A DEEP ANALYSIS OF DIFFERENT TECHNOLOGIES USED FOR DEVELOPING WEB APPLICATIONS

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Abstract- This paper includes a detailed description and deep analysis of various web technologies andweb frameworks used to design web applications. It also includes the importance of server side and client side technologies in developing the desired web application. Next, we shall also compare features provided by different web frameworks and understand which framework is most suitable according to our needs. In addition, we have also discussed the life cycle of a web application.

Keywords – Web application, Framework, application

1. INTRODUCTION

In order to start a project, IT manager must make a choice that whether the requirements may be accomplished with the Web application or desktop application. Web application is gainingmore and more acquisition everyday because of the reasons that we are going to discuss in this research paper. It has gained its popularity in recent years only that is why web applications do not render themselves well to application of the traditional systems development cycle model (Gellersen & Gaedke, 1999). Due to its gaining popularity it is also becoming more responsible interms of fast and accurate development and new methodologies have been introduced in order to replace the traditional ones which require more time in development of Web Apps. With the time many types of web applications have been introduced, some of them are static web applications, dynamic web applications, portal web apps, single page apps , multipage apps etc. We start this research paper with the architecture of web application, we will also get deep alongthe different paths for creating Web Application such as frameworks, technologies, steps for creating web application etc. We shall also compare the advantages of one technology over another.

2. ARCHITECTURE OF WEB APPLICATIONS

Three tier architecture

In this paper, most of the time we will talk about business applications and thus the most famousarchitecture that we follow nowadays is three-tier architecture. This architecture divides the mainfunctional components of a web application into different tiers (layers) so that we can easily differentiate and handle each and every tier individually. It provides us more isolation, loose coupling between modules which is obviously better for an application to be designed and handled.

We basically divide a web application into 3 tiers named as presentation layer, business layer andpersistence layer. The first layer that is presentation layer is responsible for user interface of the application which is directly accessed by the user through browsers like chrome, Edge, Mozilla Firefox etc. This layer mainly consists of some technology such as HTML, CSS and JavaScript and frameworks that give these technologies a platform to work together are React and Angular. If wetalk about next layer i.e. Business layer which consists of sequence of events that a user must gothrough while interacting with the website. It contains business logic or workflow logic which decides the requests routing and data travelling within an application.

Persistence layer also known as data access layer or storage layer connected to the business layer and is responsible for handling the data access requests and providing these requests the data they are asking for. This should be the most secured layer as it may contain the highly precious data if exposed to hackers then the business may eventually fail. This includes a server as well as a DBMS software to manage the databases and they may reside over the internet (cloud) or on-premises.

3. WEB FRAMEWORKS

As we know our web applications always divide itself into two sides one is frontend and anotherone is backend and we can develop our web application by connecting these two separated sideswhich are to be developed individually. So first we shall discuss about Frontend web frameworksand then backend frameworks and note this we are only discussing the most popular

frameworks
Angular JS

Angular is a front end framework and can handle tasks related to front end by developing dynamicweb applications and also enables MVC framework to come into picture. It is a typescript framework. It does not allow adding of Javascript libraries to the source code.When comes to testing and debugging Angular provides a great environment to complete project. It has a large community that makes it more easier to learn and practice. Nowadays AJAX is a compulsory thingwhich we have to include into out web application for making them faster and Angukar gives its full support for AJAX.When it comes to efficiency we would prefer Angular than React.

React JS

React is an open-source javascript library created by facebook and is used to develop UI components. This framework allows us to make more interactive web application as compare dtoangular. As we discussed that angular is based on MVC framework in contrary to this react is totally based Virtual Document object model. When it comes to testing it requires different toolsto perform testing and debugging which makes it a less preferred choice when compared to angular but it allows various Javascript libraries to be included into our source code and last but not the least it is not a typescript though it contains Javascript language environment. When it comes to time and weight we prefer React as it provides a faster app development and better user experience.

4. COMPARISON

Criteria	React	Angular
Learning	Easy to learn,Fast	Long and difficult
Self sufficiency	Must import additional libraries	No need of additional libraries
Developers needed	JS,JSX script	Js,Typescript
Architecture	MVC not present	MVC present.
Performance	Competitively Better	Worse for complex applications

ASP.Net core

It is an open source and free backend framework provided by the .NET Foundation. It is a very intellectual framework and provides an environment to create backend with minimal coding andin a very short time. It provides us a huge amount of libraries which may be used in order to perform our tasks better. The environment for maintenance is quite better. All these functionalities making it so much cost effective that most the businesses use this framework for their backend coding. One special feature provided by .NET is cross-platform support i.e linux,windows,Mac all use same C# code in order to implement ASP.NET Core. Almost 139000 domains registered in other TLDs immediately forward to the same name but as .NET site.

Laravel

Its an open source PHP web framework for developing web application based on mvc architecture. It has MIT licence and source hosted on GitHub.It has been rated as one of the best framework as it provides multiple ways for interacting with the database. Lavarel is best in implementing authentication as it's easy to implement and authorization is included in that. It provides drivers of Amazon SES,SMTP,Mailgun etc which helps in fast and effective development.It also offers a simple API that is the reason all businesses are shifting towards this technology. Testing functionality is quite awesome provided by lavarel as its help methods provides an expressive testing. It also has preconfigured exception and error handling technique.

Spring Boot

Here comes the mopst famous backend framework used by java developers ,It provides many extensions for creating web applications based java EE platform. It has inbuilt support forJetty, Tomcat servers. Depencies are managed in a very convenient manner if you use this framework. Customization of applications properties are managed easily using this framework. As we Java is the most popular language among developers thus this framework too.

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Django

A latest backend web framework which is also an open source and free based on python programming language and is gaining its popularity among the developers for its reduced codingdevelopment style, its optimal pluggability. It faster development is attracting too many developers that it becomes the leading framework nowadays. Features provided by this framework are large in numbers so that you can implements any functionality you want such as site maps, authentication, high scalability, versatility. It has been provided by every cloud provider which makes it more appropriate when used in cloud applications. Security provided bydjango is of ultimate level including cross site scripting, SQL injection and request forgery.

COMPARISON

Category	Spring Boot	Asp.net	Lavarel	Django
Developers	Java	C#,Java,F# etc	PHP	Python
Security	Good	Improved	Good	Best
Cost	Effective	Expensive	Low-cost	Moderate
Performance	Often requires expensive hardware	Often require expensive hardware	Great	Best among all
Operation Speed	Slow	Moderate	Fast	Very Fast
Frameworks	One standardized framework	One standardized framework	Many standardized framework	Many standardized framework offer difficultly in choosing

5. CONCLUSION

Web applications leading businesses to achieve a great level of accomplishments in today's worldbecause it connects the world as better as a satellite would do. With no doubts it is an ongoing field of research and development and its technologies will become more and more advanced inthe future for sure. In terms of development, we have seen how we are blessed with different types technologies which we choose according to our needs. Comparing those technologies was our main agenda in this paper and we have focused on various scenarios of selecting or droppingoff a web technology based on its features. Refer to table no 1.1 and 1.2 for more details.

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