

Wea  
Up



WeaUp

Know more about us at [www.weaup.io](http://www.weaup.io)

Capstone Project  
Web and Mobile App Design and Development

snəwəyət̄ leləm̄.  
THE COLLEGE OF HIGHER LEARNING.

Langara.  
THE COLLEGE OF HIGHER LEARNING.

# Contents

Proudly designed by team **Beetles**

Pooja Chauhan · Jiali Cai · Cheuk Yan Li · Anderson Marques

Wonnyo Hamester · Reinhardt Botha · Bethleen Baral · Victor Portus

# 01

## Project Overview

- Background
- Opportunity
- Solution
- Target Market
- Competitor Analysis
- Feature Explorations
- Main Features
- Project Timeline

# 03

## Technical Overview

- Tech Stack
- System Architecture
- Data Model
- Data Processing
- Real-time Monitoring

# 02

## Design Overview

- Personas
- User Flows
- Wireframes
- Mockup
- Branding
- UI Kit
- Mascot Design
- Gamification Assets

# 04

## Business Model

- Business Model
- Future Features

**Meet the Team**

**References**

**Special Thanks**

# Project Overview

## Background

### Increasing Global Burden of Neck Pain

Neck pain is a prevalent health issue caused by the excessive use of electronic devices like smartphones, laptops, and tablets. This prolonged usage often leads to poor neck posture, resulting in discomfort, pain, and long-term musculoskeletal problems, commonly referred to as "text neck".

I've felt increased neck pain recently.

I want to improve my posture for a better body shape.

It is affecting my daily activities and overall well-being.

My neck pain intensifies after long periods of working.

On weekdays, I spent 8-10 hours a day looking at screens.

**How to seamlessly integrate posture correction into everyone's daily life and make it an enjoyable activity?**

## Opportunity

With the increasing reliance on mobile devices, there is a growing need for solutions that address the health implications of poor posture.

By leveraging the capabilities of smartphones, there is a significant opportunity to create an app that helps users develop healthier habits and reduce the risk of neck pain.

## Solution

WeaUp is a mobile app that helps users recognize poor neck posture and its impact on discomfort. By monitoring neck posture throughout the day using motion sensors in mobile devices and connected earbuds, WeaUp provides real-time feedback and reminders. Users can track their progress with detailed analytics to make effective improvements.

With gamification features like our mascot, goals, and daily streaks, WeaUp transforms posture correction into an enjoyable journey towards healthier habits.

203 million

## Target Market

In 2020, approximately 203 million people worldwide were affected by neck pain. This number is projected to increase to 269 million by 2050, marking a growth of about 32.5%.

WeaUp targets individuals who experience neck pain and discomfort due to poor posture, especially those who frequently use electronic devices. This includes remote workers, students, and professionals who spend extended periods on their phones, laptops, or tablets.

By offering a convenient and engaging solution, the app aims to attract users looking for effective ways to improve their posture and overall well-being.

# Competitor Analysis

## Project Overview

There are several apps on the market designed to address neck posture habits. We identified three main competitors: Posture Pal, Qawam, and Ergo/. These apps monitor users' neck posture, send sensory alerts and feedback, and provide analytics in various ways.



	WeaUp	Posture Pal	Qawam	Ergo/
Neck Posture monitoring	✓	✓	✓	✓
Sensory Alerts & Feedback	✓	✓	✓	✓
Analytics	✓	✓	✓	✓
Daily Goals	✓	✓		
Gamification	✓			
Support internal & external sensors	✓		✓	
Multi-platform (iOS & Android)	✓			

## Detailed Analysis



### Posture Pal

iOS only mobile app that monitors head position in real-time and alerts users to correct poor posture using AirPods sensors.

- Strengths: Real-time head position monitoring using AirPods sensors, friendly interface, features timers, daily goals, and 7-day posture analytics.
- Weaknesses: iOS-only, dependent on AirPods for posture tracking.



### Qawam

Posture improvement app which features AI-driven posture tracking and real-time feedback, offering personalized exercises and monthly progress report.

- Strengths: AI-driven posture tracking with real-time feedback, personalized exercises, monthly progress reports, posture detection via AirPods or phone, detailed session summaries.
- Weaknesses: Lacks gamification elements.



### Ergo/

Posture coaching app that utilizes iPhone's built-in sensors to monitor user's posture.

- Strengths: Utilizes iPhone sensors for posture monitoring, customizable posture check frequency, weekly posture improvement summaries.
- Weaknesses: Poor visual hierarchy in the interface.

# Features Explorations

## Project Overview

After conducting a detailed competitor analysis, we gained valuable insights into the strengths and weaknesses of existing posture monitoring apps in the market. However, we knew that understanding our competitors was only one part of the equation. To create a truly user-centered product, we needed to delve deeper into the **actual needs, preferences, and pain points** of our target audience.

To achieve this, we carried out a series of **comprehensive user interviews**. These interviews were designed to gather qualitative data on user experiences, expectations, and desires regarding posture tracking and correction apps.

We spoke with a diverse group of individuals, including office workers, students, athletes, and health-conscious individuals, to ensure we captured a wide range of perspectives and use cases.



# Main Features

## Project Overview

Project Overview

### Posture Monitoring

Using the mobile device or earbud's sensors to continuously track the angle and position of the user's phone associated with the neck position as they interact with their phone, this data is processed instantly within the app to provide immediate feedback on the user's posture.



### Real-time Interactive Feedback

Utilizes the phone's visual, sound, and haptic capabilities to alert users when they exhibit poor neck posture. The app displays a visual representation of the current head angle and suggests corrective measures.



### Posture Analytics

Collects and analyzes data from scheduled monitoring sessions, including posture angles, duration, and frequency of poor posture. This data is presented through visualizations and insights within the app.



### Collaborative Challenges

Allows users to create common goals with their friends to achieve better posture together. This feature promotes social engagement and friendly competition, encouraging users to keep improving their posture and as a bonus receive additional XP and badges.



# Project Timeline

## Project Overview



### Initial Research

We began our market research, drafted a project proposal, established team agreements, and set up the development environment.

### Design Kickoff and Development Research

After gathering data from our initial research, we kicked off our design explorations with a user-centered approach.

### Usability Testing, Mockups and Backend Development

In this phase, we started iterating upon the wireframes and exploring more of WeaUp visuals. We created prototypes, conducted usability tests, designed the UI kit and mockups.

week  
01



#### Deliverables:

1. Market research
2. Project proposal
3. Team agreement
4. Environment setup

week  
02-03



#### Deliverables:

1. User Interview
2. User flows & Wireframes
3. Information and System Architecture
4. Tech Stack
5. Database Scheme
6. Features Proof of concept

week  
04-05



#### Deliverables:

1. Prototyping and Usability testing
2. UI Kit
3. Mockups
4. API development
5. Authentication



### Design Hand-off Frontend Development & Alpha Build

We handed off the final designs, created badges and mascot illustrations and motion graphics, polished the UI, worked on content for the project proposal, began frontend development and conducted an Alpha bug bash.

week  
07-08



### Deliverables:

1. Design hand-off
2. Supporting Illustrations and motion
3. UI Polishing
4. Project proposal (draft)
5. Frontend development
6. Alpha Bug Bash

### Beta Build

We worked on our project proposal and created promotional assets. This is also when we built our Beta and made the necessary improvements based on feedback.

week  
09-10



### Deliverables:

1. Project proposal
2. Landing page and promotional assets
3. Beta Build
4. Development improvements

### Beta finalized MVP

As we near the finish line, we prepared our presentation deck, fixed any remaining bugs and complete the development of our MVP, ensuring it's ready for launch.

week  
11-12



### Deliverables:

1. Presentation deck
2. Bug fixing
3. Development completion

# Design Overview

## Personas

No business can exist without understanding its users. Thus, we created two detailed personas which represent our target audience's behaviours, goals, and challenges.



**Paul Miler, 30**  
Product Designer

Daily routine starts with checking his phone, followed by a morning coffee, then 5 hours of work sitting at a desk. After work, he attends university classes and works 3 hours more.

### Challenges

- 1 Neck pain caused by sitting for a long time
- 2 Often looks down at his phone, contributing to bad posture
- 3 Prefers quiet reminders and notifications

**I use my AirPods a lot for music and meetings; I don't want audio alerts interrupting me.**

### Preferred Features

- Custom Alerts and Notifications
- Challenge friends and see their progress
- Achievements and progress tracking
- Theme customizations

### Goals

- 1 Improve posture to avoid future health issues
- 2 Improve posture during long periods of sitting
- 3 Create and maintain healthy habits

### Necessity

- 1 Reminders to adjust posture
- 2 Clear progress tracking and statistics
- 3 Simple and clean app interface
- 4 Motivation through friendly challenges

**Eduarda Bern, 26**

**Architect**

Spends 7 hours of her day seated at her computer. She enjoys going on walks and cooking. She is conscious of her posture, recognizing a family history of poor posture, and is determined to prevent it.

Introvert

Hardworking

Sociable

Curious

### Challenges

- 1 Spending long hours seated at computer
- 2 Finding and sticking to a routine that includes posture exercises
- 2 Lacking motivation to maintain good posture



A group that supports me is more important than competing with strangers.

### Preferred Features

- Subtle alerts and small on-screen notifications
- Engagement features to collaborate with friends
- Daily streaks and support groups
- Monitor improvement

### Goals

- 1 Reduce back pain, especially after gym
- 2 Create healthier habits related to posture and exercises
- 3 Stay consistent in her efforts to improve posture

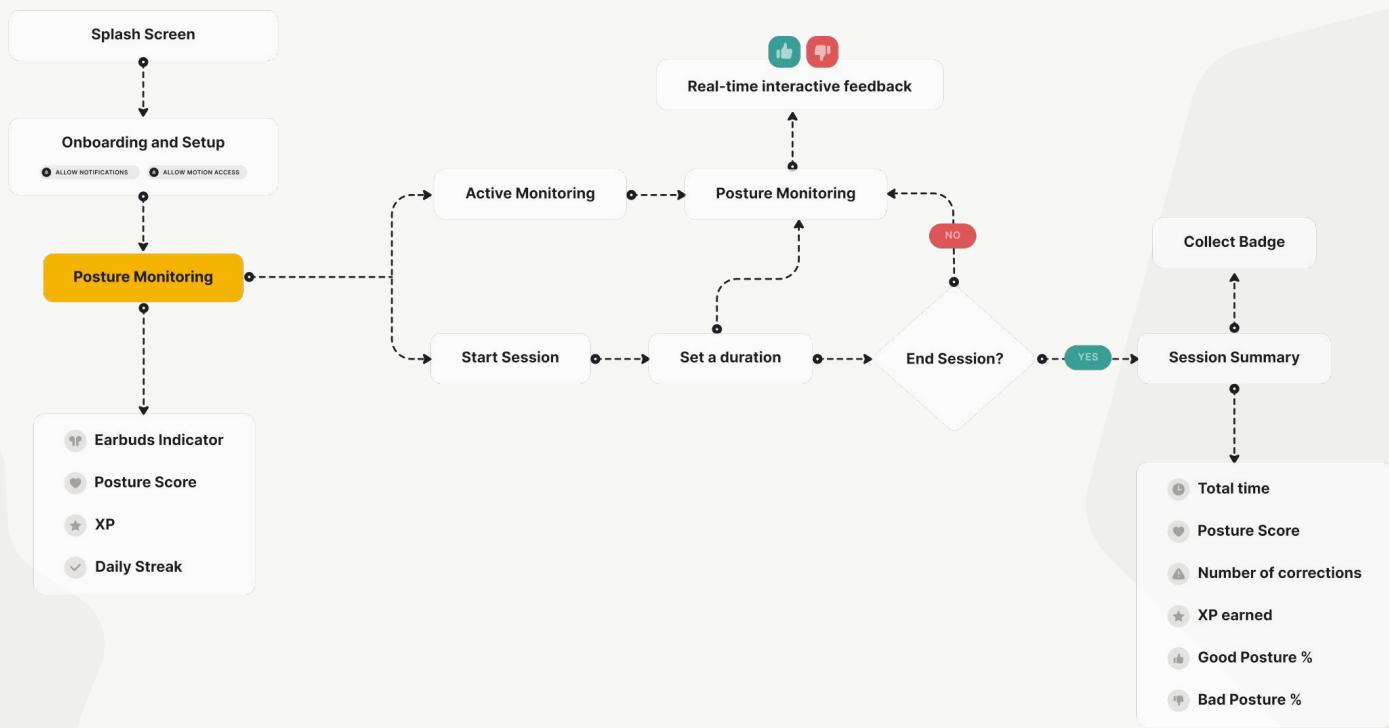
### Necessity

- 1 Regular and subtle reminders to correct posture, ideally through vibrations
- 2 Motivation through consistent tracking, setting goals, and having a support group for encouragement
- 3 Access to detailed analytics and feedback on posture

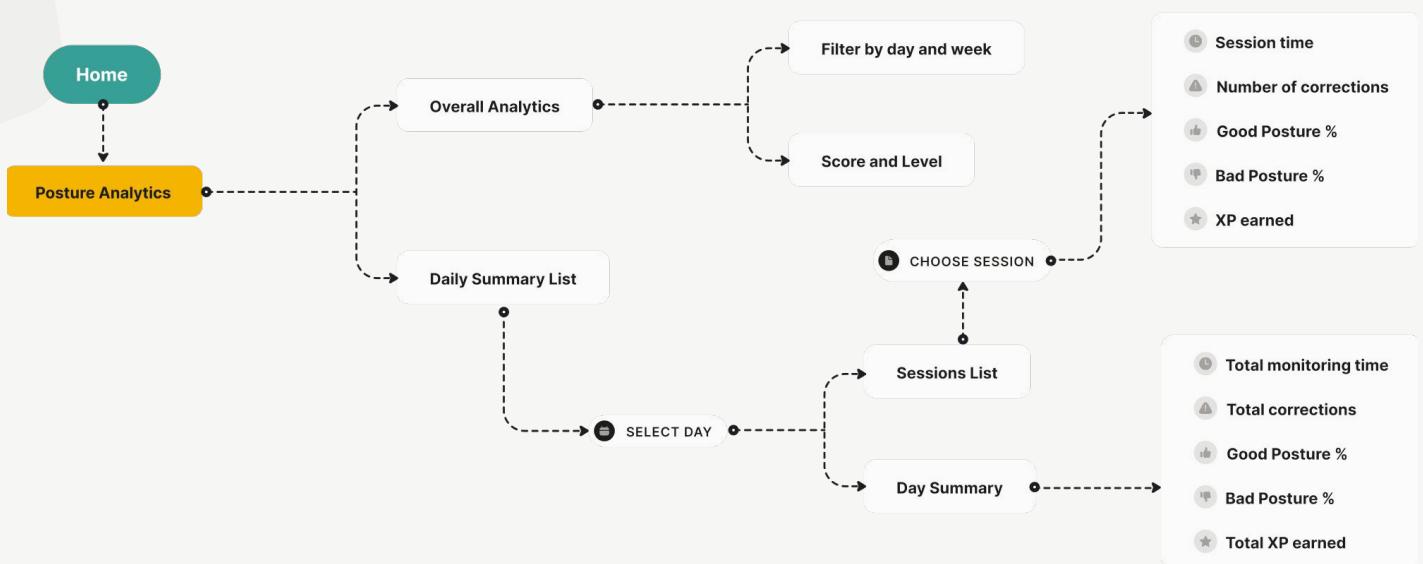
# User Flows

## Design Overview

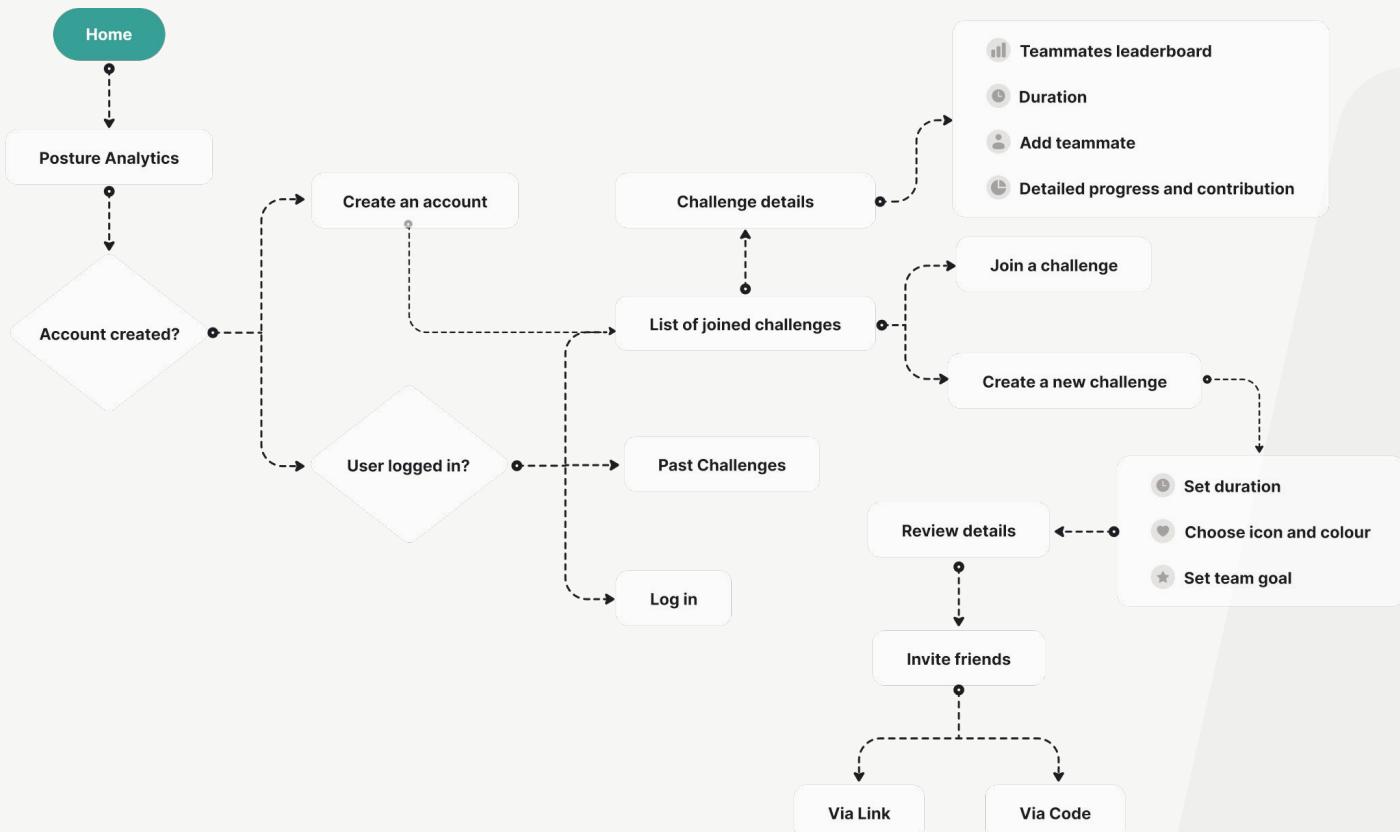
### Posture Monitoring



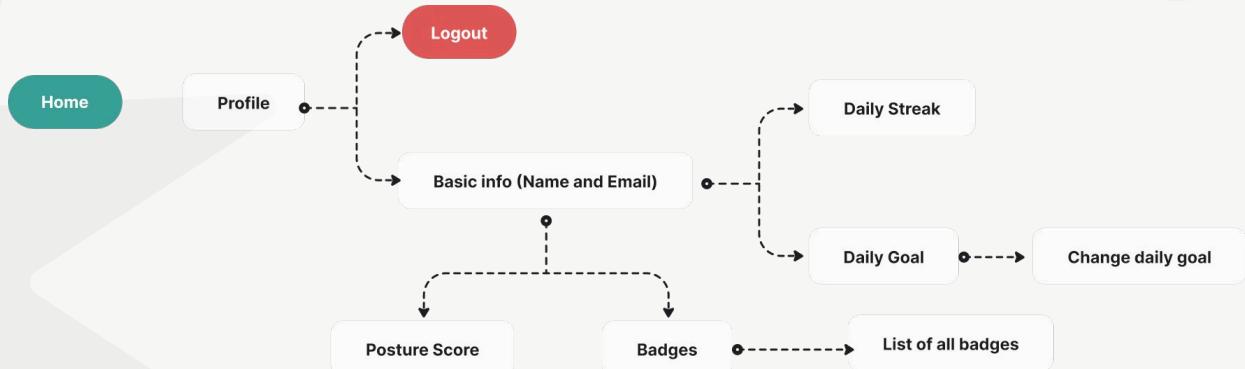
### Posture Analytics



## Collaborative Challenge



## Profile

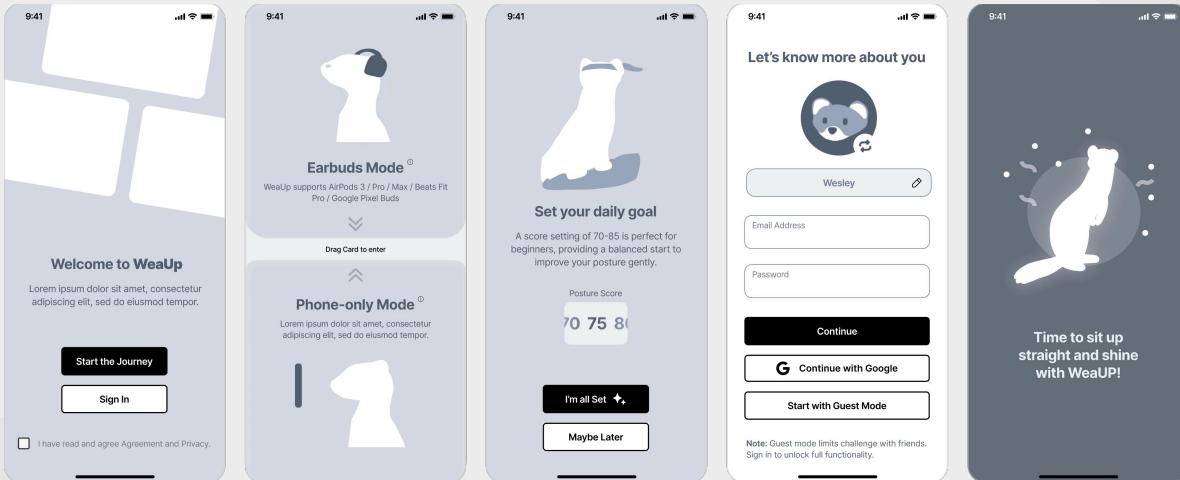


# Wireframes

## Design Overview

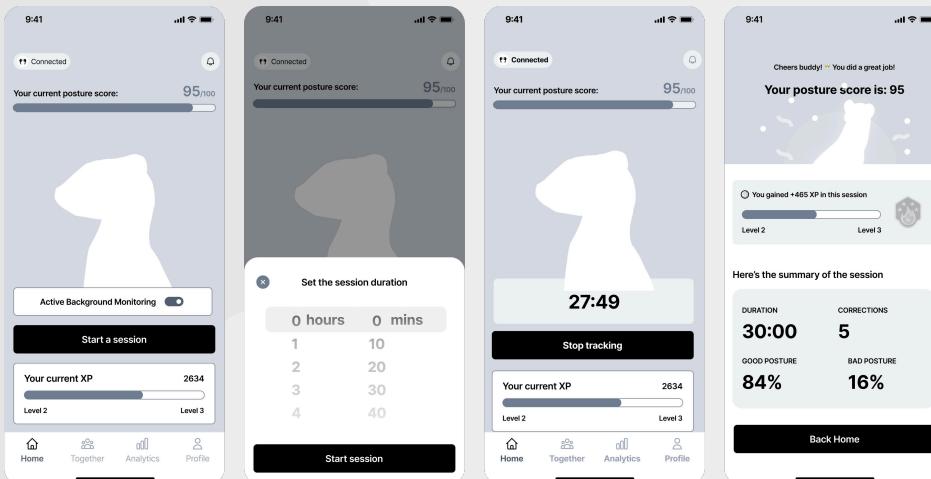
### Onboarding

We designed the onboarding screens to guide users through the setup process and provide them with different device modes based on their preferences.



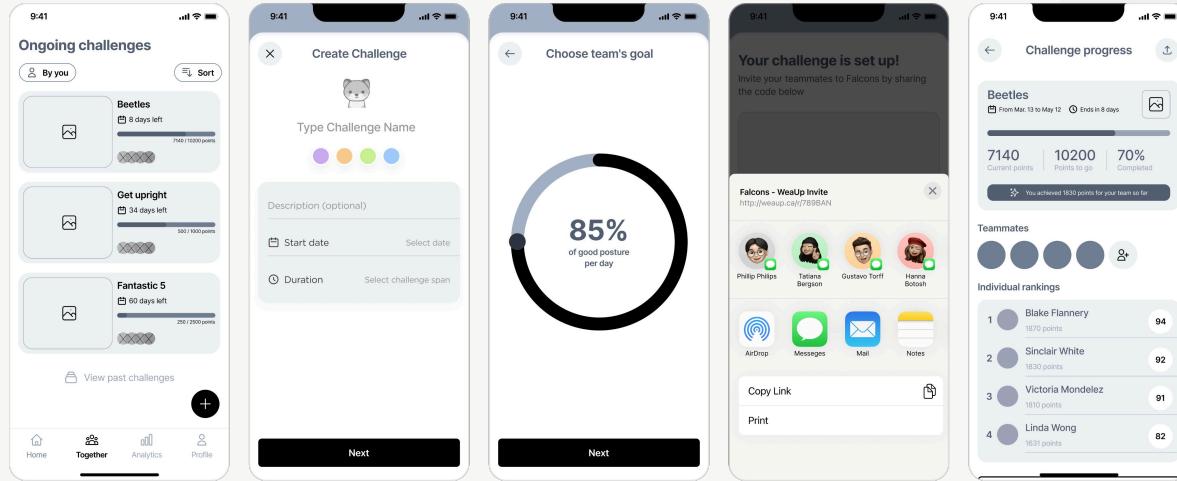
### Posture Monitoring

Here we focused on defining the interface elements necessary to display the device angle and the user's neck position. This included visual indicators for sensor data and real-time feedback.



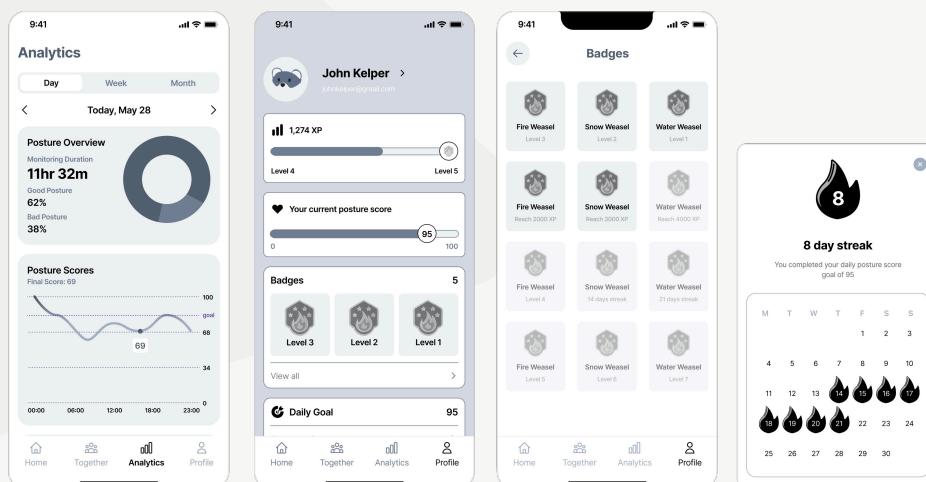
## Collaborative Challenges

For the this feature, we illustrated the process of creating, joining, and tracking collaborative challenges. It outlined the social features and user flow for setting and achieving common goals.



## Posture Analytics & Profile

We focused on presenting the collected data through visualizations such as graphs and charts. We aimed at making the data easy to visualize and understand.



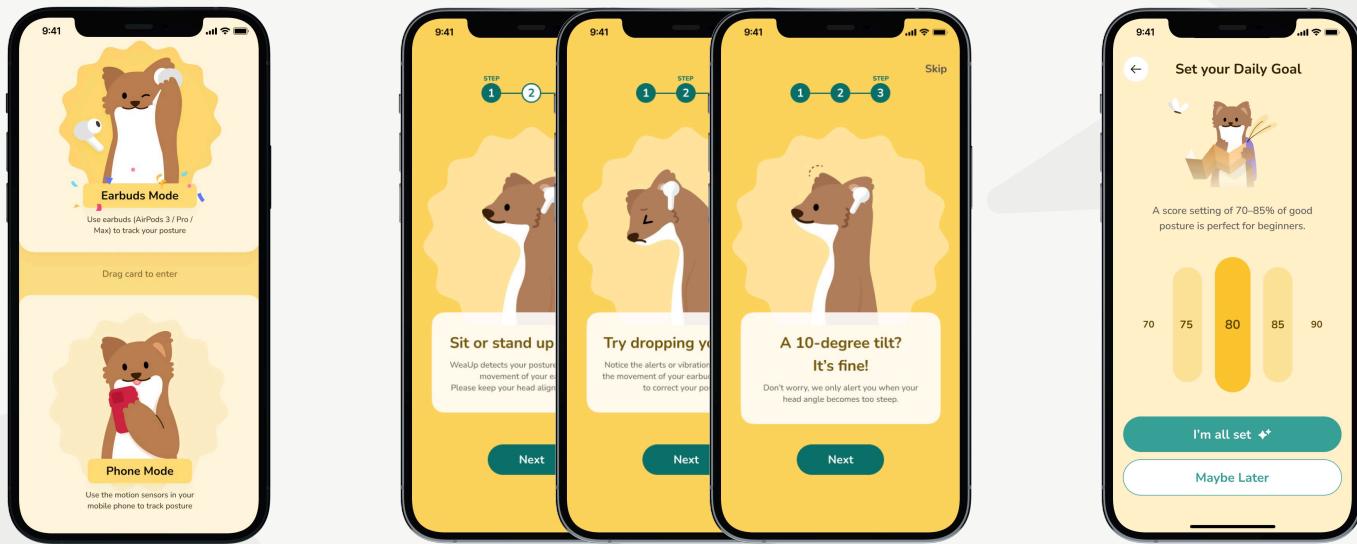
# Mockups

## Design Overview

### Onboarding

## A Quick Start to Get Onboard

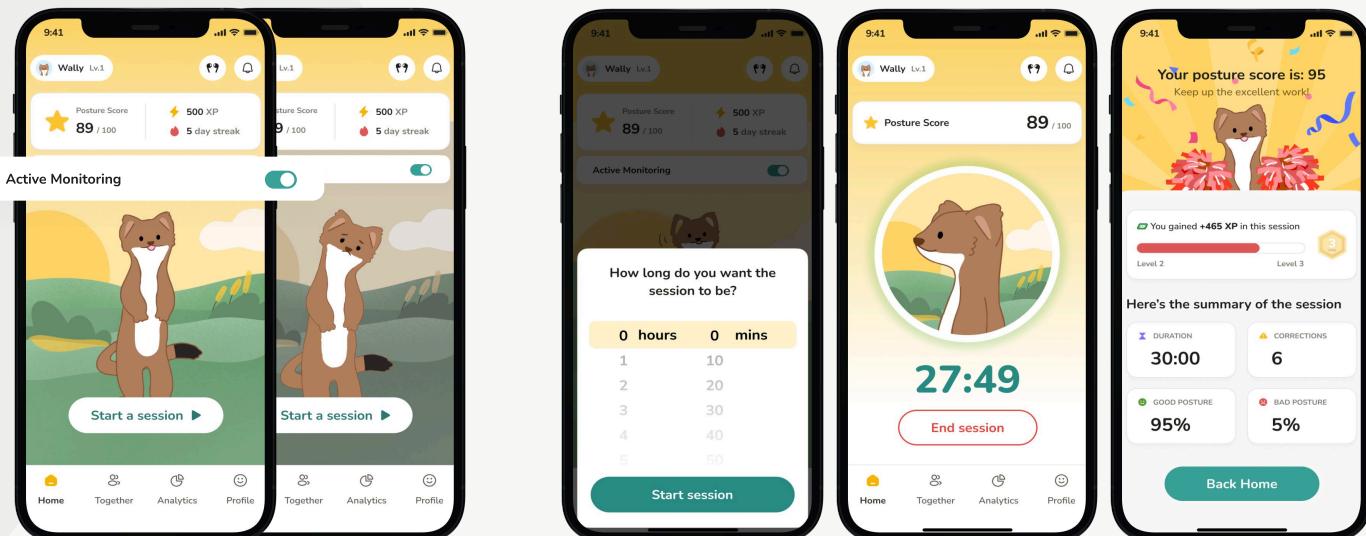
Our easy onboarding process will guide the users and they can choose between two convenient modes: Phone and Earbuds.



### Homescreen

## Posture Monitoring & Real-time Feedback

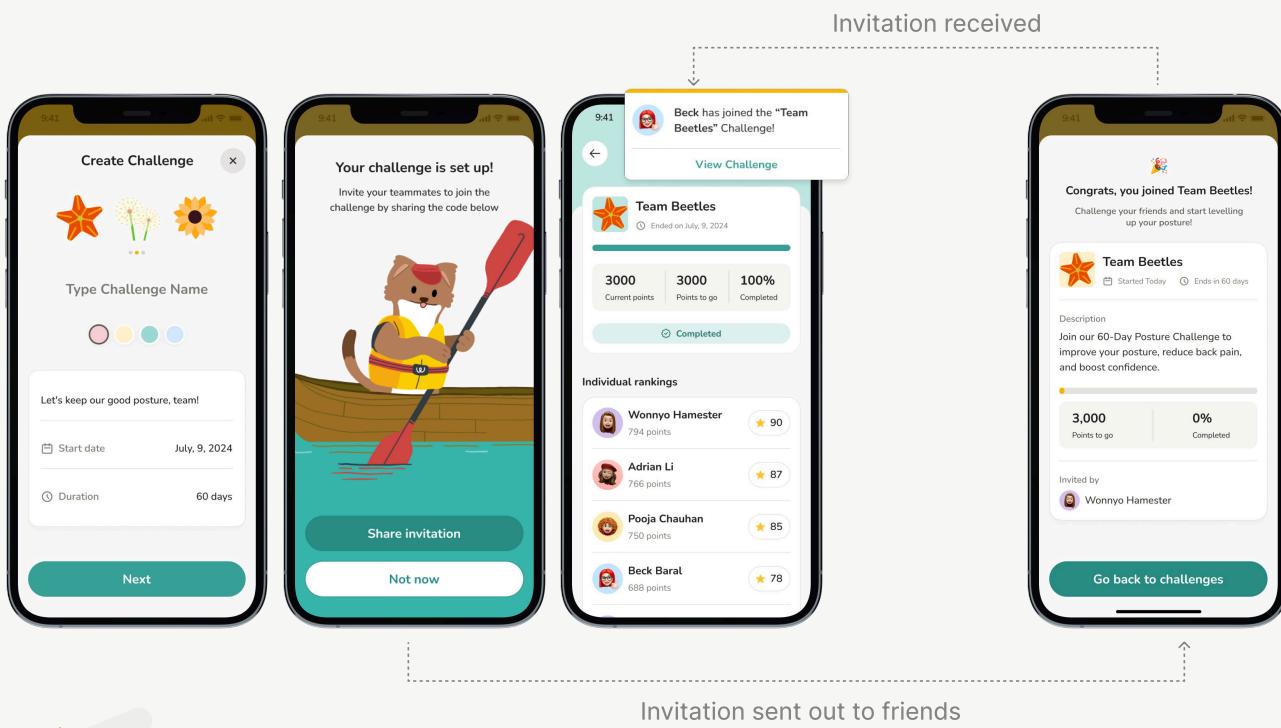
With the background monitoring on, users can easily track their posture and Wally the weasel will give them instant feedback. The background will also become desaturated when the posture is incorrect.



## Together

# Collaborative Challenges

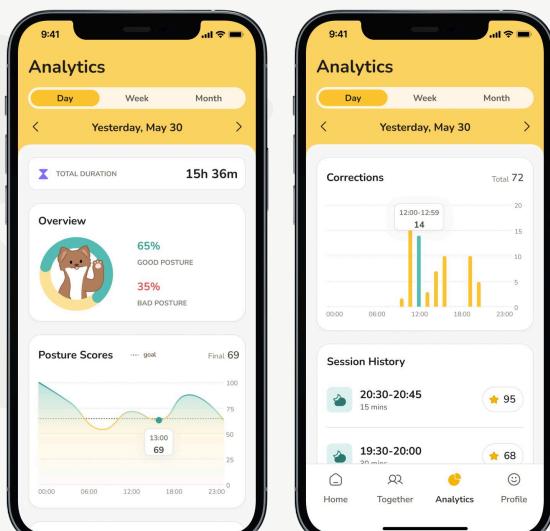
Create, join and thrive together using Challenge features by WeaUp.



## Analytics

# Posture Analytics

Users can gain insights into their posture habits, see detailed reports on their improvements, and identify patterns that need attention.



# Branding

## Design Overview

### Concept

# Wea + Up

'Wea,' derived from Weasel (our mascot), and is also pronounced as 'We.' 'Up' signifies standing up straight with good posture.



### Attributes

Friendly

Supportive

Empowering

### App Icons



### Typography

# Nunito

Nunito

ABCDEFGHIJKLMNOPQRSTUVWXYZ  
abcdefghijklmnopqrstuvwxyz  
1234567890

Aa Aa Aa Aa

Regular Medium Semi-Bold Bold

Headlines

Title 1	<b>WeaUp</b>
Title 2	<b>WeaUp</b>
Title 3	<b>WeaUp</b>
Headline 1	<b>WeaUp</b>
Headline 2	<b>WeaUp</b>

Texts

Body	Your posture better than ever with WeaUp! size: 16 / leading: 24 / weight: medium
Callout	Your posture better than ever with WeaUp! size: 16 / leading: 24 / weight: semibold
Subhead	Your posture better than ever with WeaUp! size: 15 / leading: 20 / weight: regular
Footnote / Navbar	Your posture better than ever with WeaUp! size: 14 / leading: 22 / weight: regular
Caption 1	Your posture better than ever with WeaUp! size: 12 / leading: 18 / weight: regular
Caption 2	Your posture better than ever with WeaUp! size: 10 / leading: 16 / weight: regular
Caption 3	YOUR POSTURE BETTER THAN EVER WITH WEAUP! size: 11 / leading: 20 / weight: bold

Buttons

Button Lg	<b>Next</b> size: 20 / leading: 26 / weight: bold
Button Md	<b>Next</b> size: 14 / leading: 24 / weight: bold
Pill Button	<b>Next</b> size: 12 / leading: 16 / weight: regular

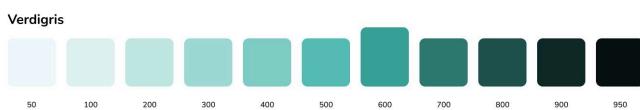
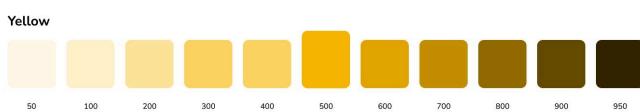
# UI Kit

## Design Overview

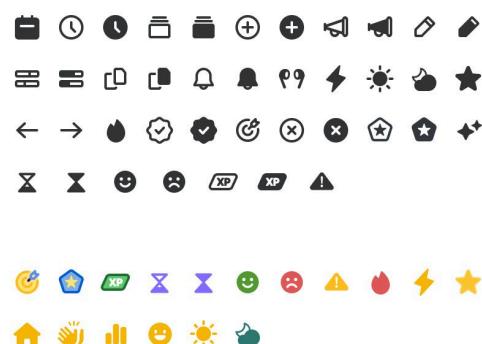
### Buttons



### Colours



### Icons



### Cards & Components

Beetles  
📅 8 days left  
7140 / 10200 points

Posture Pros  
⌚ From Mar. 13 to May 12  
7,140 Current points | 10,200 Points to go | 70% Completed  
➡ You achieved 1830 points so far!

Crickets  
📅 Started Today | Ends in 60 days  
Description

Streak  
Reach your daily posture score goal to build your streak.  
We Th Fr Sa Su Mo Tu  
✓ ✓ ✓ ✓ ✓

Badges  
XP Champion (1000 XP), Community... (20 Friends), Streak Master (7 Days)  
View all >

XP  
1,625  
Level 2 | Level 3

You have reached Level 3  
Level 2 | Level 3  
3 LEVEL UP

Beck has joined the "Team Beetles" Challenge!  
View Challenge

# Mascot Design

## Design Overview

### Posture buddy - Wally the Weasel

In WeaUp, we created Wally as a posture buddy to provide companionship to users, assisting them in cultivating better posture correction.

#### Character

Wally is the supportive posture buddy and tutor in WeaUp. Wally likes encouraging users, offering helpful tips, and making posture correction fun and engaging.

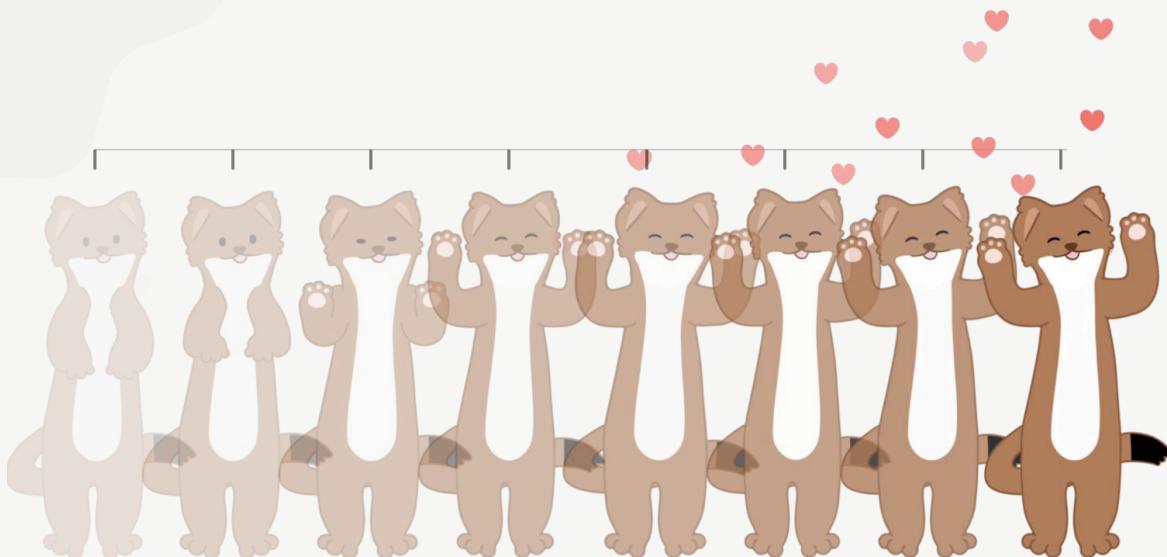
#### Personality

Friendly, Energetic, Supportive, Trustworthy



### Animation

To enhance interactivity and fun, we implemented animations for interactive feedback in WeaUp. For example, when a user taps on Wally on the home screen, Wally will wave and send out hearts to greet them.

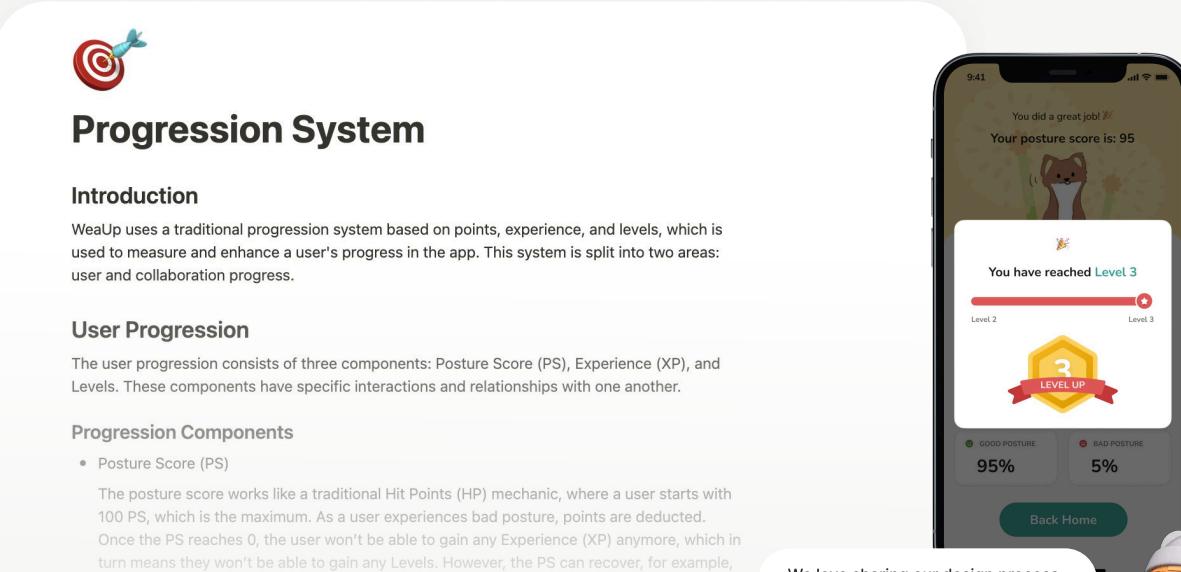


# Gamification Assets

## Design Overview

## Progression System

As a gamified posture correction app, we developed a comprehensive progression system to make the process more engaging for users while cultivating good posture habits.



The Progression System UI mockup shows a mobile application interface. At the top left is a target icon with an arrow hitting the bullseye. Below it is the title "Progression System". The main content area has a section titled "Introduction" with the following text:

WeaUp uses a traditional progression system based on points, experience, and levels, which is used to measure and enhance a user's progress in the app. This system is split into two areas: user and collaboration progress.

Below this is a section titled "User Progression" with the following text:

The user progression consists of three components: Posture Score (PS), Experience (XP), and Levels. These components have specific interactions and relationships with one another.

Under "User Progression" is a section titled "Progression Components" with a bullet point:

- Posture Score (PS)

The text explains that the posture score works like a traditional Hit Points (HP) mechanic, where a user starts with 100 PS, which is the maximum. As a user experiences bad posture, points are deducted. Once the PS reaches 0, the user won't be able to gain any Experience (XP) anymore, which in turn means they won't be able to gain any Levels. However, the PS can recover, for example, when the user is in a good posture position or when they log on the next day.

At the bottom right of the screen is a cartoon character wearing a beanie and glasses, with a speech bubble containing the text: "We love sharing our design process, check more on [weaup.io](#)".

## Badge System

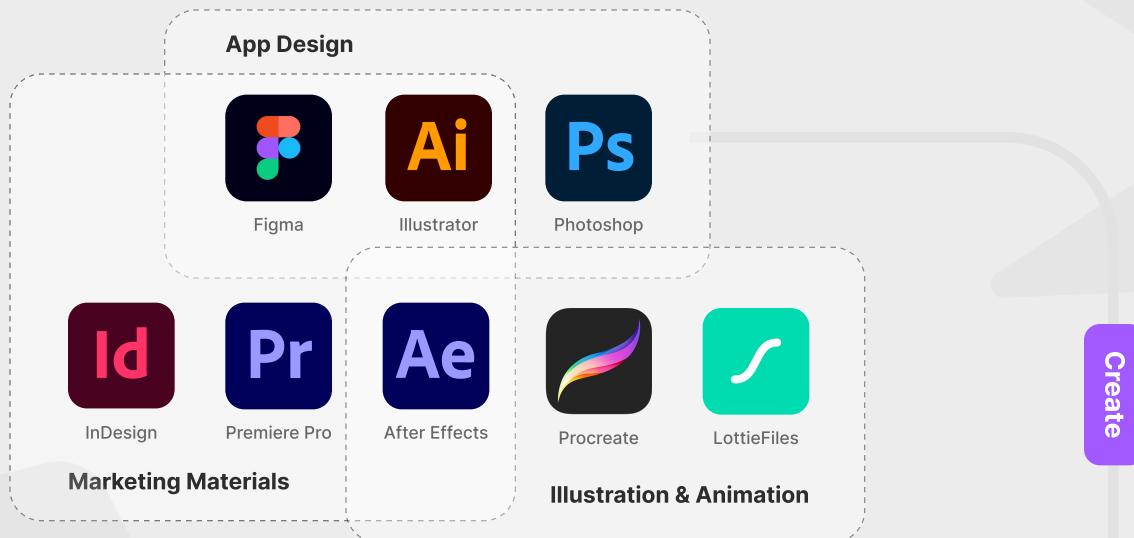


The Badge System UI mockup shows multiple overlapping smartphone screens displaying various badge achievements. In the center, a large phone screen displays a "Streak Master" badge with the text "Congratulations! Congrats on your first 7-day streak! Keep up the excellent work!" and a "Collect Badge" button. Other visible badges include "Community Builder" (20 Friends), "Streak Master" (7 Days), "XP Champion" (1000 XP), "Neck Breaker", "New Year's Weazolution", and "Sneaky Weasel". The phones also show user profiles and progress bars for Posture Score and XP.

# Technical Overview

## Tech Stack

In the past 12 weeks, this is how we brought the app to life, despite all the tears and sweat.



## Design

Our team used **Figma** during the ideation process to create user flows, system architecture, wireframes, high-fidelity mockups, and prototypes.

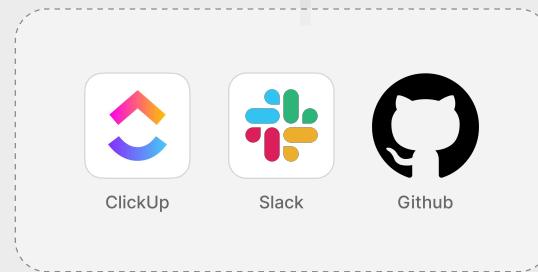
We used **Adobe Illustrator** and **Procreate** for creating illustrations, **InDesign** for preparing marketing materials, **Premiere Pro** for making the promotional video, and **After Effects** and **LottieFiles** for animations and micro-interactions.

Communicate

## Project Management

**ClickUp** was used for sprint planning, managing tickets, and tracking progress on a scrum board. We also used it as a central hub for important project documentation.

**Slack** was the main communication platform, featuring channels for both development and design teams. **GitHub** was used for code version control and issue management.



## Development

### Presentation Layer



We utilized **React Native** with **Expo** to build cross-platform applications with a single JavaScript codebase, ensuring a consistent user experience across iOS and Android. **TypeScript** was employed for type safety and adherence to industry standards. **Fast Styles** was implemented to quickly create styled components with different variants. Additionally, a **React Native Module** created with Swift, C, and JavaScript was used to communicate with the AirPods head tracking API.

### Application Layer



**Collaborate**

**Node.js** was used to develop RESTful APIs quickly, with **Express JS** serving as the framework for building the API. **Mongoose** was implemented to enforce database structure and validations. **Nginx**, along with the **PM2** service, ensured the backend API was available and accessible. **JWT** authorization was employed to secure communication between the presentation layer and the private endpoints.

### Infrastructure Layer



**MongoDB** was chosen as the non-relational database for organized data storage, and **AWS EC2** for hosting the backend API. **Google Authentication** provided a secure structure and user verification. **GitHub Actions** streamlined the CI/CD processes.

# System Architecture

## Technical Overview

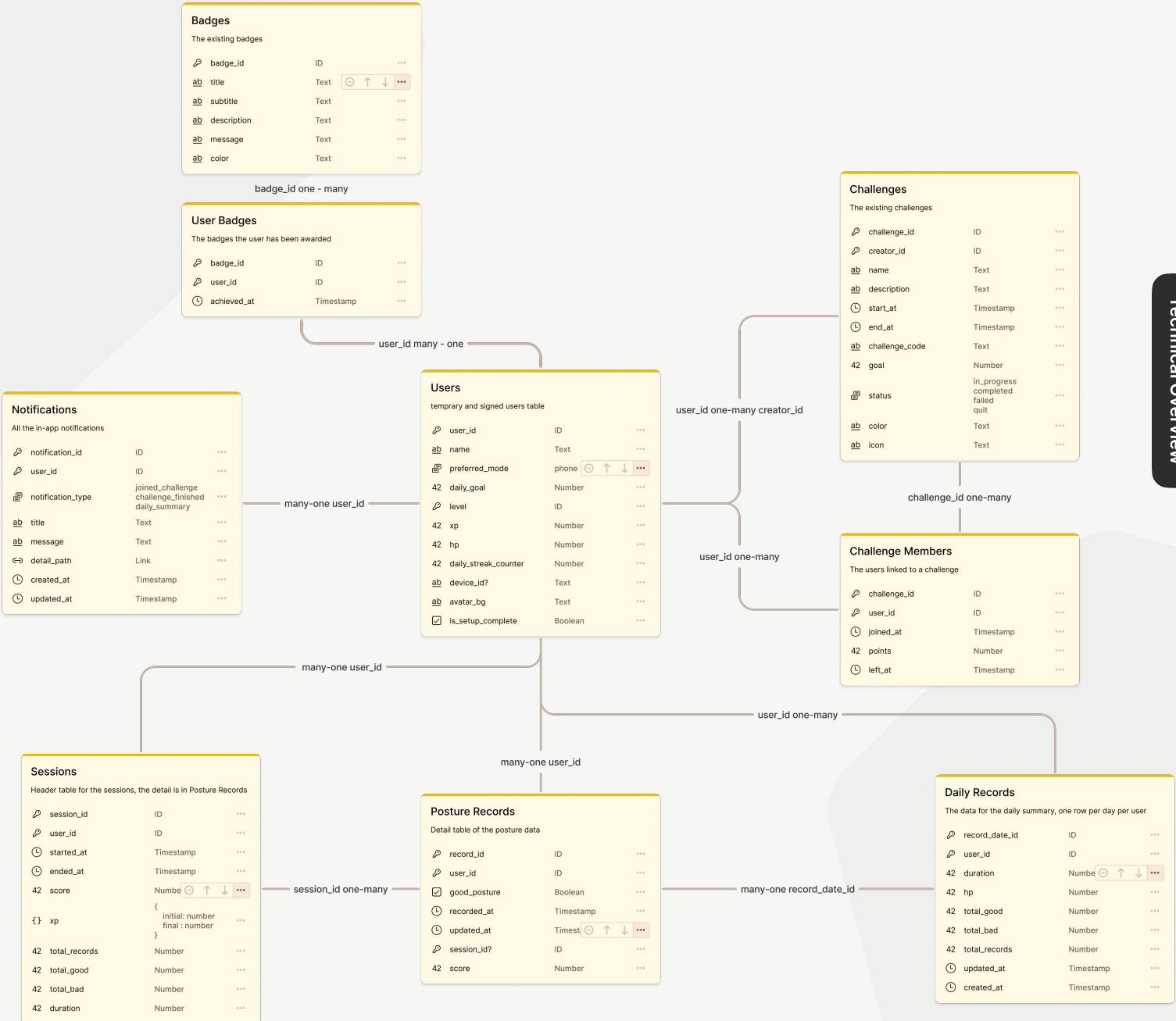
The system is divided into multiple layers, each responsible for different tasks and interacting with the layers above and below it. This layered approach simplifies development and testing, enforces security and validation, and ensures efficient and secure communication between the layers.



# Data Model

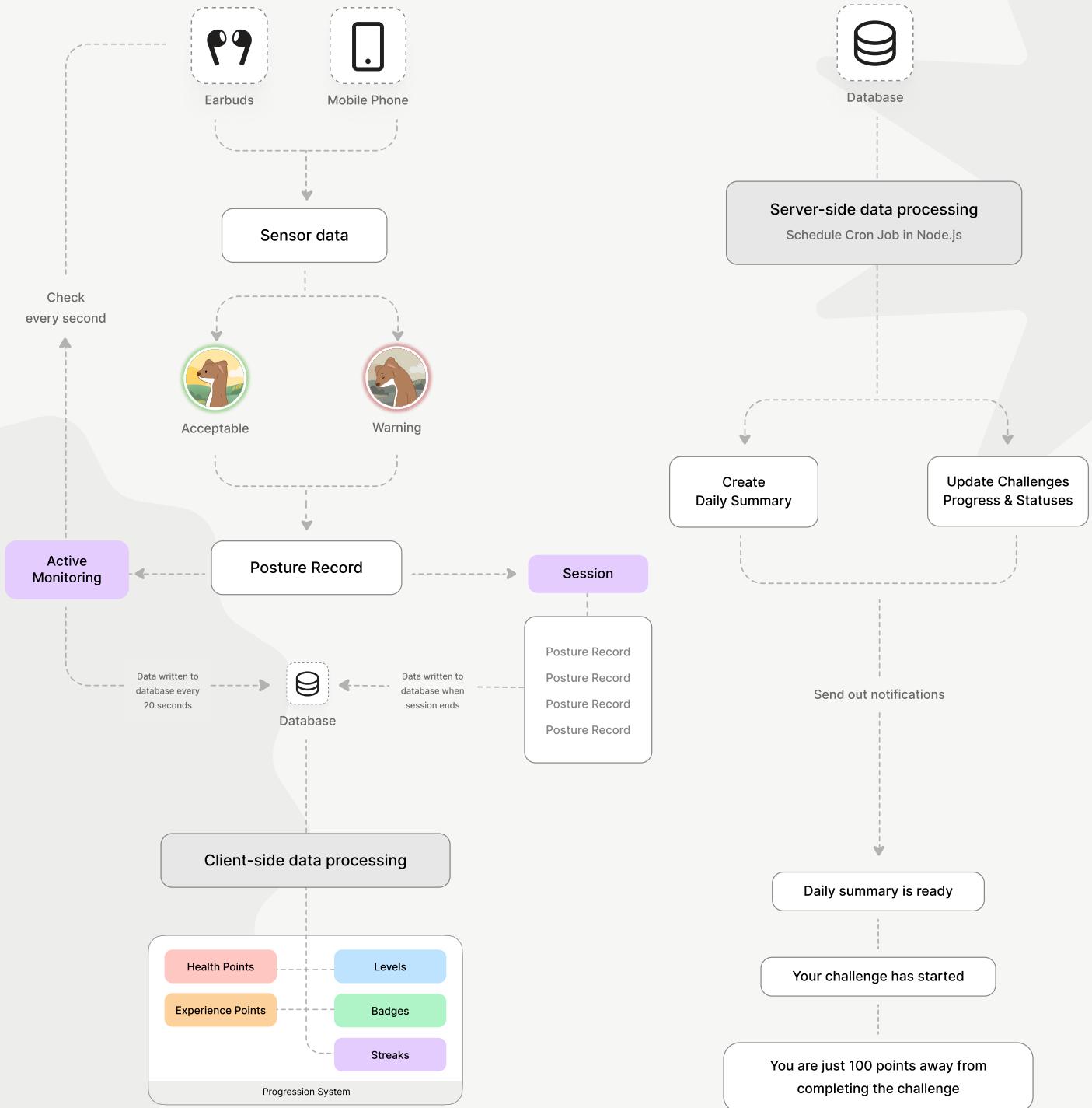
## Technical Overview

We ensured a better response for our users by reducing queries to our transactional tables. This was achieved by recording data instantly on the front-end and using scheduled tasks to consolidate data for Analytics, Daily Summaries, and Challenge progress.



# Data Processing

## Technical Overview

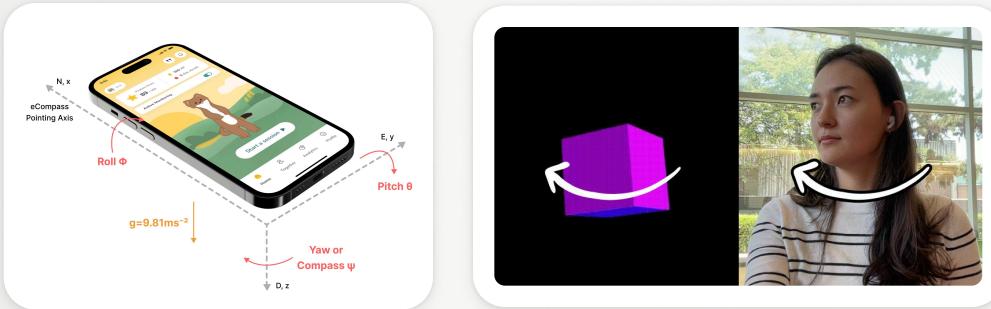


# Real-time Monitoring

## Technical Overview

When the active monitoring is enabled, we add a listener to the gyroscope sensor changes, paying special attention to the pitch value. When the user holds their phone, we save this data and alert the user of consecutive readings of when the phone position requires the user to tilt their neck forward.

Using the same logic, we also add listeners to the AirPods head tracking API, which exposes the earbuds movements; this is a more accurate way to know if the user is flexing their neck forward for long periods of time.



Given our project's requirements singularity of using the sensor data, it was challenging to communicate with the HeadphoneMotionManager API. We had to create a React Native Module that would communicate with a Swift class that utilizes the HeadphoneMotionManager main methods, giving us access to it.

```
✓ modules/headphone-motion
  > android
  ✓ ios
    C HeadphoneMotion-Bridging-Header.h
    C HeadphoneMotion.mm
    S HeadphoneMotion.swift
```

With this module, we created a React Context Provider to check the AirPods head tracking data that we catalog as acceptable or warranted warning. This logic is the backbone of the entire app and what makes the solution run with the Expo framework.

# Business Model

## Our Offer

All essential features of WeaUp are available to users for free. This strategy ensures that the app is accessible to a wide audience, encouraging downloads and usage.

Users can additionally purchase custom themes, avatars, sounds, and other personalization options. This provides an additional revenue stream while allowing users to enhance their experience according to their preferences.

### Free

#### Basic Access

Ideal for Building Healthy Habits

- Neck Posture Monitoring
- Sensory Alerts and Feedback
- Posture Analytics
- Collaborate with Friends

### Top up

#### In-app Purchase

Additional Customization

- Theme Customization
- Mascot Customization
- Exclusive Challenge and Rewards

# Future Features

## Business Model

### More Accessibility Features

We understand how important it is to enhance accessibility for users, and we want to ensure the app can reach a wider audience by including additional features for users with motor limitations.



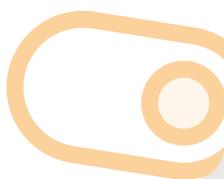
### Integration with Fitness Apps

Sync with popular fitness apps like Fitbit, Apple Health, and Google Fit to provide a more in-depth view of the user's health.



### Customizable Sensitivity and Appearance

Allow users to adjust the sensitivity of posture feedback based on their comfort level and specific needs, and to select custom icons, sounds, and themes for the app.



### Rewards

Users earn points by completing daily goals, challenges, and milestones. They can then spend these points on app customization options, exclusive content, and special badges, enhancing motivation and engagement.



# Hi! We are the team Beetles

## Design Team



**Pooja Chauhan** Lead UI/UX Designer

I am a Product Designer with 3 years of experience designing web and mobile products for both B2B and B2C domains. I believe in the power of design to create a positive impact. My expertise lies in crafting solutions that are both intuitive and visually appealing.

[in/poojachauhan21](https://in/poojachauhan21) [poojach.com](http://poojach.com)



**Jiali Cai** UI/UX Designer & Illustrator

As a passionate Visual and Product Designer with a strong background in graphic, product and IP design, I specialize in crafting intuitive interfaces and engaging digital designs. My goal is to elevate digital products through thoughtful design that brings brand vision to life.

[/in/jalicjl/](https://in/jalicjl/) [jia-li.com](http://jia-li.com)



**Cheuk Yan Li (Adrian)** UI/UX Designer & Animator

As a Product Designer with a background in media arts and 4 years of experience in marketing and curatorial roles, I bring my diverse expertise and unique perspective to the team. My goal is to create engaging and user-centered experiences that resonate with our users and leave a positive impact.

[in/adrian-cheukyan-li](https://in/adrian-cheukyan-li) [adriancyli.com](http://adriancyli.com)



**Anderson Marques** UI/UX Designer

I am a Product Designer with 4 years of experience in graphic and digital design, specializing in web and mobile design. I take inspiration from everyday life, embracing diverse cultures and perspectives to create impactful experiences for people beyond screens.

[in/andersonmarquesoli](https://in/andersonmarquesoli) [andersonmarquesoliveira.com](http://andersonmarquesoliveira.com)

# Development Team



**Wonnyo Hamester** Lead Full-Stack Developer

I am a Software Engineer with 7 years of experience in software development, specializing in front-end web applications. My goal is to create comprehensive solutions for end users through scalable, reliable, and high-quality development.

 [in/wonnyo](#)  [whamester](#)



**Bethleen Baral** Full-Stack Developer

I am a Software Developer specializing in back-end technologies. With experience in development, defect investigation and resolution, I am dedicated to continuous learning and focused on developing efficient, maintainable solutions.

 [in/bethleen-baral](#)  [zeckkimon](#)



**Reinhardt Botha** PM & Full-Stack Developer

My background in Geographic Information Systems led me to become a developer, combining geospatial thinking with coding to create innovative solutions. With strong communication and leadership abilities, I guide teams to deliver outstanding work.

 [in/wrbotha](#)  [ReinhardtBotha](#)



**Victor Portus** Full-Stack Developer

Full-Stack Developer experienced in MERN development. Skilled in designing, developing, and maintaining fully-fledged platforms with databases and servers. Passionate about delivering efficient and robust web solutions.

 [in/victor-portus](#)  [Victorportus](#)

# References

1. National Library of Medicine. "Text Neck Syndrome in Children and Adolescents" PubMed, 7 Feb. 2021 <https://pubmed.ncbi.nlm.nih.gov/33562204/>
2. National Library of Medicine. "Smartphone addiction and postural alterations in the cervical region in adolescents" PubMed, 22 Dec. 2023 <https://pubmed.ncbi.nlm.nih.gov/38126601/>
3. Posture Correction Market Size, Share & Trends Analysis Report By Distribution Channel (Pharmacies & Retail Stores, E-Commerce), By Product (Sitting Support Devices, Kinesiology Tape), By End Use, By Region, And Segment Forecasts, 2022 – 2030 <https://www.grandviewresearch.com/industry-analysis/posture-correction-market-report>
4. Global Posture Corrector Market – Industry Trends and Forecast to 2030 <https://www.databridgemarketresearch.com/reports/global-posture-corrector-market>
5. Hoy, D., March, L., Brooks, P., Blyth, F., Woolf, A., Bain, C., Williams, G., Smith, E., Vos, T., Barendregt, J., Murray, C., Burstein, R., & Buchbinder, R. (2014). The global burden of neck pain: Estimates from the Global Burden of Disease 2010 study. Annals of the Rheumatic Diseases, 73(7), 1309-1315. <https://doi.org/10.1136/annrheumdis-2013-204431>

# Credits

1. Hirsch, S. (2018). Woman using MacBook Pro. Unsplash. <https://unsplash.com/photos/woman-using-macbook-pro-7PHq2BCa7dM>
2. Harwood, S. (2019). Man wearing headphones while sitting on chair in front of MacBook. Unsplash. <https://unsplash.com/photos/man-wearing-headphones-while-sitting-on-chair-in-front-of-macbook-4-EeTnaC1S4>
3. Pavel Danilyuk. (2021). Smiling young woman taking selfie photo [Photograph]. Pexels. <https://www.pexels.com/photo/smiling-young-woman-taking-selfie-photo-6697311/>

# Special Thanks to Our Instructors and Advisors

Denis Billette  
Ivan Wong  
Jeffrey Ellis  
Jesica Ortega Nava  
Jorge Puertovannetti  
Jordan Miller  
Josué Menjivar  
Lu Yu  
Marinela Poso  
Neil MacAlister  
Paul Brassard  
Paul Lam  
Peter Vysek  
Reza Abbasi  
Reza Etemadi  
Richard Wong  
Tomoko Okochi  
Trista Townsend  
Tyler Higgs  
Amandeep Singh  
Don Gillard  
Jonathan Howard  
Merry Nguyen  
Valentina Abanina



Created in association with

**snəweyət leləm̓.**

THE COLLEGE OF HIGHER LEARNING.

**Langara.**

THE COLLEGE OF HIGHER LEARNING.



Proudly designed and developed by team Beetles

Pooja Chauhan · Jiali Cai · Cheuk Yan Li · Anderson Marques

Wonnyo Hamester · Reinhardt Botha · Bethleen Baral · Victor Portus