



“Design & And Implementation Of An Electric Retrofit For Conventional Scooty”

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Abstract: E-bikes combine the familiar mechanics of a bicycle with the power of an electric motor, making them an attractive alternative to traditional bicycles and cars. The motor is powered by a rechargeable battery, which can be recharged through a wall outlet. The assistance provided by the motor can range from a subtle boost to a more substantial level, allowing the rider to pedal less or even coast for stretches.

The biggest drawback of today's I.C. Engine motorcycles on the market is that the exhaust generated by the engine contributes to increased emissions in the environment. The fuel used to power those bikes is non-renewable, and when they're running, they make a lot of noise. Also issue of PUC due to a vehicle life is age bar. Electric scooty currently have a number of advantages over traditional I.C. engine motorcycles, but they are limited in terms of mileage. The aim of this paper is to create a cost-effective electric motorcycle while also addressing one of the electric motorcycle's main drawbacks, namely, mileage (km/charge). The goal of the paper can be met by employing low-cost materials and equipment that can increase the mileage of a motorcycle by repurposing the energy released by the engine.

Introduction

Designing and modifying electric scooters involves replacing the conventional internal combustion engine with an electric motor, utilizing a battery for power, and incorporating electronic controllers for speed and power regulation. This modification offers benefits like reduced pollution, lower maintenance, and a smoother, quieter ride. The design process includes selecting appropriate components like the electric motor, battery, and controller, as well as optimizing the chassis and other structural elements for weight and performance.

The transportation industry is undergoing a major shift towards sustainability and innovation, with electric vehicles (EVs) leading the way. Among them, E-bike scooters have emerged as a popular choice due to their eco-friendliness, cost-effectiveness, and efficiency. This project report aims to analyze the design, functionality, advantages, and market potential of E-bike scooters, exploring how they contribute to a greener and more sustainable future.

The core idea behind E-bike scooters is their ability to provide an alternative to conventional petrol based two wheelers reducing dependency on fossils fuels while also cutting carbon emission these vehicles are powered by rechargeable batteries after ion making them an ideal mode of transportation for urban commuters. The term "electric vehicle" refers to a vehicle that is propelled by one or more electric motors or traction motors (EV). A self-contained electric vehicle can convert gasoline to energy using a battery, solar panels, fuel cells, or an electric generator, or it can be powered by electricity from off-vehicle sources using a collector system. E- Cycle is an electric and power-assisted bicycle that is one of the bicycle industry's fastest-growing technologies. This bicycle has an electric motor to assist you in moving forward. As a result, you can ride it like a regular bicycle while exerting less effort. An E-Cycle motor works by turning on automatically when you peddle or throttle. There are two main types of E-Cycle

3.1 Population and Sample

In statistics, a population refers to the entire group of individuals or objects that are the focus of a study, while a sample is a subset of that population that is selected for analysis

3.2 Data and Sources of Data

Data can also be gathered from company records, market research, public records, industry studies, customer feedback, and more. places

3.3 Theoretical framework

There's a good chance that many different theories about your topic already exist, especially if the topic is broad. In your theoretical framework, you will evaluate, compare, and select the most relevant ones.

By "framing" your research within a clearly defined field, you make the reader aware of the assumptions that inform your approach, showing the rationale behind your choices for later sections, like methodology and discussion. This part of your dissertation lays the foundations that will support your analysis, helping you *interpret your results* and make broader generalizations

The equations are an exception to the prescribed specifications of this template. You will need to determine whether or not your equations should be typed using either the Times New Roman or the Symbol font (please no other font).

I. RESEARCH METHODOLOGY

The methodology section outlines the plan and method that how the study is conducted. This includes Universe of the study, sample of the study, Data and Sources of Data, study's variables and analytical framework. The details are as follows;

3.1 Population and Sample

The term "EV population" refers to the number of electric vehicles in a specific area, while "EV sample" refers to a smaller subset of the EV population used for analysis or study. EV population data is important for understanding trends in EV adoption, identifying areas with high EV usage, and informing infrastructure planning. Samples are used to make inferences about the entire EV population when direct analysis of the entire population is impractical

3.2 Data and Sources of Data

- **Weather Data:** Weather conditions can impact EV range and energy consumption.
- **Traffic Data:** Traffic congestion can affect driving time and energy usage.
- **Public Charging Data:** Data on the availability and usage of public charging stations can help optimize EV charging infrastructure.
- **Grid Data:** Data on electricity generation and distribution can help understand the impact of EV charging on the grid.
- **Geospatial Data:** Information on location and geographical features can be used to understand EV usage patterns.
- **Traffic Data:** Traffic data can help understand the impact of EVs on traffic flow.
- **Electricity Tariffs:** Data on electricity rates can be used to optimize EV charging decisions.
- **Drive Cycle Profiles:** Understanding the typical driving patterns of EVs can help optimize battery design and charging infrastructure.

Key Parameters for EV Charging Profiles:

- **Battery Capacity:** The size of the EV's battery pack.
- **Charging Power:** The rate at which the battery can be charged.
- **Plug-in State of Charge (SOC):** The level of charge when the EV is plugged in.
- **Plug-in/Out Time:** The time when the EV is plugged in and unplugged.

Charged Energy: The amount of energy transferred during the charging session.

3.3 Theoretical framework

In a rapidly evolving landscape shaped by technological innovation and environmental challenges, EVs (Electric Vehicles) have become a foundation of sustainable transportation solutions. Despite their potential, significant hurdles remain, including high initial costs, inadequate infrastructure, technological limitations, and consumer resistance. This research aims to provide a comprehensive analysis of the key factors and barriers associated with adopting EVs across global markets, leading to the developing of a structured framework that businesses can leverage for strategic market entry.

The study is divided into three main chapters: an exploration of current trends in automotive innovation with a focus on EV development; a literature review and theoretical framework that identifies the core drivers and barriers to EV adoption; and a set of findings and managerial implications offering actionable recommendations for businesses looking to enter the EV market. The research will also incorporate case studies and real-world examples to highlight how different regions and companies have tackled these challenges.

The ultimate goal is to propose a practical, step-by-step framework that allows businesses to evaluate market readiness, allocate resources efficiently, and tailor regional strategies based on specific market dynamics. By addressing these critical issues, the research offers valuable insights for companies seeking to secure a competitive position in the expanding EV market.

Furthermore, it contributes to global sustainability efforts by supporting the widespread adoption of cleaner, more efficient transportation solutions

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3.4 Statistical tools and econometric models

This section elaborates the proper statistical/econometric/financial models which are being used to forward the study from data towards inferences. The detail of methodology is given as follows.

3.4.1 Descriptive Statistics

Descriptive Statics has been used to find the maximum, minimum, standard deviation, mean and normally distribution of the data of all the variables of the study. Normal distribution of data shows the sensitivity of the variables towards the periodic changes and speculation. When the data is not normally distributed it means that the data is sensitive towards periodic changes and speculations which create the chances of arbitrage and the investors have the chance to earn above the normal profit. But the assumption of the APT is that there should not be arbitrage in the market and the investors can earn only normal profit. Jarque bera test is used to test the normality of data.

3.4.3 Comparison of the Models

- **Battery Electric Vehicles (BEVs):**

These are fully electric, powered solely by batteries. They offer zero tailpipe emissions and are available in various body styles (sedans, SUVs, hatchbacks, etc.).

- **Plug-in Hybrid Electric Vehicles (PHEVs):**

These combine a gasoline engine with an electric motor and battery. They can run on electricity alone for short distances and can be recharged by plugging into an outlet.

- **Fuel Cell Electric Vehicles (FCEVs):**

These vehicles use a fuel cell to convert hydrogen into electricity, producing only water as a byproduct. They are still in development and less common than BEVs

3.4.3.1 VEHICLE WEIGHT CALCULATION

Person Weight	=	100kg
Battery Pack	=	6kg
Motor & Controller	=	4kg
Cycle weight	=	10kg

Total	=	120kg

3.4.3.2 Posterior Odds Ratio

Our initial hypothesis was that e-scooter and e-bike related injuries, particularly lower extremity injuries, would have a higher incidence of medial-sided involvement due to the mechanism of many e-scooter injuries, as riders plant their extended leg to stop, causing a rotational moment on the lower extremity combined with the sudden deceleration. Isolated medial-sided fractures of long bones are observed less frequently than their lateral counterparts, and they have historically been associated with high-energy trauma in orthopedic literature. Not only can this be explained by the fact that traumatic impact most often comes from the lateral side, but also likely related to the biomechanics of medial-sided bones and bony prominences.

IV. RESULTS AND DISCUSSION

Shoulder	18 (13.2)
Shoulder dislocation	6 (4.4)
Scapula fracture	4 (2.9)
Clavicle fracture	7 (5.1)
Acromioclavicular separation	1 (0.7)
Humerus	10 (7.4)
Proximal humerus fracture	4 (2.9)
Humeral shaft fracture	1 (0.7)
Distal humerus fracture	2 (1.5)
Supracondylar humerus fracture	2 (1.5)
Capitellum fracture	1 (0.7)
Elbow	22 (16.2)
Radial head fracture	11 (8.1)
Radial neck fracture	3 (2.2)
Olecranon fracture	4 (2.9)

Elbow dislocation	2 (1.5)
Monteggia injury	1 (0.7)
Terrible triad injury	1 (0.7)
Forearm	14 (10.3)

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