# OPEN INNOVATION

**Problem statement:**

To Develop a wearable device that monitors a user's posture using gyroscope and flex sensors with real-time feedback.

**Components:**

1. Voltage regulator - AP2112K-3.3V.
2. Battery - Li-ion (400mAh, 3.7V).
3. Battery protection - TP4056.
4. Gyro - BMI160.
5. Flex - Resistive Flex Sensor.
6. Speaker - Dynamic Speaker Driver.
7. Audio amplifier - MAX98357A.
8. Mic - SPH0645LM4H.
9. Passive Components - Resistors, Capacitors, Inductors.
10. Controller - Esp-32 pico d4
11. Button, LED

**Description:**

Using the main controller : esp32-pico-d4 ( 7 mm × 7 mm × 0.94 mm) we give power supply and all the inputs to sensors and other components.

Voltage regulator(AP2112K- 2.9 mm × 2.9 mm × 1.45 mm) is used to reduce the voltage to 3.3V when needed for protection.

For power supply we have used Li-ion (400mAh, 3.7V)battery because of less power consumption and it is rechargeable

Gyro (BMI160 2.5 × 3.0 $mm^2$ × 0.8 mm) and flex sensors (2inch) are used to detect posture.

Speaker placed inside earbud to give audio feedback connected with mic and audio amplifier(MAX98357A - 1.345 × 1.435 mm × 0.64 mm)

Mic for speaking purposes during meetings and calls(SPH0645LM4H - 3.5 × 2.65 × 0.98 mm )

Passive Components are used to make your system run smoothly

i.e Resistors = current control flow

Capacitors = Stores current

Inductors = coiled pipes that resist sudden flow changes.

Button is used to on or off, play or pause and led is used to indicate whether on or off.