DSD 603 Dynamic Web Technology- Assessment 1

Dynamic Web Technology

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Assessment Tasks Section 1-

Theory [40 Marks] ATC Movie Blog website would like to create an interactive admin dashboard to enter upcoming movies' details. They have hired you to develop a new web application to access the back-end CRUD (Create, Read, Edit & Delete) functionalities. ATC Movie Blog has asked you to provide the following details to make a selection of suitable development platforms.

• Analyse server-side frameworks- Django, Asp.net, and Laravel that are used to create a dynamic web application. In your analysis include a brief description, features (4) and limitations (3) of the framework. [6 marks for each framework, 6 X 3 =18 marks]

Analyse server-side frameworks
Django:
Features:
1. Django is a web development framework. But with its batteries included feature, it's as easy to use as if you wrote everything from scratch. This means developers can focus on writing functionalities once and don't have to worry about the backend delivery details.
2. The configuration and architectural design enable rapid development. Concurrently, developers can work without any loss of development speed.
3. Django REST framework is the most popular Django-based framework for creating web APIs. It allows you to create a simple endpoint for your web application and further build complex, complex backends simply through opting to integrate through any backend with Django.
4. Django is an open-source web framework written in Python and used to develop websites, software, and mobile apps. The Django framework provides developers a powerful and flexible toolkit for rapid development of their applications.
Limitations:

1. Django is a very powerful web framework that can be used to build all types of applications. However, it is not ideal for some projects since it has features that can prove difficult if not impossible to adapt to smaller, specialized applications.

2. Django is a very lightweight Python web framework with minimal dependencies. Its design matters because it's likely to influence your choice of other libraries, your testing strategy, and how you unit test.

3. The web framework is one of the hardest to master because it has been evolving for so many years. New frameworks are released constantly, but old frameworks are still widely adopted by developers.

Asp.net:

Features:

1. .NET Core platform is a set of NuGet packages that provides a small, discrete piece of functionality. It allows you to optimize applications, make them more lightweight and much leaner.

2. ASP.NET Core is a free, open-source framework made by Microsoft. It is a powerful and easy to use application framework that you can use to build modern web sites, applications, and services.

3. The package also features like configuration features and a Single API that runs on different platforms. They do not need to take care of it any more as the package already contains different implementations for each of the environments.

4. Visual Studio Code is a fast and lightweight code editor that runs directly within your web browser, allowing you to quickly edit classic source code files or TypeScript. Type anything in the editor and immediately see the results in your app on any operating

system and allows you to build, debug and run ASP.NET Core web applications. It's free for open-source projects, with additional features available at an affordable price.

Limitations:

1. WCF services are currently not available for .NET Core. The most practical way to consume WCF services is using the library called WCF-Client. It is available as part of any WCF service but can also be used standalone or as a reference library. This means that it might be used in a web application, desktop app or server-side component.

2. Workflow-related services include WF and WCF Data Services. These services are no longer in .NET Core.

3. Microsoft Missing Third party library support. .NET Core 2.0 provides 'compatibility shims' between the .NET Framework and .NET Core, but you may still have some issues with compatibility if your class library uses any .NET Framework APIs that are not supported by .NET Core.

Laravel:

Features:

1. Laravel has full support for user authentication and role-based access control. With Laravel, you have full control over the processing of data access requests and can reject unauthorized requests. This keeps your application secure and compliant with best practices.

2. Laravel is an open-source web application framework built on top of PHP. It is designed with simplicity and speed in mind, while still being able to provide the flexibility you might need to build any type of web application.

3. Email integration with Laravel is possible using drivers for Mandrill, Amazon SES, Send mail and others. You can send emails both in the cloud and through local services.

4. Laravel provides caching support through built-in drivers. By including the file storage, it can increase the performance of any system.

Limitations:

1. Laravel has a lot of complicated features and functions, which make the project difficult to grasp and even automate. Therefore, Laravel experts are not so many.

2. Laravel is not a fully featured framework like Rails or Django. Laravel has limited built-in support and there are no ORM's, but the problem with the lack of built-in support is easily resolved by the built-in utilities.

3. Laravel is a platform that is updated very often, and these updates have little problems. However, it may be confronted with some issues. The programmers should be having enough experience to handle them.

• Compare server-side programming languages

C#:

a. Popularity:

C# is a simple, powerful, and modern programming language that allows developers to create high-quality software, quickly and efficiently. More than 770 million active users on games created with Unity game engine show the popularity of C# for video game development.

b. Scalability:

Good performance is the goal of the software, and that begins with performance testing. Performance testing gives us the information we need to

1) determine if the software has the correct behaviour and

2) identify areas that can be improved.

The main benefit of asynchronous programming comes from making our code more scalable and efficient. The scalability feature of a system relates to how it handles a growing amount of work. And its potential to scale to accommodate that growth.

c. Usage:

- C# is a well-known programming language that enables developers to create powerful websites and programs using Microsoft .NET Framework. Many businesses such as Xbox, Slack, and Netflix use C# to build their websites.

- C# is a programming language based on the object-oriented programming paradigm that's powerful and flexible, making it easy to develop robust, secure applications across an array of industries.

- A workflow app is a development tool that helps automate tasks and projects within a business. These systems are based on .NET and require C# programmers to set up a project in Visual Studio and the .NET framework 4.0.

d. Security:

The existence of multiple web applications and their advances makes it the biggest target for hackers and attackers. The main reason behind the major vulnerability to C# applications is the insufficient strength of their security system in comparison with programming languages like Python, VB.NET or other high-level languages. The third and fourth most common type of attack on C#-based applications is LDAP Injection (97), Command Injection (64) and Xpath Injection (42).

One of the most important aspects of a secure software development process is quality assurance. Checkmarx's CxSAST, a static code analysis solution 51, stands out amongst C# testing solutions as not only the solution which will keep your C# code

free from security and compliance issues, but also as the tool which will contribute to your organization's advancement when it comes to application security maturity.

e. Community support:

Full support refers to the period during which Microsoft provides a full set of support services and updates for a release. The goal of full support is to fix reported issues, including crashes and bugs in mainline scenarios, as well as adding new features. Maintenance support refers to the last 6 months of support, during which only security issues are addressed by patching. After the maintenance period ends, there will be no more patches released.

f. Cost:

NET is an open-source platform that enables developers to build and run apps on any device. The latest versions of .NET are all open-source and maintained by Microsoft, with contribution from the .NET community on GitHub. That means you can use the latest .NET technologies and never pay licensing fees for commercial use.

PHP:

a. Popularity:

PHP is known to be the most frequently used programming language on the web. According to W3Techs, 78.8% of all websites are using PHP for their server-side scripting. It also stands for Hypertext Pre-processor, so you can see why it has become so popular among developers.

b. Scalability:

Create a website with PHP. Create a scalable website that can handle millions of users and make use of its existing extensions. PHP is a great way to create web applications using dynamic programming techniques, as well as its ability to be scaled easily.

Having a website built with PHP makes it easier to scale. When you build your website with PHP and run it on virtual machines or cloud servers, you can easily scale the server load by simply adding more physical or virtual servers.

c. Usage:

PHP is an excellent option for web applications. It is open-source and standards-compliant, making it highly reliable and easy to use. PHP can be paired with any kind of database, as well as many other programming languages including JavaScript.

d. Security:

PHP is not the only language prone to security breaches. Any language can be used for good purposes and bad ones, that's just a matter of how we use them, and therefore it's essential to test software as much as possible before releasing it to the public.

e. Community support:

Once the three years of support are completed, the branch reaches its end of life and is no longer supported. Since PHP 5.2 is not receiving any further bug fixes or security updates, you'll need to upgrade your systems to a more recent version of PHP.

f. Cost:

PHP is quite a popular language among the developers, and this is for a reason. PHP is an open-source language that has no restrictions, cost, and it's easy to learn. Because of these factors, PHP is very popular among newbies as well as experienced programmers.

Python:

a. Popularity:
- Python is a great choice for those without proper coding experience, as it's easy to learn and use, has a large support ecosystem, is open-source and can be used on multiple operating systems.

- The Python community is one of the most active and helpful communities in the programming world. Whether you're stuck on a problem or need recommendations, the community can be there to help.

b. Scalability:

Python's scalability limitations make it a strong candidate for projects that require both high-level, language-based functions and fast performance. It is still used in many famous projects, such as YouTube, Pinterest, Reddit, Dropbox, and Quora were built on it.

c. Usage:

Python is an adored programming language and one of the most popular worldwide. It is also very useful to machine learning projects because it supports all types of data, it's easy to use, and has a vast collection of libraries and packages.

d. Security:

The Python Security Response Team (PSRT) is a group of professionals who ensure that Python and its surrounding ecosystem are secured. Responsible for handling security issues in Python and its supporting infrastructure, the PSRT also develops resources to support the community in securing their implementation of Python code.

e. Community support:

The Python Community is backed by the countless Python conferences, meetups, online communities, chat rooms, and GitHub projects that give Python developers a place to connect with others. The Python community is a diverse community that prides itself in being inclusive, and at Microsoft diversity and inclusion is a top

priority. Build a stronger community that welcomes all kinds of people to learn and code together.

f. Cost:

Python continues to grow across the world, with its status as an open-source language making it easy to learn and its support community providing a rich set of resources. Python's libraries can be accessed easily, encouraging programmers to explore them. And the easy availability of free IDE and code editors makes Python a desirable alternative.

• List the four factors, a back-end web application developer should consider in selecting a suitable tech stack for the ATC Movie Blog. [4 marks]

1. The LAMP stack has been a classic and reliable stack for more than ten years. This stack is ideal for hosting dynamic pages and e-commerce applications. It uses open-source software such as PHP, MySQL, and Apache to easily modify components within the stack.

2. For a MEAN stack, you only need an end-to-end JavaScript language. Hence, there is always a chance to reuse the code in the application. The technologies used in the MEAN stack are also free and open source, with a supportive community where you can ask for help.

3. MERN is an open-source JavaScript web application platform. It includes the back-end components of Express (Node.js), RESTful routing, database connectivity and support for MongoDB, Redis and many other database systems. The frontend components include ReactJS and VueJS. In short, MERN stack is a

> technology stack that allows users to create rich client applications which run in the browser.

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4. The MEVN stack is the next evolution of the MEAN stack using modern front-end technologies. The name stands for MongoDB Express Vue.js Node.js, an open-source JavaScript framework that enables developers to build modern web applications.

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