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## IMPLEMENTATION OF WEB APPLICATION USING LARAVEL FRAMEWORK

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### ABSTRACT

This paper contains design and implementation process of a complex Laravel application. Laravel is most advance and elegant PHP framework & it make the development process simple. It processes non-business logic on its own that allows programmers to focus on business logic of an application. It has three interconnected parts called Model, View and Controller. Model consist of data and business logic. A view uses Laravel's blade templating engine which works seamlessly with HTML for representation of information. Controller classes are used are used to organize the behavior of request handling logic. Related HTTP request handling logic can be grouped into controller class. With Eloquent ORM active record implementation is done for working with database. Each table in MySQL database has a corresponding model which is used to perform CRUD operations on it. Third party packages can be integrated easily into Laravel application by writing few artisan commands. These packages save tremendous amount of development time. Most of these packages are well tested, stable and available for free of cost.

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### INTRODUCTION

To build a web application for all kinds of grocery stores to provide them easy way to sell their products and services online, to find potential customers and to make communication between customers and store owners easier by creating online store. This store pages have been indexed and can be searched within and outside the platform. This store pages are ranked based upon customer ratings and reviews. This platform shows the most relevant results near to the customer's location. All of the store information is represented in unified format that gives rich user experience. Customers can simply search for product or service and based on customer's location all the stores that sells those product or service are shown in search results. Then customer can add this product in the cart and can specify the quantity. Once the order is confirmed by customer it will be show in store owner pending order section when order is packed store owners can notify customer by processing order packed button a messaging service is implemented so that customer and store owners can chat with each other directly. Each register store can be accessed by a unique page URL. Feature like authentication, online store creation, page ranking, messaging, service, searching, order tracking and management makes this web application on complex to develop.

### FRONT END DESIGN

Google have introduced material design to make web page beautiful and user friendly twitter have introduced bootstrap for farther development of responsive website. Best feature of both are introduced in material designed for bootstrap. To designed the front end MDB library is used. It has 400+ impressive UI element It contain precompiled and minified files. These files need to be in the public directive of site.

### Grid System

Bootstrap provides mobile-first grid system which adapt its UI element according to the screen size. Whether the site is being displayed on mobile phone, tablet or laptop it automatically wraps the content and adjust them according to screen size. Bootstrap grid system divides the entire screen into 12 columns and the UI element needs to be place inside container and rows for making proper use of 12 columns.

### Blade Templating Engine

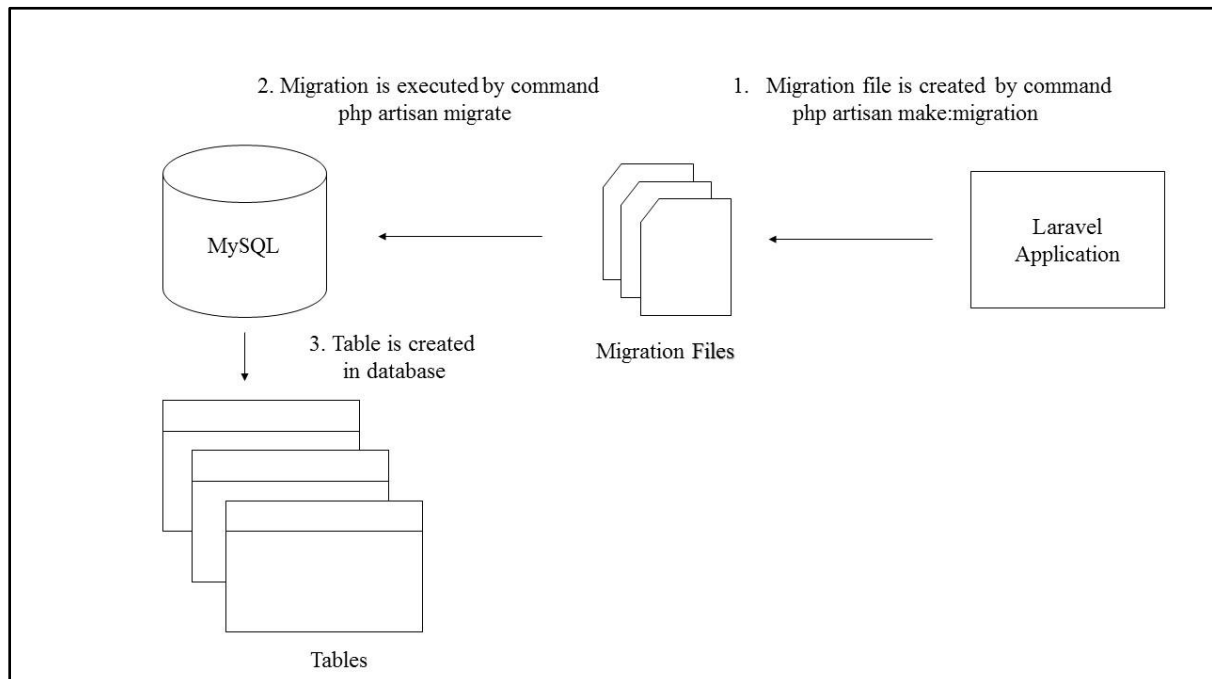
Laravel have its own templating engine called "Blade". Blade efficiently escape the HTML tags when it encounters blade syntax and executes PHP script. Laravel distinguishes blade files by its extension filename.blade.php Minimalistic web design approach is followed and implemented. Front end is designed by considering the needs of Indian store owners. Only few important features are added. For rich user experience design is made clutter free and ornamentation is reduced. To create online store six simple steps have been designed. Store owners can create their online store under 2 minutes. Google maps API is integrated to get exact store location. This store location is stored in latitude, longitude format. This information is used while

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calculating distance between user & store. Google places API is integrated in order to search places quickly. Card layout is used to display product and services. An admin view is created dynamically for store where store owners can read & respond to customer's messages. All the orders placed by customers are grouped in Orders Pending section whereas delivered orders are grouped in orders are grouped in Orders Completed section. Store owners can read ratings & reviews in all reviews section.

### DATABASE SCHEMA

MySQL is used for storing data of application. Twenty different tables are used to store data and they are interconnected by foreign keys. Level 1 normalization is achieved by removing redundancy from each table.



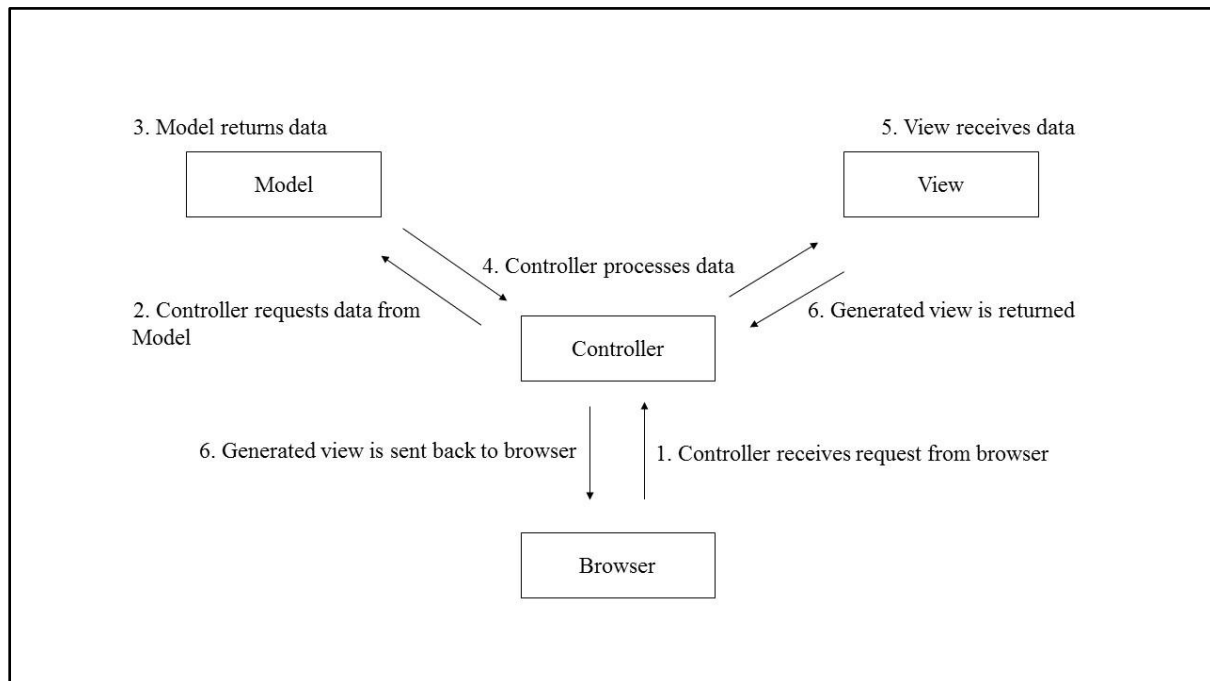
**Fig 1: Laravel Migrations**

Laravel stores the schema blueprint of each table in migrations files. This schema blue print executes SQL commands and create table in the database. Artisan command `php artisan migrate` is used to migrate all the migration files.

### ARCHITECTURE DESIGN

Laravel is full stack framework because it generates HTML it does web serving and also does database management. Laravel has excellent command line utility called Artisan that can generate boilerplates and database schema blueprints.

All the HTTP request sent to and from browser are handled by Controller. Model retrieves data from database and returns to the controller. Corresponding views are generated by representing this data and these views are sent back to the browser.



*Fig 2: Architectural Design Laravel Framework*

## IMPLEMENTATION

A fresh copy of Laravel application is downloaded on machine by executing command `laravel new project_name` on XAMPP. After setting the application key, namespace is set for application.

### Authentication Scaffolding

User authentication, sign up and sign in, password reset and their corresponding views are provided as a boilerplate by Laravel. This boilerplate can be integrated by executing artisan command `php artisan make:auth`. The default user id for this scaffolding is email id, it has been changed to mobile number.

### Input Validation

Validation of user input is done at each stage. Content in the HTTP requests are filtered and corresponding error message are displayed to the users. For example, mobile number is validated, if it is less than 10 digits error message is shown.

### Online Store Creation

Creation Flow Controller handles all of the business logic required for creating online store. Each store needs unique page URL. This is validated by Laravel's unique validation method. Google maps & places API is integrated to get exact store location. Products and services table is seeded by sample data.

### Image Intervention

This package is integrated in application to perform operations on images. Each image uploaded by user is resized in order to reduce its size. Each store gets a unified store template which gives rich user experience. Business Profile model represents the instance of Business Profiles table. Most of the CRUD operations are performed by using this model only.

### Search

Search Controller filters the user queries. It checks for keyword in query. If query contains any product or service name then all the stores that sells those products and services are shown in search results. If keyword contains city name or postal code then all the stores in that area are shown. Haversine distance calculation formula is used to calculate distance between store and user.

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### Cart

Users can add products to the cart and can specify quantity they need. Once the order is confirmed by user it appears in orders pending section. Cart Controller is responsible for order tracking and management.

### Csrf Protection

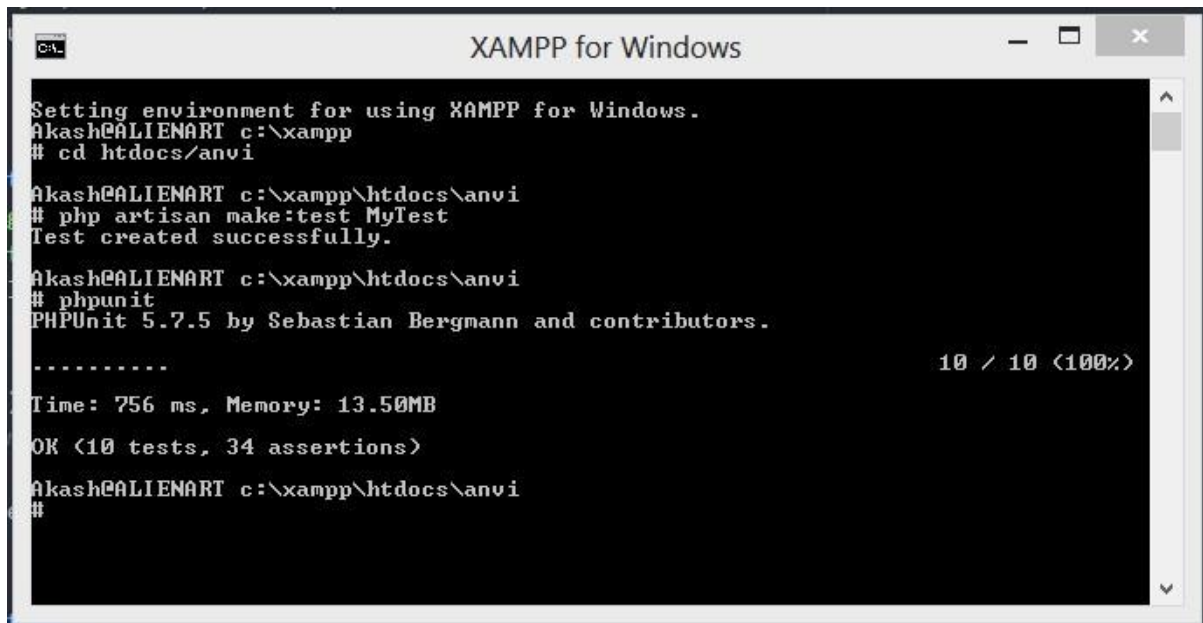
To protect application from Cross-Site Request Forgeries CSRF Tokens are included in each POST request to the server.

### Powerful Routing

Except search and store, all other routes have been protected by Auth middleware in order to restrict unauthorized access.

### TESTING AND DEPLOYMENT

PHPUnit is used to test application and to seed data Faker tool is used. Most of the business logic is manually tested whereas the routes, database operations, GUI activities are tested by PHPUnit test cases.



```

C:\> Setting environment for using XAMPP for Windows.
Akash@ALIENART c:\xampp
# cd htdocs/anvi

Akash@ALIENART c:\xampp\htdocs\anvi
# php artisan make:test Mytest
Test created successfully.

Akash@ALIENART c:\xampp\htdocs\anvi
# phpunit
PHPUnit 5.7.5 by Sebastian Bergmann and contributors.

.....                                     10 / 10 (100%)

Time: 756 ms, Memory: 13.50MB
OK (10 tests, 34 assertions)

Akash@ALIENART c:\xampp\htdocs\anvi
#
  
```

*Fig 3: Test Results*

Hostingers hosting platform is used to host the site and anvikshan.com domain is used.

### CONCLUSION AND FUTURE WORK

This application is one stop solution to access information of businesses, easy business-client communication and product ordering and management. It has modernized and integrated business processes and system. This application simplifies the process of creating online store. It creates online presence of small-mid scale businesses for free of cost.

Currently this application contains store creator module for only grocery store. Other types of businesses can be added which will make this application a single platform for all categories of business which will help them to expand their business scope and to increase their presence on internet.



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