2CSDE86 Application Development Frameworks (ADF)

Lecture-1

7th CSE

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Disclaimer

- The content in the ppt is taken from various online sources and reference books and after referring it was considered for including it in the ppt slides.

Course Policy

- ADF Course Policy Odd 22-23

Introduction to Course- ADF

- 3 credit course : [2 0 2 3] ([L T P C])

- **Importance of Course:**

- Django is a Python based web framework that enables rapid development of secure and maintainable websites.

- Built by experienced developers, Django takes care of much of the hassle of web development, so you can focus on writing your app without needing to reinvent the wheel.

- It allows developers to use modules for faster development. As a developer, you can make use of these modules to create apps, websites from an existing source. It speeds up the development process greatly, as you do not have to code everything from scratch.

Introduction to Course- ADF (contd…)

- **Importance of Course:**

- Basically Python is a language that can be used for developing anything and everything you want.

- Django is new web development framework in python which support MVT (Model-View-Template) architecture.

- Now a days, most of the organization wants to develop data science and analytics to enhance decision making.

- Huge community support and large amount of API is available.

Introduction to Course- ADF (contd…)

- **Pre-requisite:**

- Awareness of basics of python

- Eagerness and readiness to do programming

Web Development Framework

- What is a framework?

- What is a web development framework?

Web Development Framework (contd…)

- What is a framework?

- What is a web development framework?

- A framework, or software framework, is a platform for developing software applications. For example, a framework may include predefined classes and functions that can be used to process input, manage hardware devices, and interact with system software.

- A web development framework is a set of resources and tools for software developers to build and manage web applications, web services and websites.

- Developers can use the framework to define the 'out-of-the-box' content management capabilities, user authentication features, and administrative tools.

Web Development Framework (contd…)

- Why framework needed in web development?

Web Development Framework (contd…)

- Why framework needed in web development?

- The purpose of framework is to allow designers and developers to focus on building an unique feature for their web based projects rather than re-inventing by coding.

- Framework is specially created to help you boost the performance and efficiency of your web app development task.

- Easy de-bugging, improved code efficiency, Easy code reusability, etc.

Web Development Framework (contd…)

- How have Web Development Frameworks Eased the App Development Process?

- **Higher Performance**

- Web frameworks are specifically designed with pre-built features and functionalities to deliver extremely high efficiency and performance while building apps.

- The loading capacity of the websites designed with appropriate framework enhances significantly.

Web Development Framework (contd…)

- How have Web Development Frameworks Eased the App Development Process?

- **Reduction in Errors**

- Most of the framework methodologies incorporate the finest software engineering practices.

- Numerous web frameworks have a pre-built or externally integrated testing mechanism that tests the code there and then, reducing the number of errors in the final code.

Web Development Framework (contd...)

- How have Web Development Frameworks Eased the App Development Process?

- **Faster Development**

- Most web frameworks come with pre-written templates and objects that could be leveraged to complete redundant programming tasks.

- These tools save the time of developers and let them focus on the core programming part producing swift and more productive outcomes.

Web Development Framework (contd…)

- How have Web Development Frameworks Eased the App Development Process?

- **Better Reliability and Security**

- Frameworks include hundreds of ready-made components created and regularly updated by a community of developers.

- This enormous backing by the programming community ensures your project won't get stuck in between, and the best possible solution for the business challenges can be developed.

Web Development Frameworks (contd…)

- Ruby on Rails

- Django

- Angular

- Laravel

- Express

- Etc…

Web Development Frameworks (contd…)

- **Post Lecture task**

- **Comparative study of Web Development Frameworks available in market.**

Web Development Framework- Django

- **What is Django?**

- Django is an open-source framework for backend web applications based on Python — one of the top web development languages.

- Its main goals are providing simplicity, flexibility, reliability, and scalability to developers.

- Django is the framework for web applications, as it allows developers to use modules for faster development. As a developer, you can make use of these modules to create apps, websites from an existing source. It speeds up the development process greatly, as you do not have to code everything from scratch.

Web Development Framework- Django

- **What is Django?**

- Django is a prominent Python framework that has an extremely high demand among developers and businesses.

- Django uses the concept of code reusability and follows the MVT (Model-View-Template) Architecture that enables it to develop applications at a faster pace.

- Django is one of the finest web frameworks that can be leveraged to create both the frontend and backend of the application.

Web Development Framework- Django (contd...)

- **Why Django?**

- Some of the key features of Django are messaging, in-built validation, and authentication.

- This framework is suitable to design complex and large business projects.

- Faster development.

- Availability of inbuilt authentication tool.

- Huge community support.

- Well-organized documentation.

- It can create secure and robust applications.

Web Development Framework- Django (contd...)

- **Why Django?**

- **It's fast and simple**

- One of Django's main goals is to simplify work for developers. To do that, the Django framework uses:

  - The principles of rapid development, which means developers can do more than one iteration at a time without starting the whole schedule from scratch;
  - DRY philosophy — Don't Repeat Yourself — which means developers can reuse existing code and focus on the unique one.

- As a result, it takes a lot less time to get the project to market.

Web Development Framework- Django (contd...)

- **Why Django?**

- **It's secure**

- Security is also a high priority for Django. It has one of the best out-of-the-box security systems out there, and it helps developers avoid common security issues, including:

  - clickjacking,
  - cross-site scripting
  - SQL injection.

- Django promptly releases new security patches. It's usually the first one to respond to vulnerabilities and alert other frameworks.

Web Development Framework- Django (contd...)

- **Why Django?**

- **Clickjacking:** an attack that fools users into thinking they are clicking on one thing when they are actually clicking on another. Its other name, user interface (UI) redressing, better describes what is going on.

- Eg. The user visits the page and clicks the "Book My Free Trip" button. In reality the user is clicking on the invisible iframe, and has clicked the "Confirm Transfer" button. Funds are transferred to the attacker's account.

Web Development Framework- Django (contd...)

- **Why Django?**

- **Cross-Site Scripting:** Cross-Site Scripting (XSS) attacks are a type of injection, in which malicious scripts are injected into otherwise benign and trusted websites.

- Eg.: Examples of reflected cross-site scripting attacks include when an attacker stores malicious script in the data sent from a website's search or contact form. A typical example of reflected cross-site scripting is a search form, where visitors sends their search query to the server, and only they see the result.

Web Development Framework- Django (contd...)

- **Why Django?**

- **It suits any web application project**
- With Django, you can tackle projects of any size and capacity, whether it's a simple website or a high-load web application. Why use Django for your project? Because:

  - It's fully loaded with extras and scalable, so you can make applications that handle heavy traffic and large volumes of information;
  - It is cross-platform, meaning that your project can be based on Mac, Linux or PC;
  - It works with most major databases and allows using a database that is more suitable in a particular project, or even multiple databases at the same time.

Web Development Framework- Django (contd...)

- **Why Django?**

- **It's well-established**

- Django is time- and crowd-tested. It has a big, supportive community accessed through numerous forums, channels, and dedicated websites.

- It's easy to find help when there's a problematic function in the code, and to find developers if your company is looking to base the next project on Django.

- Well documented, updated along with the new functions and fixes, so you can easily adapt to changes.

Web Development Framework- Django (contd...)

- **What can be Django be used for?**

- Django was first created to power a web application for a newspaper publisher, the Lawrence Journal-World.

- You can expect it to be amazing at handling projects with volumes of text content, media files, and heavy traffic — or anything else that works like a web-based periodical.

- But the publishing industry is not the framework's only area of application.

Web Development Framework- Django (contd...)

- **What can be Django be used for?**

- Django is also used to build e-commerce websites and health care and financial applications for transportation and booking, social media sites, and more.

- Here are some of the many project types you can develop using the framework:

  - Financial platforms with features for analyzing and calculating approximate results based on personal data, risk tolerance, the probability of achieving goals.
  - B2B CRM systems for handling communication between businesses
  - Android and iOS mobile apps that support web application
  - Real estate property evaluation systems etc…

Web Development Framework- Django (contd...)

- **What can be Django be used for?**
- Some companies choose to base their projects on more than one framework. Django can also be used to create separate features, such as:

  - An emailing system for sending notifications to users
  - A filtering system with advanced logic and dynamically changing rules
  - Algorithm-based generators
  - Data-analysis tools
  - Interfaces for managing investment funds
  - Admin dashboards
  - Photo-based verification systems etc…

Web Development Framework- Django (contd...)

- **Famous companies that use the Django framework**

Instagram: A popular social network that deals with a great deal of media data and user interactions. Django enables the functionality that makes the web application work seamlessly, add new features, and fix issues in no time.

Spotify: A large media library with huge volume of information that allows users to listen to music free of charge or on an ad-free subscription basis. On the technical side of things, Spotify also uses machine learning, where Python is one of the best choices. The creators chose to combine it with the Django framework.

Web Development Framework- Django (contd...)

- **Famous companies that use the Django framework**

The Washington Post: It's no wonder that The Washington Post would use Django to handle its heavy traffic, since the framework itself was created to power an online newspaper. Several other online periodicals also use Django.

Dropbox: A cloud technology for file storage requires high-performance functionality. Django provides Dropbox with the tools it needs to provide sharing and synchronization, as well as scalability.

Web Development Framework- Django (contd...)

Django is a great addition to projects that need to handle large volumes of content (e.g., media files), user interactions or heavy traffic, or deal with complex functions or technology (e.g., machine learning).

Yet it is simple enough for smaller-scale projects, or if you intend to scale your project to a much higher level.

That's why Django is used by so many companies that vary in size and goals.

Next Lecture Topics

- MVC architecture

- MVT architecture