What are the reasons to choose Laravel MVC for web development?

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Abstract— In the current market, there is a wide range of interesting technological solutions. So, it is recommended to properly research, identify and implement the solution which most suited to the information system strategy. In contemporary years due to the brisk development of internet technology, online business is gradually rampant. Website users are very demanding as all the time they expect the web services to be quickly and easily accessible from different places around the world, whenever they need it. Website users always need very rapid and quick responses. Website development is a process that takes time and takes more time if the development language is simple, which is not consistent with this quick and evolving world of technology. So that's why frameworks are developed to overcome these problems related to web development and to create websites very conveniently.

Keywords— Laravel framework; Authentication; MVC; PHP; Middleware

I. INTRODUCTION

In the modern IT enterprise, it's far essential for web developers to recognize at least one conflict-demonstrated framework. In the modern IT industry, it is very important for web developers to have the knowledge and awareness of at least one framework. Laravel is one of the most successful PHP frameworks in 2015, primarily based on an annual framework recognition survey carried out by using Site point [1]. The free, open-source system was planned by Taylor Otwell, and was propelled back in 2011, at present running its 8.0 adaptation dispatched on September 8th 2020 [2].

PHP platform facilitates the rapid application development (RAD), that saves our time by reducing development time for the developers, helping to create a more reliable application. It saves the developers from writing the repetitive codes due to which it allows developers to spend more their time on developing the actual web application, instead of writing repetitive codes and wasting time on them. A Laravel Framework mainly has many robust libraries and convenient tools which helps to reduce the complex tasks and repetitive tasks [3]. Further, using a Laravel it also helps to strengthen the security of a website. Website security in the business world plays an important role. So, with using Laravel framework, the developer doesn't need to have much deeper knowledge about website security because Laravel supports many features to prevent security attacks such as cross-site request forgery (CRF), Cross-site Scripting and SQL injection. Laravel additionally offers a well-established skeleton for building big projects. Essentially, Laravel employs the well-known MVC architectural sample, which facilitates to prepare code better. MVC pattern separates the business logic (models), the manipulate coordination (controllers) and the presentation of statistics (views) into 3 distinctive layers. In other phrases, the heart of the MVC pattern is the concept of "Separation of concern" [4]. The framework additionally helps modular architect which enables developers to separate code into unbiased manageable modules [5]. Laravel is one of the PHP systems that have distinctive aspects e.g., expressiveness and clean code [6].

In this context, this paper focuses on below hypothesis questions:

- ➢ What is MVC Really?
- ➢ What is Laravel Authentication?
- ➢ What is Laravel Middleware?
- ➢ What is Laravel Starter?
- ➢ What are the key features of Laravel?
- ➢ What are the Pros of Laravel?
- ➢ Problem with Framework and How to overcome it?
- ➢ What are the Cons of Laravel?
- ➢ What are the reasons for selecting the Laravel Framework?
- ➢ What are the improvements to the Framework?

II. LITERATURE REVIEW

According to [7], to test the efficiency of various PHP measurements, certain tasks are performed. So, these tasks were: text files read/write, uploading and saving images on the server, all the CRUD operations and retrieve large data from the database. So, by their experiment, Laravel is the best for reading and writing text files. As compared to other PHP frameworks the file processing component of Laravel performs the best. According to [8], based on the Laravel framework a web application has a layered structure. The first layer consists of the Laravel core component extension and Framework. The second layer consists of Laravel persistence layer of database and labels extension. The third layer consists of a common data persistence framework and batch query analysis page. A large amount of data can be identified by Laravel for the business purpose. The frameworks basically based on Model, view, and Controller design pattern.

Referring to Figure1 [9], MVC is a short form for 'Model View Controller'. This illustrates the use of structure developers when constructing applications. MVC basically is a software which separates utility/domain/commercial

enterprise in terms of the interface of customers. This is done by breaking MVC software into the further three parts: first is the Model, second is the View, and the last one is the Controller. The model handles basic machine behaviours and information. It answers to instructions to change the status of its documents and also to alert observers of periodic systems when the facts change. This may be a database or a retrieval device. So, in short, this is the record-management of the programme or software. View correctly provides the software's user interface feature and display information into a form via a model which is sufficient for the interface of the user. The controller gets the data request from the user and passes it to the model objects and sees the execution of appropriate actions [5].
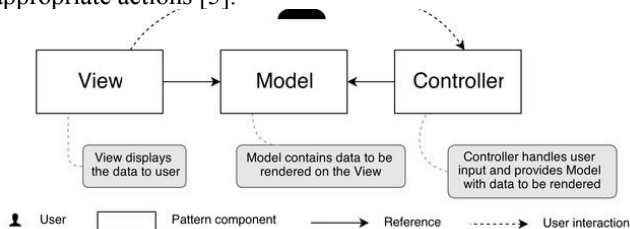

Figure 1: Web MVC Pattern. Adapted from [9]

A. Laravel Authentication

Authentication is the method for deciding what someone pretends to be. The authentication mechanism works on a website as defined in the following Figure 2.
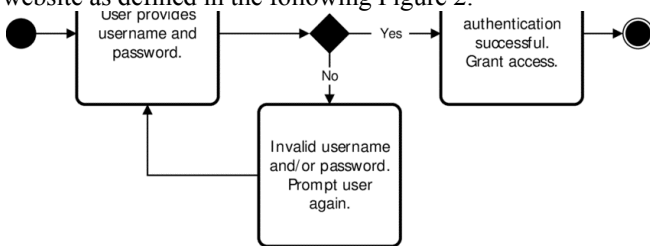

Figure 2: Website Authentication Stages. Adapted from [10]

One of the modules is Laravel's implementation of authentication. The authentication file of configuration is located at config/auth.php, which provides some well-documented alternatives for changing the actions of authentication services.

Laravel is having predefined and equipped with php artisan tool and it can be used to create controller and model. Laravel contains many pre-built controllers having functions to be connected between view and model and each controller uses a trait to include the important methods. The Laravel authentication layer allows users to create accounts and log in to the application. Following are the procedures to implement Laravel authentication: -

So firstly, need to add the routes to app/http/routes.php

Route::group(['middleware' => ['web']], function () { Route::get('/', function () {return view('welcome'); }) ->middleware('guest');Route::auth(); });

Create register.blade.php and login.blade.php inside resources/views/auth directory

These two views are used for authentication mode Login view handle the login process where users can log in and register view handles the registration process by a new user. Users use this default authentication module.

Lastly, use Middleware

Figure 3: Laravel Authentication Default. Adapted from [11]

B. Middleware in Laravel

Middleware shares mechanism with which it filters HTTP request entering the application. For example, default there is a middleware in the Laravel which usually authenticate the user, means it verifies the user. If the user is not authenticated then middleware automatically redirects the user to the Login screen and if the user gets authenticated it will allow the request to move further within the application. We can create additional middleware to perform a variety of tasks besides authentication. There is multiple middleware integrated into the Laravel framework, all of these middleware are in the app/Http/Middleware directory. Usually, a developer can modify the existing or create a new middleware for the application [2].

C. Laravel Starter

Laravel is designed in such a way that it improves the quality of your software by reducing the cost of initial development and ongoing maintenance costs and provide the clear expressive syntax to improve the experience of working within the application and core set of functionalities to save the hours of implementation time. One of the few PHP frameworks that provide true code modularity is Laravel. It is done by a mixture of drivers and a series of packages. Drivers help you to adjust and expand the features of caching, session, and database and authentication quickly. Laravel also offers cutting-edge database interaction toolset. You can easily design and modify a database with the help of database migrations in a platform-independent way due to which there will be no compatibility issues. Implementation of Laravel's Active record is called Eloquent. It is the modern way of interacting with a database in an object-oriented way. With Eloquent, without having to write a single SQL line, we can create, retrieve, refresh, and erase database records. Eloquent has powerful relationship management as well as it also handles the pagination automatically for you and saves time [12].

D. Key Features [5]

Laravel provides the following main capabilities that make it a truly ideal desire for web application design –

Modularity: Laravel offers 20 libraries and modules that are combined, allowing the framework to be enhanced. It offers integrated 20 modules and libraries to improve the application. Due to the fact, every module is covered with the Composer dependency manager it makes updates easier.

Routing: It provides a versatile way for the user to outline routes within the Internet utility. It helps to scale the utility in a better manner and will increase its general overall performance.

Email: Laravel provides a mail elegance that allows to send mail with rich content material and web software attachments.

Authentication: Laravel has predefined features like login, register, forgot password and password reminders which promotes the designing authentication.

E. Pros of Laravel [13]

Enhanced Security: Laravel provides enhanced security to the data as well as users. It does not let access the paid resources or anything important to the business to unauthorized users.

Excellent Mail Services Integration: Usually, mail services are used as notifications to the users' following any event. Laravel framework offers a powerful and clean API, over the famous Swift Mailer library. It also offers a robust solution for SMTP, Amazon SES, Mandrill, and "Send mail", which helps an app to send mail through a cloud-based or nearby carrier.

Robust Tools Integration for Agile Development: In this digital world, the application should be agile in a structured way, that finally result in significantly growing ROI. It supports backends like Redis and Memcached which are robust cache. It effectively uses the file cache driver because it is well configured in a manner, to stores cached components in the file system dynamically. Also, Laravel enables developers to implement various cache configurations significantly.

Automation Testing Work: Testing is crucial, for any successful website development & deployment. Automated testing is supported by Laravel, and which not only saves a lot of time but also provide more accurate reports than manual testing.

F. Problem with Framework and How to overcome it

Mass Assignment: Furthermore, need to discuss one-point i.e., Mass Assignment in Laravel and how to overcome it. Mainly Mass Assignment objective is to save models from being injected with unpredicted values which mainly comes from request data. It is important if it's seen from a security perspective and it works in case of feature perspective. Deeply most of the developers set all model columns as fillable or completely disable mass assignment by unguarding the models, so both of which beat the purpose of the mass assignment.

So basically, to overcome there is one approach which will be to reimplement the feature as Rails did so by using strong parameters [18].

As it says, so it's better to see it removed as this would force developers to take responsibility for correctly validating and assigning model data.

G. Cons of Laravel

Lack of technical talents: Laravel seems simple as it is equipped with automated functions which is misleading [14].

No built-in support functions: Unlike Ruby on Rails and Django, Laravel has very limited built-in support as it is a small framework. Using third-party tools, the issue can be resolved through and get back to the track quickly [14].

Some upgrades might be problematic: With Long term support it has few issues in general regarding versions and it gets critique sometimes because of this. Updates can cause minor problems. But developers can smooth out the process with the proper attention [14].

Legacy systems: It's not easily transferred to Laravel. Some companies will stay with Zend or Symfony because it would make too much effort to build it again with Laravel [15].

III. CRITICAL ANALYSIS

A. The Reasons for Selecting Laravel Framework [12]

Laravel is a web application platform with an intuitive, trendy syntax. Laravel tries to make the web development easier by easing some of basic tasks such as sessions, authentication, routing and caching which is used in most of the web development projects.

According to [2] have different functionalities like:

Security Level: Laravel is safer since it avoids the use of SQL injection, Xsrf, Xss.

Storing Password: Due to Hash class, the Laravel offers stable Bcrypt hashing password encryption.

Reset Password and Reminders: Most web applications offer a way for users to reset their forgotten passwords. Instead of requiring users to re-execute this on every programme, Laravel has simple procedures to send password reminders and reset passwords.

Encryption: Laravel provides facilities via the mcrypt PHP extension for strong AES encryption.

Validation: Laravel provides a facility for data validation and reverting validation of error messages through the Validation class. It's a simple way to show the error messages back to the views until the validation is performed. This is simply handled by Laravel [1].
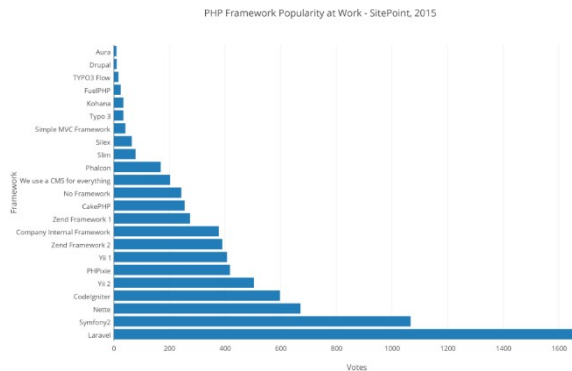
Figure 4: PHP Framework Popularity at Work. Adapted from [1]

B. Improvements to Framework

Minimize use of Libraries: Reduce the use of libraries in an app because the drawback is that it reduces the application experience which results in the overall application experience slow down. So, it's important that firstly to review libraries rather than directly call them in the app, if that particular functionality can be done without library, remove it.

Helper Files: While development make sure to make use of DRY (Don't Repeat Yourself) concept for which use helper file and make common functions in the file which can be use globally anywhere by calling that particular Helper file. DRY basically means not to repeat the same code multiple times for the different modules, always use common functions for same functionalities for a different module.

IV. RESULT COMPARISON OF DIFFERENT PHP FRAMEWORKS WITH LARAVEL

Frameworks	Comparison
Laravel	• Strong encryption packages • Due to wide-ranging documentation, it is the best framework for a novice • It offers unit testing • Very good GUI for the internal errors to recognize • It creates a massive ecosystem that gives a solution to all mistakes
CodeIgniter	• Non-friendly unit testing • Limited amount of inbuilt libraries • No use of namespaces
Cakephp	• In compare to Laravel the creation of Restful APIs is not as good
Zend	• Non-ideal Rapid application development

Table 1: Result Comparison of different PHP frameworks. Adapted from [17]

V. CONCLUSION

In comparison to other PHP frameworks, Laravel has simple files directory structure and best in reading/writing files with the migration process from one platform to another. As of PHP developer, it is very hard to transfer the database from one platform to another it would take more time in website creation but in Laravel, it is an easy task. Furthermore, there are predefined Laravel artisans' commands which are built-in commands to understand the architecture of Laravel. So once developers understand the architecture, they can make websites with so much ease.

Laravel is a new PHP framework but happens to be the most popular framework among developers due to easy coding standards, structure and with a wide range of features. This

framework with a simple and graceful syntax make the web development fast and easy. Simple processes like caching and routing are user simplified. Laravel has a strong base of reliable and tested code, as it is built upon Symfony Robust components [16].

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