METROBAND

PROJECT PROPOSAL

team MOSFETS

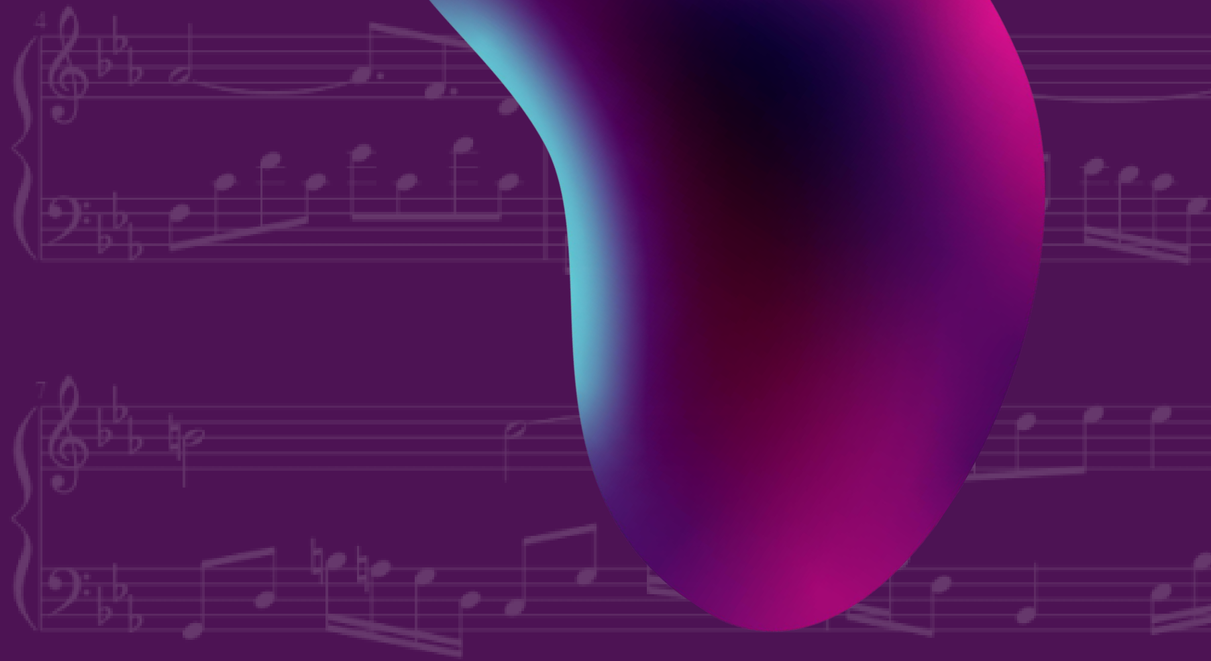
Introduction

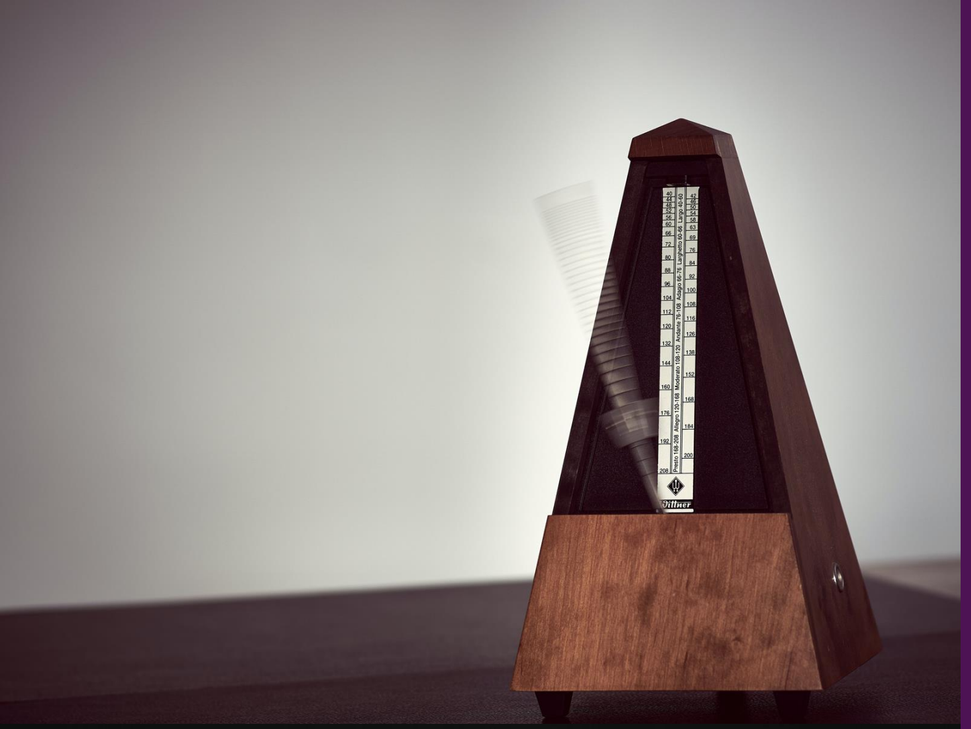
The Problem, and the Solution

01

The Problem

- **Tempo** is the musical **speed** measured in BPM
- Crucial for Mastering and group performances
- **Metronome** or conductor maintains the tempo
- Keeping Tempo is a common problem
- Can cause frustration and **ruin group timing**





Existing Solutions

01 Metronomes

02 In-Ear Headphones

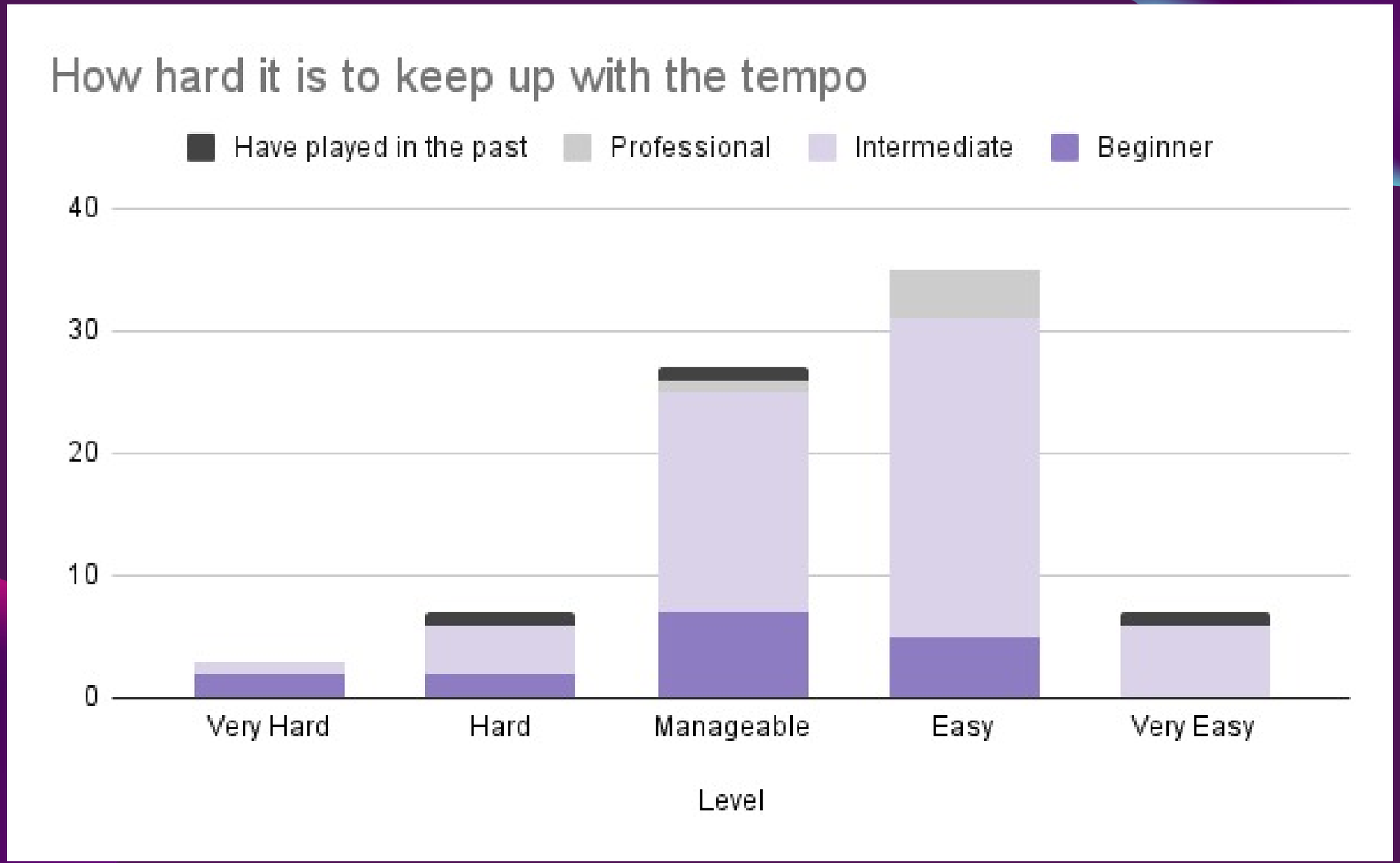
But these have some LIMITATIONS:

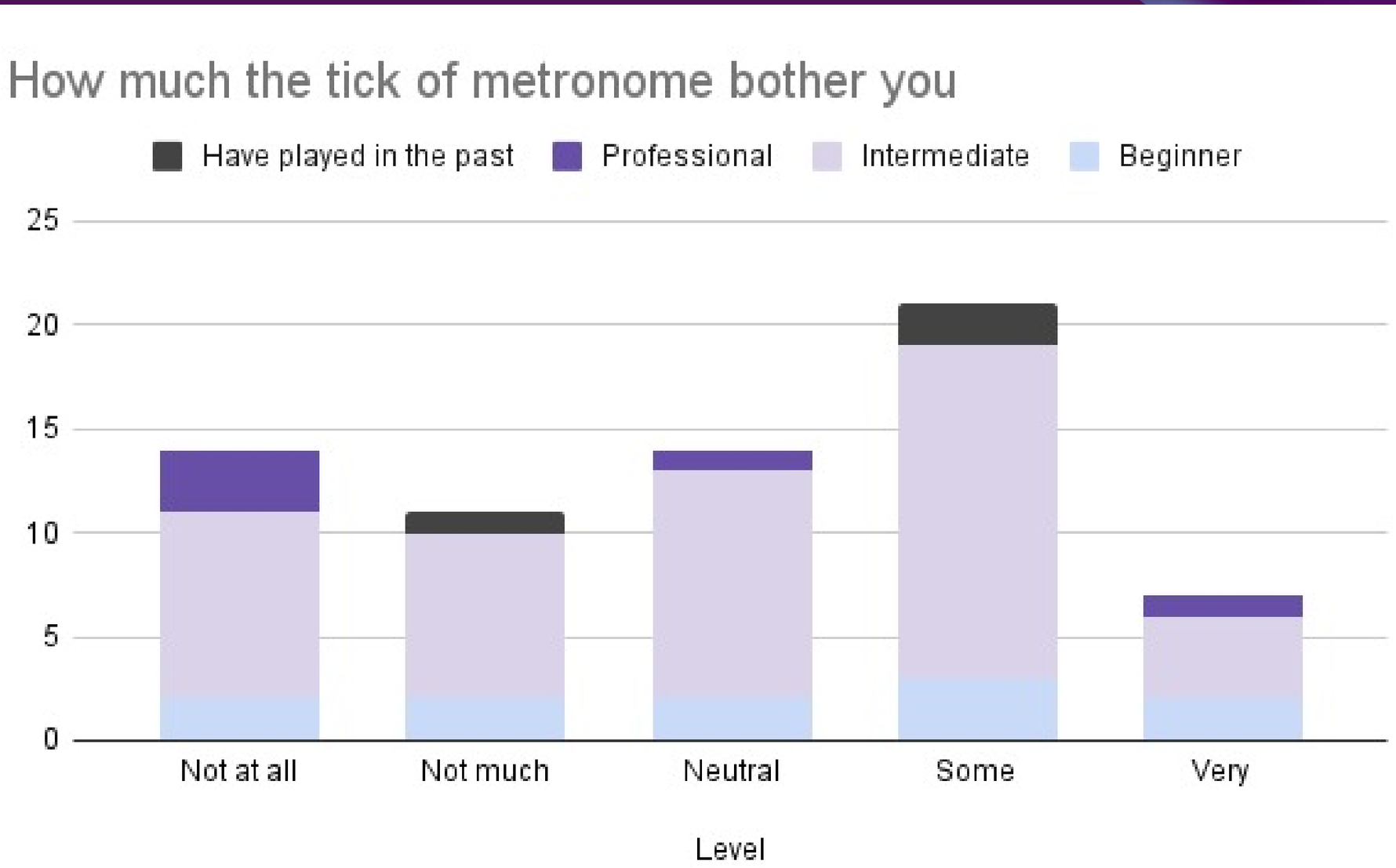
- External Noise makes it hard to hear
- Distracting and Irritating
- Inaccesible to musicians with hearing impairments
- Cost can be a limitng factor

02

Motivation

- Group members felt the need of addressing this music problem
- Conducted an online survey
- Surveyed local and global music societies Including
  - Classical Music Society
  - Discord servers
  - Social media
  - Personal contacts


How hard it is to keep up with the tempo
Have played in the past
Professional
Intermediate
Beginner
40
30
20
10
0
Very Hard
Hard
Manageable
Easy
Very Easy
Level


How much the tick of metronome bother you
Have played in the past
Professional
Intermediate
Beginner
25
20
15
10
5
0
Not at all
Not much
Neutral
Some
Very
Level

Our Solution:

METROBAND

the metronome wristband

METROBAND pulsates to the given BPM addressing problems and limitations

Convenient

Portable and wearable
Designed with ease in mind

Personal

Personalized to user's preferences

Accessible

Useful for musicians with hearing impairments

Discreet

Subtle and tactile cue, just like a watch

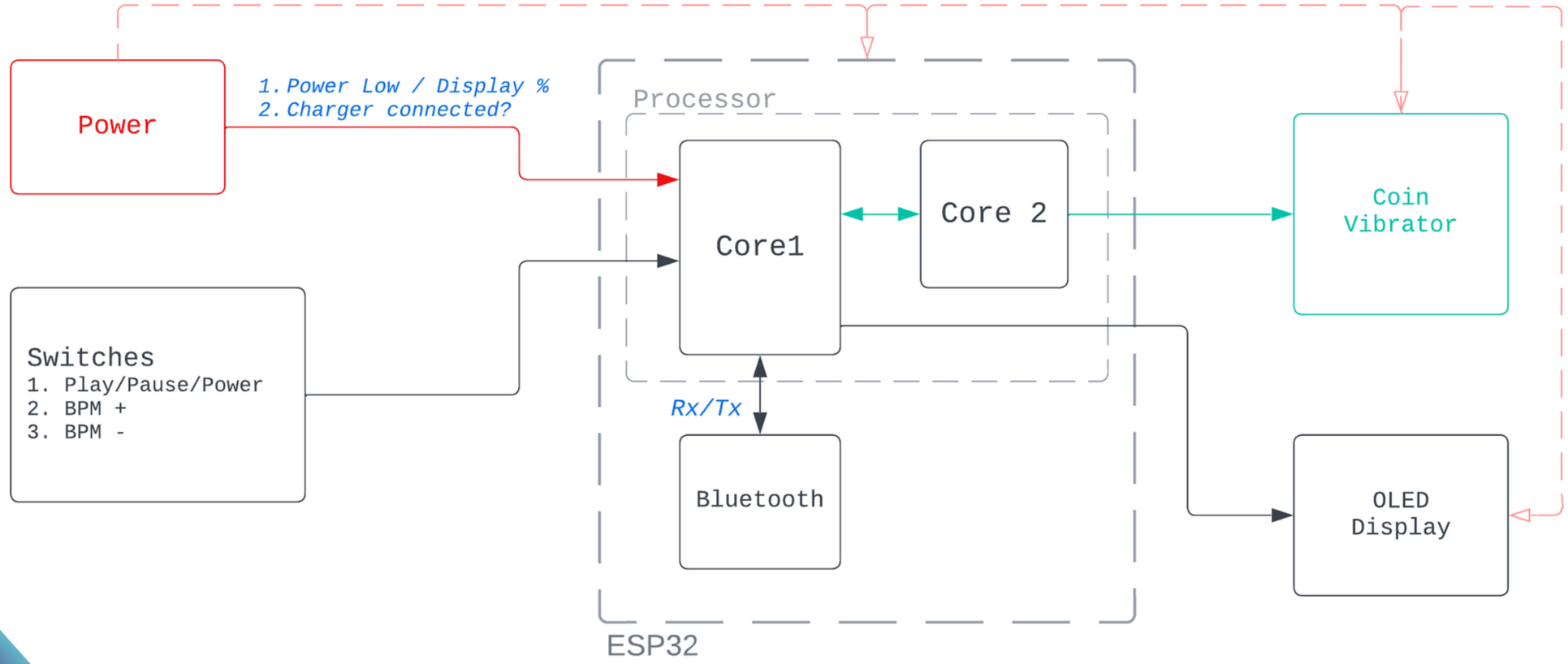
03

Technical Feasibility

- Metroband looks like a smartwatch
- **One knob** for all operations
- **Dual-core** microcontroller takes inputs
- OLED display shows **BPM**
- Powered by a **rechargeable Li-ion battery.**

04

Product Architecture



Product Architecture

Dual Core ESP32

We're using both the cores of the ESP32, one for time-keeping, and one for the other processes

Bluetooth LTE

User can connect the their phone through the inbuilt Bluetooth functionality of ESP32

OLED Display

Giving the user the experience of using a sleek experience of using an modern gadg

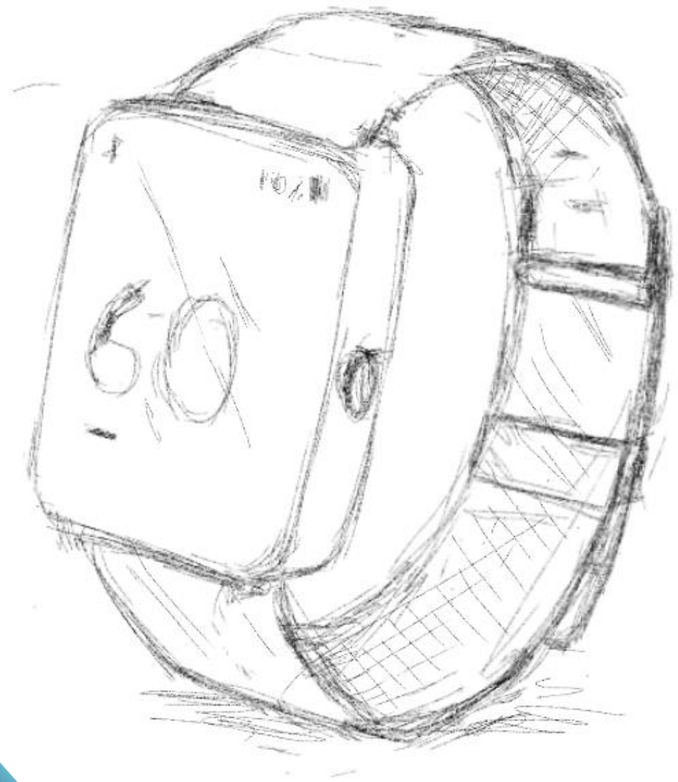
05

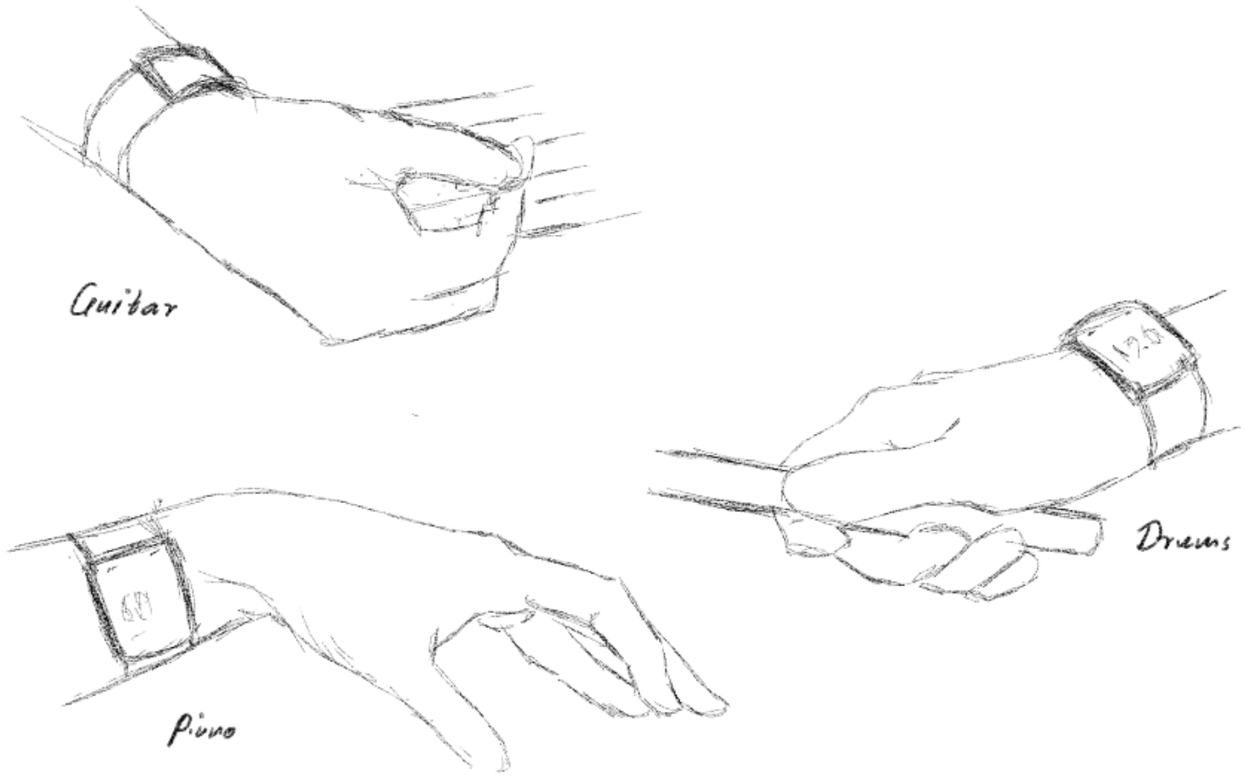
Metroband: The Mobile App

- Added functionality of setting the BPM via bluetooth
- Ability to set complex beat patterns
- Ability to save presets

06

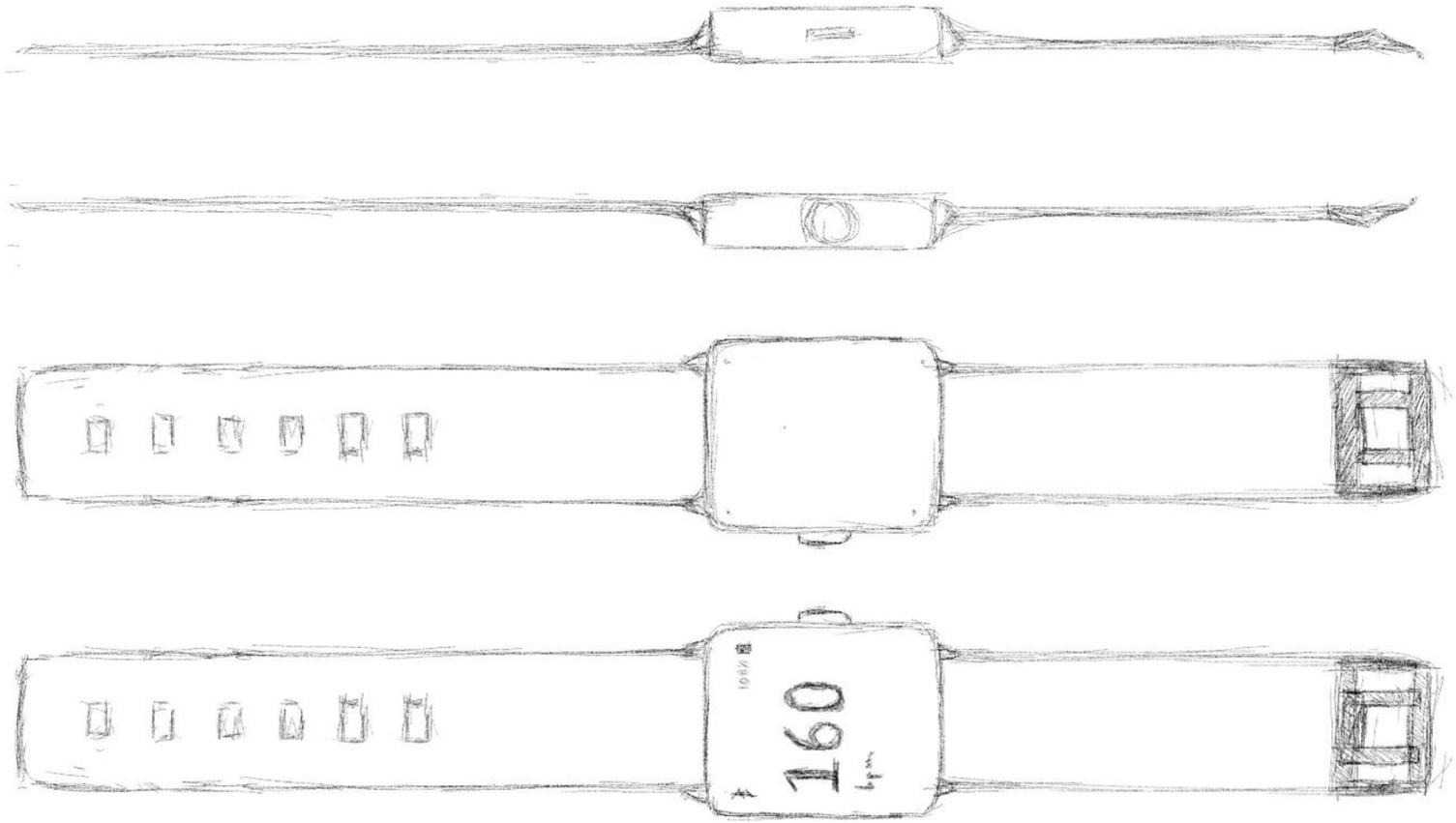
Design: Sketches





06

Design: Sketches



08

Estimated Budget

Rs. 4,900

Estimated Selling Price

Rs. 4,380

Estimated Costs

500

Estimated first batch of production

Rs. 250,000

Estimated First Profit

07

Marketing: Target Base

Music Students

It would allow students and enthusiasts to practice music without loosing the feel to a tick

Orchestras

It would help greatly for all the musicians in cutting down the time wasted on tempo

Hearing Impaired

It would help the hearing impaired people to enjoy the feeling of playing an instrument

08

Promotion

- Promotion via Social Media
- Creative and informative videos
- Focus: The mobile app, and syncing
- Website

09

After Sales

Software Updates

The phone application will be constantly updated

OTA Firmware Updates

More functionalities can be added with the same hardware

Recyclability

The product is mostly made of plastics and rubber, can be recycled at any service provider

10

Progress So far

- Part by part simulated on Wokwi
- Functionality and the sensing ability tested via an Arduino UNO

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Task Allocation

Yasith Silva

- PCB Design
- Power Module
- Coding

Julian Silva

- Microcontroller
- Enclosure
- Market Research

Bimsara Nawarathne

- Coding
- PCB Design
- Motor control

Isuranga Senevirathne

- Enclosure
- Mobile App
- Budget Management

Thank You