

Tribhuvan University Faculty of Humanities and Social Sciences D.A.V College

Supervisor's Recommendation

I hereby recommend that this project prepared under my supervision by Md Noorullah Khan entitled "ONLINE BIKE RENTAL SYSTEM" in partial fulfillment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

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Tribhuvan University Faculty of Humanities and Social Sciences D.A.V College

LETTER OF APPROVAL

This is to certify that this project prepared by MD NOORULLAH KHAN entitled "ONLINE BIKE RENTAL SYSTEM" in partial fulfillment of the requirements for the degree of Bachelors in Computer Application has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

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Abstract

An online bike rental system is a web-based platform that enables customers to search, book, and manage their bike rentals online. This Bike Rental System, deals with various activities related to the rental or booking systems. In the current existing firms manual record keeping is highly in practice, which is very difficult to organize. Adapting the advancement of technology, Online Bike Rental System can help discard such traditional way of maintaining records. Online Bike Rental System has been designed tocomputerize the operations performed over the information about the customer, vehicles and bookings, and other operations. This computerization of the rental system helps in many instances of its maintenance. It reduces the workload of management as most of the manual work done is reduced.

Keywords: *Online Bike Rental System, booking, traditional, operations.*

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List of Abbreviations

CRUD Create, Read, Update, Delete

DFD Data Flow Diagram

ERD Entity Relationship Diagram

PHP Hypertext Preprocessor

SQL Structured Query Language

VS Visual Studio

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CHAPTER 1 INTRODUCTION

1.1. Introduction

Online Bike Rental System is the service by which users can directly rent a motorcycle and confirm rental services for various purpose over internet. Since technology has advanced, more and more buyers are willing to skip physically visiting the showroom in favor of riding an expensive motorcycle and using a computer and the internet. This is the result of the World Wide Web's development. Businesses have tried to rent out their pricey motorcycles to web surfers. Thus, with the aid of a computer and the internet, people can rent almost anything thatmeets their needs online.

The main purpose of this project is to develop an online bike rental system that will rent out motorcycles via the internet. Additionally, the system's development has made it dependable, safe, and easy to use. It is the system that maintains number of motorcycles and can book and rent them out for a set amount of time. A bike rental is a rented vehicle that can be used temporarily for a fee during a specified period. Getting a rental bike helps people get around despite the fact they do not have access to their own personal vehicle or don't own a vehicle at all.

The main target audience of this system is bike enthusiasts. Owning a high-end motorcycle is expensive. Most people appreciate the idea of renting a bike and riding it whenever they want. Bike rental services are used by people for many purposes, one of which is transportation.

Not just for tourism, but also for personal and work commutes, people are turning to bike rental services. Nepal's market for two-wheeler rental services is ripe with opportunities, and new rental platforms are igniting a new passion among city dwellers. People can rent a variety of bikes for different periods depending on their needs and preferences.

1.2. Problem Statement

All of us have a fascination for motorcycles. The number of bike lovers is increasing day by day. Since a motorcycle is an expensive product, so it is not possible to purchase for everyonein terms of financial condition. However, it is possible to fulfill their desire to ride bikes through rental services. In this way the customer will be able to rent a bike according to his needs. Although this service is available outside our country, this service has not yet been fully launched in Nepal. However, this business has immense growth potential. So, it will become very popular in this country very soon.

The proposed solution involves the development of a robust online platform that integrates user-friendly interfaces, booking functionalities and bike listings. The Online Bike Renting System is reliable for the customers as it provides customer register and login portal for the registration process. The customers can easily view the list of different motorcycles and also can view the status of vehicle and easily apply for rent. They do not have to visit the sites for the confirmation process as, clients can receive confirmation as soon as they apply or book bike for rent through the web application. The admin can also easily view the reservation history and update the bike status. Most importantly, there is less probability of data loss.

1.3. Objective

The primary goals of this system are:

- To develop a web-based system to reserve bike online.
- To provide customers platform for easy browsing, booking, and renting of bike.

1.4. Scope and Limitation

Every application has its unique feature and its limitation. This system offers the following scope and lacks the following things:

Scopes:

- User-friendly environment.
- Users can easily view book details in their dashboard.

- Unauthorized users cannot access the system.
- Users of any or no experience can easily browse through the website.
- User can easily view the availability status.

Limitations:

- No online payment available, only cash on site is preferred.
- Since it is online based, internet is required. The location of vehicles or customers who
 booked the vehicles cannot be tracked.

1.5. Report Organization

The report on "Online Bike Rental System" is organized into Five chapters.

Chapter 1:

Includes the introduction of whole project in brief.

Chapter 2:

Describes the background study of the present system available related to rental system. Includes overview of related existing systems and their pros and cons.

Chapter 3:

Describes the analysis and design of the system which consists of the functional and non-functional requirements of the system along with use case diagrams. It also explains the feasibility analysis of the system.

Chapter 4:

Presents the Implementation, Testing, and debugging part of the system.

Chapter 5:

Provides brief explanation that Conclusion, Limitations, and Future Enhancement of the system.

CHAPTER 2 BACKGROUND STUDY AND LITERATIRE REVIEW

2.1. Background Study

This online bike rental system is a web-based system for the users or customers that rents bike. This system enables the bike rental firms to make their services available to the public through the internet and also keep records about their services. This is a platform that allows renting bike for a short period of time for a few days or week This system can be used to make service more popular and accessible to the public as it has been transformed into a web-based system and connected to the internet were everyone can be able to have access to it [1]. In today's world, the use and access to the internet are so high so most people are busy with their job so, this system is developed so that users or customers can create and access their accounts through the use of the internet and general concept and terminologies are mentioned below:

- 1. Create New Account: A user can register an account through the registration process and the user can create an account when there is access to the internet through this module.
- 2. Login: After the creation of the account user can log in through their valid details and can access to customer dashboard of this system.
- 3. Book Bike: After logging in, customers can book the desired bike based on some terms and conditions.
- 4. Approves the booking: Admin can approve the rental request sent by a customer.

2.2. Literature Review

We have surfed through some of the rental-based websites, and we observed those and compared the features with this system. One of them is Self-Drive Nepal.

The online bike rental system offers two distinct portals to cater to its users: the Client-side Portal and the Admin Portal.

The Client-side Portal provides a range of features aimed at facilitating the user experience. Firstly, it offers User Management capabilities, allowing users to create accounts and log in

securely. Additionally, the portal enables Rental Management by sending vehicle booking requests to the admin along with customer information and booking details. Customers can also submit inquiries through the Enquiry feature, which forwards these to the administrative site for handling. The portal further allows clients to browse and view the available vehicles through the 'Show vehicle list' feature, aiding them in making informed booking decisions. An integrated chatbot is also available, allowing customers to communicate with the admin, with automatic replies being generated for user queries. Furthermore, customers can track their rental history through the 'Total bookings' feature and view detailed booking information, including renting dates, locations, and request statuses, via the 'Show booking details' section in their dashboard [1].

On the other hand, the Admin Portal is designed to streamline the administrative tasks associated with managing the rental system. It provides a clear overview of the booking requests received from clients, displaying the client's renting request alongside their booking details. The administrator has the authority to update and expand the rental vehicle list through the 'Add vehicles to the list' feature, ensuring that the system's offerings remain upto-date. The portal also facilitates communication by displaying and allowing responses to the inquiries sent from the client side through the 'Show enquiries' section. Additionally, the Admin Portal maintains a comprehensive 'Show users list' that records all users who have utilized the system for renting purposes, aiding in effective user management.

Limitation of this system, the user could book any vehicle without adding any documents like license. This "Online Bike Rental" system will ask to add license photo along with sign up and later again with bike rental so that admin can verify it and approve the rental.

Another system is Maharjan Bikes Rental [2]. The system in that website only had vehicle data and their rates and we could only enter our name and email in their system. This system offered Bikes Rental Rate, Vehicle gallery and their contact information. Limitation of this Existing system: Maharjan Bikes Rental did not have any kind of authentication or authorization. Image of citizenship and passport could not be uploaded in it even though the system had mentioned about citizenship and passport.

This "Online Bike Rental" system will add authentication and authorization.

CHAPTER 3 SYSTEM ANALYSIS AND DESIGN

3.1. System Analysis

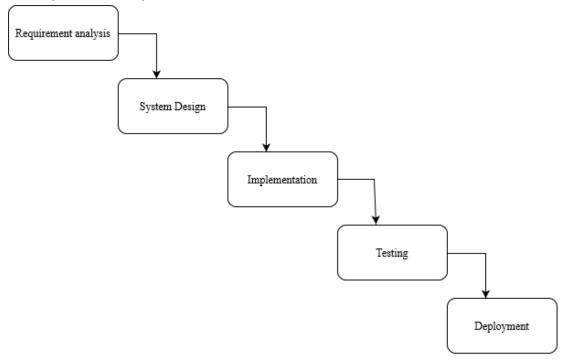


Figure 3.1 Waterfall Model

The waterfall model is ideal for developing this project because all the requirements are known and there is not much time left for development. The requirements analysis, system design, implementation, testing, and deployment phases make up the project's five stages.

3.1.1. Requirement Analysis

I. Functional Requirements

• Customer Login/Registration Module:

This system allows customers to establish and manage accounts, including personal information.

Customer Dashboard:

It shows different varieties of bike to apply for rent to the customers.

It allows customer to see the availability status of vehicles.

• Admin Dashboard:

Administrator has the access of viewing details of rented vehicles.

Admin has an option to add list of vehicles and change the vehicle status.

• Bike Selection:

The system allows customers to select any bike from the varieties of bikes to rent.

• Availability Status:

This system provides accurate details about vehicles, vehicle availability status and pricing to customers.

• Rental Management:

Customers can use this system to reserve and cancel a rental online.

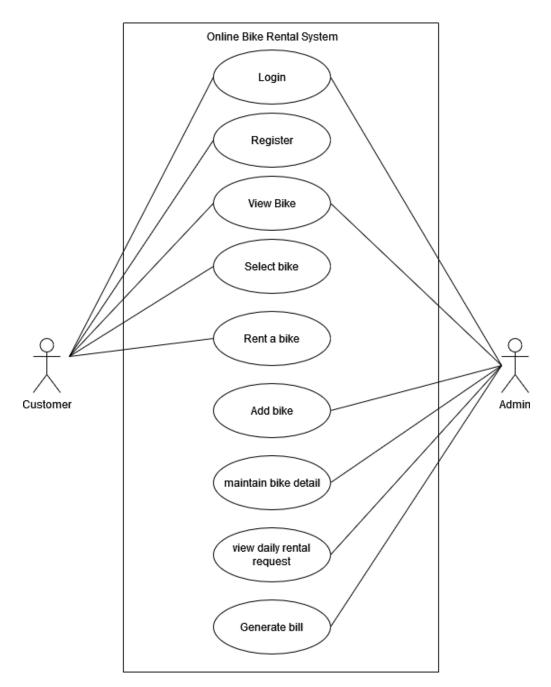


Figure 3.2 Use Case Diagram

The use case diagram of this rental system is as shown above. This system has two users i.e., customer and the admin. Here admin and customer both have their own respective roles. The customer needs to register and customer as well as admin both need to login to the system. The admin has the authority to maintain all the bike related details such as bike rate, booking status etc. whereas the customers also have total authority in renting bikes with their choices.

II Non-Functional Requirement

a) Usability:

The system has a user-friendly design so that it will be easy to navigate and understand for the clients.

b) Security:

The system is quite secured as all the rental details are recorded.

c) Reliability:

The system is available at all times.

3.1.2. Feasibility Analysis

i. Technical Feasibility:

This project can simply run in the web browser easily. The programming language used in this system is PHP and since this is the easy to implement there is less possibility of system failure. Hence, the system is technically feasible.

ii. Operational Feasibility:

The major goal of this project is to provide a system that is valuable and beneficial to client. This system provides the convenience of online renting. This project has manageable design which is reliable for the users or clients for the interaction. Hence, we can say that this project is operationally feasible.

iii. Economic Feasibility:

It is the measure of cost effectiveness of the project. All the procedure is done online, customer do not have to visit vehicle rental companies' site which reduces the cost as well as time. Since we are using PHP and other free applications to develop this system it is economically feasible.

iv. Schedule

The development of the project is completed under the time criteria with every aspect necessarily implemented and documents properly presented. The time schedule of the different parts of the project can be seen below in the following Gantt chart.

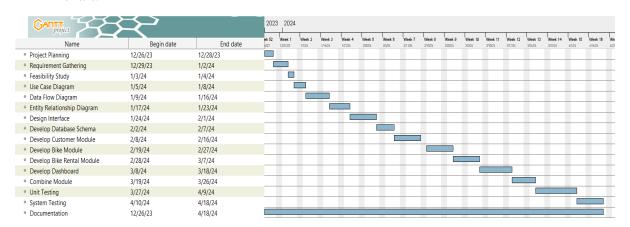


Figure 3.3 Gantt Chart

The above figure replicates the time schedule for online bike rental project. The project period has been scheduled from the project planning phase till the documentation phase. The documentation has been carried on since the first day of the project. The Gantt chart of this project has been planned as per the waterfall model. The project was started on 26th of December and will be completed by 4th of April. The project will be completed with duration of about four months.

3.1.3. Data Modeling (ER-Diagram)

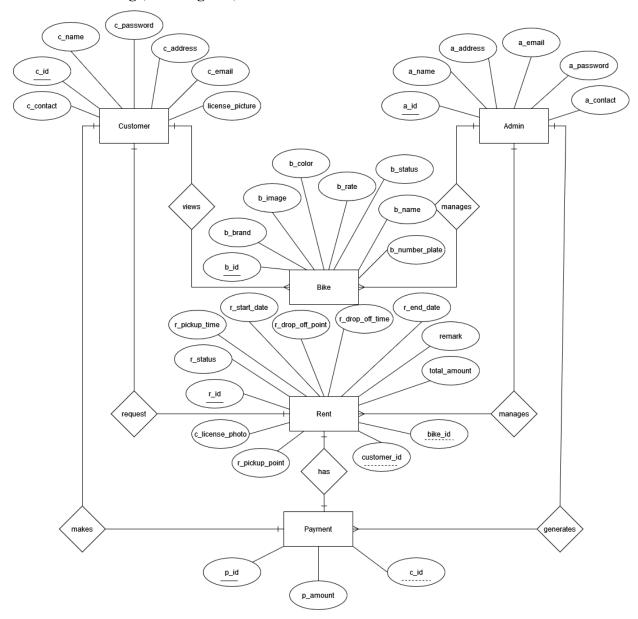


Figure 3.4 ERD

The above figure replicates the entity relationship diagram of the online bike rental system. This system consists of five entities along with their respective attributes. The relationship has been developed within those entities. Here the entities are customer, admin, bike, rent and payment. The relationship that exists between the entities are one to many and one to one. The relationship is symbolized with diamond shape, entities with rectangular shape and attributes with oval shape. Here, the primary keys are all unique and well identified and underlined. The foreign key also has been well defined.

3.1.4. Process Modeling (DFD)

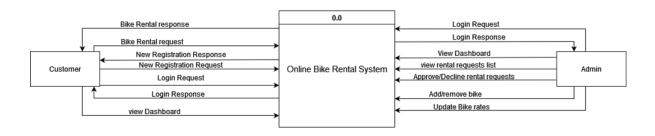


Figure 3.5 level 0 DFD

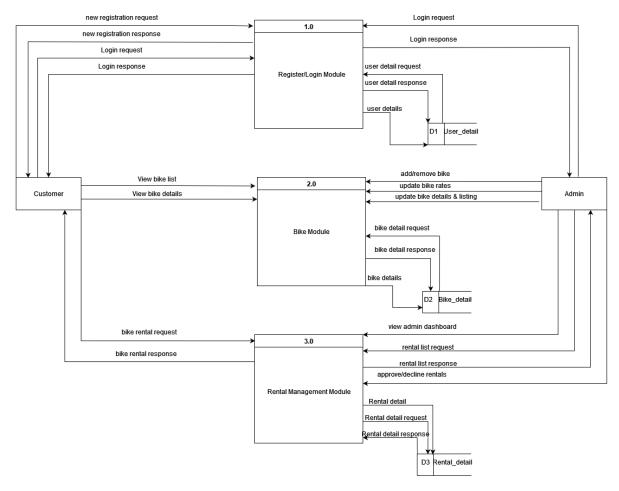


Figure 3.6 level 1 DFD

3.2. System Design

3.2.1. Architecture Design

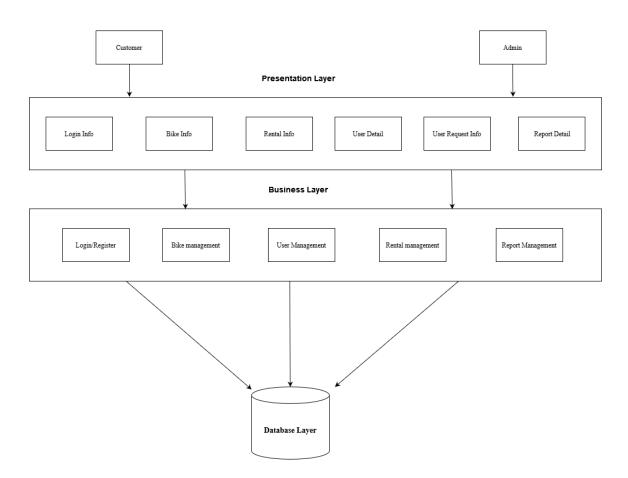


Figure 3.7 3-tier Architecture Design

3.2.2. Database Schema Design

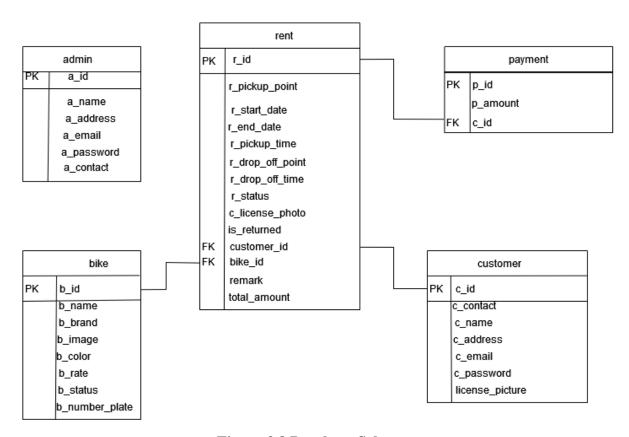


Figure 3.8 Database Schema

3.2.3. Interface Design (UI Interface/Interface Structure Design)

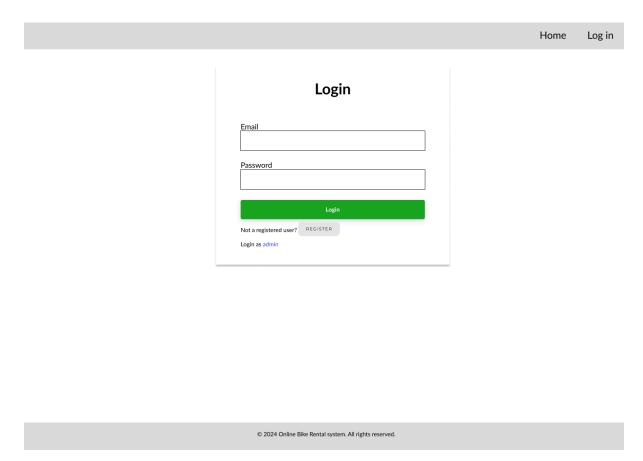
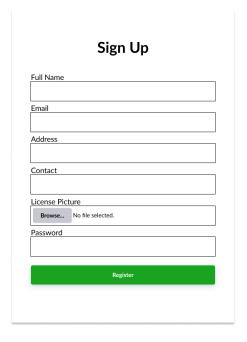


Figure 3.9 Login Page



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Figure 3.10 Register Page

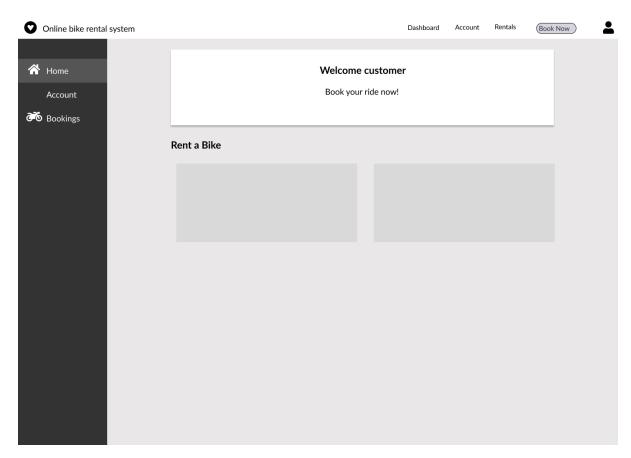


Figure 3.11 Customer Dashboard

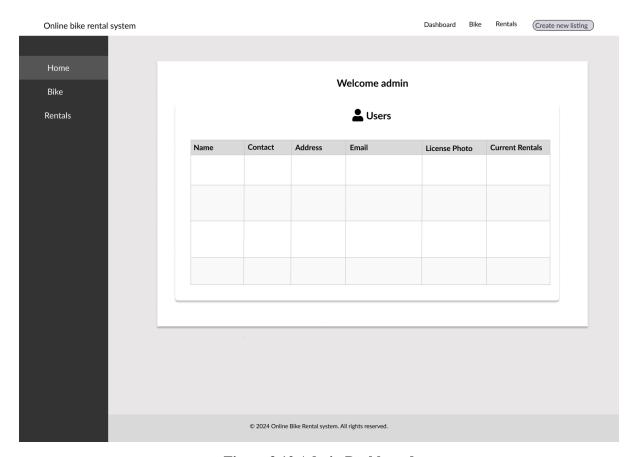


Figure 3.12 Admin Dashboard

CHAPTER 4: IMPLEMENTATION AND TESTING

4.1. Implementation

4.1.1. Tools Used:

- Draw.io
- Gantt Project
- PHP
- MySQL
- Java script
- Xampp
- VS code

4.2. Testing

The aim of program testing is to help realize/identify all defects in a program. However, in practice, even after satisfactory completion of the testing phase, it is not possible to guarantee that a program is error free. This is because the input data domain of most programs is very large, and it is not practical to test the program exhaustively with respect to each value that the input can assume. The primary goal of software testing is to identify defects, errors, or bugs in the software and ensure that it behaves as intended. Testing is an integral part of the software development life cycle, helping to deliver quality and reliable product to end-users [3].

4.2.1. Test Case for Unit Testing

A test case for unit testing includes input data, expected output, and a set of conditions or actions to be tested. Individual components or functions of a program in a software are tested in isolation to ensure that they work as expected.

Table 4.1 Admin Login Test

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S.N	Test Case	Test Data	Expected Result	Result
1.	Admin enter valid	Email:test@gmail.com	Redirects to	Pass
	username and password	Password:test	admin dashboard	
2.	Admin enter invalid	Email:testabc@gmail.c	Invalid	Pass
	Email and password	om	credentials	
		Password:123		

Table 4.2 Customer Registration Test

S.N.	Test Case	Test Data	Expected Result	Result
1.	Customer registers to	Full name: test	Redirects to	Pass
	the system	Email:	customer login	
		test2@gmail.com	module	
		Address:		
		teku		
		Contact: 1234567891		
		Password: test123		
2.	Customer registers	Full name: test	Cannot register:	Fail
	to the system with	Email:	User already	
	same name, email,	test2@gmail.com	exists	
	address, contact,	Address:		
	password	teku		
		Contact: 1234567891		
		Password: test123		

Table 4.3 Customer Login Test

S.N.	Test Case	Test Data	Expected Result	Result
1.	Customer logs in	Email:test2@gmail.com	Redirects to	Pass
	with registered data.	Password:test123	customer dashboard	
2.	Customer logs in	Email:test3@gmail.com	Invalid Credentials	Pass
	with unregistered	Password:test1234		
	data			

Table 4.4 Add and Request Bike Test

S.N.	Test Case	Test Data	Expected Result	Result
1.	Admin adds	Bike Name: hunter 350	New row is added	Pass
	vehicle through	Bike brand: royal enfield	to the list of	
	form	Bike color: red	bike table.	
		Bike rate: 125		
		Bike photo:		
		Bike number plate Photo:		
2.	Customer request	Pickup point:	show booking	Pass
	Bike through	Start Date:	successful &	
	booking form with	End Date:	the details is sent	
	all field filled.	Pickup Time:	to the admin in	
		Drop Off Point:	rental management	
		Drop Time:	for	
		License Photo:	approval/rejection.	

4.2.2. Test Cases for System Testing

Table 4.5 Test Cases for System Testing

S.N.	Test Case	Test Data	Expected Result	Result
1.	Customer registers to	Full name: test	Redirects to	Pass
	the system	Email:	customer login	
		test2@gmail.com	module	
		Address:		
		teku		
		Contact: 1234567891		
		Password: test123		
2.	Customer register	Email: test2@gmail.com	Displays user already	Pass
	with the already		exists	
	registered email			
3.	Customer logs in	Email:test2@gmail.com	Redirects to customer	Pass

	with registered data.	Password:test123	dashboard	
			approval/rejection.	
4.	Customer logs in with	Email:hellow@gmail.com	Display invalid	Pass
	not registered data	Password:123123	credentials	
5.	Admin adds new	Bike Name: hunter 350	Displays bike	Pass
	bike.	Bike brand: royal enfield	in admin	
		Bike color: red	dashboard and also	
		Bike rate: 125	displays in	
		Bike photo:	customer dashboard.	
		Bike number plate Photo:		
6.	Customer request	Pickup point: dhobighat	Booking successful	Pass
	bike	Start Date: 5/5/2024	pop up and redirect to	
		End Date: 5/6/2024	bookings	
		Pickup time:12:00 PM		
		Drop time: 12:00 PM		
		License Picture:		
7.	Admin	Admin clicks	Displays approved or	Pass
	approves / reject	approve button to approve vehicles or	rejected status after	
	Booking request	reject button to reject	clicking.	
8.	Customer	vehicles. Admin clicks on	Displays the status	Pass
0.	Returns the	returned button	of vehicle as	1 433
	vehicles after Rental		returned after updated by	
	Period is		admin.	
0	over.	Start data: 2024 02	Tt 1 11	D
9.	Customer can choose	Start date: 2024-03- 28	It sends the request to	Pass
	specified	End date: 2024-03-29	admin for approval	
	time and date	Start Time:6:00 End Time:12:00		
10.	Customer	Start date: 2024-04-	It gives error message	Pass
	chooses wrong date	28 End date: 2024-03-25	dates cannot be	
	and time	2021 00 25	selected before started	

			date	
11.	Customer cancels the bike rental	Press the cancel button on pending	It confirms cancellation and cancels the booking	Pass
12.	Admin edits bike	Edits bike info	Displays update bike info	Pass
13.	Admin deletes bike	Press delete bike	Removes the bike from database	Pass
14.	Inserting javascript or html codes on forms	<script>console.log ('Hello'); </script>	It displays it into plain text and wont run the code in it	Pass
15.	Trying to delete a bike with link in different pages after log out	Press delete	Shouldnot delete the bike if session destroyed	Fail

CHAPTER 5 CONCLUSION AND FUTURE RECOMMENDATION

5.1. Lesson Learnt/Outcome

After the completion of Online Bike Rental System project, the following things were achieved while constructing this project:

- Learned about HTML, CSS, PHP, JavaScript and MySQL.
- Learned about how to connect all the modules.
- Learned about research and literature review of system.
- Learned to solve problems while testing.
- Learned to implement a CRUD operation in a system.

5.2. Conclusion

The Online Bike Rental system is simply a web-based application that provides facility of renting bikes online. All the modules required to build this system have been implemented successfully. After the successful completion of Online Bike Rental System Project, the customers can perform easy bike rental transactions. This web application has been developed with all the objectives fulfilled. All the specifications have been followed strictly. After completion of Online Bike Rental System project, the customers will now be able to view the available bikes in their dashboard. Customers will be able to request various bikes to rent. Admin can now easily add and remove bikes to the list. Admin have the authority to approve or reject the rental request based upon the certain defined credentials. Admin can now insert, update, delete the vehicle that will be shown in the customer dashboard. Hence this system has been developed to provide reliable services to the customer to book or rent bike anywhere and at any time.

5.3. Future Recommendations

There is a lot that can be added to enhance the features of this web application. Other extra modules can be added to make this system more realistic. Some future recommendations that can be added in this system are:

- Accessing the online payment method.
- GPS Bike Tracking.
- Implementation of graph report of rental history for admin dashboard.

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APPENDICES

