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Carpooling For GVSU

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CARPOOLING FOR GVSU

By

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August, 2015

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A project submitted in fulfillment of the requirements for the degree of

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Table of Contents

Abstract4

Introduction4

Background5

Program Requirements5

Implementation6

Results, Evaluation, and Reflection8

Conclusions and Future Work8

Acknowledgement.....8

References.....9

Abstract:

Carpooling is car-sharing or ride-sharing so that more people can use one vehicle which reduces each person's travel cost such as fuel costs, tolls and the stress of driving. It is seen as more environmental friendly and sustainable way to travel as sharing journeys reduces carbon emissions, traffic congestion on the roads and the need for parking spaces. Ride-sharing is encouraged especially during high pollution periods and high fuel prices. Though, there are numerous carpool applications available online. GVSU do not have a carpooling application specific only to GVSU. With this intention, ride sharing application is being developed for GVSU.

This web based application is developed using PHP Laravel web application Framework which makes the development easy for common tasks used in majority of web projects such as authentication, routing, sessions, queuing and caching and expressive migration system. Bootstrap, which is the popular HTML, CSS and Java Script frame work for developing web applications is used in this project. To search for the geographical locations, Google Places API is used. To store the data, MySQL database and Apache Tomcat is the server used to build this application. Carpooling web application provides one platform for people (who are available to give a ride) to create a pickup where he can enter the details such as name, phone number, email ID, availability time, pickup location, destination, fare , number of seats available in the car and the preferences. Users who need a ride can login to the application and search for the available rides. They can also pull up the details of the available ride using the Book now option. The client can view the number of available seats which is updated each time a user reserves a ride. This application may have a potential of daily use at Grand Valley State University.

Introduction:

Real-time ride sharing is a popular way to make use of the unutilized seats in passenger car. In few cases the passengers can serve areas not covered by a public transit system and act as a transit feeder service. Ridesharing can directly or indirectly help environment by decreasing the carbon emissions from automobiles and also bring down the utilization levels of fuel.

Carpooling applications may have more potential use in schools and colleges. As students, we transit between and to common places very often, for instance, the distance between Grand Valley State University Allendale campus and the Downtown campus is around 14 miles. We often see students and faculty shuttle between these two places. This may be applicable to any other university or

organizations in the world. A carpool application can help us reduce travel, parking costs and bridge the gap of communication between a ride giver and seeker.

Background:

Carpool applications have become popular in past few years, with some of the commercial applications such as Uber, Lyft, and Haxi where the ride givers work as drivers and make money. However there few applications that are non-commercial such as RideShare (www.rideshare.com), eRideShare (www.erideshare.com), CarpoolWorld (www.carpoolworld.com), BlaBlaCar (www.blablacar.in).

The extent of use of carpool applications is very limited in reality due to various reasons (Yu-Tso Chen and Chen-Heng Hsu, 2013). Some of the reasons can be low level security, no social association with fellow riders/driver which makes carpooling inconvenient to users. There drawbacks may be overcome with help of institution based carpooling, by registering users belonging only to particular institutions. The registration can be restricted to domain specific, for example only students, staff or faculty who possess a valid GVSU email ID can register for the carpool application. Institution based carpooling can build reliability and safety among the users and ride givers.

The Grand Valley website do not have a built in carpool application. This application can help GVSU integrate a carpooling application into the website and help students and faculty to share and offer rides to fellow Lakers. The application is built using PHP Laravel framework and it makes use of Google places API.

4. Program Requirements:

The carpool application is a web based application built using the technologies such as PHP, Laravel framework, CSS, Bootstrap, HTML, JavaScript. Apache Tomcat server, an open source server was used to run the application. The business logic is simple and clear, where a user can register for application. The registered user details of the user are stored in the MySQL database for authentication. Registered users can login to the application with valid ID and password, once logged in the user has various options in the application. He or She can offer a ride or create a new ride. User can make use of the available rides and the application takes care of the updating the travel information.

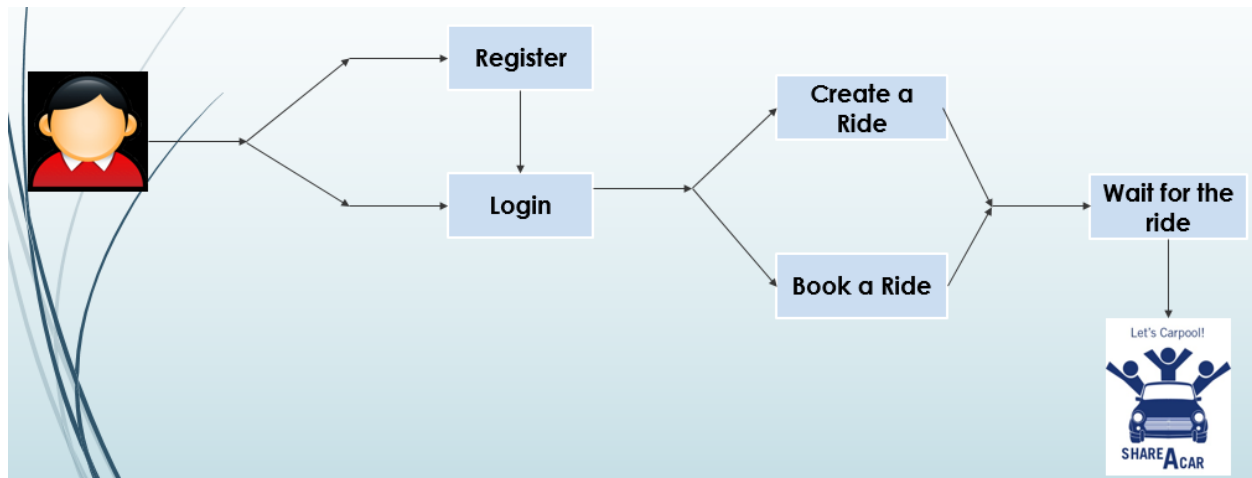


Figure 1 represents the business login of the carpool application

5. Implementation:

The application, carpooling is developed in a PHP web application framework named as Laravel. Laravel is a famous and most used framework from web applications. HTML bootstrap template used for beautiful graphical user interface. JavaScript and JQuery are used for client side evaluations and JQuery frameworks for date picker, time picker. Google places API is used for loading places so that users can easily select places for carpooling.

Users who would like to book a pickup need to register with the application. Registered users can search for the pickups by inputting the date, start location and destination. This will search all the pickups registered for that day from and to the given fields. Hence, the user can easily book a pickup of his requirement by easy search. The application also shows are the pickups registered so that user and browse and choose the one he wanted. Users have an option to create their own pickup which will show that to all other users. One can input personal preferences also which will allow others to view and select pickups based on preferences. The cancellation of a booking is also very easy. The application is implemented to make it user friendly, fast and comfortable to end users.

5.1 Technologies used:

PHP:

PHP is a scripting language which can be used for web application development as well as a programming language. PHP is powerful tool for server side scripting and creating dynamic web pages.

PHP is a programming language that can do many things like evaluating form data sent from a browser, build custom web content to serve the browser, interact with the database, and even send and receive cookies.

Laravel:

Laravel is an open source web application built and implemented in PHP. It follows a model-view-controller (MVC) architecture. This makes developer to easily learn and build application comfortably. Laravel features include its expressive syntax, a modular packaging system with a dedicated dependency manager, different ways for accessing relational databases, and various utilities that aid in application deployment and maintenance. Blade templates is used for front end design. Blade templating engine combines one or more templates with a data model to produce resulting views, doing that by transforming the templates into cached PHP code for improved performance. Blade also provides a set of its own control structures such as conditional statements and loops, which are internally mapped to their PHP counterparts. Eloquent ORM (object-relational mapping) is an advanced PHP implementation of the active record pattern, providing at the same time internal methods for enforcing constraints on the relationships between database objects. Following the active record pattern, Eloquent ORM presents database tables as classes, with their object instances tied to single table rows.

MySQL [15]:

MySQL is a famous open source relational database management system (RDBMS). Databases are helpful in defining, storing, manipulating and querying the data. The information is stored in the form of simple tables with multiple records and fields. The predominant feature of the RDMS is that, we can relate multiple tables with help of common and relative information. MySQL database is leverages by the project to store the simulation and geospatial information in different tables. Various queries were used to retrieve application specific sensible information.

Google Places JavaScript API:

Google places JavaScript API is an open source technology. Using Google places API we can embed the features of google locations in to our customized web pages. Google places have inherent coverage of the world and can instantly choose any location around the map. The project leveraged the Google

places API for selecting the start and destination locations while creating a pickup and also while searching a pickup.

6. Results, Evaluation, and Reflection:

GVSU Carpooling application enables GVSU students and staff to share transport to travel any time round the clock just by choosing a pickup online. This can be an advantage to two sections of people. One section are the car owners who can share their travel with other members. This will enable them to share the travel expense which in turn shall reduce the cost of travel. The other section are the passengers which can get a pickup and drop at their comfortable time and place at a very reasonable fare. In this way, they do not need to depend on the public transport and can travel to their destination at chosen time without any worry. Using such applications can improve public relations between the students or staff. The primary advantage of GVSU carpooling is that it can be deployed on a public server and can be used by citizens from anywhere.

7. Future Work:

The application needs more validations in the login and registration form. I would also like to implement few more business logics such as creating instant rides between two popular destinations. Due to shortcoming of time, I was not able to implement these requirements. I would like to work on them and make a positive progress on the application design in future.

8. Acknowledgement:

I am very thankful to my project guide and mentor Dr. Yonglei Tao, for his valuable guidance. I am thankful to the open source technologies and frameworks for making this project a well-built web application. I take this stance to thank my friend Ms. Shravya Siluveru for her timely help without which this project may not have been a success. Finally I extend special thanks for all the GVSU faculty and staff for educating me in various subjects, which were directly or indirectly helpful in completing this project.

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