Assignment 10

Final Presentation

IU Athletics & Wearables

Team E

Mayur LS, Sohile Ali, Yashvi Upadhyaya, Zain Rajwany

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Project Overview

Our project focuses on visualizing the data collected by wearable technology to motivate athletes during workout sessions - thus helping them improve their performance. Our process is outlined below:

1. **Preliminary Research**: To derive a Stakeholder Map and brainstorm wearable technology usage.
2. **User Survey**: To understand athlete needs in regards to motivation and performance.
3. **Design curation**: To establish themes and generate concepts based on the themes.
4. **User Interviews:** To validate and explore further thoughts of athletes on the chosen concept.
5. **Prototyping**: To represent our concept in a high-fidelity mockup design for feedback and iteration.

Preliminary Research

Based on our literature review and ongoing research in the domain of athletics we better understood how athlete motivation helps them improve their performance.

Some insights are as follows:

Do athletes need motivation? - YES

In sports, coaches and teammates provide motivation for athletes.

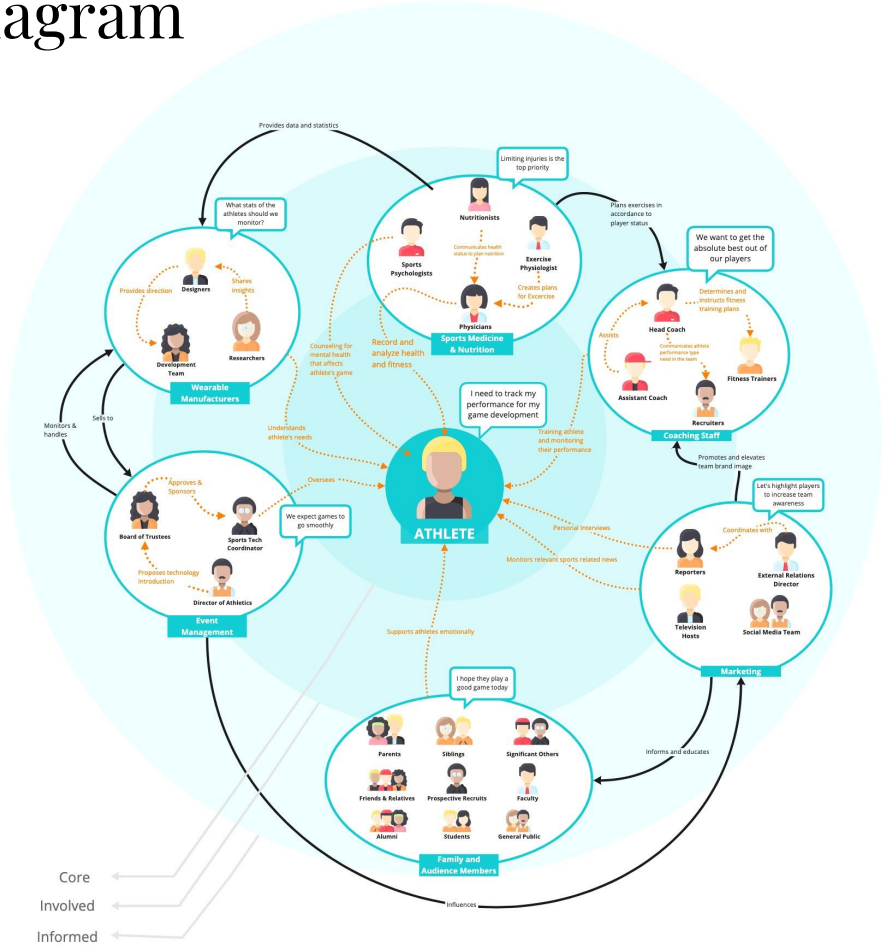
It is proven that there is a positive effect of motivating agents - eg cheering on athletes' mental state in the field of sports psychology. **[2]**

Tracking Enhances Motivation

Effects on motivation of self-tracking devices are more pronounced in amateur athletes.

"You're more motivated because you know that you're registering yourself, whereas before I went out without it and I knew that there wasn't someone up there measuring me...and maybe this thing pushes you to do more...before you could also say 'well even if I stop here, it doesn't change anything.'" **[1]**

Stakeholder Diagram



[Click here for Miro board.]

Brainstorming Scope of Wearables in Athletics

Position Tracking

Wrist wearables for football players that show the play they are running. Quarterback selects the play then receivers can see it on their wrists, lineman can see their blocking lines, etc. More effective playmaking. (football)

Wrist wearable that alerts player when not in position in the game

Team position tracker

Location based wearable with a display that detects a certain player on the court and can give an overview of their strengths/weaknesses, basically a profile on the player so you are better prepared to guard them and anticipate their play style (basketball or any 1 on 1 guarded sport)

Smart tech in the sports gear

Wearable for wrist/arm that is a Fatigue detector that measures heart rate, blood oxygen levels, alerts coaches and trainers when a player is needing to come out of the game (any sport really)

Sensors in equipment that collect data on the usage of said equipment (ex. baseball bat and perfecting a swing)

Trainer/tracker for bodily movement centric sports - which gives review on the player's performance.

Smart glasses that assist in training

Wrist wearable that tracks sleep patterns

Smart helmets

Visualization of biometric stats

Vest that tracks biometric stats

Wearable for inside of jacket that can detect the impact force of being hit. Connects to app so coaches and trainers can develop the best recovery plan (ice hockey)

Hydration Alert
- https://www.forbes.com/sites/shouriyasanyal/2018/11/30/how-are-wearables-changing-athlete-performance-monitoring/?sh=1401bb0fae09

Wearable for arm/wrist that tracks how many miles the athlete has ran during the game. In order for coaches to manage playing time. (basketball)

https://www.usa.philips.com/healthcare/product/HC989803196871/wearable-biosensor-wireless-remote-sensing-device?origin=2_us_en_5370367_Skimlinks_12056403_mixedtype_ci&utm_medium=affiliate&utm_campaign=partnerize&utm_content=Skimlinks&utm_term=12056403&cjevent=a7a10d8f9c8d11eb80ad00a0a0a1c0e11

Doping - prevention

Inertial sensor wearable around ankle that can learn different movements for the sport. This way, during practice/training it can make sure the move is being done correctly, many times, keep track etc. Combining data sensors with machine learning. (any sport, I think basketball due to certain repetitive movements)

In the weight room, a wearable for the wrist that can measure the weight, rep count, and movement the athlete does. This way, they can record their workout with specific weights, reps, etc, and have that data moving forward (increasing for next time). All sports that have athletes that lift weights.

ECG monitors - stamina?

Wearable that Gamifies practice

Sensors that can detect early signs of injuries (soft tissue injuries sepcifically)

Shoes that reduce impact of turf, court, etc on one's feet

Foul detector - No need for a referee on the field

Our research questions

1. How can wearables be used to track performance of the athletes?
2. How can we use visualization of performance and gamification to motivate athletes during practice sessions?
3. How can wearables be used to personalize nutrition and wellness plans?

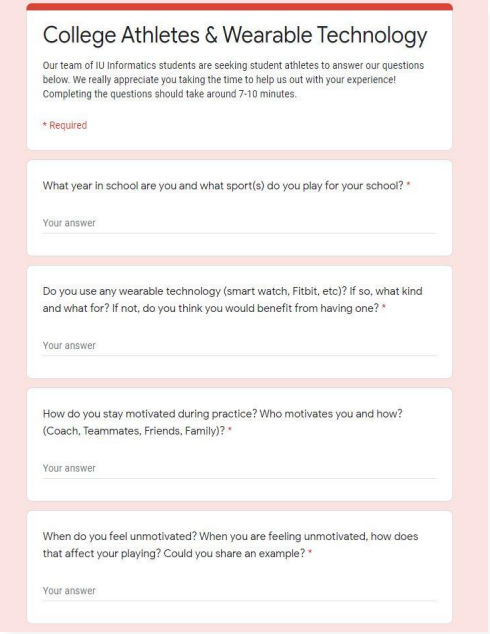
User Research

1. Survey

We shared a Google Form with questions to a number of college athletes, based on our preliminary research.

The athletes were asked 7 questions based on their experiences focusing on:

- Wearables they use
- When they feel motivated/unmotivated
- Performance tracking
- Injuries



Screenshot from Google Form

Click here for Google Form User Survey.

Survey – Insights and Findings

Participants: 10 College Athletes | Age Range: 18-23 | All Play Team Sports

Motivation

Players are motivated by their coaches, teammates, family, and their own desire to get better.

“My teammates motivate me since they’re going through the same thing I am”

Performance Tracking

Players keep track of their own progress by evaluating their performance & referring to their coach's notes.

“I rely on my coaches for advice.”
“I study film to see where to improve.”

Wellness

Injury prevention is achieved by stretching, wearing protective equipment, and hydration.

“Stretching, proper weight room movements, and wearing braces helps me stay healthy.”

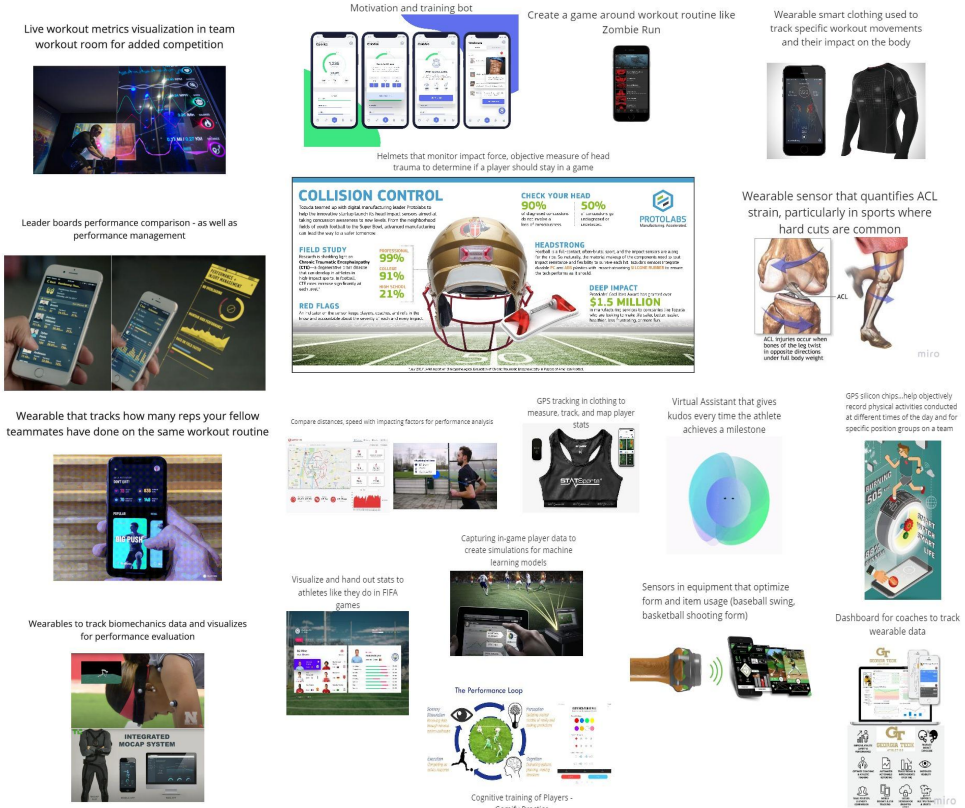
2. Design Curation

Based on the survey insights, we individually researched design ideas and generated **3 themes**:

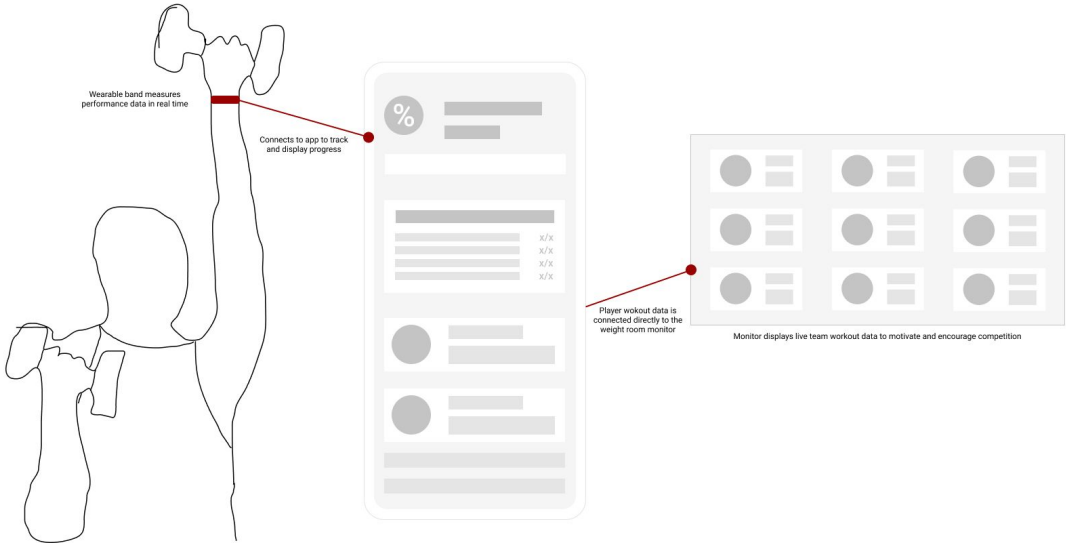
1. Tracking Athlete Performance
2. Motivating Athletes During Practice
3. Athlete Wellness

From the realized themes - we formed 4 concepts for our design solution.

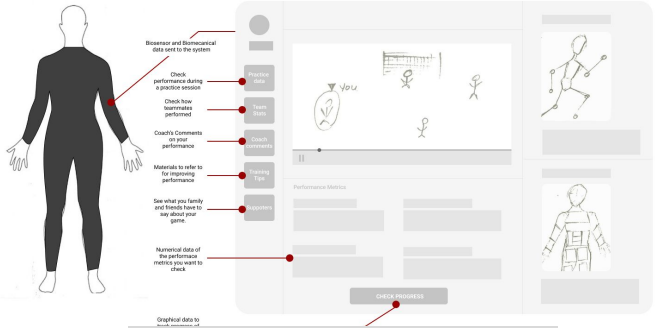
Click here for Design Curation Research.



3. Concepts

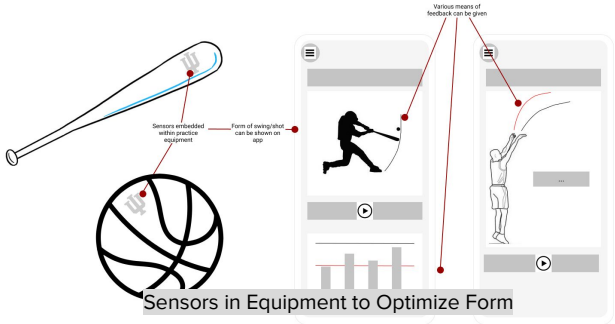


Final concept: Rep Tracking Wearable For Motivation During Team Workouts



Dashboard for Personal Performance Tracking

Arm Sleeves that Give Feedback on Performance



Sensors in Equipment to Optimize Form

[Click here for Insights & Concepts.](#)

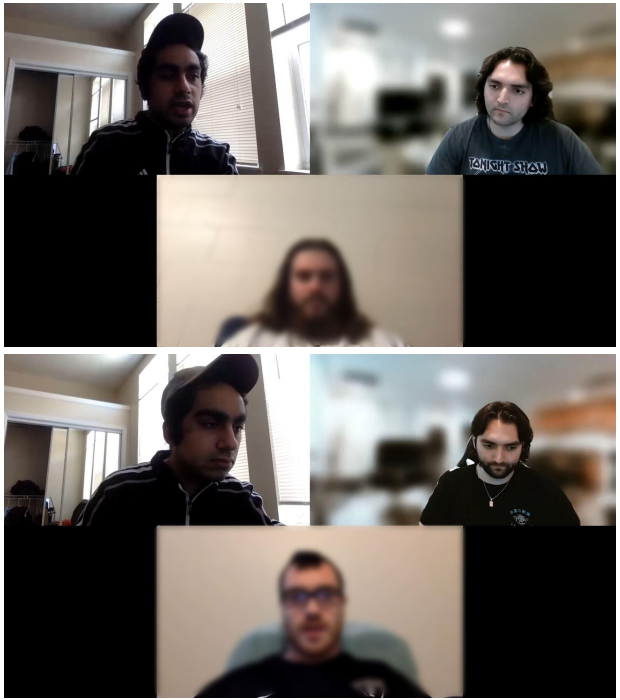
4. User Interviews

We interviewed 2 college athletes who had previously taken our survey.

The athletes were asked to share their experiences as college athletes, specifically focusing on practice and workout sessions. And their views on the proposed concept.

Our questions centered around 4 aspects of practice and preparation:

- Motivation During Practice and Weight Lifting Sessions
- Performance Tracking
- Injury Recovery
- Nutrition and Wellness Plans



Screenshots from User Interviews

User Interview – Relevant Insights and Findings

Participants: 2 College Athletes | Ages: 20 & 23 | Collegiate Football Players

Camaraderie and Team Spirit

Through shared experiences, athletes bond with each other and become each other's main motivation as to not let the team down. Teammates consistently root for each other during games, practice, and lifting sessions.

"If you do make a mistake or don't make a play, they [teammates] always got you."

Performance and Wellness Tracking

Players keep track of their performance by analyzing game and practice film. Feedback from trainers and coaches help gauge their progress.
However, keeping track of diet and nutrition falls on the athletes themselves.

"We have position meetings before practice everyday, where we watch film from the day before."

Competitiveness

Players often compete with one another to better themselves. This includes offense vs. defense, 1-on-1 drills, and in lifting sessions. These act as additional forms of motivation to continually improve.

"If we do receiver vs DB 1-on-1s...all the other guys start whooping and hollering, and talking smack to the other side."

What can we gain from these Insights?

Through our user interviews, we gained a better understanding of the college athlete experience. Our design solution should fit their needs while allowing them to thrive in their environments.

Our design concept should emphasize these points:

- **Encourage college teams to workout** and achieve goals together, while allowing for individual competition as well.
- **Athletes can keep track of their progress** and records during lifting sessions, similar to film study for practice.
- If players are inclined to, **provide the option to monitor** their nutrient intake and set goals for themselves in that area.

Proposing Design Solution

Our design solution takes 3 forms:

1. **Wearable Band** - collects athlete performance data.
2. **Mobile Application for Athletes**
    a. Athletes can keep track of their performance, improvement, and nutritional intake.
    b. Athletes can schedule their workout sessions and invite/challenge teammates and compare their performances. Varsity Points, Leaderboards, and Notes from teammates and coaches enhance motivation and performance improvement.
3. **Real Time Display** - placed in the workout facility for athletes to keep track of their performance as a team and compared to other teammates.

Click here for Figma Prototype.

Wearable Band Concept

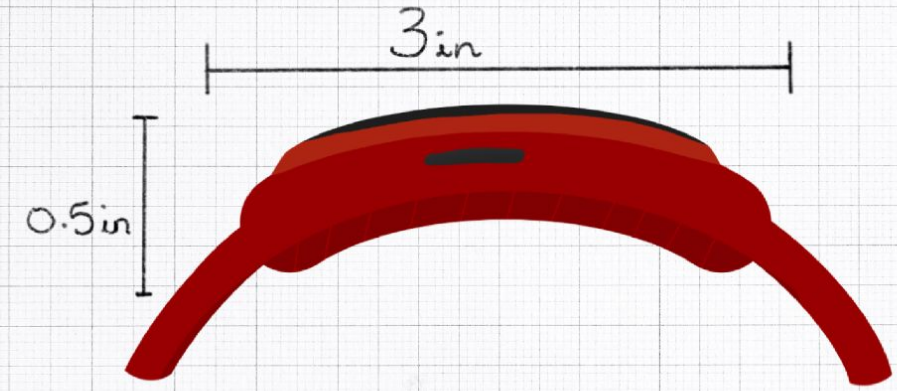


Figure 1

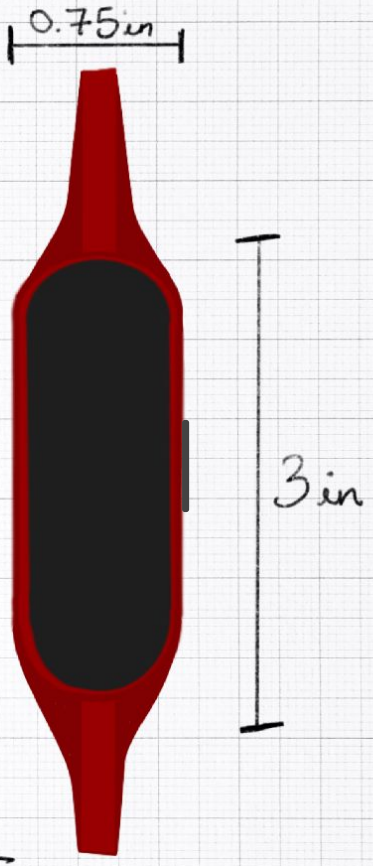
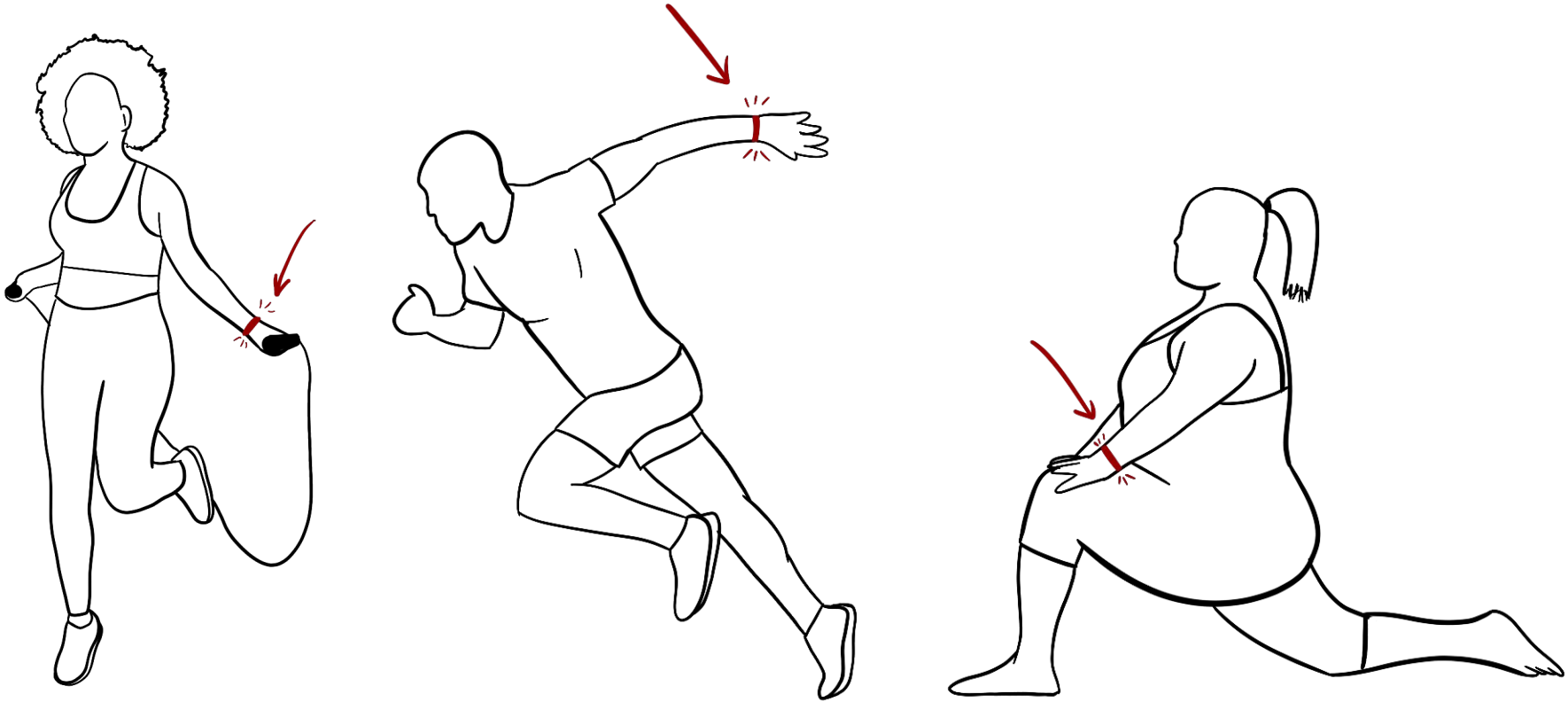
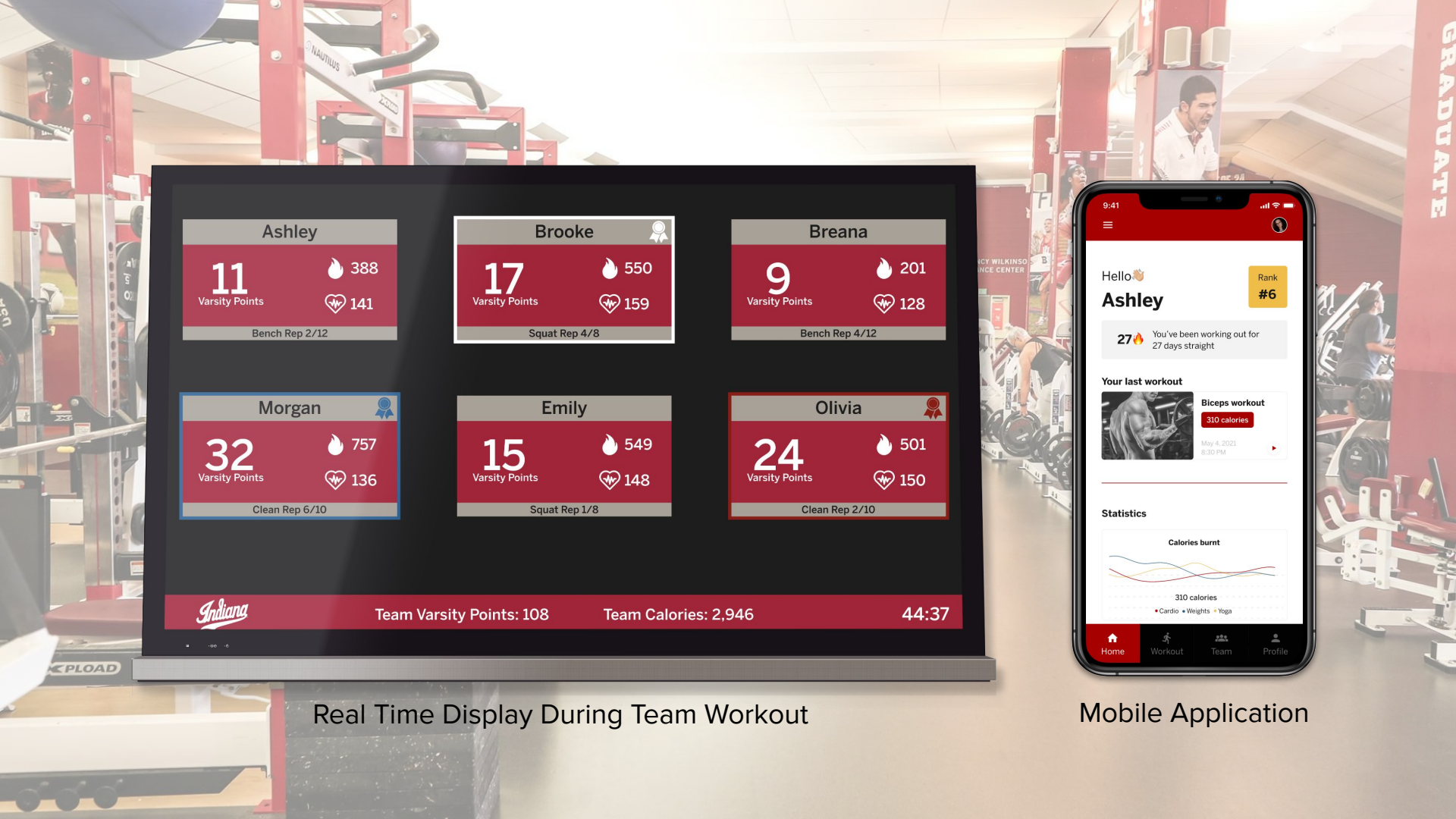


Figure 2



Wearable Band Concept Sketched Onto Various Athletes

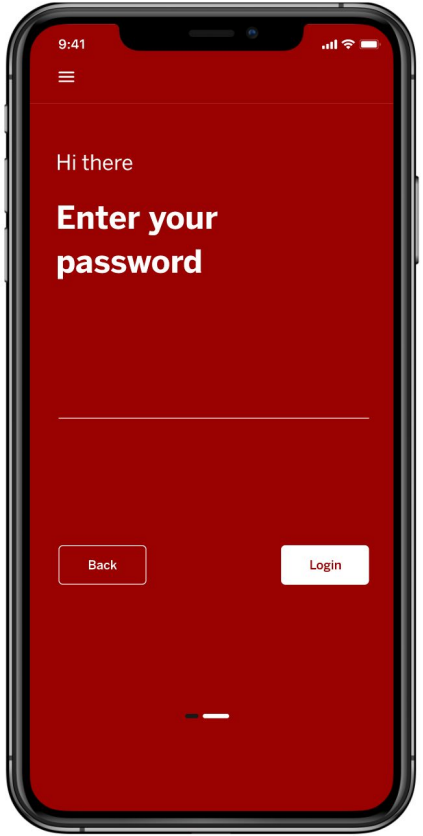

Prototype Design
IU Athletic Wearables
Page 1 - IU Athletic Wearables
Share
Layers
Assets
Design
Prototype
Inspect
Background
Real Time Display
Bench Press
Line 28
Bench Press
Group 79
MacBook Pro
Hello
Ashley
#5
27
Your last workout
310 calories
Statistics
Calories burnt
310 calories
Home
Workout
Team
Profile



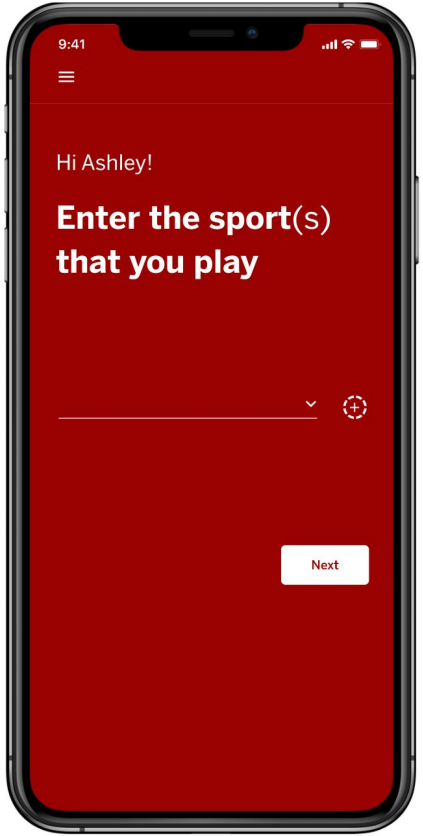
Real Time Display During Team Workout

Mobile Application

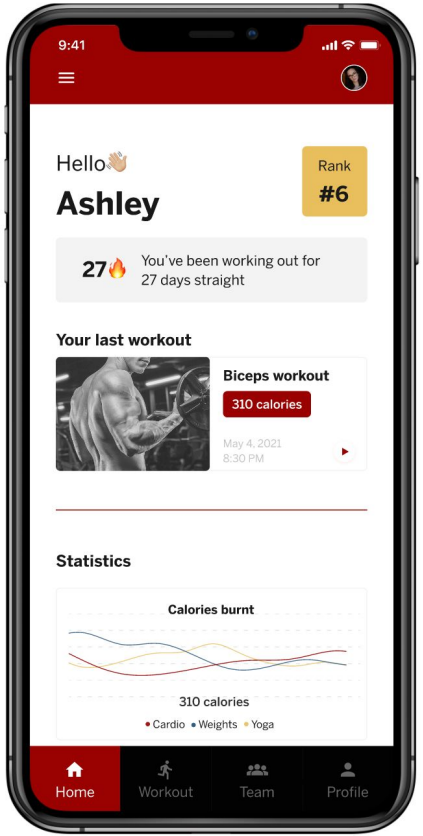
Email Prompt



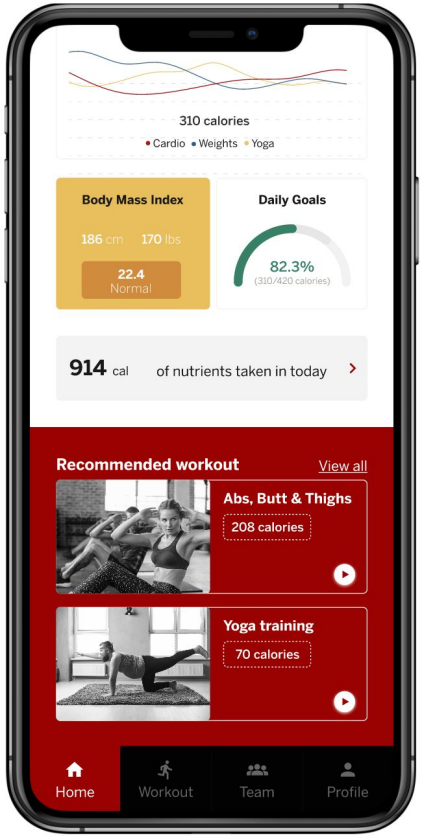
Password Prompt



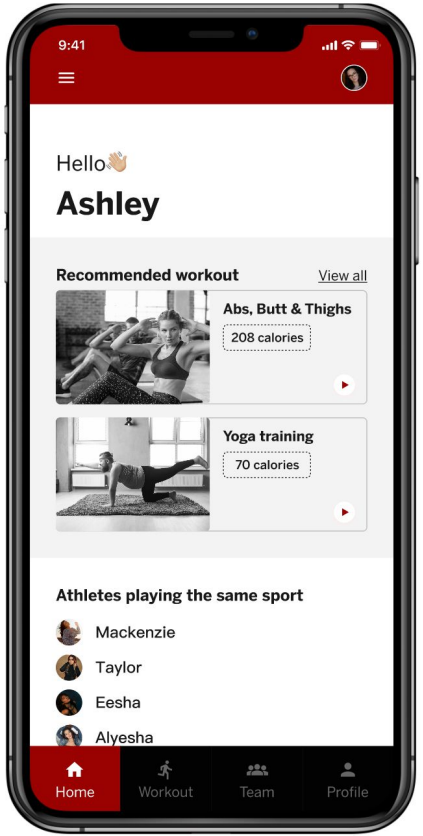
Enter Athlete’s Sport(s)



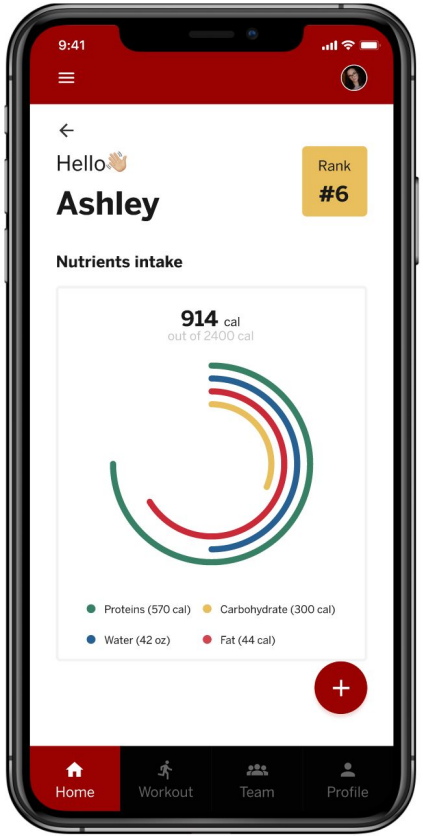
Home Screen



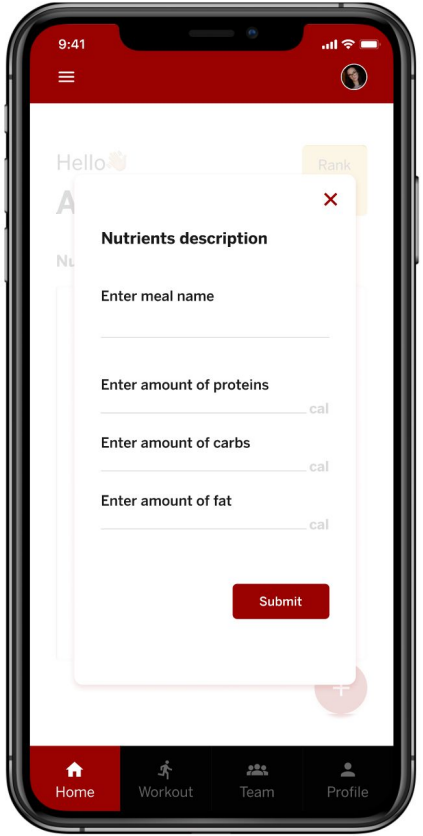
Home Screen
(scrolled down)



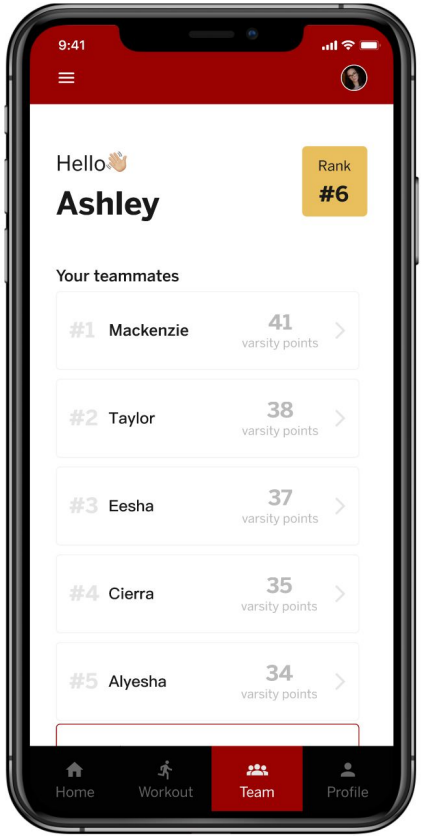
Home Screen
(on first time login)



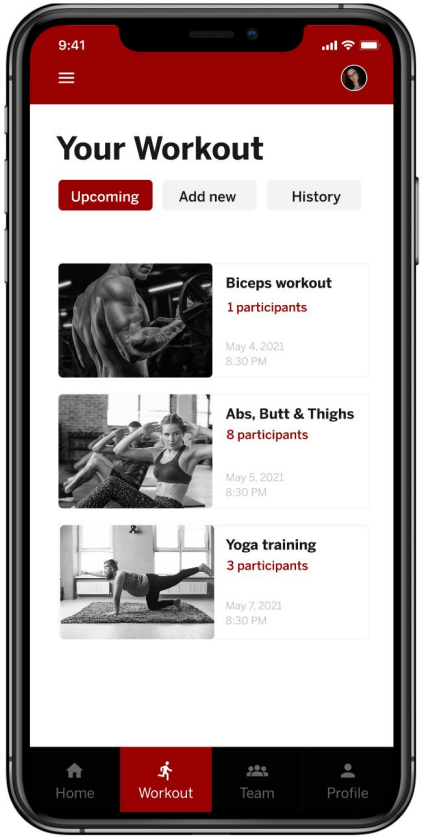
Nutrients Intake



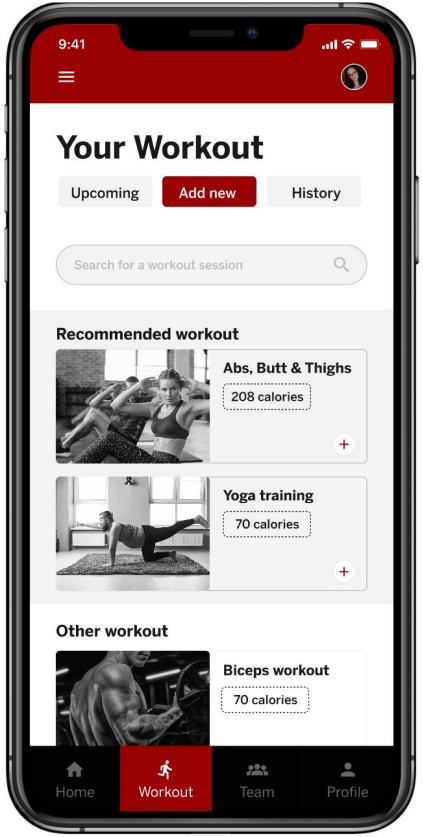
Nutrients Submission



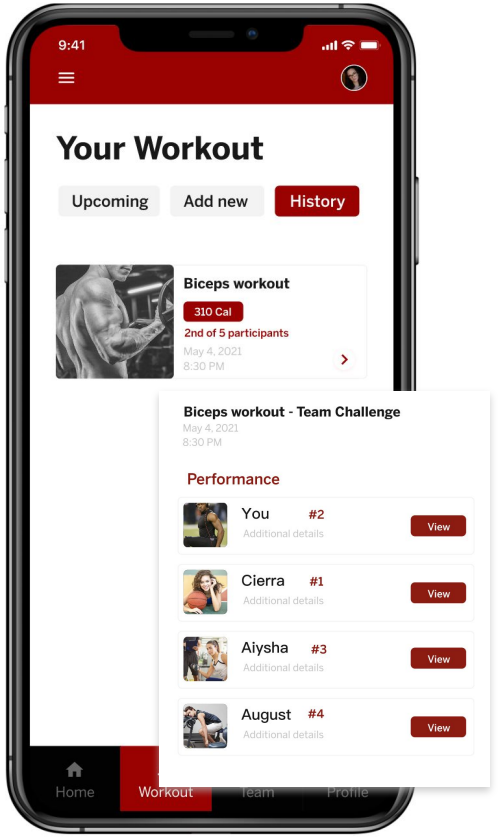
Teammates Scores



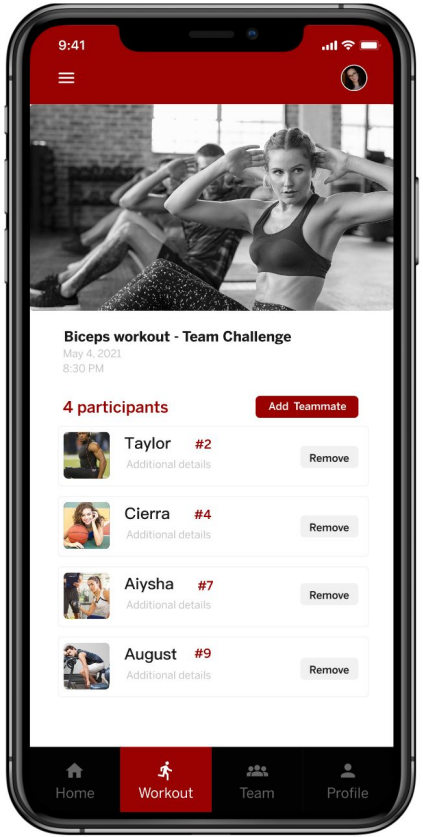
Upcoming Workouts



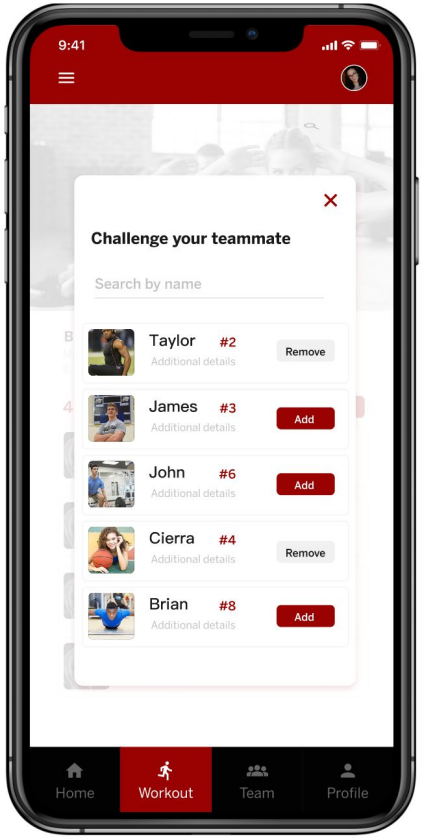
Add New Workouts



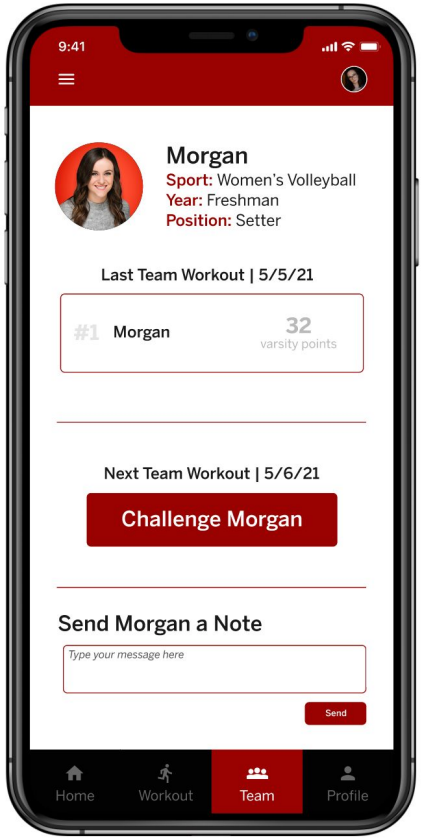
Workout History



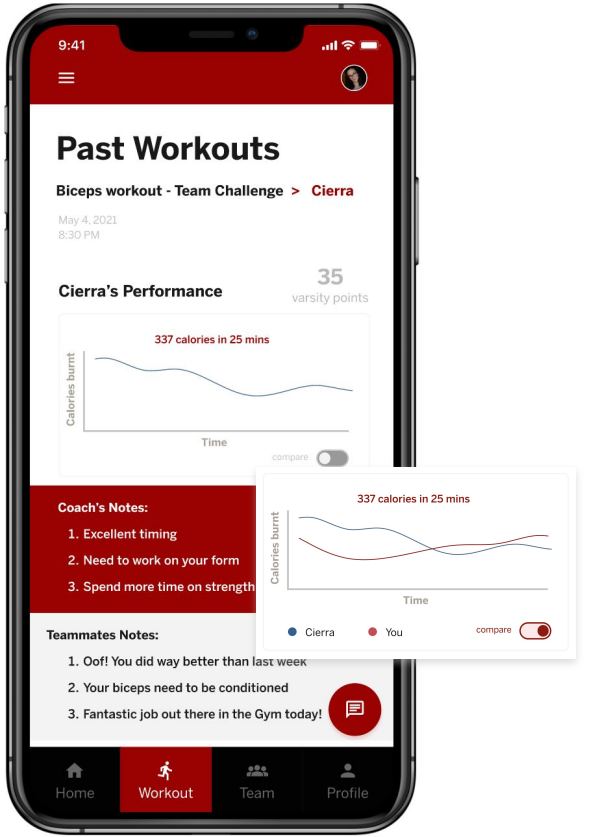
Workout Challenge



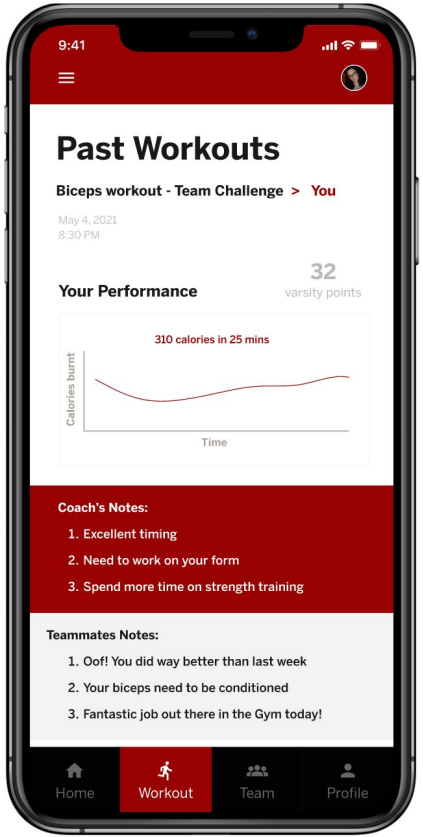
Challenge Teammates



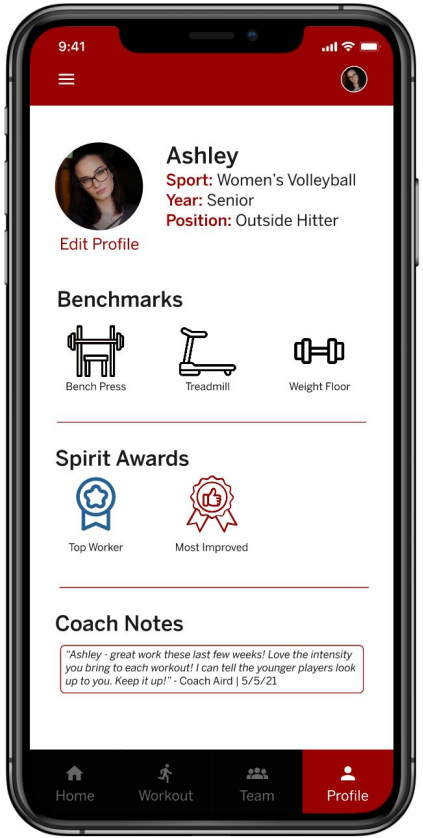
Teammate's Profile



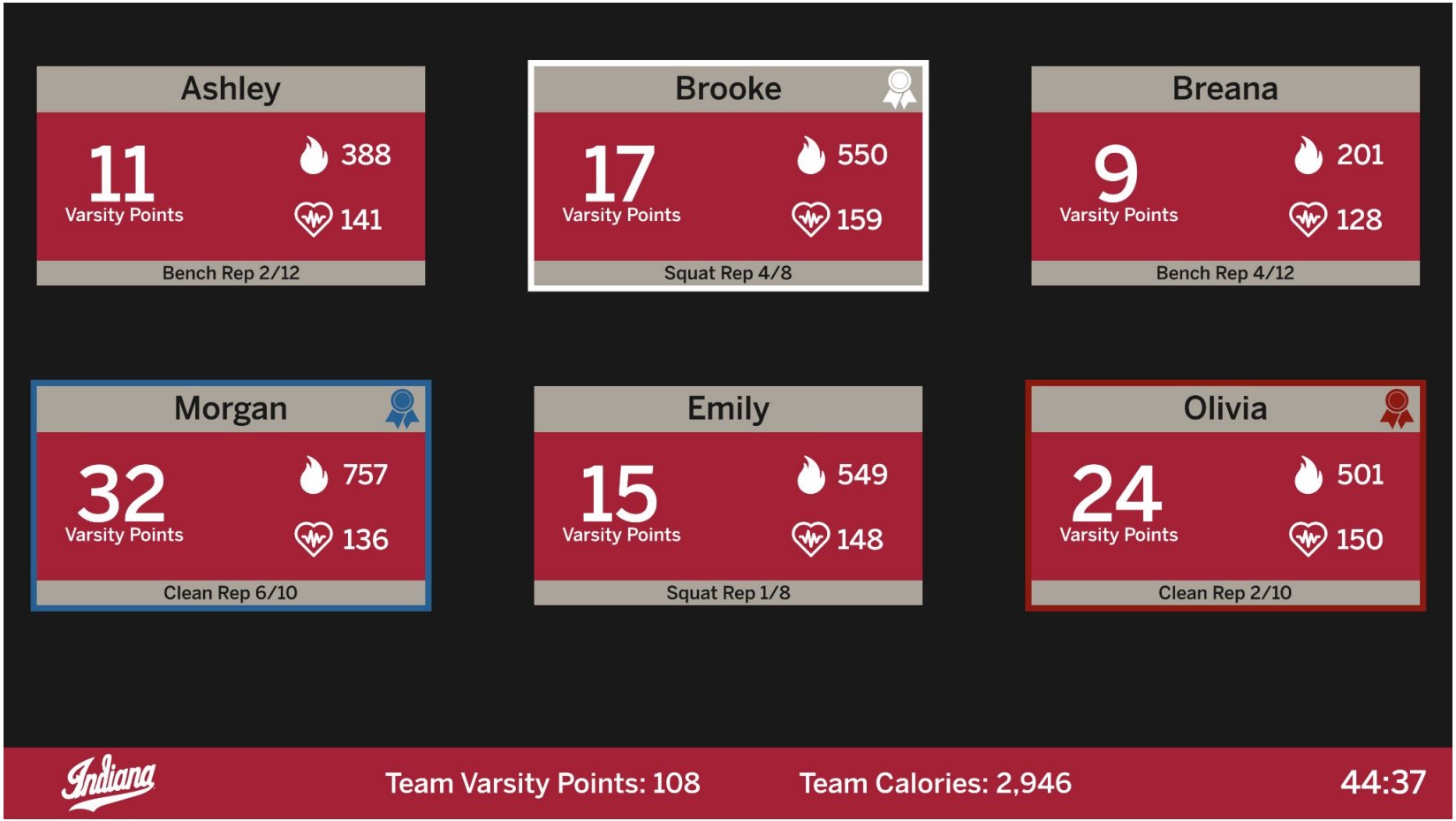
Compare With Team



Personal Workout history



Athlete's Profile



Real Time Display During Team Workout

Future Work

Given additional time and resources, our team sees the following areas as opportunities to continue building upon this project:

- Presenting to the IU Athletics team
- Additional Athlete User Interviews
- Prototype Testing with Current IU Athletes
- Functional Prototype Development
- Design and Functionality Iteration

References

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4. Research: R. Li, S. R. Kling, M. J. Salata, S. A. Cupp, J. Sheehan, and J. E. Voos, “Wearable performance devices in sports medicine,” Sports Health, vol. 8, no. 1, pp. 74–78, Jan. 2016.
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9. Research: https://digitalcommons.unl.edu/athleticresearch/

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15. Laptop Mockup: https://www.anthonyboyd.graphics/mockups/modern-iphone-x-and-macbook-pro-mockup-vol-2/

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17. Figma Icons plugin: https://iconscout.com/

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19. Indiana logo: https://theshopindy.com/collections/indiana-university/unisex

20. IU Workout Facility image: https://iuhoosiers.com/facilities/w-jay-and-nancy-wilkinson-performance-center/17

Thank You