

# CAMPUS MOBILITY FOR THE FUTURE: THE SMART ELECTRIC BICYCLE

*Project Reference No.: 45S\_BE\_ 0781*

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## **Keywords:**

Low-cost, eco-friendly, Hub Motor, BMS module, Li-ion Battery, IoT.

## **Introduction:**

Concern about global warming and urban air pollution have become central issues in transport policy decision-making, and as a result much research in recent years has focused on the development of vehicles which are environmentally friendly.

Now more than ever, people, especially Gen Ze's and Young Millennials, are becoming conscious of the impacts that their actions have on the environment. Micro-mobility provides them with the opportunity to reduce the carbon footprint. They usually have two hard small wheels, one fitted with an electric motor, connected by a platform on which the rider stands, and with a handlebar for support and steering in front. The use of an electric motor makes gears unnecessary.

In 2017, some bicycle-sharing companies such as Lime, and some scooter-only companies such as Bird, began offering dockless electric kick scooter sharing services. This segment of the micro-mobility market made large inroads in 2018, with numerous dockless electric scooters appearing in major cities worldwide, sometimes in controversial and contentious unsanctioned roll-outs, such as in San Francisco. The Mobility e-scooter or motorized scooter is a stand-up scooter powered by an electric motor. These electric scooters can pose as an environmentally friendly alternative personal mode of transportation that has appeal in urban settings and for short distances. This e-scooter is designed in such a way that anybody can use it easily. And this vehicle is portable, compact and weightless.

## **Objectives:**

The main objective of the present work is to develop a low-cost, robust, efficient and eco-friendly e-bike for within campus mobility. Further, the bike will be having Smart Monitoring System, which shows Heart rate, Blood Oxygen %, Steps tracking and mobile phone notifications

## Methodology:

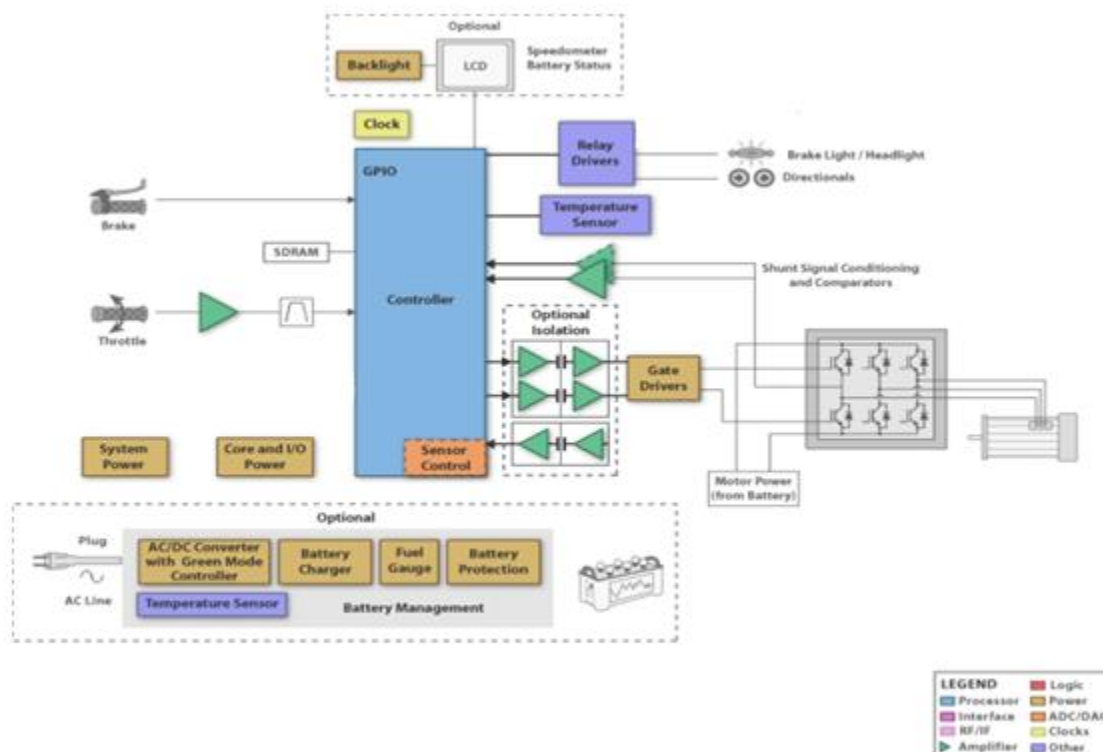


Fig: Circuit diagram of The Smart Electric Bicycle

This electric vehicle is essentially simple to ride and maintain, and that's why they are so useful and fun. The vehicle consists of rechargeable Li-ion electric battery for energy storage, an electric motor (Hub Motor), and a controller. The controller will normally control the power supplied to the motor, and hence the vehicle speed, with increase and decrease.

When the rider uses the throttle, electric signals go from the throttle through wires to the controller, which instructs the battery to release electric energy to one or two motors in the wheels. The motor transforms that energy into a movement of the wheels, and the electric bicycle moves forward.

The Hub-motor and the battery are connected through electric wires, all controlled through BMS module. Their performance is managed by the rider through the controller component.

Further we used the concept of IoT for Smart monitoring system which shows heart beat rate and all when finger is placed behind it

**Conclusion:**

The developed bike could help to encourage new generation to use eco-friendly bikes for green campus initiatives and also an innovation potential of cycling as active, sustainable and networked mode of transport in the context of in and around campus and also is designed for a broader segment of the population and is meant to meet a wider variety of mobility requirements in urban transfers to alternative forms of mobility and use for short distances.

The scooter movements easy to perform. However, this electric vehicle is targeted more for young people and seems primarily intended for recreational purposes

**Scope for future work:**

- By adopting BMI module in vehicle and we can access the Body weight management.
- Furthermore, features from IoT can be adopted in the smart monitoring system.
- By introducing AI and ML self-driving system can be implemented.