Implementation and Comparison of MVC Model in ASP.net Framework and PHP Framework

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ABSTRACT *A Web application is a distributed application that runs on multiple computers and communicates over a network or server. Web programmers today face the challenge of working with ever-changing technologies and choosing the development technology to use. Model-View-Controller (MVC) could be a very good solution for solving the problems of separating the user interface logic from the business logic that the developers found in this document. Web Applications serve the people by easing their tasks. There are sample web applications distributed over the internet. But what matters a lot is the performance shown by them. Performance means the request response time, page load time, etc. With the comparison between the ASP.Net framework and the PHP framework, our results show that the PHP framework is harder than the ASP.Net framework to implement the MVC architecture and that the ASP.Net framework is better than the PHP framework in the same environment.*

Keywords: *Web Application, MVC, ASP.Net, PHP*

1. Introduction

With the rapid development of Internet technology, more and more ministries, companies, and research institutes tend to disseminate information over the Internet. But developers find the problem of importance and practical significance. This is impossible to avoid when they establish a platform for disseminating information for these departments, companies and institutions. User interface logic often changes more often than business logic and it is difficult to separate user interface logic from business logic due to tight coupling, especially in web applications. The solution uses Model-View-Controller (MVC) architecture, which increases code reusability and applicability. In this thesis, we use the ASP.Net and PHP frameworks to implement the MVC architecture. These two frames have both advantages and disadvantages. Tests to fully compare integrity evaluate the advantages and disadvantages of the two frameworks.

1.1 MVC (Model-View-Controller) architecture

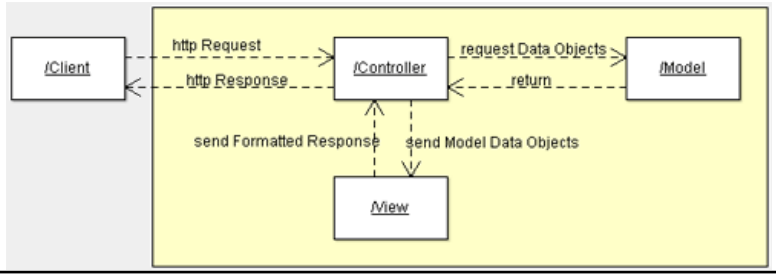
Model - View - Controller is an architectural model commonly used to develop user interfaces that divide an application into three interconnected parts. This is done to separate internal representations of information from the ways in which information is presented to and accepted by the user. The MVC design model decouples these core components, enabling efficient code reuse and parallel development.

Traditionally used for desktop graphical user interfaces, this architecture has become popular for designing web applications and even for mobile, desktop and other clients. Popular programming languages such as Java, C #, Ruby, PHP have MVC frameworks that are used in web application development right away.

1.2 Components Interactions

In addition to dividing the application into three types of components, the model - view - controller design defines the interactions between them.The template is responsible for managing the application's data. It receives a user input from the controller. View means presenting the model in a particular format.The controller responds to user input and performs interactions on data model objects. The controller receives the input, validates it, and then passes the input to the model.

The figure -1 below contains the MVC collaboration diagram, where the links and dependencies between the figures can be observed:



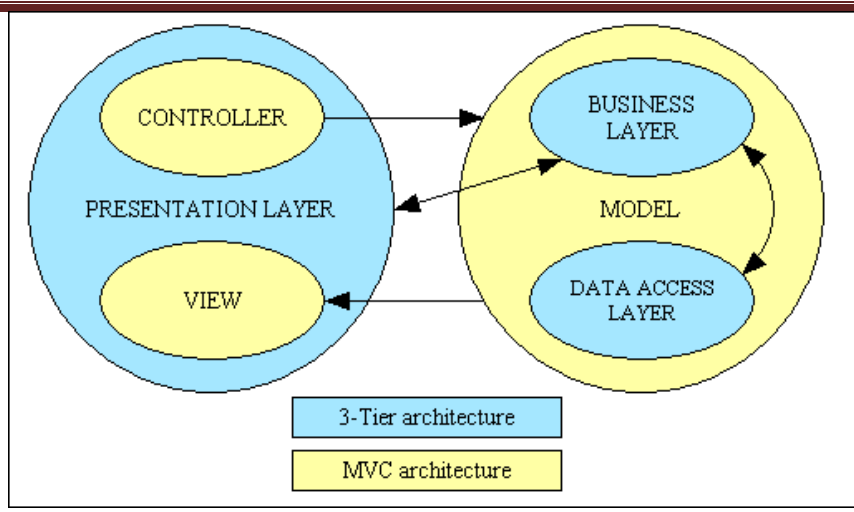


Fig.1 MVC collaboration diagram

2. PHP MVC framework

PHP MVC is an application design model that separates application data and business logic (model) from the presentation (view). MVC stands for Model, View and Controller.The controller mediates between models and views.Think about the MVC design model as a car and driver.The car has windshields (view) that the driver (controller) uses to monitor traffic, then the speed or brakes (model) depending on what he sees in front of him.

2.1 PHP MVC Feature

- MVC PHP frameworks simplify work with complex technologies by hide all the details of the complex implementation. It provide standard methods that we can use to build our applications.
- Increased developer productivity because basic implementation of activities such as database logging, user input disinfection, and so on is already partially implemented. It
- Respect of professional coding standards.

2.2 System Architecture using PHP

MVC design model that was used to develop the system in PHP. The views were developed using PHP web pages and controllers using PHP classes (.php). The models were developed using Entity Classes, which are also PHP classes (.php).

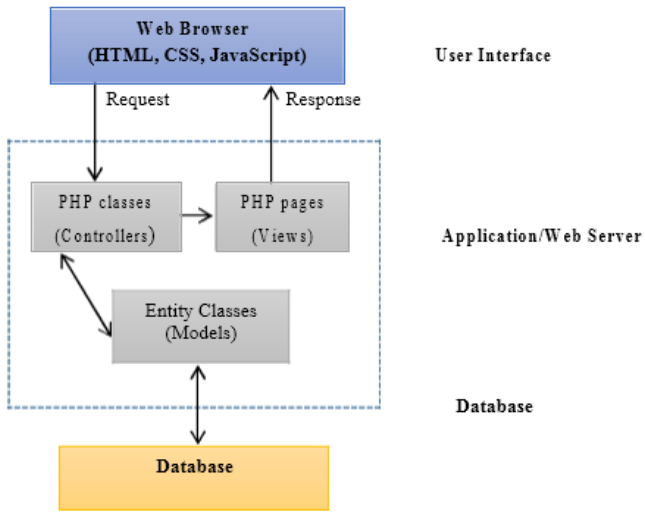


Fig.2 System architecture of PHP

2.3 PHP implement MVC

PHP is a leader in the server-side scripting language. The rapid development of the Internet for Web application development has resulted in a high demand for efficiency, reliability, maintainability and scalability. PHP has the following features: intuitive, easy to handle, fast, cross-platform, open source, etc. ,

making it one of the most important and popular Web development languages at the moment. Using the MVC architecture, it complements the separation between business logic and user interface logic. Figure 3 illustrates the PHP data flow for the MVC architecture.

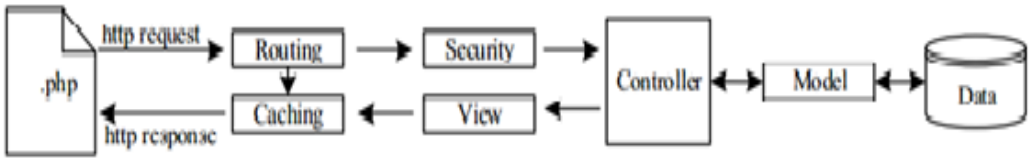


Fig.3 PHP Data Stream For MVC

From Figure 3, the php page can initialize the basic resource needed as a front controller. The router checks the http request to determine who will handle the current request. If the cache file exists, it will bypass the usual system execution order and will be sent directly to the browser. Before loading the application, the http request and the data submitted by the users will be filtered. The controller loads the model to process a specific request. Finally, the view renders the content to the web browser. If the cache is open, the view will be cached first so that it can be used for subsequent requests.

3. ASP.Net MVC framework

ASP.NET MVC is a Web application infrastructure developed by Microsoft, which implements the MVC (model - view - controller) model. It is open source software, apart from the ASP.NET Web Forms component, which is proprietary.

3.1 ASP.NET MVC Features

- Ideal for developing complex but lightweight applications.
- Provides an expandable and pluggable frame, which can be easily replaced and customized.
- Uses component-based application design by logically dividing it into Model, View, and Controller components.

3.2 System Architecture using ASP.NET

Figure 4 illustrates the Model-View-Controller (MVC) design model used to develop the application in ASP.NET. This is similar to the MVC design model for Java, except that the view was developed using an Active Server Pages (ASP) and the controller is in C # code. The views were developed using ASP.NET Web pages. There are two engines for developing views, namely razor (* .cshtml) and aspx (* .aspx). The razor engine was used to develop all the views, the controllers were developed using C # classes (* .cs) and the models were developed using entities, which are also classes C # (* .cs).

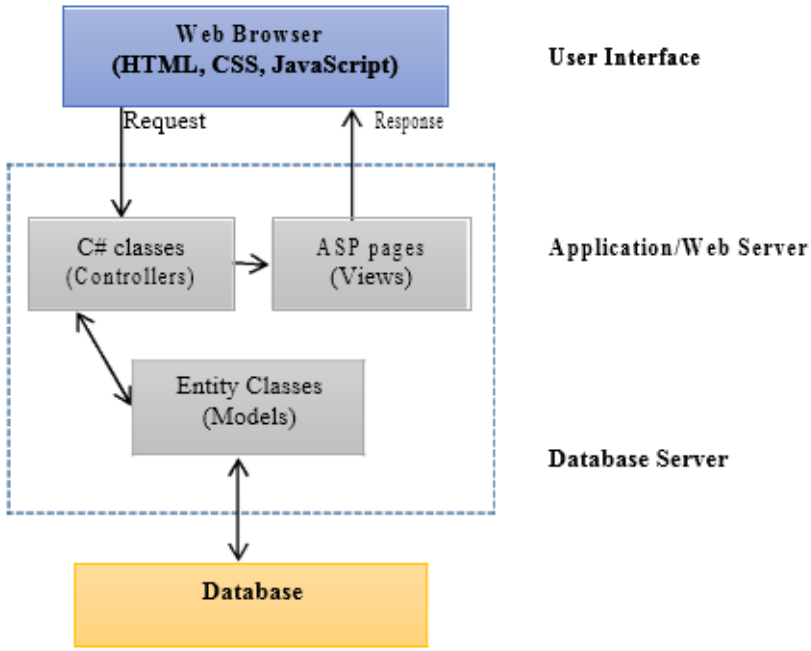


Fig.4 System Architecture of ASP .Net

3.3 ASP.Net implement MVC

ASP.Net MVC is a new Web development architecture released by Microsoft in April 2009. It integrates traditional MVC development ideas with ASP.Net and separates Model, View and Controller. Here we use a simple one-page solution that is a login screen to show the process by which ASP.Net implements the MVC architecture. The login screen application is a login web page that provides the user with a login page where the user can enter their identity and press the login button to access the system. The user can also activate the check box to remember the user. In addition, when the user logs in, a new session is created on the server side to keep his activities active while using the Web application. In fact, the structure is a kind of service-oriented architecture, so you need another controller to be a business services controller. In this application, we integrate a security services controller. Therefore, ASP.Net implements the MVC architecture sequence diagram , as shown in FIG. 6. The ASP.Net MVC programming model is illustrated in FIG. 5.

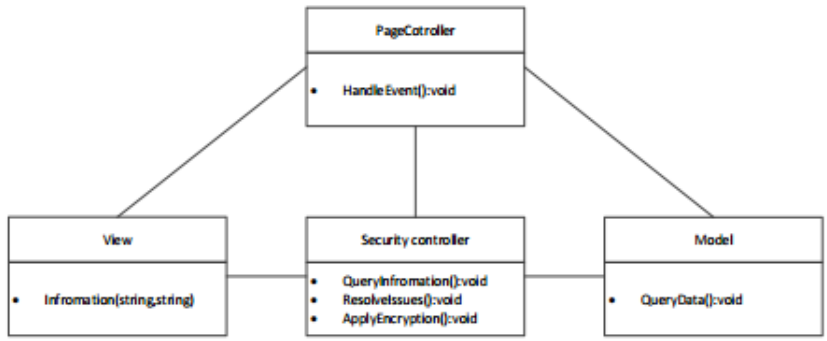


Fig.5 MVC programming model of ASP .Net

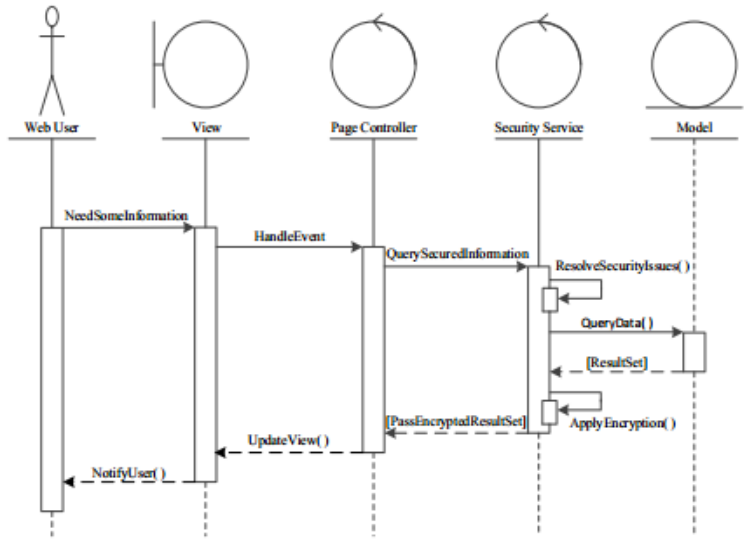


Fig.6 The sequence diagram for ASP .Net implement MVC

The system has been implemented in ASP.NET using the ASP.NET MVC 4 framework. ASP.NET MVC is a framework for building web applications that applies the general Model View Controller model to the ASP.NET framework. The Razor view engine was used for views, C # controller classes for controllers, and C # feature classes for models. The Razor view engine combines C # code and HTML tags to generate dynamic web pages. The controllers wrote the C # language to process incoming requests, perform model operations, and select views to render to the user. Entity classes represent database objects and are responsible for implementing the business logic.

4. Implementation Strategy

The implementation of Web Applications, using ASP.NET technology, is accomplished with the aid of Visual Studio 2015 in built SQL Server 2015. CakePHP 3.5.0 is installed for the implementation of web applications which have used PHP technology. WAMP server is also installed on the machine for proper implementation of dynamic web applications written in PHP. So we are comparing the web applications which are developed

on different architectures using different technologies. We have created the MVC web application with the INSERT, UPDATE and DELETE functionalities. The two web applications are created on MVC architecture using PHP and .NET framework. Web Application's Interface based on ASP.NET Technology

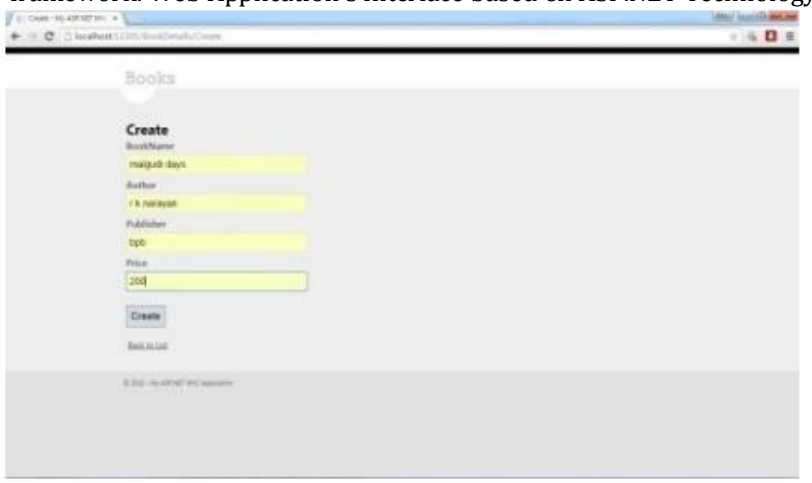


Fig 7: Insert Operation in ASP.Net

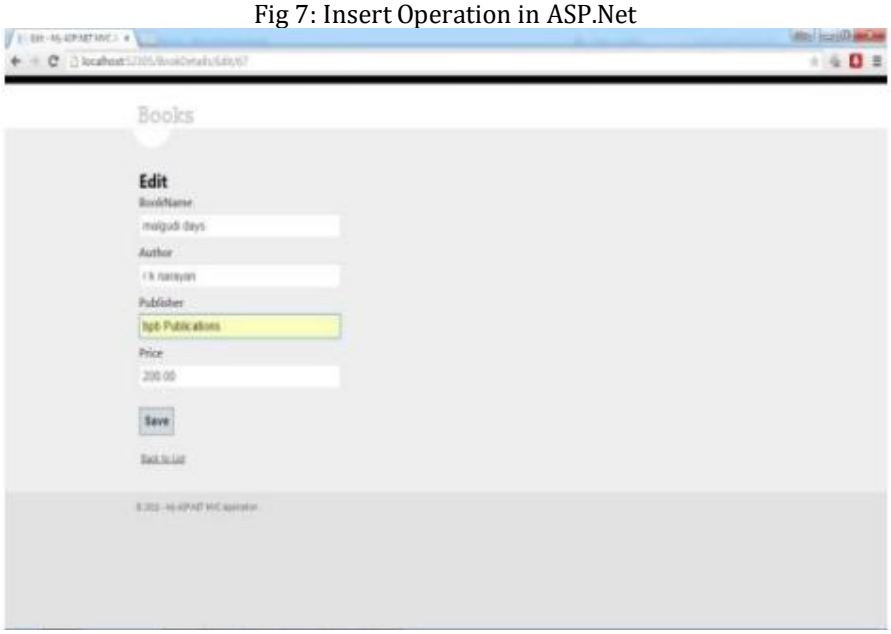


Fig 8: Update Operation in ASP.Net

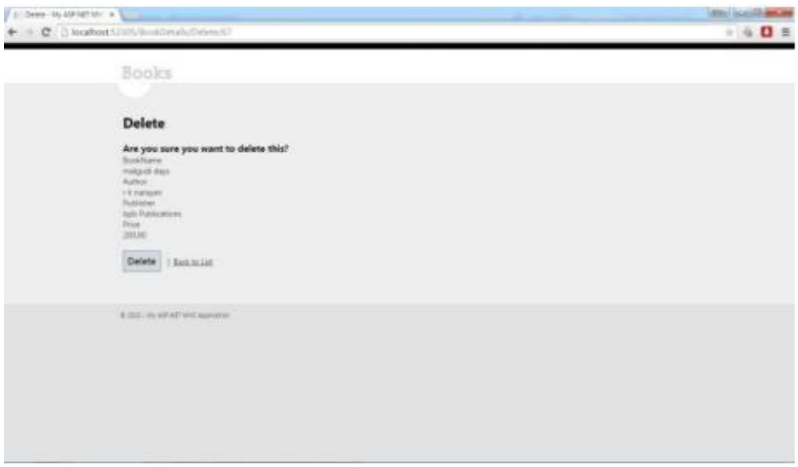


Fig 9: Delete Operation in ASP.Net

Web Application's Interface based on PHP technology

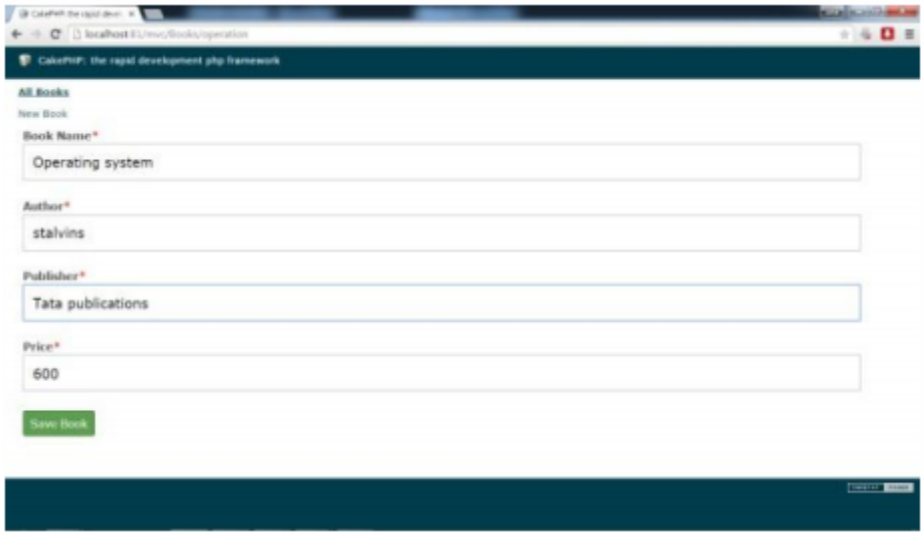


Fig 10: Insert Operation in PHP

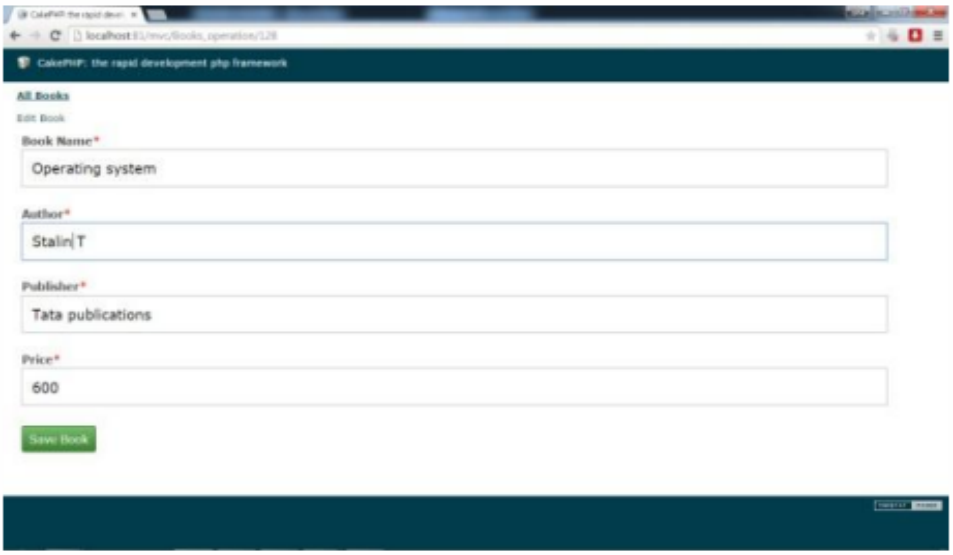


Fig 11: Update Operation in PHP

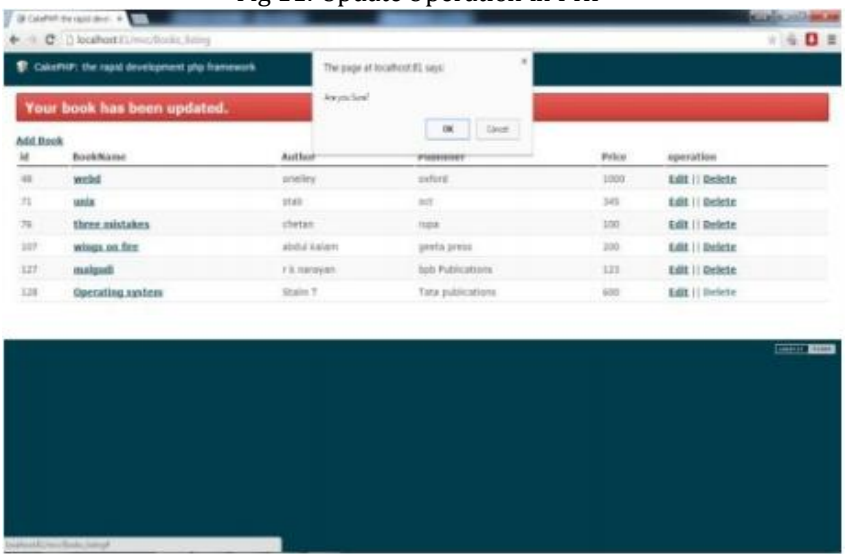


Fig 12: Delete Operation in PHP

5. Evaluation

The performance evaluation of web applications is done by considering various factors like Page Load Time, Request Transfer Speed, Response Transfer Speed, Server Time etc. The evaluation is done by using LOADCOMPLETE 3 testing tool. Load Complete is a load testing tool for web applications. It helps in checking web application's performance under heavy load which aid in knowing web application's robustness and scalability.

The following graphs are generated considering few specifications and helps in evaluating the web Application's performance. The graph depicts two axes, X-axis and Y-axis. The X-axis shows the Time interval and the Y-axis varies along the graphs. The number of virtual users is 20.

Web Application graphs based on ASP.NET Technology

PAGE LOAD TIME

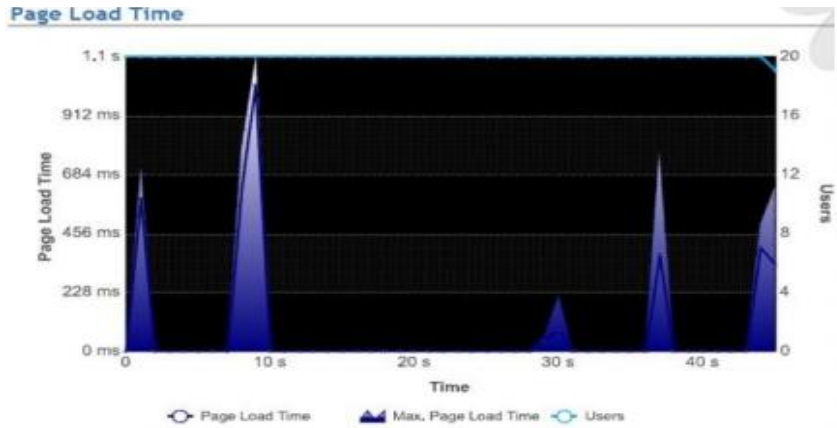


Fig 13: Page Load Time

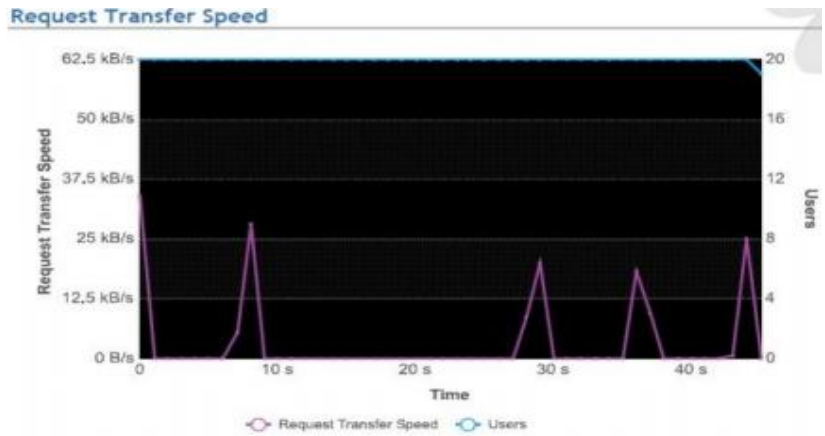


Fig 14: Request Transfer Speed

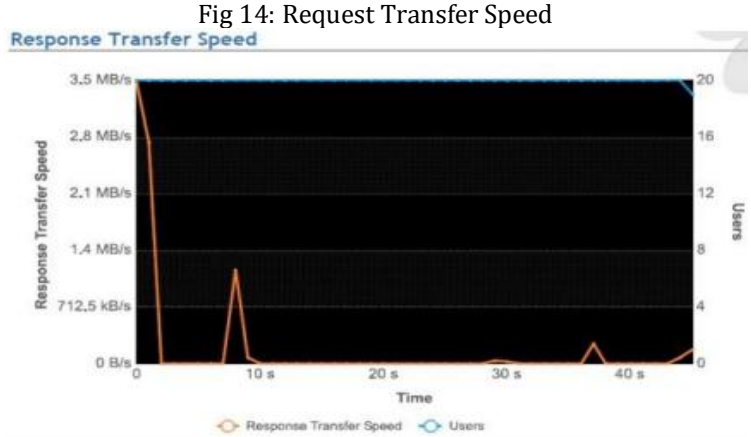


Fig 15: Response Transfer Speed

Web Application graphs based on PHP Technology

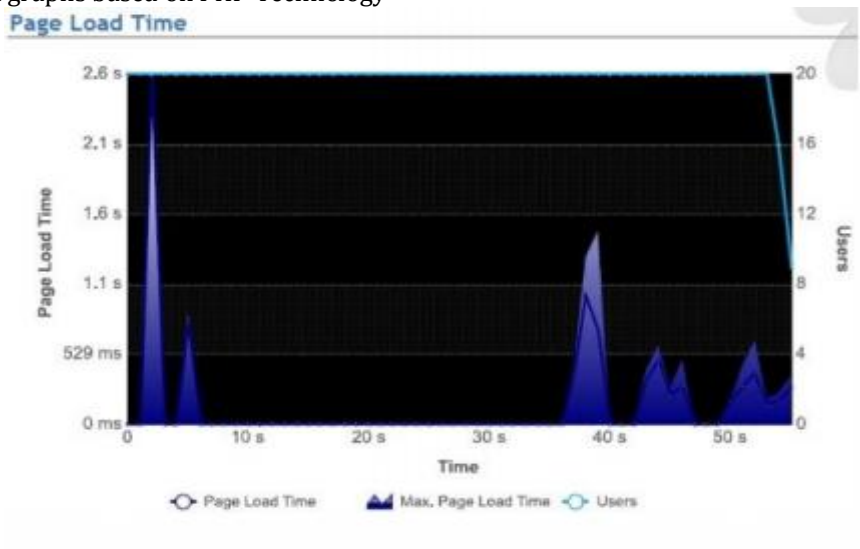


Fig 16: Page Load Time

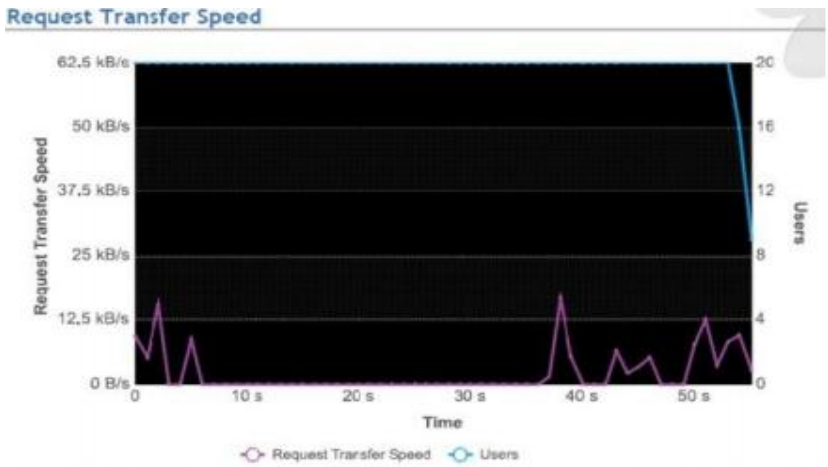


Fig 17: Request Transfer Speed

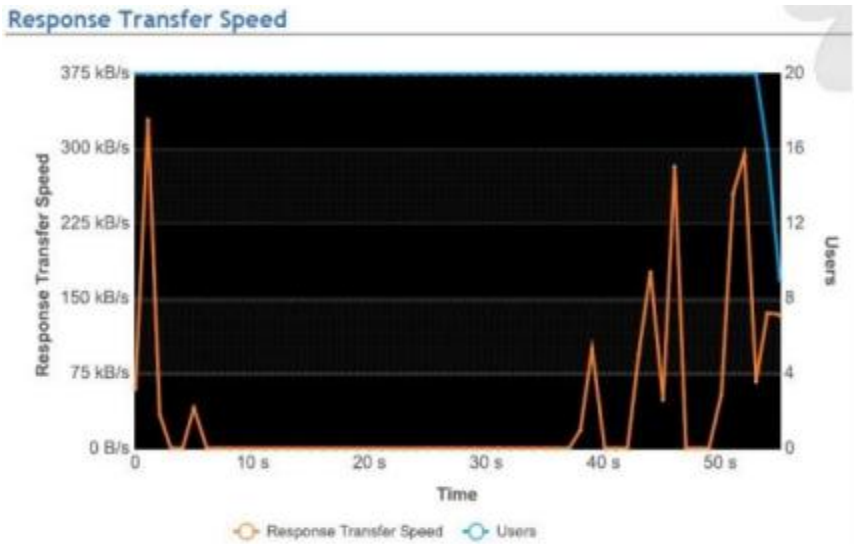


Fig 18: Response Transfer Speed

6. Comparison among PHP and .NET framework for MVC architecture

S.NO.	PROFILE	ASP.NET	PHP
1	Page Load Time(ms)	370	676
2	Time to First Byte(ms)	213	383
3	Time to Last Byte(ms)	165.69	293.47
4	Request Transfer Speed(kbps)	10.68	5.938
5	Response Transfer Speed(mbps)	0.612	0.101

The result of testing is displayed using the Table above. It shows that the web application made Using .net it gives better result for parameter like page load time, Time to fist byte, Time to last byte as compare to PHP based web application. But PHP based website gives much more promising result for request and response transfer speed.

7. Conclusion

The analysis and experimental results of the ASP.Net framework and the PHP framework above make it possible to conclude that the ASP.Net framework is superior to the PHP framework and that it is easier to implement the MVC architecture in the PHP framework. Same platform environment. This result can also provide a more theoretical basis in the practical development environment to help developers choose a more appropriate development framework. And this has a realistic meaning for engineering applications.

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