

# DESIGN AND DEVELOPMENT OF NEW GEN SMART CYCLE

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**ABSTRACT:** The paper reviews the SMART BICYCLE, which is eco-friendly and the commercial use of this makes human life easier. We aim to provide the bicycle with health monitoring system and charging system. The key technology discusses about the smart cycle with heart rate sensor, calorie detector, mobile charging system which uses the energy generated and stored during pedaling of the cycle. The actual system encloses various sensors, software and hardware parts too.

**KEYWORDS:** Smart cycle, Heart rate detector, Calorie detector, Wireless charging System, Energy conversion system, etc.

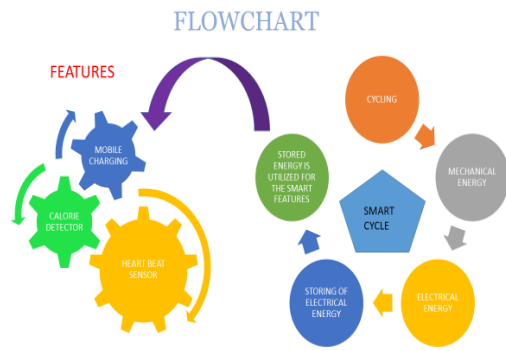
**I. INTRODUCTION:**

Among many countries in the world India is also one of the country facing many health hazards due to obesity, pollution, etc. In the 21st century we are living in pleasure with lot of technological magic's happening all around the world. The technology gives solution to lots and lots of environmental problems and makes life easier and comfortable. Our project is also a solution to an environmental problem and also for the health issues of the human. With increasing AIR POLLUTION, FUEL COST & for HEALTH HAZARDS caused due to air pollution and obesity, CYCLE is the one of the best solution. With the evolvement of new technologies, we are also in need of old habits for maintaining our health like we started to make trend of old food habits which is nutritious and ensures long life. In such way with increasing pollution, fuel rate and health issues we are in need of getting back to bicycles. The project deals with such a bicycle with new generation technologies which will be most liked by the people and they would get both healthy lifestyle vehicle along with new technology inbuilt in that. This cycle can also be exported to many countries, it commercially adds profit, as many countries like Nauru, Cook Islands, Palau, etc. are ranking top in obesity population.

**II. PROCESS:**

**2.1 OVERVIEW**

The proposed smart cycle generates electrical energy from the mechanical energy(while cycling) and this generated electrical energy is stored and this stored energy can be utilized by other systems as a source of input or this energy conversion can be further expanded in future and can be used as a source for electric bicycle. The cycle also includes a heart beat sensor for detecting the heart beat rate when needed (like before and after cycling). The calorie detector makes you know that how much of calories have you reduced from the best exercise (CYCLING).The wireless charging system is helpful in charging your gadgets while moving or travelling like you have in some of the technologies.



FLOW CHART OF NEW GEN SMART CYCLE

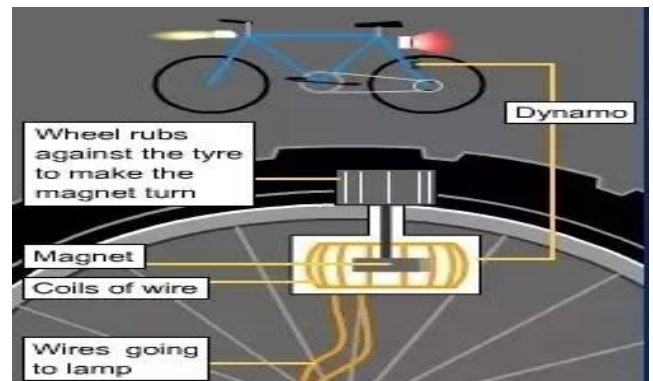
**2.2 PROCESS**

Our smart cycle looks like a actual bicycle. We have added the smart technologies to the cycle for the benefit of the rider. When the rider rides the cycle the dynamo affixed to the wheel of the cycle utilizes the mechanical energy and converts it to electrical energy, this electrical energy is stored in a lead acid battery. The heart rate detector is used to know the heart beat of the rider after and before riding. The calorie detector is used to detect the calories of the rider before and after riding, so that it would easy for the rider to the know how much calories he had lost through the ride. The wireless charger is another useful feature that will help the rider to charge his /her gadget during the ride.

**III. WORKING:**

**3.1 ENERGY CONVERSION**

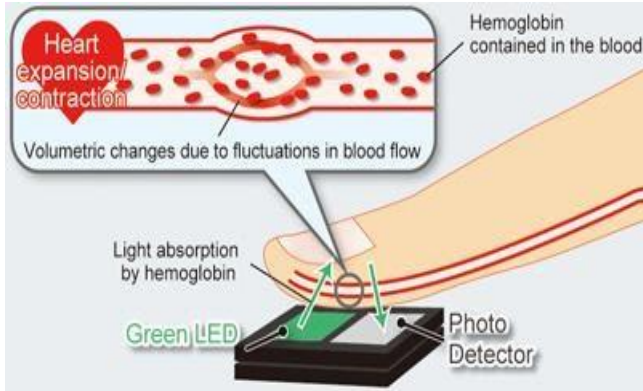
Dynamos convert mechanical rotation into electric power. Dynamo - a device that makes direct current electric power using electromagnetism. While the rider rides the cycle the wheel rubs against the tire to make the magnet turn, thus the dynamo affixed to the tire generates electricity and stores it for further utilization.



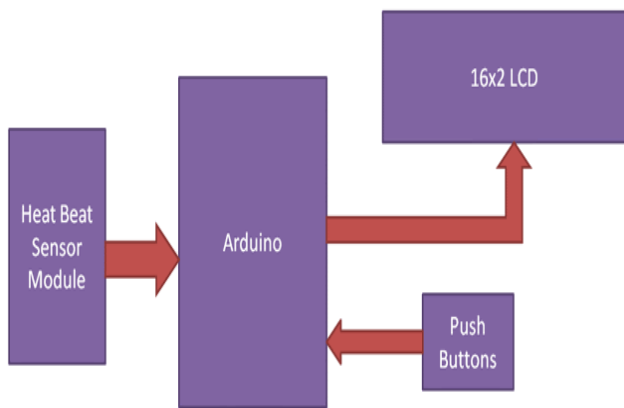
3.1.1 WORKING OF DYNAMO

### 3.2 HEART BEAT DETECTOR

Heart beat sensor is designed to give digital output of heart beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the Beats Per Minute (BPM) rate which is displayed in the OLED display.



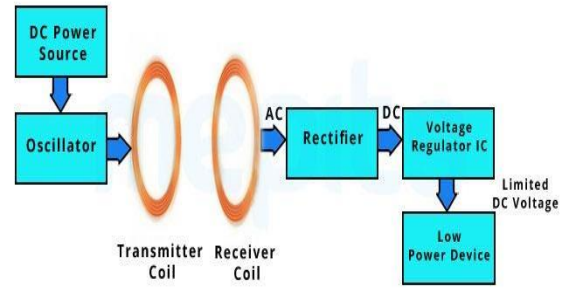
3.2.1 WORKING OF THE HEART BEAT SENSOR



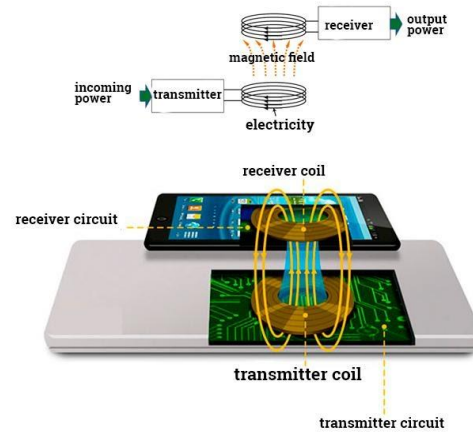
3.2.2 BLOCK DIAGRAM

### 3.3 WIRELESS CHARGING SYSTEM

The wireless charger uses the principle of electromagnetic induction to wirelessly transmit power between the wireless charger and the device that is capable of charging wirelessly. In other words, the electromagnetic field between the transmitter coil in the wireless charger and the receiver coil in the phone, transmits the current and thus it is received by the receiver coil and the phone gets charged.



3.3.1 BLOCK DIAGRAM OF WIRELESS CHARGING SYSTEM



3.3.2 WORKING OF WIRELESS CHARGING

### 3.4 CALORIE DETECTOR

As the calorie detector is inbuilt in the smart cycle. You need not to have a separate equipment or fitness Detectors. The accelerometer affixed to back side of the pedal, measures the distance travelled and thus it is helpful in knowing how long you had a ride and how much calories you have burnt. The distance travelled and the amount of calorie burnt is displayed in the OLED display.

### IV. CONCLUSION

Our main aim is to reduce the pollution in the surroundings. Instead of using pollution causing vehicles people can switch to this kind of smart cycles. So that they can keep themselves healthy, fit and can be free from fuel cost. There is no need for buying separate heart rate detector or calorie detector or a wireless charger which are costly. The cycle, itself possesses all these features and these are very much cost efficient and ease to use. The cycle acts as a both fitness maintaining system and a pollution free vehicle. The smart cycle will be very useful as it is a natural fitness keeper you don't want to pay lots and lots of

money to gym or fitness centers. Cycling naturally increases cardiovascular fitness, improves joint mobility, decrease stress levels, strengthening bones, decrease body fat levels and improves body posture and coordination, etc. For the hike in fuel and vehicle cost which causes pollution, the best alternative is switching to smart cycle so that you can be fit and pollution free. The smart cycle comes with all these goodness and is much affordable by all kind of people.

## RESULT

Here by we infer that the new gen smart cycle is pollution free, cost efficient and also it has easy to access inbuilt technologies and affordable by all people. Thus the new gen smart cycle will be very useful in many aspects to the human life.

## ACKNOWLEDGEMENT

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