OCC FOR EASY RIDE

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Abstract –*The OCC refers to Online Customizable Cycle for a easy ride. The Electric Cycle is also known as E-Cycle. It is a bicycle with integrated motor used for propulsion. The electric cycle is an vehicle which enables us to travel from one place to another using electric power. Here the Lithium ion type battery is used to power the cycle. For the requirements of user a web application is developed, where the user can customize their existing or new bicycle into electric cycle by selecting the parts that are available. The web application also contains different layouts of the cycle, with that user can select the required motor, batteries, tires and other parts of their cycle. The specified application allows the e-cycle to be monitored the speed and battery level. The proposed system is designed to reduce cost of e-cycle and to utilize the cycle by converting it into e-cycle.*

 Key Words: *Customize , Monitor , web application Electric cycle.*

1. INTRODUCTION

At present, Electric Vehicle (EV) is becoming popular because of the fuel prices becoming more expensive and scarcity. Due to this many vehicle manufacturer looking for alternatives of energy sources other than fuel. The use of electrical energy sources improve the environment and less pollution. In addition, Electric Vehicle produces great advantages in terms of energy saving and environmental protection. Most of the EVs use rechargeable lithium ion battery. It is smaller compared with lead acid battery. The life cycle of Lithium ion battery is shortened due to overcharging and deep discharges. . On the other hand, Electric Vehicle usually has limited range of travelling due to battery size and body structure. For maintaining proper flow of charge to the battery current and voltage sensors are used. . Now, an important reason that limits the application of Electric Vehicle is the safety. For safety concerns a IR sensor is used for measuring the speed of the motor which ensures the nominal speed for the cycle and ultrasonic sensor is used to detect the obstacle and stops the cycle if any detected using a the relay attached to the motor. These sensors, battery and motor are connected to a Arduino and they are controlled by it. A Node MCU is attached with Arduino which is a wi-fi module that transfers the data to IoT via internet. Through this the user can track the information of the cycle in the IoT application. This application is used to notify the user about the battery health, speed of the vehicle and also track the location of the user. It also notifies the user about proximity alert and also displays the battery charging status through the LCD screen fixed. In this work, the development of a E-cycle and monitoring using IoT technology is proposed.

1.1 STATEMENT OF PROBLEM:

Today, since EVs can reduce gasoline consumption up to 75%, EV batteries have gained renewed attention in the vehicle market. To enlarge the market share of Electrical Vehicles, safety and reliability are the top concerns of users. However, both of them subject to not only the battery technology but also management system for battery.

Therefore, Battery management system needs to monitor and controls the battery based on the safety circuitry. Whenever any unusual conditions is seen, such as over-voltage or overheating, are detected, the system should notification to user and execute correction procedure. The system also checks the battery temperature which provide a better power consumption scheme, and communicates with individual components and operators.

The most commonly used battery type in modern electric vehicles are lithium - ion and Lithium polymer battery, because of their high energy density to their weight. Lithium-ion batteries are widely used in electric vehicles due to their high discharge volt, and high energy/power density.

The sensor failure may also occur in the cycle and sometimes sensor can also get damaged by overheating and upon hit by a particle. It is also possible that accurate function of sensor may also occur.

1.2 AIM AND OBJECTIVES OF THE PROJECT:

The main aim of the project is to modify existing bicycle into an E-cycle, through our application user can select what type of battery and motor can fix in cycle. Also, a LCD display is attached in cycle which helps to track the speed and battery level. Also there's an application in which we can track the cycle status like speed, Battery also GPS location in web application.

The main objectives of the project are:

- The proposed system is designed to convert the bicycle into Electric cycle.

- A web application is used to customize the various part of the cycle on their own.

- All specification and requirements of cycle will be collected and design is made.

- To design a smart system that recognize and respond, the vehicles coming from sides of the rider.

- The real time data like speed, battery levels is displayed in the LCD screen and viewed in the web application.

- The Ultrasonic sensor used for obstacle detection and ensures safety.

2. RELATED WORK

This section presents previous work related in our proposed architecture. Many researchers had placed a significant sign in the field of IoT and Knowledge-based expert systems. We highlighted some of them to identify the significant attributes of these systems.

Ventsislav Petkov Keseev, Angel Kanchev Ruse [1] proposed an approach experiences on design, performance and riding cost of an electric bicycle, being one of the smallest representatives of electric vehicles on market. The lack of profitable Lithium battery recycling process is another key problem which leads to battery waste accumulation. With 1 kWh battery the bicycle could make over 60 km run.

Katharina Wöhrl , Christian Geisbauer , Christoph Nebl, Susanne Lott and Hans-Georg Schweiger [2] proposed a method for providing a comprehensive picture of the accident handling process in Germany, beginning with the damaged car on the scene and progressing through the risks and obstacles faced by stakeholders such as transportation and recycling organisations. The rescue team's main issue is determining the state of the high voltage battery at the accident site. To protect the vehicle owner's privacy, the access point must be secured with sufficient protection. The car is fitted with a miniature transmitter that is powered by its own battery.

Bharathi S.H, Y.V Nithin Reddy, Dinesh, Ram Gopal [3] has proposed the the use of the Internet of Things (IoT) to monitor the deployment of electric vehicle batteries Without a doubt, the battery is the sole source of energy for this electric vehicle. However, as the proportion of energy given to the vehicle decreases, the vehicle's appearance degrades. The usage of IoT techniques is provided in this paper, therefore checking is plainly possible. LCD and voltage sensor are included in the proposed IoT-based battery checking system.

Akash Nandargi, Rohit Jirole [4] has proposed the battery is a key component of an electric vehicle, and it represents a significant step forward in terms of sustainable mobility. In hybrid and electric vehicles, battery management is crucial. The Battery Management System's goal is to ensure that the battery is operated safely and reliably. Battery Management System has features for maintaining safety, battery state and evaluation, charge control, and cell balancing.

Vladimir Dimitrov [5] has proposed potential methods to designing an electric bicycle with a focus on three domains: electrical, mechanical, and system level. It examines the solutions available to a wide range of problems in each of the aforementioned domains. The paper gives a classification on the approaches to build an electric bike after grouping and classifying the solutions offered on a domain basis, so that the engineer can quickly obtain the information needed to begin their project. Because the new bicycle is an Electric Power Assisted Cycle (EPAC), the electrification of this mode of transportation is already well underway. System level, electrical engineering, and mechanical engineering domain designs are the three broad kinds of designer.

Anjali Vekhande, Ashish Maske [6] proposed system describes the application of Internet-of-things (IoT) in monitoring the operation of an electric vehicle battery. The battery is the sole source of energy for electric vehicles. The amount of energy given to the vehicle is gradually diminishing, resulting in vehicle performance decline. Battery manufacturers are quite concerned about this. The idea of monitoring the performance of the vehicle via IoT is proposed in our proposed system so that the monitoring may be done directly. The system may detect deteriorated battery performance based on experimental results and sends alarm messages to the user for further action. They built a PIC-based system to monitor these battery properties and devised a data gathering system.

3. PROPOSED SYSTEM

The web application is used to order a new e-cycle or to convert a current standard cycle to an E-cycle, and consumers can choose which motor and battery they want.

The main goal of this application is to allow users to learn about E-cycles and their values before placing an order, as well as to adjust them as they see fit. The most serious issue with E-cycles is battery management; users are unaware of the battery level while charging and riding, as well as how far it can still travel, as these details are unavailable until it is monitored. As a result, battery levels and speed is displayed in the LCD. Additionally, if any blocks appear, the ultrasonic sensor will stop the cycles from running and display a message on the LCD display to prevent any accidents. We can also track the location of the cycle using Arduino which is connected with Node MCU that transmits the data to ubidots, which is a IoT platform.

Fig. 1. PROTOTYPE OF E CYCLE

4. METHODOLOGY

The methodology of the proposed consist of two modules: Web application and E-cycle Designing.

4.1. WEB APPLICATION

User can select or modify the new or existing cycle using the web application and they'll pay the payment in same web application. This Application build by PHP and MySQL language using Xampp and Tomcat Server.

In this application user can step by step move to order the E cycle as shown in below Fig. 2 .Using this application user can easily buy a E cycle depends on their need and their money basis. Firstly user need to create an account and login his account for order the E cycle. Also, there's an option to make a payment in online after they decide the design and confirm the order of E cycle.
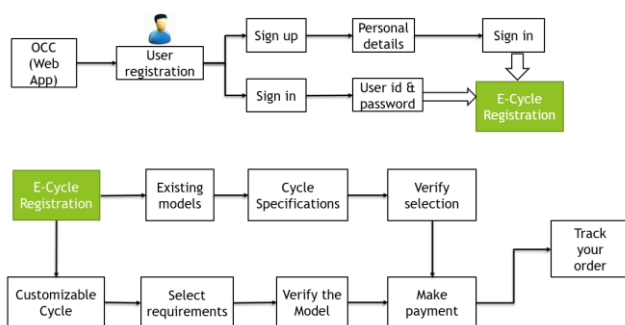

Fig. 2. FLOW DIAGRAM OF WEB APPLICATION

4.2. E-CYCLE DESIGNING

Design the E cycle as per user's design and using IoT they can track the status like speed, battery and current location of the cycle. The ultrasonic sensor is used to detect any blockage and stop the motor to prevent from accidents.
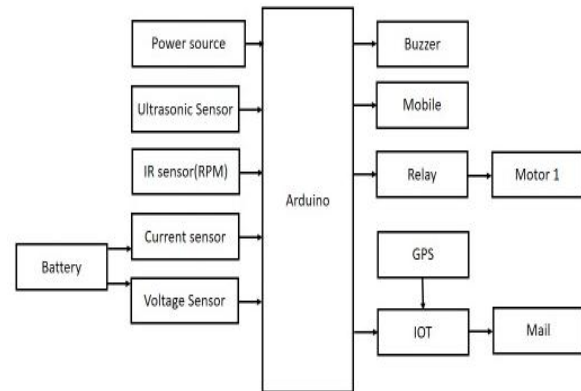

Fig. 3. BLOCK DIAGRAM OF ADRUINO UNO

Hardware-Requirements: Arduino uno, Ultrasonic sensor, IR sensor, Voltage Sensor, Current sensor, Relay, Motor, GPS.

Software-Requirements: Arduino IDE are mentioned in the above Fig. 3.

4.2.1. ARDUINO UNO

The Arduino microcontroller is an easy to use and powerful single board computer that is useful for beginners. The Arduino is a open source software, which means hardware is reasonably priced and development software is free.

The Arduino programming language is Embedded C. It is similar to C and C++.

5. EXISTING SYSTEM

The existing system faces lots of battery management issues such as overcharging and heating. It does not have a real time monitoring system. Like the speed, location and battery status cannot be viewed. The customization according to users are not provided and only basic models are available for purchase.

The safety mechanisms such as accident detection and monitoring through IoT applications are not implemented and does not provide at a low cost.

6. CONCLUSIONS AND FUTURE ENCHNACEMENT

Easy way for users to modify or buy a new E cycle through the web application and also make it as low budget. The advancement of technology enables to switch from fuel injected vehicles to electric vehicles, since it can produce equivalent travel experience.

The battery in electric vehicle produce performance to a normal vehicle. This system has a feature of viewing the info like speed, battery health and charging status through a LCD and ubidots. The location of the cycle can also be tracked through this application. Also there are sensors placed for monitoring and to prevent from accidents.

This framework was proposed to deal with the deficiencies of current battery management in both research and commercial products. Based on previous work, the specific challenges facing in the system and their potential solutions were presented as a sound basis for future research. Due to changing circumstances in real time applications, a standard solution was not required. Depending on the specific situation, different strategies should be implemented to improve and optimize the performance of battery in future EVs.

7. REFERENCES

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