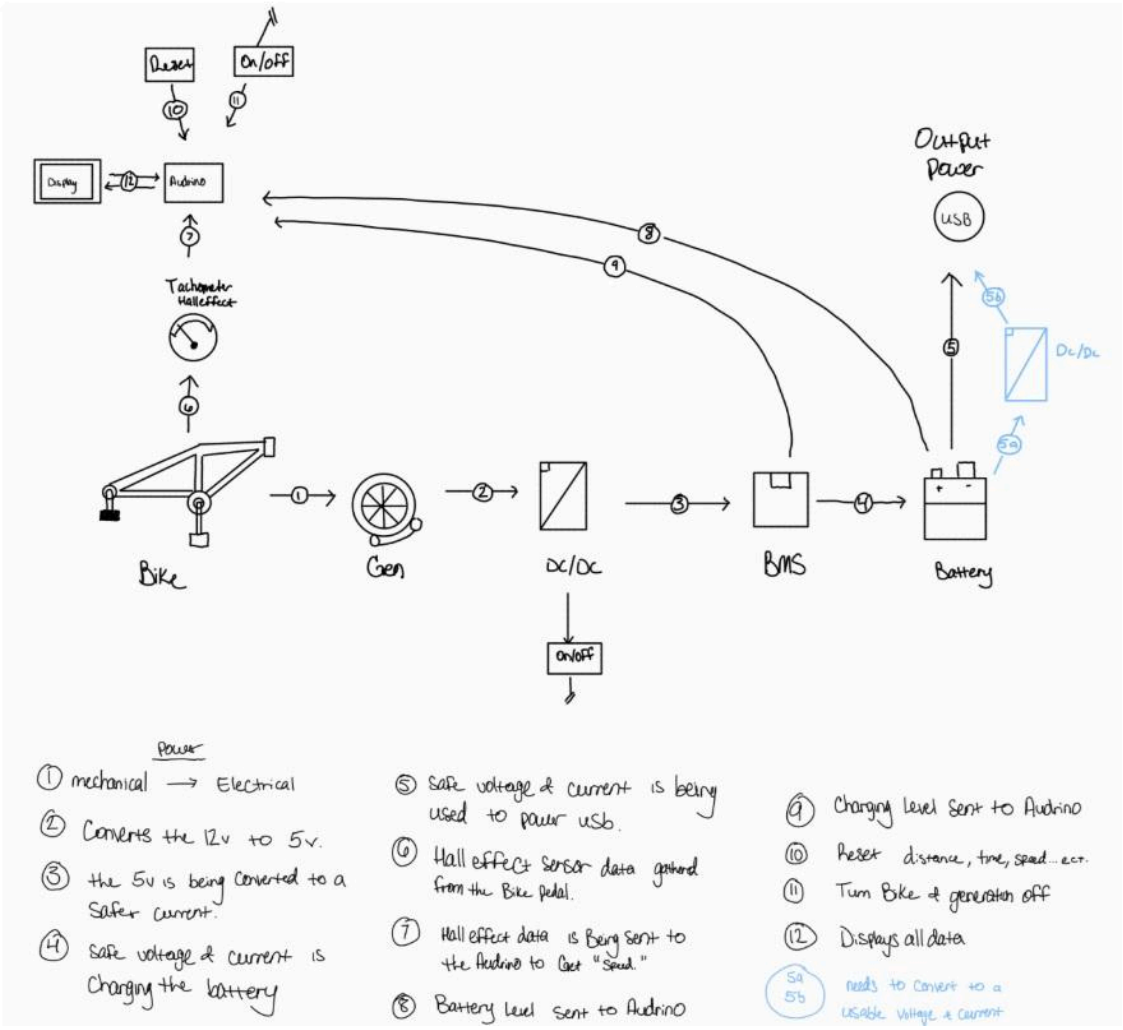
BLOCK DIAGRAM



Decisions made:

- DC motor selected for easier use
- Atmega328P microcontroller selected to control the operation
- Two buck-boost converters will be used
- I2C, 8bit parallel communication from microcontroller and peripherals
- Internal comparator and external op amp used for reading motor rotation and power generation for cost reduction.
- All active components will be powered by the internal battery to not draw power from the unfiltered DC generated power.
- Soft latch circuit to turn on the device or off
- 1602 LCD screen selected for ease of programming
- SparkFun Battery Babysitter and Adafruit TPS63060 selected for the battery charging
- Hand crank with gear ratio for proof of concept prototype for the power generation

- Scope:
  This is as of Prototype Alpha stage.
  Demonstrates power generation from a DC motor that will be stored for later use in a battery.

- Microcontroller
- Atmega328P, PDIP .

- Programming through Arduino USB Link.

- Battery Management System: SparkFun Battery Babysitter
  (BQ24075 Charger) & (BQ27441-G1 Fuel Gauge)
  Communicates with the atmega328P through I2C communication

- Buck-boost converter: TPS63060
  Allows for controlling the voltage going into the battery charger, giving a more stable input than directly from the motor.
  A second one will be used to regulate the output when discharging the battery
  Can be enabled or disabled by the atmega328P by GPIO

- Display: 1602 LCD Display (datasheet).
  Display will need to be fitted with enclosure
  Communicates through 8bit parallel communication with the atmega328P GPIO

- Firmware
  Needs to be created

- Future Improvements
  A stronger motor can be implemented for higher power generation
  With a larger battery, we could store more energy giving the opportunity to output even more power.