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**KSCST Project synopsis**

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**KSCST ID: 46S\_MTech\_002**

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**Title: Development of a Low-Cost Modified Hybrid Bike for Rural Areas**

**Synopsis:**

The proposed project aims to address the transportation challenges faced by rural communities in Karnataka by developing a cost-effective modified hybrid bike. This innovative solution incorporates a hub motor (BLDC) and a lithium-ion battery system, while utilizing a 2-stroke engine for enhanced efficiency and affordability.

The primary objective of this project is to design and develop a modified hybrid bike that can provide reliable and sustainable transportation options for rural areas. The utilization of a hub motor powered by a brushless DC (BLDC) system allows for efficient power delivery and improved performance. Additionally, the integration of a lithium-ion battery system ensures long-lasting power storage and enables eco-friendly operation.

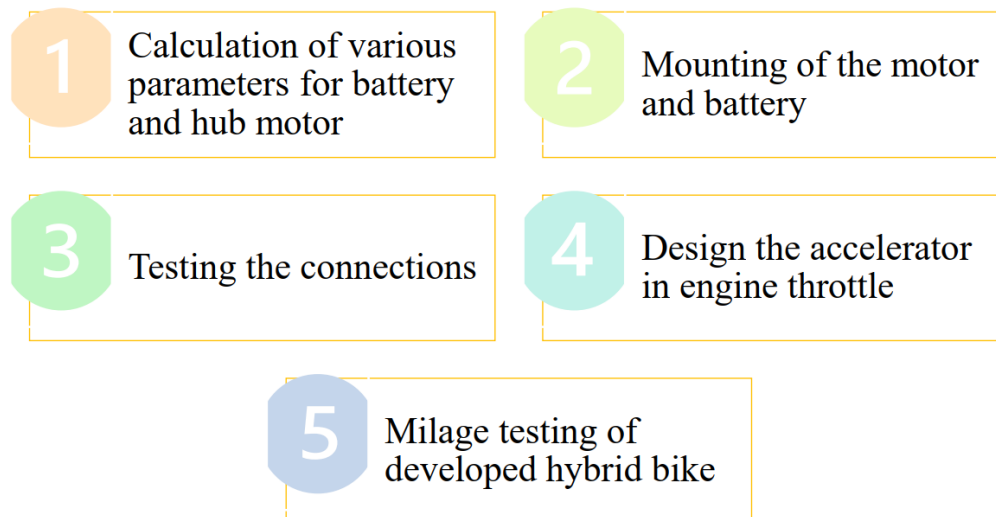


Fig.1. Methodology

The project will focus on the following key activities:

**1. Research and Development:** Extensive research has been conducted to identify the most suitable components and materials for the modified hybrid bike, ensuring optimal performance, durability, and cost-effectiveness.

**2. Motor and Battery Calculations:** Extensive calculations were performed to determine the suitable hub motor and lithium-ion battery specifications. Factors such as power requirements, torque, efficiency, and range were taken into account. The team ensured that the selected components would provide optimal performance for the hybrid electric vehicle.

**3. Integration of Hub Motor and Lithium-Ion Battery:** The project will involve the integration of a hub motor (BLDC) into the bike's drivetrain, enhancing its overall performance and providing efficient power delivery. A lithium-ion battery system will also be integrated to ensure reliable and long-lasting power supply.

**4. Testing and Performance Evaluation:** The developed modified hybrid bike will undergo rigorous testing to assess its performance, efficiency, and durability under real-world rural conditions. Performance parameters such as speed, torque, range, and charging time will be evaluated to ensure optimal functionality.

**5. Cost Optimization:** The project will focus on cost optimization to make the modified hybrid bike affordable for rural communities. By exploring local manufacturing capabilities and utilizing readily available materials, the project aims to reduce the overall production cost without compromising on quality and performance.

### **Conclusion:**

The development of a low-cost modified hybrid petro-electric bike for rural areas holds significant promise as an affordable and eco-friendly transportation solution. By combining the benefits of both petrol and electric power, this innovative bike offers improved efficiency and reduced environmental impact.

With its cost-effective design, this bike addresses the affordability constraints faced by rural communities, making it accessible to a wider population. The integration of hybrid technology allows for increased fuel efficiency and extended range, enabling riders to cover longer distances without compromising on performance.

Moreover, the hybrid bike offers a reliable mode of transportation in areas with limited access to fuel or charging infrastructure. It presents an opportunity to enhance mobility and connectivity in rural regions, thereby empowering individuals and fostering economic development.

The development of this low-cost modified hybrid petro-electric bike brings us closer to achieving sustainable transportation solutions that cater to the unique needs of rural communities. Its affordability, efficiency, and reliability make it a compelling option for individuals seeking a reliable and eco-friendly mode of transportation in rural areas.



Fig.2. Petro Electric Bike