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Title: Ride Sharing Web App

I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.

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1. INTRODUCTION

This project is a web-based app through which users can request a vehicle for a ride and driver arrives to take the specific users to their destinations. This web app provides on-demand ride-sharing services through several modes of transportation such as cars, bikes and tuk-tuks. This web app provides services to the users and drivers as well. This web app uses GPS module to interconnect users and drivers.

Initially, the user must register their personal information as requested by the app, and then they must login to the app to request a vehicle for a ride. A user can detect the vehicles nearby to his/her location and can request a vehicle for a ride to the specific destinations. A user can also bargain over the fare of a ride. If a driver accepts the fare offered by the user then the server will send the message of confirmation to the user. This web app manages user bookings in the fastest and easiest way possible. With a single click, user can request or cancel a vehicle for a ride and a driver can accept or cancel user requests for rides with a single click.

The admin has entire authority over this web app. The admin authenticates the user's and driver's personal information as requested by the app. The admin has the authority to add, delete, and update user and driver information. When registering a driver for the app, the admin verifies to see if the driver has a valid driver's license. A driver can't register for the app if he/she doesn't have a valid driver's license. Payment transactions in this web app is automated. All the payment transactions are monitored by the admin.

1.1. Problem Scenario

In most urban areas, two modes of transportation are frequently used for day-to-day travel: private/personal vehicle and public/mass vehicle transportation.

Private vehicles provide a convenient and pleasurable trip, however, due to increased population and increased vehicle usage, transportation networks are experiencing capacity issues, traffic issues due to the high demand during busy hours, and environmental issues. Individual transportation adds considerably to global emissions, increases oil dependency, and hence increases the country's economic reliance on shifting price of oil.

Public transportation is one of the popular and cost-effective means of transportation. Although public transportation can reduce some of the negative consequences of private vehicles, it lacks flexibility and dependability. This transportation also has the drawback of having a lower capacity per vehicle, with most buses moving empty seats during off-peak hours and regularly becoming overloaded during peak hours. People who seek a comfortable ride generally don’t favor public transportation. Nowadays, the traveling fare of public transportation is not fixed as their fare fluctuates day-to-day.

1.2. Project as a Solution

This project executes direct solution for addressing and overcoming all of the challenges and difficulties specified in the above problem scenarios. This project is an online vehicle booking web app which will help the users to request a ride with just a single click. This web app seems to have a quite impressive impact on physically impaired people and people who are new to a place. The payment process does not necessitate users to utilize cash. Though payment transactions are carried out digitally, which removes the burden of gathering and depositing cash. This web app allows the user to set the intended fare for their selected route and can bargain in fare for a better price.

The major roles in this web app:

Users:

- Register and Login
- Detect the nearby vehicles from their location

- Request and cancel a vehicle for a ride
- Give review and ratings
- Update profile and password

Drivers:

- Register and Login
- Accept and cancel the requests of the user for a ride
- Update profile and password

Admin:

- Payment Management
- Add update and delete users and drivers
- View all the details of users and drivers
- Verify driver based on driving license
- Update password

2. AIMS AND OBJECTIVES

The main aim of this project is to mitigate the problems generated from public and private transportations by developing ride sharing web app which help the users to request a vehicle for a ride with just a single click and to promote sustainable transportation service. To achieve this aim, the following objectives have been set up:

Objectives:

- To conduct an extensive and comprehensive analysis of the major terms and resources required for the development of the web app.
- To develop a complete web application.
- To create proper format for the project documentation.
- To build a web app using the agile methodology's development process.
- To detect various items required to create wireframes and GUI.
- To facilitate convenient way to request a vehicle ride for the users.
- To determine whether the web app is impactful for the users or not.
- To develop a better understanding of web platforms.
- To learn how to use various tools necessary for the development of the project.
- To record the precise details of this web app's development and execution.

3. EXPECTED OUTCOMES AND DELIVERABLES

After the project is accomplished proficiently, the web app will be able to do the following activities:

- To develop a web app that allows users to request a vehicle for a ride from one location to another and detects the nearby driver from their location.
- To provide ride-sharing services through several modes of transportation such as cars, bikes and tuktuks.
- To authenticate users and drivers relying on the credentials they provide.
- To notify users with a confirmation message after their request of a vehicle for a ride is accepted by the driver.
- To register the driver to web app if he/she has proper driving license.
- To provide a payment gateway so that users can pay straight from the web app following a successful ride.
- To provide the field to bargain in fare by the users.
- To create an appealing, responsive, and user-friendly web app so that users can navigate easily and efficiently.
- To handle all the data of the user and driver systematically and mitigate the data redundancy.
- To provide the web app as a real time app that shows the precise location of the user and driver.
- To generate a log of ride history requested by a user for a ride.

4. PROJECT RISKS, THREATS AND CONTINGENCY PLANS

Not every project proceeds as planned. Like everything else, there are benefits and drawbacks. Every project has a set of circumstances connected to it that may interrupt its successful completion; these events are referred to as risks. Project risk, on the other hand, is an unpredictable occurrence that may or may not occur throughout the process of a project (teamwork, n.d.). Some of the risks/threats that I might encounter while undertaking my project, as well as contingency plans to mitigate them, are included in the table below:

Table 1: Project Risks, Threats and Contingency Plans

S.N.	Risk Description	Probability	Impact	Contingency Plans
1.	Natural Disaster	Low	High	Back up all data
2.	Lack of internet connection	High	High	Store the data offline
3.	PC Crash	Low	High	Back up all data
4.	Technical Failure	High	High	Verify the system is error free
5.	System might not be able to show the user exact location	High	High	Enable the system reliably pinpoint the user's location
6.	Theft	Low	High	Safeguard and keep PC safe and secure
7.	Design of web app might not be responsive	Medium	Medium	Make the system responsive so that the user can browse it conveniently.

5. METHODOLOGY

5.1. Agile Software Development Life Cycle (SDLC)

Agile SDLC is a combination of incremental and iterative workflow paradigms. It prioritizes process flexibility and customer experience by releasing a functional software application as promptly as possible. The product is split into small incremental builds using Agile SDLC. Iterations are specified for these setups (javatpoint, n.d.). It consists of six phases: requirements collection, analysis, designing, coding, testing, and maintenance (Chaudhary, n.d.).

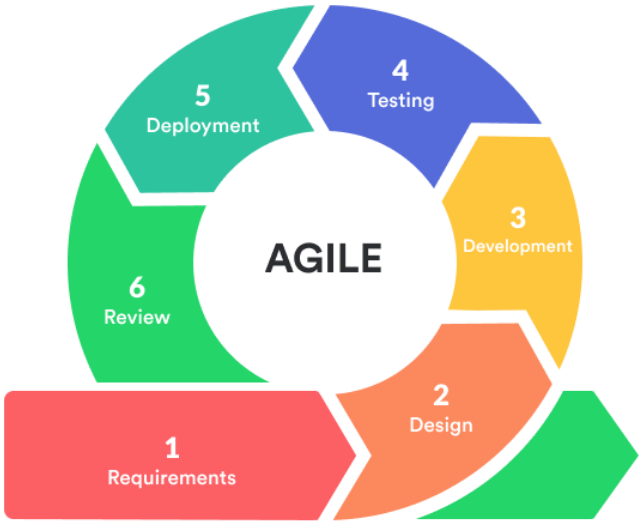

Figure 1: Agile SDLC (Anurina, 2021)

5.1.1. Rational Unified Process (RUP)

For this project, I have decided to use RUP methodology. Rational Unified Process is a methodology for agile software development. It is also known as the "Unified Process Model." It is a well-known and reliable object-oriented method for software development. RUP methodology can range from a simple procedure that satisfies the needs of particular projects to a more extensive process that meets the demands of huge projects (educba, n.d.). This methodology's role is to guarantee the timely and cost-efficient production of effective software that meets the needs of its end users (GeeksforGeeks, 2022).

Phases of the life cycle of RUP

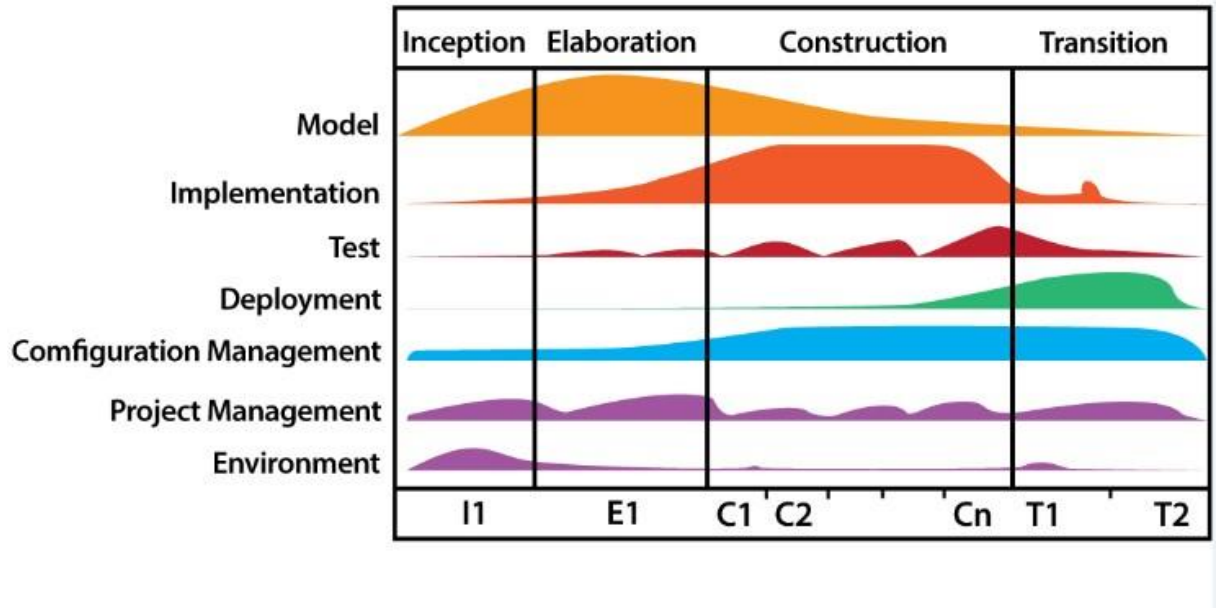

Figure 2: Phases of RUP (testbytes, 2019)

i. **Inception:** It is the preliminary or first stage of the development process. During this phase, the team will pinpoint the project's core ideas and structure in order to prepare a business suite, which will include information such as the project's goal, success criteria, estimated cost, risk assessment, scheduled time, and resources needed to execute it, and so on. It is similar to a project evaluation. If the project fails to accomplish the following, it may be cancelled or re-evaluated (GeeksforGeeks, 2022).

The process of this phase are:

- Project Idea
- Project Finalization
- Research about project related topics in depth
- Requirement Gathering
- Research about the technology used

ii. **Elaboration:** It is the second stage of the development process. The primary purpose of this phase is to eliminate the major risks discovered throughout the research. The issue domain study is completed during this phase, and the project architecture takes shape. Developers investigate the software's possible applications as well as the development expenses (GeeksforGeeks, 2022).

The process of this phase are:

- Identify project tasks and its completion date
- Project Architecture
- Project UML Diagrams
- Risk Analyzation
- Proposal Confirmation

iii. **Construction:** It represents the third stage of the development process. The project is created and finalized during this phase. This is the stage at which all of the features are developed and integrated into the product, indicating that the program has been well-planned, written, and tested. As a result, the development product will be available. It assesses the product's completeness. (GeeksforGeeks, 2022).

The process of this phase are:

- Development
  - Database Design
  - Frontend Development
  - Backend Development
- Testing
- Prepare Documentation

iv. **Transition:** It is the last of final phase of the development process. The program is introduced and rendered available to the general public or customers during this phase. The product will be updated or changed in response to client feedback. It is the deployment procedure (GeeksforGeeks, 2022).

The process of this phase are:

- Supervisor Reviews and Feedbacks
- Updates and Upgrades
- Update Project Documentation
- Project Submission

6. RESOURCE REQUIREMENTS

The resource requirements which are required to complete this project are categorized into two types .i.e., hardware and software requirements.

6.1. Hardware Requirements

- PC
- Internet Connection
- GPS Module

6.2. Software Requirements

- Web Browser: Google Chrome/Microsoft Edge
- Technology: PHP
- Tools: XAMPP
- Web Design: HTML, CSS, JAVASCRIPT, REACT JS
- Framework: Laravel
- Backend: MYSQL

7. WORK BREAKDOWN STRUCTURE

In project management, a work breakdown structure (WBS) is a strategy for executing a complicated, multi-step project. It is a technique for splitting and tackling enormous projects in order to complete them more quickly and efficiently (wrike, n.d.). It is a hierarchical description of the work required to complete the functionality of the project. Each descending level of the work breakdown structure reflects a more complete explanation of the project deliverables (Visual Paradigm, n.d.).

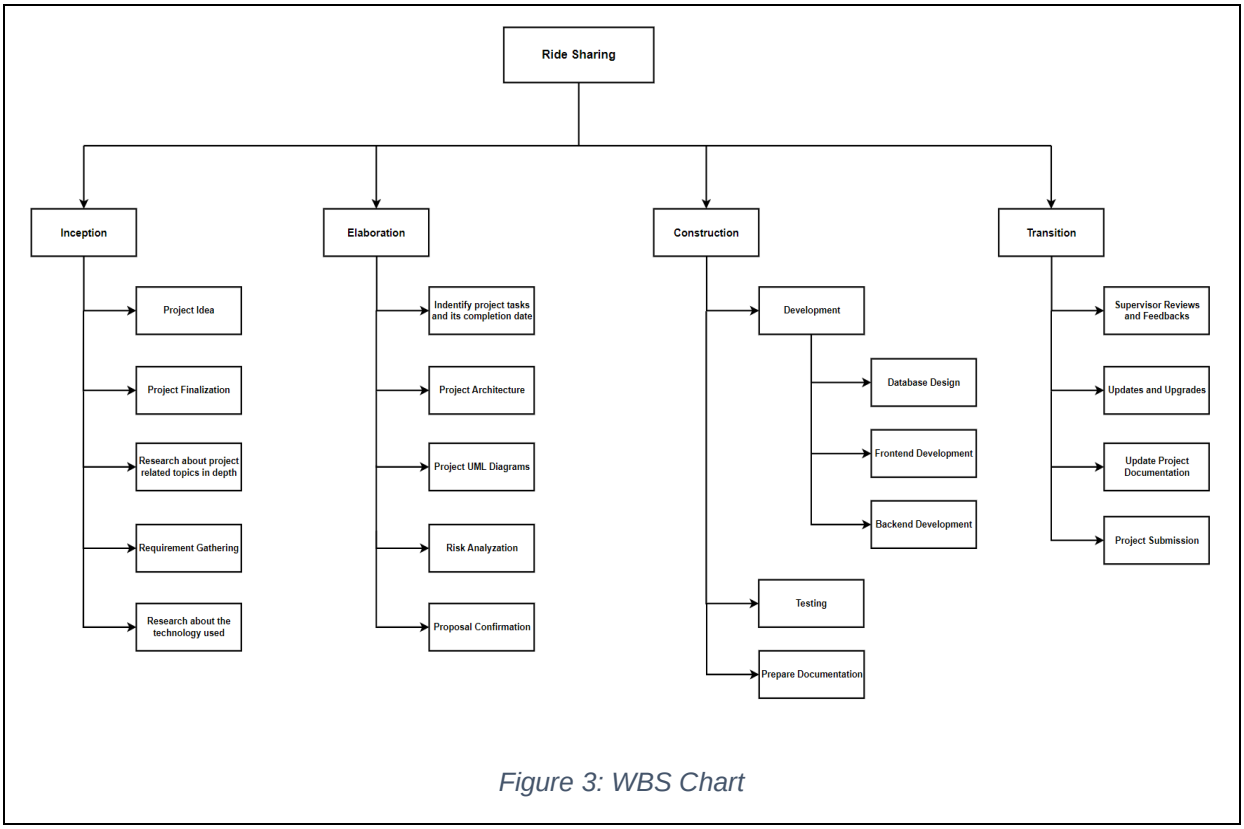

Figure 3: WBS Chart

8. MILESTONE

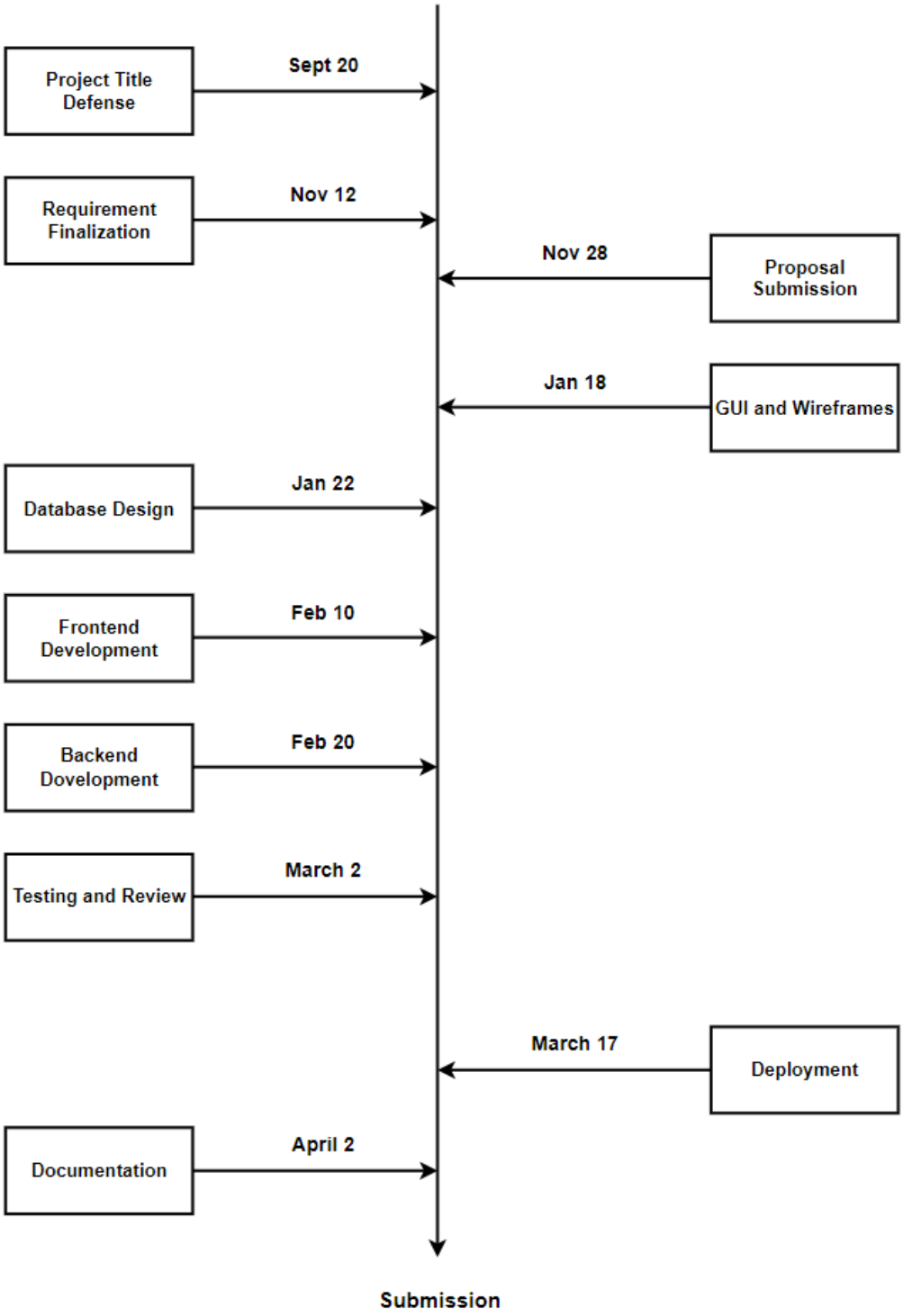

Figure 4: Milestone Chart

9. GANTT CHART

A Gantt chart is a prominent graphical representation of a project timeline. It's a form of bar chart that shows the start and end dates of project elements including resources, planning, and dependencies. Henry Gantt (1861-1919), an American engineer, designed the Gantt Chart. It consists of a sequence of tasks and progress bars for each activity. It differentiates between tasks that can be completed simultaneously and those that can't be initiated or completed until others are completed (GRANT, 2022).

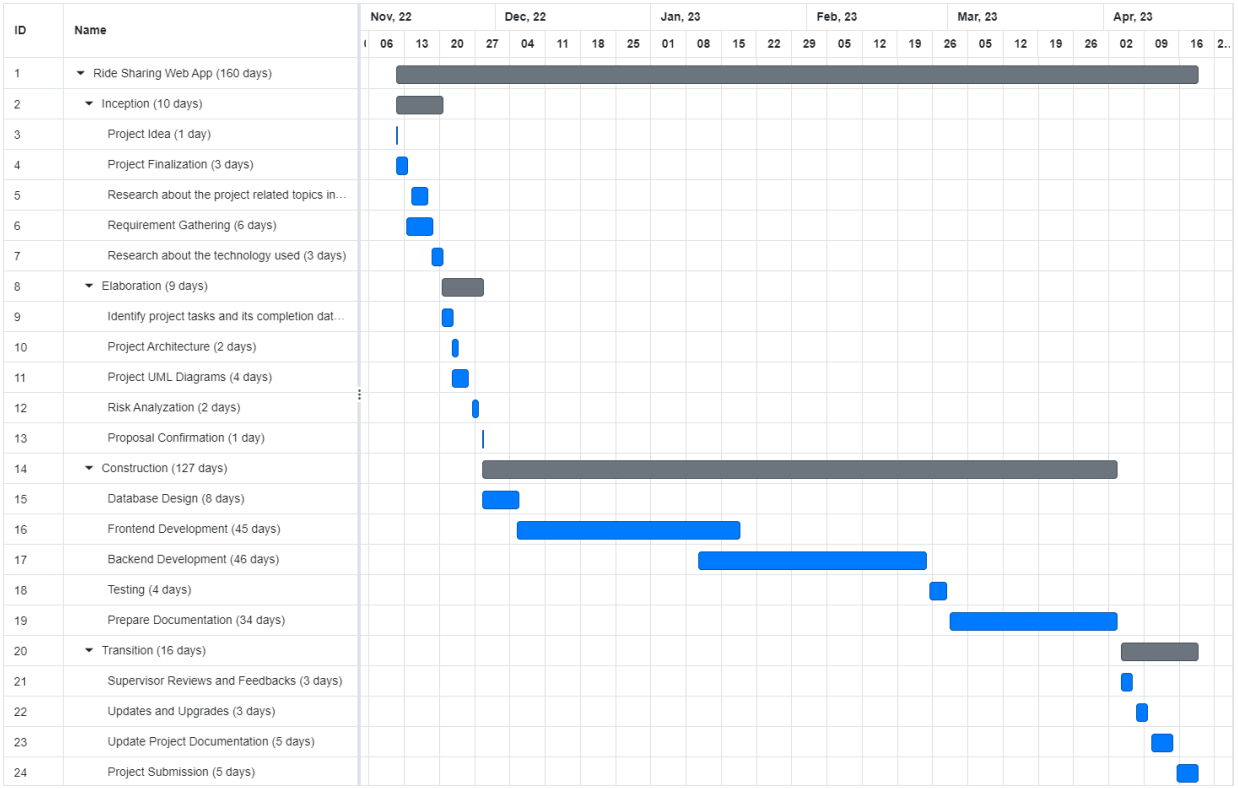

Figure 5: Gantt Chart

10. CONCLUSION

In a nutshell, this web app is developed to mitigate the problems raised by the public and private transportation. The implications of this web app seem limitless, and the project's goal is to create an application that everyone can use to make their daily life easier. This project is a web-based application that allows users to order a vehicle for a ride and a driver will arrive to take the users to their locations. This web app offers on-demand ride-sharing services via several forms of transportation, including cars, bikes, and tuk-tuks. A user can detect the vehicles nearby to his/her location and can request a vehicle for a ride to the specific destinations. A user can also bargain over the fare of a ride. To complete this project, I will have to conduct comprehensive research on several project-related terms. Every task that relates to this project will be done in phases with sincerity and dedication. I am very enthusiastic to work on this project as the skills and knowledge acquired will undoubtedly help my career advancement as a web developer.

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