A SYNOPSIS ON

Scooty and Bike rental service application

Submitted in partial fulfilment of the requirement for the award of the degree of

BACHELOR OF TECHNOLOGY

In

Computer Science & Engineering

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Graphic Era Hill University, Bhimtal, Uttarakhand March-2025

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CANDIDATE'S DECLARATION

We hereby certify that the work which is being presented in the synopsis entitled **"Scooty and bike rental service application "** in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science & Engineering of the Graphic Era Hill University, Bhimtal campus and shall be carried out by the undersigned under the supervision of **MR. Anubhav Bewerwal**, Assistant professor Department of Computer Science & Engineering , Graphic Era Hill University, Bhimtal.

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The above mentioned students shall be working under the supervision of the undersigned on the **"Scooty and bike rental service application"**

Signature	Signature
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Internal Evaluation (By DPRC Committee)

Status of the Synopsis: Accepted / Rejected Any

Comments:

Name of the Committee Members: **Signature with Date**

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Chapter 1 Introduction

In today's busy world, people need quick and easy ways to travel short distances. Not everyone owns a vehicle, and public transport is not always convenient. That's why scooty and bike rental services are becoming more popular.

This project is about creating a **Scooty and Bike Rental Service Application** that helps people rent two-wheelers easily using their mobile phones. The app will show available vehicles nearby, allow users to book them for a certain time, and make payments online. It will also help owners manage their bikes and bookings.

This application is useful for students, office workers, and tourists who need a simple, affordable, and fast way to travel around the city.

Problem Statement:

In today's fast-paced world, transportation plays a vital role in everyone's daily life. With the growing population and increasing number of vehicles on the road, traffic congestion, pollution, and parking issues have become major problems in cities. Moreover, not everyone can afford to buy and maintain a personal vehicle, especially students, tourists, or working professionals who just need a vehicle for a short duration or specific purpose.

Public transportation is available but often comes with its own set of challenges like fixed routes, limited timings, overcrowding, and delays. In such a scenario, people are looking for more flexible, affordable, and convenient transportation options.

A scooty and bike rental service can be a perfect solution to these problems. It allows users to rent two-wheelers (either scooty or motorbikes) for a few hours, a day, or even longer periods depending on their needs. This service helps users save money, avoid traffic, and reach their destinations faster.

However, there is a lack of a well-organized, easy-to-use digital platform where people can browse, book, and pay for two-wheeler rentals. Many local rental services are still operating manually, which causes confusion, delays, and sometimes a lack of availability of vehicles. Customers also face difficulties in locating nearby rental points, knowing the condition of vehicles, comparing prices, and ensuring security.

Therefore, there is a strong need for a Scooty and Bike Rental Service Application that brings all these features into one platform. The application should be user-friendly and allow users to register, choose a vehicle, check its availability, book it, make payments, and also locate pick-up and dropoff points using GPS. Additionally, the application should maintain user and vehicle records, monitor vehicle condition, and provide customer support.

Chapter 2 Background / Literature Survey

Background :

The shared mobility market in India is expected to reach **$2 billion by 2030**, and two-wheelers form a major part of this market. Platforms like **Yulu**, **Bounce**, and **Vogo** have demonstrated that two-wheeler rentals are not just viable but highly scalable. The rise of smartphones, cheaper mobile internet, and digital payment systems like UPI has further supported this growth.

Insights from existing literature and case studies:

- **Usability First**: A user-centric interface increases repeat bookings by up to 40%.
- **Fleet Tracking and Optimization**: GPS tracking and smart locking systems are essential for managing vehicle misuse and theft.
- **Payment Flexibility**: Integrating multiple payment options (UPI, cards, wallets) significantly boosts conversion.
- **Data Analytics**: Historical ride data can be used for predictive maintenance, demand forecasting, and dynamic pricing.

Gaps in Existing Systems:

- Few platforms cater to **Tier 2 & Tier 3 cities**.
- Most services are limited to **short ride durations** and lack long-term rental options.
- Poor support for **electric vehicles** (EVs) and no integration with battery-swapping stations.
- No gamification or **loyalty features** to retain users.

By addressing these gaps, this project aims to design a more robust, scalable, and customerfriendly rental ecosystem.

Chapter 3

Objectives

This project is designed with the following clear and measurable objectives:

Core Functional Objectives:

- Develop a **user-friendly mobile and web app** to facilitate seamless scooty/bike rentals.
- Enable **real-time vehicle discovery** using live location tracking.
- Offer **OTP-based login**, with **optional Aadhaar/Driving License upload** for verification.
- Allow users to **book, unlock, and end rides** via the app.
- Display **ride metrics** like distance, speed, and fare in real-time.
- Provide **secure digital payments** through multiple gateways (Razorpay, UPI, Paytm).
- Enable **user ratings, reviews, and ride history** tracking.

Admin and Business Objectives:

- Build a **robust admin dashboard** for vehicle inventory, maintenance, and bookings.
- Implement analytics for **peak-hour demand**, **most-rented vehicles**, and **revenue tracking**.
- Allow scheduling and logging of **routine maintenance and servicing**.
- Enable **discount code generation** and promotional offers.
- Support **franchise management** for local partners to expand services city-wide.

Future-Proof and Advanced Features:

- **IoT integration** for smart locks and battery monitoring.
- **Gamification modules** (e.g., earn credits for eco-friendly rides).
- AI-based **predictive analytics** for demand and pricing optimization.
- **Battery swap station locator** for EVs

Chapter 4

Hardware and Software Requirements

Hardware Requirements:

Component	Description
Smartphone	Android/iOS device with GPS & 4G internet
PC/Laptop	For developers and admin dashboard access
GPS Tracker (optional)	For real-time location of rental vehicles
Smart Lock (future version)	To remotely lock/unlock vehicles via mobile app
Cloud Hosting Server	For backend API hosting and data storage

Software Requirements:

Component	Details
Frontend	Flutter / React Native for cross-platform mobile development
Backend	Node.js (Express) or Django REST Framework
Database	MongoDB / Firebase Firestore / PostgreSQL
Authentication	Firebase Auth / OAuth 2.0 / Custom JWT-based login system
Payment Gateway	Razorpay / Paytm / PhonePe integration
Admin Panel	React.js / Vue.js based single-page application
Cloud Services	AWS EC2 / Google Cloud / Firebase Hosting
Tools	Postman, GitHub, VS Code, Android Studio, Figma

Chapter 5

Project Approach

The development of this project will follow a step-by-step approach to ensure a smooth and successful implementation. The methodology can be divided into the following stages:

1. Requirement Gathering:
Understand the needs of users (tourists, locals, students, etc.) in hilly areas.
Identify features like vehicle booking, GPS tracking, payments, login system, etc. Study existing bike rental apps to see what works and what can be improved.

2. System Design:
Design the app layout (UI/UX) using wireframes or prototypes.
Plan the backend system for data handling (bookings, users, vehicles, payments). Decide on the technologies (Flutter, Firebase, Google Maps, etc.).

3. Frontend Development:
Build the user interface of the app using Flutter or React Native.
Include screens like login, home, vehicle list, map, booking, and payment. Ensure the app is simple, attractive, and easy to use.

4. Backend Development:
Create server-side logic using Node.js or Django.
Connect the app to the database (Firebase or MySQL) for storing user and vehicle data. Set up APIs for login, booking, vehicle status, and payments.

5. Integration of Services:
Add Google Maps API for location tracking and navigation.
Integrate payment gateways (Razorpay, Paytm) for smooth transactions. Set up Firebase Authentication for user login and security.

6. Testing:
Test the app using tools like JUnit or Appium to find bugs and fix errors.
Perform both manual and automated testing for smooth performance.
Check app behavior on different devices and in poor network areas (common in hilly regions).

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