



A Systematic Analysis: Website Development using Codeigniter and Laravel Framework

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ABSTRACT

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The use of the website as one of the most influential means of communication in various human activities has been so widespread with a low cost factor, the website is often functioned as a medium for storing data and information using certain topics, besides that the website is also a collection of web pages that related to each other on the web. In general, there are several programming languages that are used to create website applications. such as, HTML (Hyper Text Markup Language), PHP (PHP Hypertext Preprocessor), CSS (Cascading Style Sheet), Javascript, Mysql, and jquery. The CodeIgniter is an open or open source application based on the PHP framework with the MVC model or also commonly called the Model View Controller which is used to build a dynamic website using PHP code. CodeIgniter helps make it easier for developers or developers to be able to create a website-based application very quickly and quickly. In this study, analysis and comparison of the accuracy of preventing SQL injection attacks is carried out on the CodeIgniter framework and the Laravel framework. In the CodeIgniter framework, the escaping query function is used to prevent SQL injection attacks. Meanwhile, the Laravel framework uses theloquent ORM function to prevent SQL injection attacks. The Codeigniter and Laravel frameworks have different time and speed performance results. Codeigniter has a higher average time and speed than Laravel. In the average time value, Codeigniter has a greater time duration than Laravel with a difference of 4.2 ms and in the average speed value, Codeigniter is still superior with a difference of 40.08 Kbit/s from Laravel.

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1. Introduction

In the current digital era, the use of information technology as a tool for modern information systems is very widely used in various business fields, both in the public business sector and in the government business sector. The ease and convenience of its use can be seen from the various activities that are carried out programmatically and organized by an information system that is run according to the circumstances and wishes of its users (Anugerah, 2015; Jaja et al., 2021).

Technology is a knowledge that is intended to be able to create a collection of tools, a collection of data processing, and to extract an object as a whole, on the other hand the use of information technology can also be used as a means of preparing items needed for survival and creating comfort in the human environment so with all the conveniences that have been provided by the information technology, the dissemination of news to the wider community can be done easily, practically and of course renewable, if initially all news developments can only be accessed using radio, books, television which are classified as outdated. , then through the internet as one of the most influential alternative media among the community, a variety of news and information can be obtained quickly, accurately, and relevantly presented in the form of a website application using mobile devices or computers (Prapitasari et al, 2016; Irawan, 2017; Pangistu et al., 2019; Achmad, 2021).

Website technology is experiencing a fairly rapid development. The current website is not only a medium of information that is read or tends to be static, but has developed into a more dynamic and interactive medium. A website is a web page that is interconnected with one another where the web data is located on the same server and contains various collections of information that can be provided to individuals, groups, and organizations (Jaja et al., 2021; Sudrajat, 2021). The use of the website as one of the most popular means of communication among the public, has indeed undergone a very diverse transformation, with a very low cost factor, as well as ease of access and efficiency because it can be accessed within 24 hours. Making a website is indeed undergoing many very diverse developments, it is proven by the many choices of frameworks that can be used to build a website.

Framework is a basic programming language that has been developed and made easy to use so that a website can be completed in a relatively short time. Frameworks are also often interpreted as a collection of scripts (especially classes and functions) that can assist developers/programmers in dealing with various programming problems, such as connecting to databases, calling variables, managing files, and so on. used by calling it on the program, of course how to call it depends on the framework used, then the programmer does not need to recreate these functions from scratch, while the method that is often used by the framework is Code Igniter or it can also be called Model-View-Controller or it can be abbreviated as MVC. MVC is an application architecture that separates the user interface, data, and process interfaces, making it possible to develop or maintain applications more effectively and efficiently. This can be done because developers/programmers can concentrate more on business processes and isolate development/maintenance only on application components related to the business process in question (Rahman & Ratna, 2018; Sidiq et al., 2021).

The MVC method divides the application into three parts, namely (1) Model, functions as a behavior and data manager in the application domain, responds to requests for information and responds to instructions to change a condition (2) Translates information from the model into an appropriate form. to interact with users. Usually one or more user interface elements (3) Receive input from the user and trigger a response by making calls to some predefined object (Susanto, 2016; Putri, 2018; Purbo, 2021). CodeIgniter is also one of the preferred frameworks that allows developers to create web applications with RAD (Rapid Application Development) character development, which allows them to be used and developed into other more complex applications. CodeIgniter consists of several library files and runtime infrastructure inspired by the Ruby on Rails Framework. In addition, CodeIgniter is a framework that is claimed to have the fastest execution compared to other frameworks, CodeIgniter has several components that can make it easier for PHP programmers to make it easy and fast to create web-based applications.

The comparison of CodeIgniter with other frameworks lies in its design, which is very flexible and has simple features. Developers can use this framework completely or partially. In addition, developers are also given the freedom to code themselves conventionally or without using the features provided. In addition to the CodeIgniter model, there is also another model, namely Laravel. Laravel web is a free and open source PHP framework created by Taylor Otweel that can be used in developing web applications using the MVC (Model-View-Controller) architecture. The Laravel framework is easy to understand and facilitates authentication, routing, session manager, caching, and several other uses of the components in Laravel. Laravel also provides features such as database migration and integration unit testing support that make it easier for developers to build complex applications (Warsito et al., 2015; Lucianto, 2020; Muhammed et al., 2020).

Making a website is a combination of pages to show information in the form of text, images, sound, animation, or a combination of all of them that form an interrelated series, which are connected by page networks. Websites are created and developed using programming languages. In website development there is also such a thing as a framework which is a library that has been structured in the architecture in application development in order to provide convenience, speed, accuracy, and consistency in designing a website. So based on the background that has been conveyed, the researcher tries to make a comparative study on the development of website creation using the CodeIgniter and Laravel frameworks and to determine the effectiveness and customization of website development in the era of globalization as it is today.

2. Method

The development model used in this research method is the waterfall model. System development is carried out sequentially starting from analysis, design, coding, testing and support stages. System requirements analysis is the initial stage where problem identification, problem solving proposals and system requirements analysis are focused on making software software. At the next stage, software models are made. The purpose of making this model is to obtain a good understanding of the data flow and control, functional processes, operating behavior and the information contained therein. Consists of the main activities of process modeling, data modeling and interface design.

The coding stage is to implement the results of the design into a form that can be read and understood by the computer. At this stage the results of the design begin to be translated into machine language through a programming language. The type of programming used by the author is the type of Object Oriented Programming or commonly called OOP (Object Oriented Programming). At this stage, is the stage of maintenance or maintenance of existing applications. The waterfall cycle is executed sequentially, from the first step to the last step. Every step that has been completed must be reviewed, sometimes with expert users, especially in the requirements specification and system design steps to ensure that the steps have been carried out correctly and as expected (Djaeng & Burhanudin, 2016; Dwi, 2018; Gomes et al., 2019).

3. Result and Discussion

3.1 CodeIgniter framework model working principle

A framework is an abstraction in software that provides generic functionality so that it can be modified by user-generated code so that it can provide software for a particular application. The MVC method is an architecture that can be implemented freely with or without an object-oriented programming language. Thus the MVC method can be implemented in a framework. CodeIgniter is a web programming framework using the PHP language (Putri, 2018).

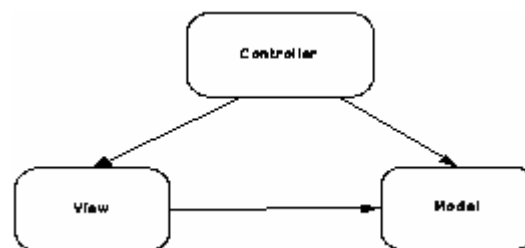


Figure 1. MVC concept

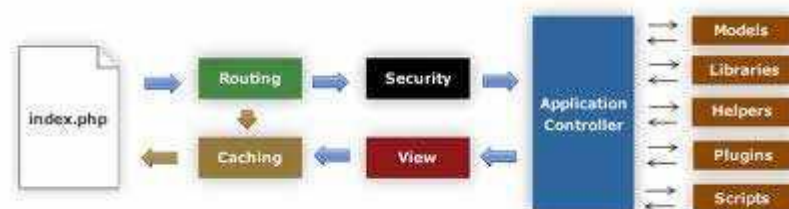


Figure 2. CodeIgniter Framework Working Principle

Some of the functions and working principles of the CodeIgniter Framework include (1) Index.php functions as the first file in the program to be read by the program (2) The Router functions to check HTTP requests to determine what the program should do (3) Cache File is used if the program already has a "cache file" then the file will be sent directly to the browser. This cache file can make a website open faster. The cache file can bypass the actual process that the codeigniter program must do (4) Security functions to filter and protect (5) The controller functions to open model files, core

libraries, helpers and all the resources needed in the program. The CodeIgniter framework folder structure in the major version does have different functions. This is reflected in the very significant structural difference between version 1.x.x and version 2.x.x. Because in this discussion version 2.0.2 is used, the following will explain the folder structure in the CodeIgniter framework version 2.0.2 as shown in the image below.

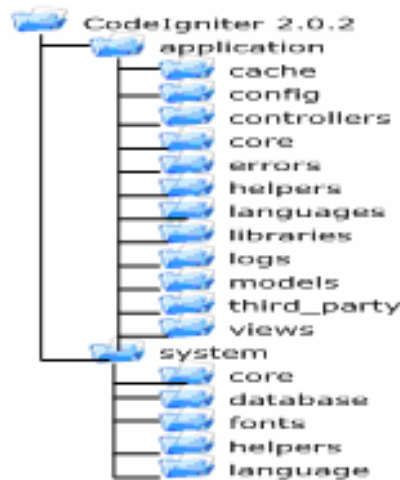


Figure 3 CodeIgniter Framework Directory Structure

In principle, the use of MVC methods in the CodeIgniter framework is in the form of classes. Inside the System folder are the definitions of the Controller and Model classes. Whereas view is purely a file that is inserted into a member function in inheriting Controller class. To create applications with this framework, controlling objects, in the form of business rules, are defined as Controller objects by inheriting class (inheritance) to the Controller object. While the data access functions are defined in a class that inherits the Model class (Istiono & Hijrah, 2016; Luczak et al., 2021).

Table 1
Analysis of the tested system

Analysis Type	Old System	Proposed system
Analysis Performance	The amount of information that limited delivery because it only uses existing facilities on the blog.	The amount of information that delivered can be more optimal according to what the user needs.
Analysis Information	Information submission delivered less thorough so that information submitted can't maximize	Submission of information that delivered more and can vary so that information to be conveyed can be thorough
Analysis Economy	The fee is free but the facilities you can't get as desired	Cost is not free because it requires a server to put website files and the cost of maintaining the website
Analysis control	Insufficient upgrade quality	Facilities can be added as needed because Website using CodeIgniter Framework which makes it easy to its development.

CodeIgniter is a PHP framework with a Model View Controller (MVC) model that can speed up developers to create web applications. In addition to being light and fast, CodeIgniter also has a very complete documentation that is equipped with examples for implementing the code. This is a

strong reason why many people choose CodeIgniter as a framework that is often used (Susanti et al., 2017; Silviana et al., 2018). As well as many other advantages that can be used, here is a comparison that can be seen between commonly used PHP and CodeIgniter:

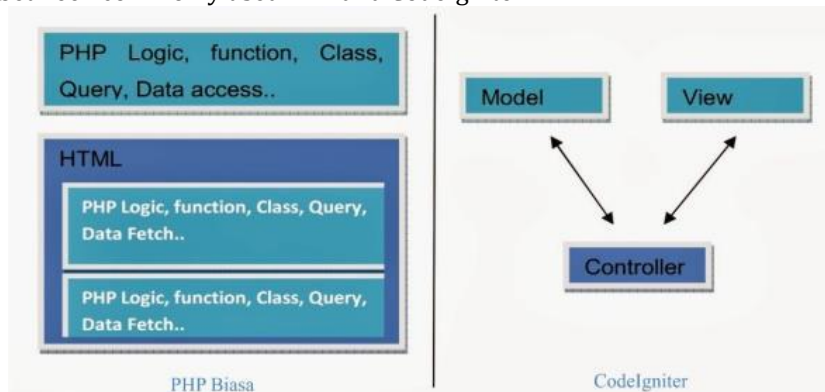


Figure 4. Comparison of CodeIgniter with Plain PHP

Figure 5 Login Form

3.2 Laravel framework model working principle

Laravel is a PHP (Hypertext Preprocessor) based framework that has a systematic framework using the MVC (Model View Controller) concept. Laravel was released on June 5, 2011 under the MIT License using GitHub as a code sharing site. After undergoing many improvements and developments, Laravel began to show very stable graphics and was finally introduced to the wider community.

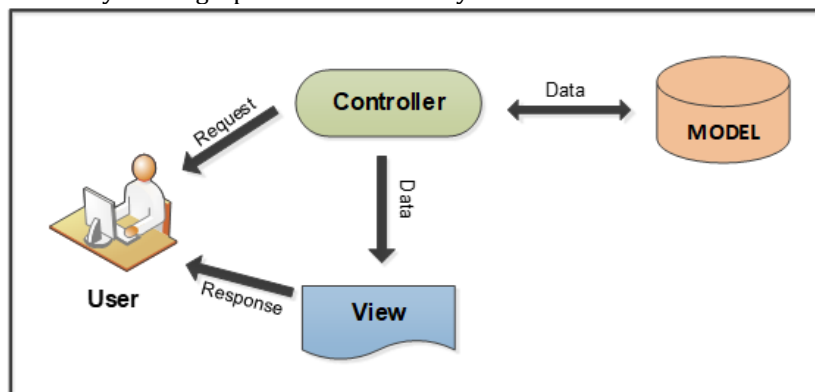


Figure 6: Overview of the Laravel framework model system

The picture above shows a general framework of the Laravel Framework system, and it is explained that the system used in a framework division is based on three parts, namely a model, the

second part is a view, and the third part is a controller.

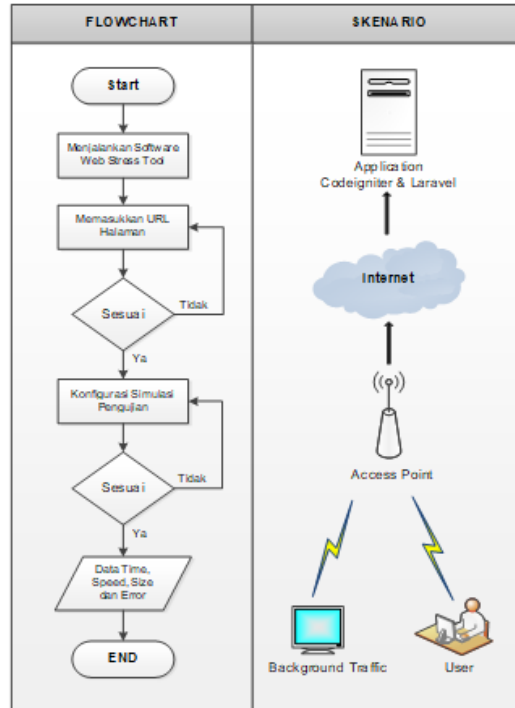


Figure 7: Testing Scenario

At this testing stage Load Test parameters generated from the tests carried out include speed, page size, and time. Page size is a measure of the size of the page that must be loaded, while time is the time it takes to display text pages on a web

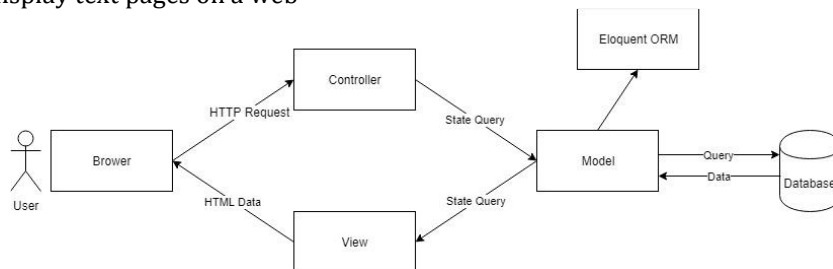


Figure 8: SQL Injection Prevention Model on the Laravel Framework

The picture above is the process of preventing SQL Injection in the Laravel framework by using Eloquent ORM on the block model, where there is a Controller function in the Laravel controller framework as a controller of all working flows. When the user makes an HTTP request the controller will handle it. If in the request process there are input variables related to the database, the controller will call the block model.

4. Conclusion

The conclusion that can be obtained from the comparative study of website development with codeigniter and laravel frameworks is: in developing web-based applications, designers need a framework to simplify the work process. In its development, many frameworks have been created with features that simplify the performance process of an application, therefore an analysis of the selection of the right framework is needed. The frameworks that will be analyzed in this research are Codeigniter and Laravel, the test analysis uses Load Test with a file size of 3401 KB. The Codeigniter and Laravel frameworks have different time and speed performance results. Codeigniter has a higher average time and speed than Laravel. In the average time value, Codeigniter has a greater time

duration than Laravel with a difference of 4.2 ms and in the average speed value, Codeigniter is still superior with a difference of 40.08 Kbit/s from Laravel.

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