Behavior of MVC (Model View Controller) based Web Application developed in PHP and .NET framework

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Abstract-As the people are shifting from offline to online in every perspective of life, the dependency on Web Applications is becoming rampant. Web Applications serve the people by easing their tasks. There are ample 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. In this paper we have discussed the behavior of MVC architecture based on PHP and .NET framework. The comparison helps us to distinguish among them that which technology performs better. We have used one Web Application testing tool. This tool helps us to evaluate the web application based on various metrics.

Keywords- Model; View; Controller; PHP; .NET, MVC;Architecture;

I .INTRODUCTION

The Web Applications are defined as the applications that uses web browser to fulfill the requirements of users and are written in browser compatible programming languages (such as HTML, JavaScript and CSS). In this paper, we have discussed MVC architecture. MVC architecture stands for Model-View-Controller architecture. MVC is a software design pattern which is used to implement user interfaces. Effective use of the pattern isolates business logic from user interface which results in an application which is easier to customize. MVC consists of three components and they are Model, View and Controller components. In this paper, we have compared the performance of Web Application using PHP and .NET technology.

MVC-Model View Controller

MVC is a software design pattern which is used for building web applications. MVC was first introduced in Smalltalk'80 by Krasner and Pope [1]. It is a universally accepted pattern, across various languages and implementation frameworks. The MVC framework has been extensively become the benchmark in modern software development.

The aim of this software design is to attain a thorough division among three components of any web application.
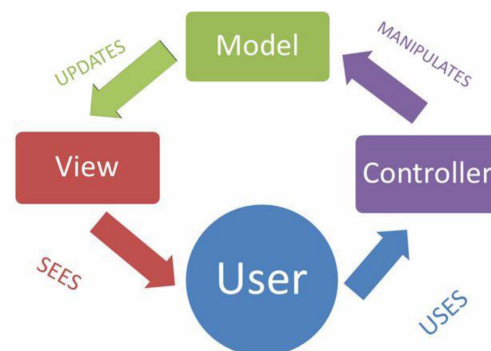

Fig 1: MVC Architecture

These components are:

Model-It depicts the database records. It manages the application data. It basically contains the application data, logic definition, function specification, business rule involvement. A model possibly is a single object or it is some composition of objects. This layer can manage the data and also allow the database communication.

View- View shows the results of the data that is contained in model. A view has the responsibility to display all data of the model. It only shows the required attributes and hides the unnecessary attributes. It thus provides us the advantage of presentation encapsulation. It is script based template systems like JSP, ASP and PHP and very easily integrated with AJAX technology.

Controller- A controller is the connection between the user and the system. Controller handles both Model and View. It controls how the data flow in model and updates the view as soon as the data get altered. It is the separation between the Model and the View. The controller receives the data; it works on the data and then carries out the execution which alters the state of the data model.

II. RELATED WORK

As we are moving forward, the web technologies are also moving at pace. With the advancement in technologies, we are getting new ideas and works in this domain. Many people have worked on these new technologies and architectures. Among them, the Cloud and MVC architecture are in great demand. The PHP framework is implemented on MVC pattern for basics operation on web application is proved to be as panacea for problems related to SQL syntax [5].

PHP started MVC framework in 2008 and current version is 3.1 which are used Rapid Application Development (RAD) model [2]. Web development in PHP has a approximately 17 frameworks like ZEND,CAKE PHP etc. They support all databases like SQL, My SQL, Oracle and ODBC. These frameworks provide a great combination of database application (model), HTML coding (view) and input/ output instructions (controller) [3]. It is widely accepted approach for developing optimized and better performing web applications. It is also now in demand for developing mobile based application because of its potential to provide different views for different devices without altering any other component of the application [6]. The business logic issues in N-Tier are evaluated on the basis of performance testing for the validation of web applications also in MVC architecture using ASP.NET technology [7].Performance of web crawler on different architecture also discussed by various author [8].Comparative analysis of MVC web application using struts and PHP is done by authors[9].Performance analysis of MVC and Cloud architecture is done by authors[10].

III. IMPLEMENTATION STRATEGY

The implementation of Web Applications, using ASP.NET technology, is accomplished with the aid of Visual Studio 2012 in built SQL Server LocalDB.

CakePHP 2.6.3 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

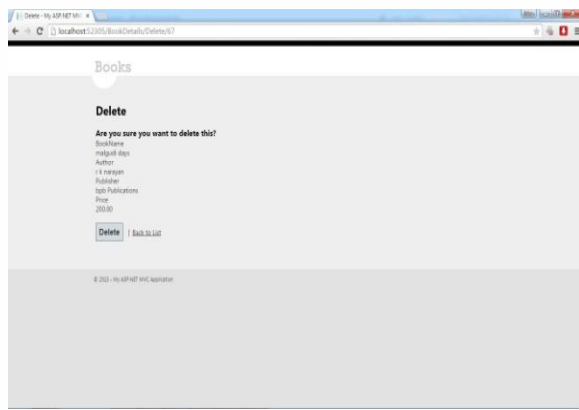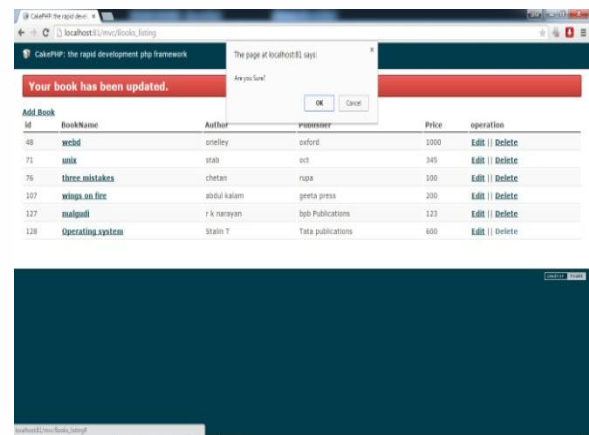

Fig 2: INSERT Operation

Fig 3: UPDATE Operation

Fig 4: DELETE Operation

Web Application's Interface based on PHP technology
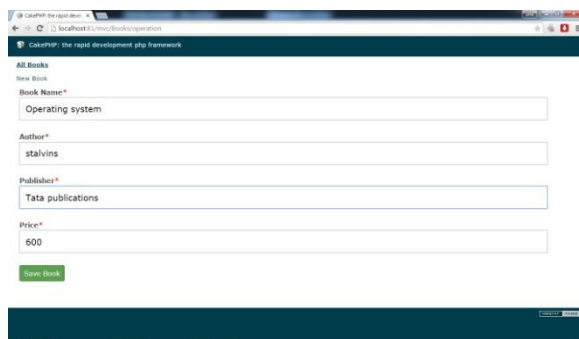

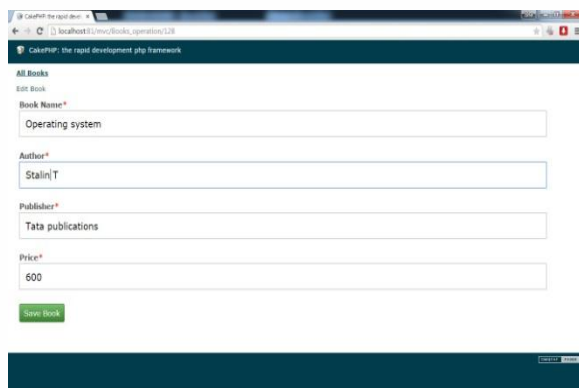Fig 5: INSERT Operation

Fig 6: UPDATE Operation

Fig 7: DELETE Operation

IV. 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. LoadComplete 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
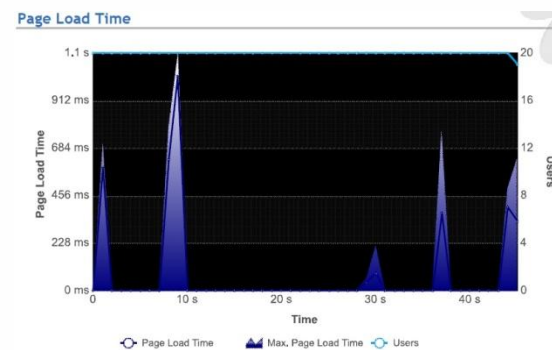
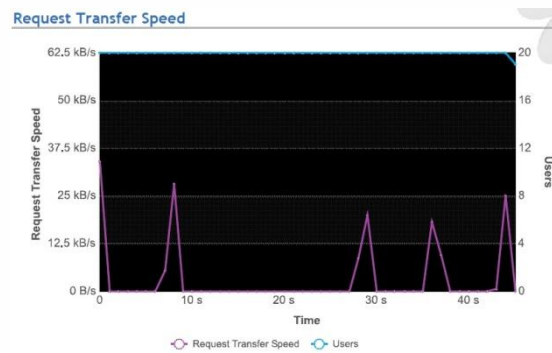PAGE LOAD TIME

Fig 8: Page load Time
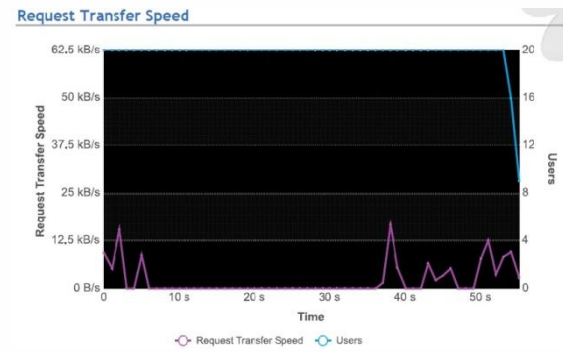
Fig 9: Request Transfer Speed
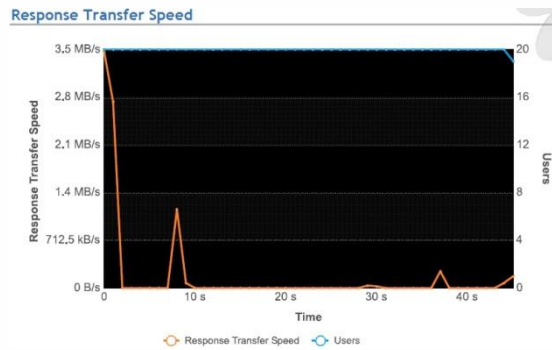

Fig 12: Request Transfer Speed

Fig 10: Response Transfer Speed

Fig 13: Response Transfer Speed

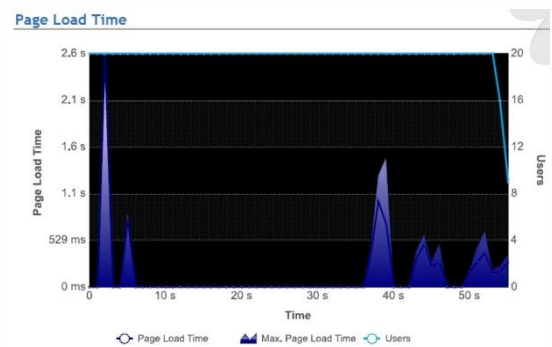Web Application graphs based on PHP Technology

Fig: 11 Page Load Time

Table 1: 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 1 above. It shows that the web application made using

.net it gives better result for parameter like page load time, Time to first 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.

V. CONCLUSION AND FUTURE WORK

The growth of web applications in today's era is rampant. Nowadays, web applications has widen its wings in various fields, such as e-commerce, banking, medical, sports, entertainment, education etc. with the increasing in development of web

applications, the patience of web application users is diminishing. The user can't tolerate if any page of web application takes time to load. The user simply switches to other alternatives as there are ample options available to the user. So, this paper focuses mainly on how to make a web application response quickly to retain more and more users. We compared the performance of web application made on MVC architecture using two different technologies. So we conclude through result that the MVC architecture based website gives better result as compare to .net framework. In future we'll do comparison among other architecture also with different web technologies.

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