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*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

Ride-sharing refers to the use of a digital platform to connect passengers with drivers for the purpose of transporting passengers from one location to another. Ride-sharing services have become increasingly popular in recent years as a convenient and cost-effective alternative to traditional taxi services. A ride-sharing web app is a software application that allows users to request and pay for rides through their internet browser. These apps typically use GPS technology to match passengers with nearby drivers and to track the progress of the ride. Passengers can usually rate their experience and leave reviews for drivers. This feedback system helps to ensure and maintain the overall quality of the service.

Ride-sharing web apps offer a number of benefits to both passengers and drivers. For passengers, they provide an easy way to get around without the need to own a vehicle or deal with the inconvenience of public transportation. For drivers, they offer the opportunity to earn money by providing rides to people in their community. Overall, ride-sharing web apps have revolutionized the way people think about transportation and have made it easier for people to get around in urban areas.

This project is a web-based app through which is a popular alternative to traditional modes of transportations, such as taxis and public transportation. 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 technology to interconnect passengers and drivers. Initially, the passenger must register their personal information as requested by the app, and then they must login to the app to request a ride. A passenger can enter their pick-up and drop-off locations and can request for a ride. A passenger can also bargain over the fare of a ride. If a driver accepts the fare offered by the passenger then the server will send the message of confirmation to the passenger. This web application manages user bookings in the fastest and easiest way possible. With a single click, passenger can request or cancel a vehicle for a ride and a driver can accept or cancel passengers request for a ride with a single click.

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

## 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 a straight solution for dealing with and getting over all the problems and challenges specified in the above problem scenarios. This project is an online vehicle booking web application which will help the passengers to request a ride with just a single click. This web application 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 passengers to use cash. The inconvenience of gathering and depositing cash is removed because payment transactions are handled digitally. This web application allows the passengers to set the intended fare for their selected route and can bargain in fare for a better price.

## 1.3. Aims and Objectives

The main aim of the project is to promote sustainable transportation service and mitigate the problems generated from public and private transportations by developing ride sharing web app which helps the passenger to request a vehicle for a ride with just a single click.

In order to achieve this aim, the following objectives have been set up which are listed below:

**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 application 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.

## 1.4. Web Application Features

1. **Admin**

* Login to the app using their email address and password.
* Set up and manage their password if necessary.
* View and manage all users (passengers and drivers) and their profiles, including personal information, ride history, ratings and reviews, and any other relevant details.
* Set policies and rules for drivers and verify the driver based on their driver KYC details which includes driving license as a necessary credentials.
* Monitor and analyze ride data.
* Manage payment processing and billing for rides.
* Set pricing and pricing policies for rides, including dynamic pricing based on factors such as demand, time of day, and distance travelled.
* View and manage driver ratings and reviews to ensure that drivers are meeting the required standards of service and safety.
* Log out of the app when they are finished using it to protect their account and personal information and prevent unauthorized access.

1. **Passenger**

* Login to the app using their email address and password.
* Register for a new account by providing their personal information, such as name, and email address.
* Set up and manage their password if necessary.
* Create and manage their personal profile.
* Request rides by specifying a pickup and drop-off location, and view quotes and estimated arrival times for available drivers.
* View a map with real-time location tracking of their assigned driver and the estimated time of arrival at their destination.
* Rate and review drivers after a ride to provide feedback and help other passengers make informed decisions.
* View and manage their ride history.
* Accept or cancel a ride request if needed.
* Set up and manage digital payment options.
* View and manage their preferences or special requests, such as preferred vehicle types or accessibility options.
* Log out of the app when they are finished using it to protect their account and personal information and prevent unauthorized access.

1. **Driver**

* Login to the app using their email address and password
* Register for a new account by providing their personal information and vehicle details.
* Set up and manage their password if necessary.
* Create and manage their personal profile.
* View a map with real-time updates on ride requests and their current location.
* Accept or decline ride requests.
* View and update their availability status to let passengers know when they are available to pick up a ride.
* View and update their earnings and payout information, including a summary of their total earnings.
* View and manage their ride history.
* Log out of the app when they are finished using it to protect their account and personal information and prevent unauthorized access.

# 2. Background

## 2.1. Technology used

This section of the report describes the overall analysis of the technologies used or will be using for the development of the **Sawar - Ride Sharing Web App**.

### 2.1.1. Web Browser

1. **Google Chrome:** Google Chrome is a free web browser created by Google that can be used to browse web pages on the internet. It is also a cross-platform browser, which means that various versions of the browser work on different computers, mobile devices, and operating systems. It is fast, secure, and easy to use (Moreau, 2022).
2. **Microsoft Edge:** Microsoft Edge is the official name for the new and updated Web browser that was released in Microsoft's Windows 10 operating system to replace the ancient Internet Explorer Web browser. It shares several functionalities and menu options with Chrome while having a distinct overall design and structure. It provides more security features (Stroud, 2021).

### 2.1.2. Server Side Scripting Language – PHP

PHP is a server-side programming language used to create static, dynamic, and web-based applications. PHP is an abbreviation for Hypertext Preprocessor, which was previously known as Personal Home Pages. PHP code can be integrated into HTML code or used in conjunction with a wide range of web template systems, content management systems, and online frameworks (Jackson, 2022).

### 2.1.3. IDE – Visual Studio Code

Microsoft's Visual Studio Code (often known as VS Code) is a free, open-source text editor. VS Code is compatible with Windows, Linux, and macOS. Although the editor is lightweight, it contains several powerful capabilities that have helped VS Code become one of the most popular development environment tools in recent years (Mustafeez, 2022).

### 2.1.4. Web Design

1. **HTML:** HTML stands for Hyper Text Markup Language. HTML is a markup language that is used to create appealing web pages that seem nice on a web browser with the help of styling. An HTML document is comprised of several HTML tags, each of which includes unique content. It is simple to understand and modify (javatpoint, 2022).
2. **CSS:** CSS stands for Cascading Style Sheet. CSS is simple to comprehend and understand, but it offers users a great deal of control over how an HTML document appear. CSS is most typically used in conjunction with the markup languages HTML or XHTML. CSS allows developers to isolate content from visual components, giving them more website flexibility and control (techopedia, 2018).
3. **JavaScript:** JavaScript is a text-based programming language that can be used on both the client and server sides to render web pages dynamically. It is a lightweight object-oriented programming language. JavaScript is a translated language, not a compiled language. The JavaScript Translator is in responsible of interpreting JavaScript code for web browsers (javatpoint, 2022).
4. **React JS:** React JS is a JavaScript library used to create user interfaces. React JS is an extremely powerful library that allows for efficient front-end development by dividing the page into several building elements known as components. The Model View Controller (MVC) architecture is used by React JS, and the view layer is in charge of dealing with mobile and web apps (tutorialspoint, 2022).

### 2.1.5. Framework – Laravel

Laravel is a PHP framework for web applications with powerful, attractive syntax. Laravel aims to make development easier by simplifying typical tasks seen in the majority of online projects, such as authentication, routing, sessions, and caching. Laravel promises to make the development process more enjoyable for developers while maintaining application functionality (Laravel, 2022).

### 2.1.6. Web Server – XAMPP

XAMPP is a popular cross-platform web server that enables programmers to write and test their programs on a local webserver. It was created by Apache Friends, and the audience can update or modify its native source code. It includes the Apache HTTP Server, MariaDB, and interpreters for many programming languages such as PHP and Perl (javatpoint, 2022).

### 2.1.7. Database Management System – MYSQL

MySQL is a relational database management system that is free and open source. MySQL, like other relational databases, stores data in tables comprised of rows and columns. MySQL operates on almost every platform, including Linux, UNIX, and Windows. Although it can be used for a variety of purposes, MySQL is most commonly linked with web applications and online publishing (Moore, 2022).

## 2.2. Methodology

A software development methodology is a procedure or set of procedures used in the development of software. Basically, it is pretty wide, but it includes things like a design phase and a development phase. The purpose of software development methodology is to offer a methodical approach to software development (Alliance Software, 2022). Every day, a massive chunk of software is planned, designed, built, and deployed, and each of these activities needs intense concentration and teamwork. Software businesses contemplate software development approaches to examine client requirements and construct a strong business solution on time (Positiwise, 2022).

### 2.2.1. Methodology Consideration

**i. Scrum**

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Scrum is an agile methodology that is used to manage complex projects, particularly in software development. It involves working in short, iterative cycles called "sprints" to deliver working software. The process emphasizes transparency, inspection, and adaptation, and it encourages frequent communication and collaboration between team members. In Scrum, the team holds daily stand-up meetings to check in with each other and ensure that the work is on track. At the end of each sprint, the team holds a review meeting to demonstrate the work that has been completed and discuss any issues that arose. After the review, the team holds a retrospective meeting to reflect on the sprint and identify areas for improvement. Scrum is designed to be flexible and adaptable, and it is well-suited for projects where requirements are likely to change.

Some benefits of Scrum methodology are as follows:

* **Self-organizing teams:** Scrum teams are self-organizing, meaning that they are responsible for determining how best to complete the work. This can lead to higher levels of team morale and engagement.
* **Flexibility and adaptability:** Scrum is designed to be flexible and adaptable, which means that teams can respond to changing requirements and priorities more easily.
* **Improved collaboration:** Scrum emphasizes the importance of frequent communication and collaboration between team members, which can lead to better teamwork and higher levels of productivity.
* **Faster delivery:** Working in short, iterative cycles allows teams to deliver working software more quickly and get feedback from stakeholders earlier in the process.
* **Continuous improvement:** The focus on delivering working software and getting frequent feedback helps teams identify and fix issues early in the process, which can lead to higher quality software.
* **Greater transparency:** Scrum encourages transparency in communication, both within the team and with stakeholders, which can improve trust and collaboration.

**DSDM**

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| Dynamic systems development method - Wikipedia  Figure 2: DSDM |

DSDM, or Dynamic Systems Development Method, is an agile methodology used for managing the development of software and other systems. It is based on the principles of active user involvement, frequent delivery, and focus on the business need, and emphasizes the importance of delivering working software quickly and getting frequent feedback from stakeholders. Teams work in short, iterative cycles called "timeboxes" to deliver working software, holding regular progress reviews and review meetings to ensure that the work is on track (QA LEAD, 2022). In addition to these features, DSDM is also known for its flexibility and adaptability, which make it an ideal choice for projects where there is a need for frequent communication and collaboration between team members and where requirements are likely to change. Overall, DSDM is a powerful and effective methodology that can help teams deliver high-quality working software efficiently and effectively. So, it is a highly attractive methodology for managing complex projects.

Some benefits of Scrum methodology are as follows:

* **Active user involvement:** DSDM emphasizes the importance of involving users actively in the development process, which can lead to a final product that better meets their needs.
* **Frequent delivery of working software:** By working in short, iterative cycles and delivering working software frequently, teams using DSDM can get feedback from stakeholders earlier in the process and ensure that the final product meets their needs.
* **Focus on the business need:** DSDM places a strong emphasis on meeting the business need, which can help teams deliver products that have a greater impact and value.
* **Flexibility and adaptability:** DSDM is designed to be flexible and adaptable, which means that teams can respond to changing requirements and priorities more easily.
* **Continuous improvement:** The focus on delivering working software quickly and getting frequent feedback allows teams using DSDM to continuously improve the process and deliver higher quality products.

**iii. Extreme Programming (XP)**

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| Figure 3: Extreme Programming (XP) |

Extreme Programming (XP) is an agile software development paradigm that seeks to deliver software of a better quality while also improving the team's quality of life. Of the agile frameworks, XP is the most precise in terms of the proper engineering methods for software development. Teamwork is important in extreme programming. Managers, customers, and developers are all equal partners in a collaborative team. Teams can become very productive because to the environment that Extreme Programming offers in a basic but effective way. To solve the issue as quickly as feasible, the team self-organizes around it (AgileAlliance, 2022).

### 2.2.2. Methodology Section Justification

In this project, I have decided to implement 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**

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| The Rational Unified Proces Methodology (RUP) explained - Toolshero  Figure : Phases of RUP |

**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

## 2.3. Similar Systems

### 2.3.1. Similar System Consideration

**i. System 1**

**System Name: Uber**

**URL:** <https://www.uber.com/>

Uber is a ride-hailing service that uses a smartphone app to connect drivers and passengers. The company was founded in 2009 and is based in San Francisco, California. Uber Technologies Inc. (UBER) is one of the most exciting businesses to arise in the last decade, due to its tremendous expansion and continual controversy. One can order a ride with Uber by using the app and a driver will pick up and transport to the set location. One can pay for the ride using the app, rate the driver, and leave feedback about the riding experience. Uber is a transportation service that is accessible in many locations across the world and is well-known for its ease and convenience of usage (BLYSTONE, 2022).

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| Figure : Uber |

**ii. System 2**

**System Name: OLA**

**URL:** <https://www.olacabs.com/>

Ola is an Indian ride- hailing service. It was founded in 2011 and is now available in over 100 cities worldwide, including India, Australia, New Zealand, and the United Kingdom. Ola's mobile app, which is accessible on iOS and Android devices, allows users to request rides. The software connects drivers and passengers, and users may use it to monitor the progress of their rides and make payments. Ola provides a number of services, including automobile trips, auto rickshaw rides, and, in some areas, boat rides. Customers are promised low pricing and an easy-to-use solution, according to the corporation (engineeringforchange, 2022).

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| Figure : OLA |

**iii. System 3**

**System Name: Lyft**

**URL:** <https://www.lyft.com/>

Lyft is a transportation company that allows users to request rides from drivers using a smartphone app. It is a popular alternative to traditional taxi services and is distinguished by the pink mustaches that drivers wear on the front of their vehicles. Lyft provides a variety of services, including shared rides, in which passengers share a car with others traveling in the same area, and luxury rides, which provide higher-end automobiles for a more premium experience. The company was founded in 2012 and is headquartered in San Francisco, California. General Motors invested $500 million in Lyft in early 2016 to encourage the development of self-driving taxis and a car rental programs for Lyft drivers (DAVIS, 2022).

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| Figure : Lyft |

### 2.3.2. Similar System Comparison

A tabular comparison of my system's features to those of other similar systems are presented below:

Table : Comparison between similar projects

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.N** | **Features** | **My project** | **Uber** | **Ola** | **Lyft** |
| 1 | Registration and login | **✓** | **✓** | **✓** | **✓** |
| 2 | Tuk-tuk service | **✓** | **🗶** | **🗶** | **🗶** |
| 3 | Online payment | **✓** | **✓** | **✓** | **✓** |
| 4 | Offline payment | **✓** | **✓** | **✓** | **✓** |
| 5 | Rating and feedback | **✓** | **✓** | **✓** | **✓** |
| 6 | Bargain option | **✓** | **🗶** | **🗶** | **🗶** |

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