The view is where the business logic resides.
- It interacts with:
 - Model (for data fetching/storing)
 - Template (for rendering UI)

6. Model

- Represents the data structure and database tables.
- Django's ORM allows you to interact with the database using Python classes instead of raw SQL.

7. Template

- Contains the HTML presentation logic.
- Templates receive data from the view and render it into a dynamic webpage.

8. Response to User

- The view returns an HTTP response (usually rendered from the template).
- Django passes this back to the server, which delivers it to the user's browser.

WHAT IS A VIRTUAL ENVIRONMENT IN PYTHON?

A virtual environment is an isolated environment that allows you to:

- Run a Python project with its own dependencies and versions.
- Avoid conflicts between packages required by different projects.

Step-by-Step: Set Up Django with Virtual Environment:

Step 1: Create a Virtual Environment

```
PS C:\Users\WELCOME\Desktop\training> python -m venv myenv
```

Step 2: Activate the Virtual Environment

```
PS C:\Users\WELCOME\Desktop\training> cd myenv\Scripts
PS C:\Users\WELCOME\Desktop\training\myenv\Scripts> .\activate
(myenv) PS C:\Users\WELCOME\Desktop\training\myenv\Scripts> cd ..\..
```

Step 3: Install Django in the Virtual Environment

```
(myenv) PS C:\Users\WELCOME\Desktop\training> pip install django
```

When working on a Django project:

→ You must always activate your virtual environment before running your Django commands (like `runserver`, `makemigrations`, etc.).

CREATING A PROJECT AND AN APP:

```
(myenv) PS C:\Users\WELCOME\Desktop\training> django-admin startproject project
(myenv) PS C:\Users\WELCOME\Desktop\training> cd project
(myenv) PS C:\Users\WELCOME\Desktop\training\project> django-admin startapp myapp
```

What is a project?

A Django Project is the entire website or web application. It is the main container that holds all configuration and multiple apps.

What is an app?

A Django App is a specific module or component inside a project that handles a particular functionality.