Part 1: Cognitive Walkthrough and User Flow Diagram

<u>Description:</u>

I used youidraw.com to draw a tree with a simple background. This website is for beginners, so it is extremely limited in the tools that it has. I started by manually setting the color to a light blue, as there were no preset colors. I used the fill tool to cover the entire canvas with the shade of blue to represent the sky background. I then drew a line horizontally across the bottom half of the page in light green using the brush tool. I could not figure out how to use the fill tool to only fill in the area I drew in, so I manually colored in the area under the line I drew by increasing the brush size to 40. I then selected the circle and set the color to yellow to make a sun. Using the brush tool, I drew triangles around the circle. I also drew in a cloud by lowering the brush tool's opacity and changing the color to white. Then, to draw the tree, I selected the rectangle and chose a pattern instead of a color, to make the tree trunk look grainy. Finally, I used the brush tool, set to green, to draw and fill in the leaves.
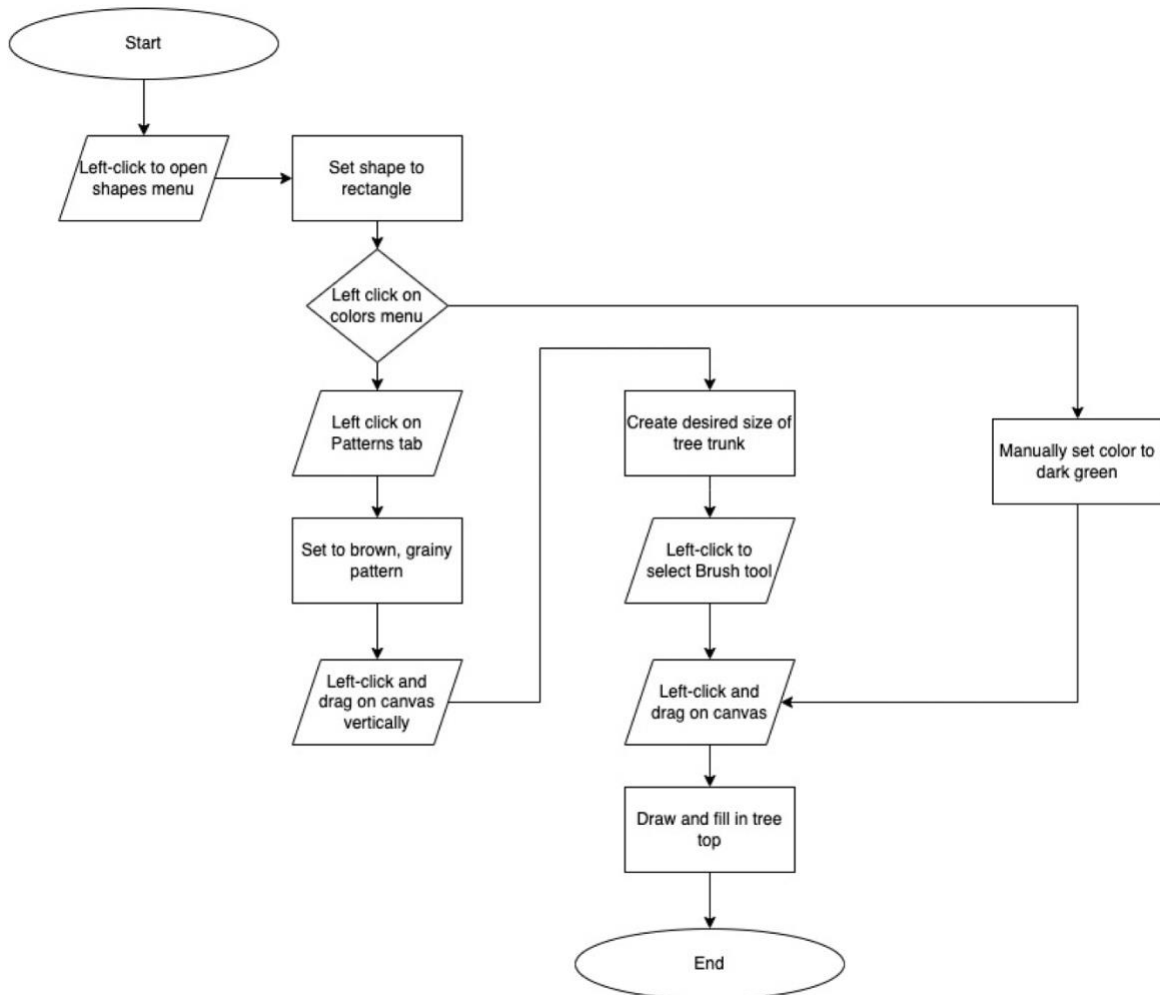
Action Statements:

Feature: Drawing the tree

1. I clicked the shapes menu.

2. I selected the rectangle shape.

3. I manually set the color to a pattern.

4. I selected a brown, grainy pattern.

5. I left-clicked and dragged vertically down, until I received the desirable size for my tree trunk.

6. I manually changed the color to a dark green.

7. I selected the brush tool.

8. I set the brush size to 20.

9. I left-clicked and dragged to manually draw the shape of the treetop.

10. I changed the brush size to 40.

11. I left-clicked and dragged to manually color in the treetop to the same shade of green.

Action Statements:

Feature: Drawing the tree

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                    ┌──────────────┐
                   (    Start      )
                    └──────┬───────┘
                           │
                           ▼
        ┌──────────────┐      ┌──────────────┐
       / Left-click to /─────▶│ Set shape to │
      /  open shapes  /       │  rectangle   │
     /   menu        /        └──────┬───────┘
    └──────────────┘                 │
                                     ▼
                               ◇ Left click on ◇ ──────────────────────┐
                               ◇ colors menu   ◇                        │
                                     │                                  │
            ┌──────────────┐         │        ┌──────────────┐          │
           / Left click on /◀────────┘        │ Create       │          │
          /  Patterns tab /                   │ desired size │          ▼
         └──────────────┘                     │ of tree trunk│   ┌──────────────┐
                │                              └──────┬───────┘   │ Manually set │
                ▼                                     │           │ color to     │
        ┌──────────────┐                              ▼           │ dark green   │
        │ Set to brown,│                    / Left-click to  /    └──────┬───────┘
        │ grainy       │                   /  select Brush  /            │
        │ pattern      │                  └──────────────┘               │
        └──────┬───────┘                          │                      │
               ▼                                   ▼                      │
        / Left-click and /───────▶ / Left-click and /◀───────────────────┘
       /  drag on canvas/         /  drag on canvas/
      /   vertically   /         └──────────────┘
     └──────────────┘                    │
                                          ▼
                                  ┌──────────────┐
                                  │ Draw and fill│
                                  │ in tree top  │
                                  └──────┬───────┘
                                         ▼
                                  (    End      )
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Sketched Drawing

Part 2: Mixed Reality App Proposal

Who is your intended user or users? Be specific.

My intended users are volleyball players and athletes in training. This app is not exactly designed for beginners but rather skilled volleyball athletes who are training to up their competitive edge. To be even more specific, this app is intended for professional athletes who want to train efficiently while preventing injury before gameday. This being said, beginners can still use the app if they are afraid to get injured during early stages, it is just more needed for professionals who face high intensity volleyball scenarios.

What existing apps if any are similar to your proposed app? Give some examples that you find through your research.

I did not find many training apps specifically for athletes. Through research, however, I did find apps for coaches to keep track of their athletes' stats. The only thing I found somewhat in the similar market as my app are workout equipment stretch bands called VertiMax. VertiMax physically helps and athlete fix their form when playing volleyballs, however, in the process, it restricts movement. It also does not use the aspect of mixed reality, whereas my app does. My app explores a whole new, mixed reality world in the art of volleyball training for athletes specifically.

What will the product do? How is it used?

This product will create intense game like volleyball scenarios for volleyball players to experience without actually risking injury of a fast driven volleyball. For passing, the app will have a ball being hit from specific positions in different ways. The athlete can then learn how to pass a ball being hit from these several different angles. For setting, the app will create scenarios with multiple different type of passes, good or bad, and the athlete can figure out how to adjust to each pass. For hitting, the app will be able to run different plays with many different types of sets, controlled by the user, for the hitter to learn how to run different plays.

This app will require a mixed reality headset as well as wrist sensors. The app needs to be downloaded or installed onto the gaming software. The app will provide a menu where the athlete can select which position they want to play as well as the skill they want to practice, down to the specifics. The wrist sensors will be used to represent the ball contacting the athlete. When the athlete contacts the ball show through the headset, the wrist sensors will vibrate accordingly.

What will the user experience while using the product? How will it make them feel?

This product will provide volleyball athletes with an easy way to train for higher competition. As athletes progress in the sport of volleyball, gameplay intensifies. It is hard to put yourself behind a ball being hit 80 miles per hour and not be afraid that you are going to get injured. It's difficult to keep up with the fast pace of the sport as the level of play increases. This app provides skilled athletes with game like plays which they can use to practice without having the fear of getting injured through getting hit by the ball at full speed if the mess up.

This product will provide athletes with a sense of ease and comfort. They will be able to perfect their skills before putting themselves behind a real volleyball. This way they get to make errors without the risk of getting hit in the head and getting a concussion. They will then know how to play a ball actually being hit at them in real life after practicing with this product.

Describe the app interface. What will the users see and hear and how will they interact with the AR elements?

The app will be downloaded onto a gaming software and paired with the mixed reality headset and wrist sensors through Bluetooth. The headset comes with control buttons through which the athlete can navigate through the menu which will pop-up. The user will first see a screen in which they can personalize the app to their needs. It will ask for their gender, their preferred hand: right or left, their position(s), what they want to focus on practicing, etc. These can be changed at any time through the settings menu. The app will then prompt the user to do a slow 360 degree turn so that it can fully scan the volleyball court as well as its surroundings in order to make the practice session as life-like as possible. The user will then be prompted to take their position on the court and prepare to play. Once the practice session begins, on the user's command, a ball will appear, being played by an assisting silhouette player. The user will also have a training option in the menu which will break down exactly where on the court the athlete should be and break visually show the step-by-step of what they should do as the ball is being played live. The user can control the speed of the game and level of intensity through the menu as well. The wrist sensors will vibrate every time the player contacts the ball correctly.

What technologies will be required? MR glasses, other peripherals?

This product requires a few things. First, a device with Bluetooth pairing onto which the app can be downloaded. This includes a smartphones, computers, as well as gaming consoles. The product will also require a mixed reality headset for the user to be able to see the gameplay occur. Lastly it requires wrist sensors for the app to detect the users movements accurately and in real-time.

How will using this product be a beneficial user experience?

This product will provide the user with many benefits. It allows professional athletes to train for high intensity competition without risking injury. This is vital for professional athletes, as they do not want to get injured before a big game. It also is a great way for athletes to train safely while actually being on the court. Unlike other equipment athletes use for training, this app is a way for athletes to train and not have to restrict their movement.

What is the name of your app? What does the name you chose convey to the user?

The name of my app is VBallSafe. This name conveys to the user that this app provides a way for them to still practice and play the game they love in a safe and injury-free way. Like all sports, volleyball has a high risk of injury. As a volleyball athlete myself, I have been injured right before a big game many times. I have also seen countless horrible injuries such as bad concussions and torn ACLs. This app provides athletes with a sense of security without having to slow down the intensity of the game. The name, VBallSafe, appropriately conveys this to the user while also being creative and drawing them in to use it.

Sketch

| Menu |
| Athlete Settings |
| Wrist Sensor Settings |
| Play Settings |
| Training Mode |
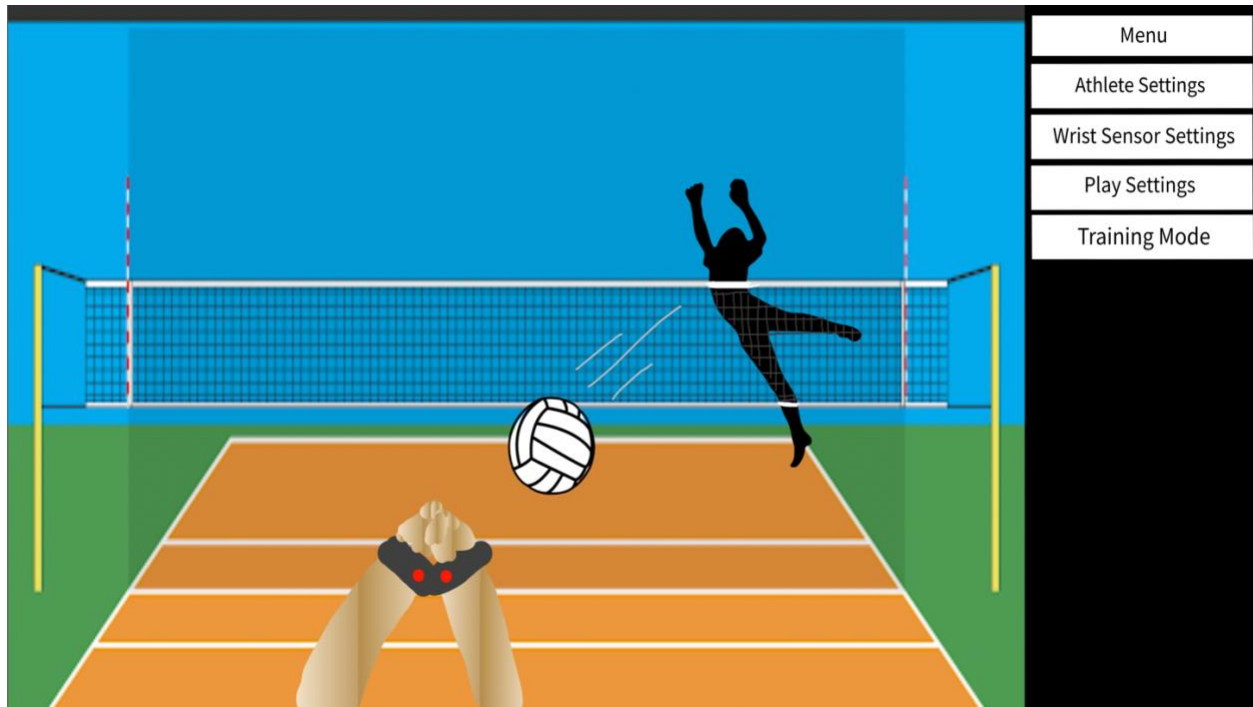
<u>**Cognitive Walkthrough**</u>

**Feature 1: Setting Up a Training Session**

Action Statements:

1. Download app onto device.

2. Launch the app.

3. Connect the mixed reality set to app through Bluetooth.

4. Connect the wrist sensors to the app through Bluetooth.

5. Put on the mixed reality headset.

6. Put on the wrist sensors.

7. Use the control buttons on the headset to personalize the settings to the user.

8. Set up what the user wants to focus on this training session.

9. Scan the court by doing a full 360.

10. Begin the training session.

Description:

Beginning a training session should be quick and easy so that the athlete can get on to the court and begin as soon as possible. Once the user personalizes the app for the first time they can save their information, as well as their progress during each training session so that they can simply pick back up where they left off each time. This being said, the user can change the settings at any time through the menu bar.

User Flow Diagram
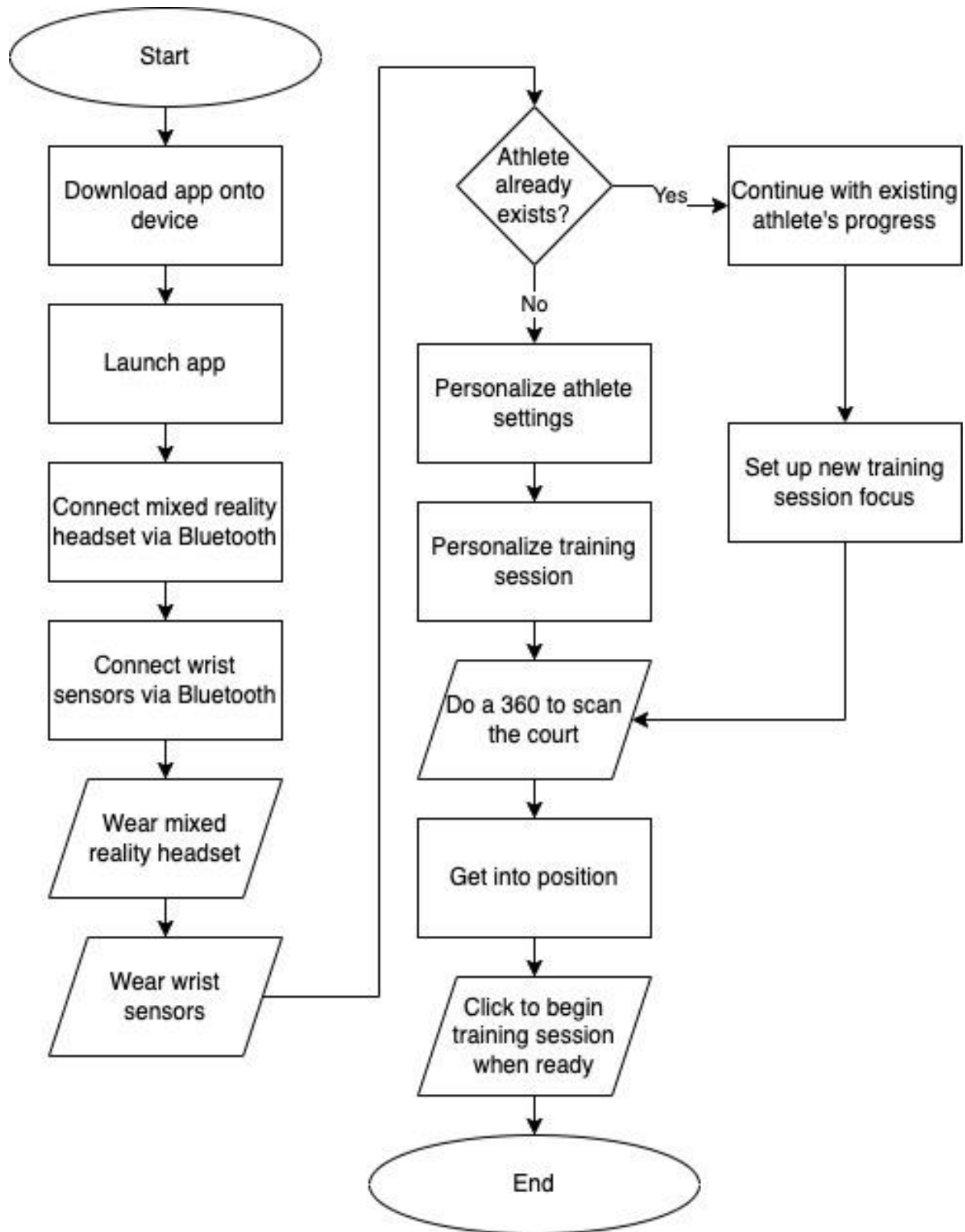
Feature 2: Personalizing to Specific User

Action Statements:

1. Select Athlete Settings in menu bar.

2. Select gender.

3. Select whether user is a righty or a lefty.

4. Select athlete's position(s).

5. Select athlete's level of play.

6. Select athlete's main focus for training.

7. Select gender of opponent.

8. Select height of the net.

9. Save athlete's information.

10. Exit the Athlete Settings.

11. Continue to Training Session

Description:

VBallSafe is designed to give the user a personalized training experience. In order to do that, the user needs to personalize the athlete settings on the app by accurately entering their information as prompted. The gender of the athlete as well as the opponent is vital as men's and women's volleyball have different factors. This goes for all the personalized questions that the app prompts the user to answer. They are all needed in order for the app to best provide for the athlete's needs.

User Flow Diagram
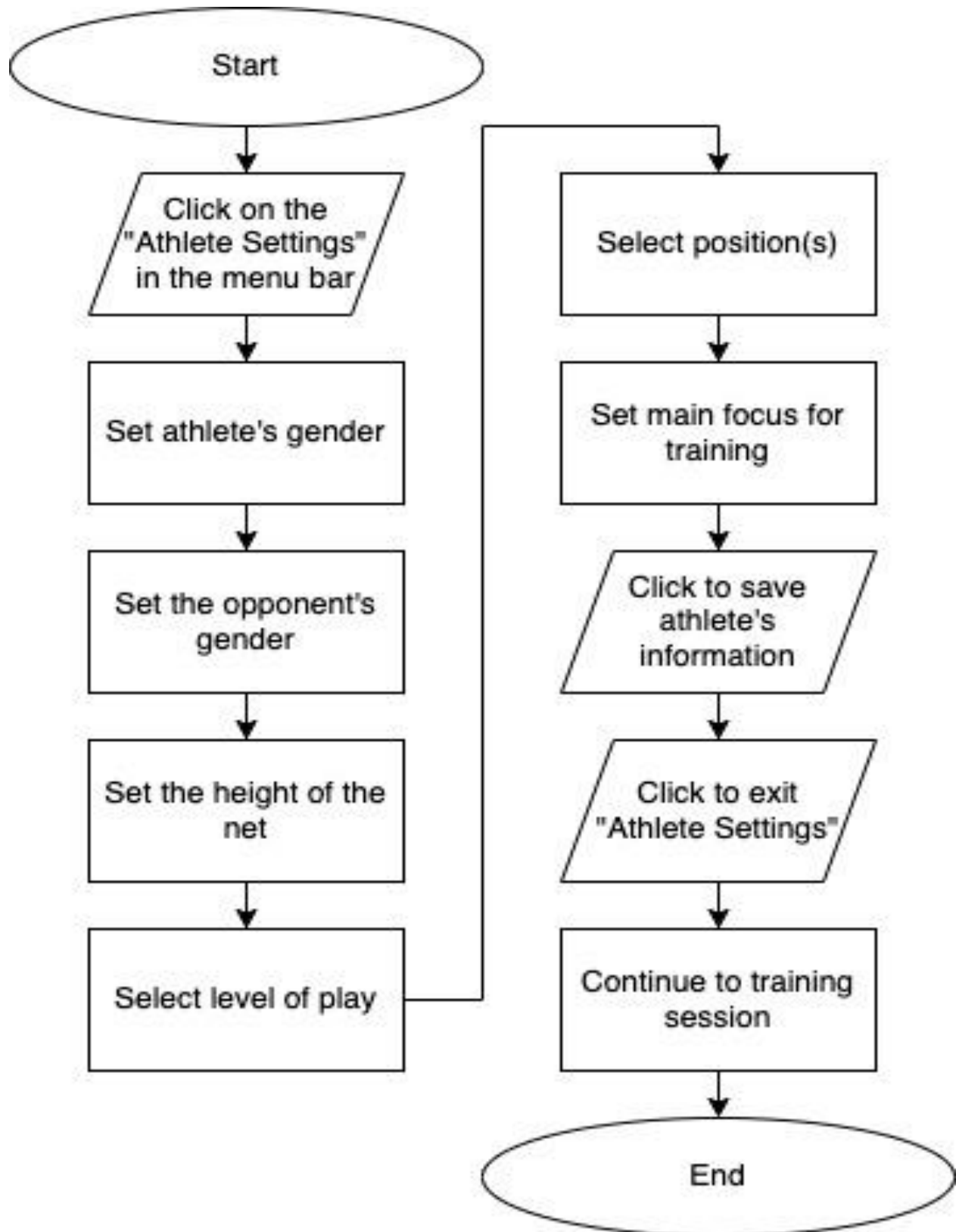
Feature 3: Step-by-Step Training Mode

Action Statements:

1. Select Training Mode in menu bar.

2. Select speed of play.

3. Select intensity of play.

4. Select what needs to be broken down.

5. Select step-by-step option if needed.

6. Select whether visual prompts, audio prompts, or both are needed.

7. Save inputted information.

8. Once completed, exit out of training mode.

9. Continue to training session.

10. Either restart training session or pick up where it was left off.

Description:

Sometimes even professional athletes need a breakdown of a specific play. Training Mode provides athletes with exactly that. There are different levels of breakdowns provided through this app, all the way to a full step-by-step walkthrough of how a specific play should be executed. VBallSafe provides the user to full access of exactly how in-depth they want to breakdown their training session if and when needed. To add to that, after using Training Mode, the user can either pick up their training session where they left off or restart it from the beginning.

User Flow Diagram

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        ┌─────────────────┐
        │      Start      │
        └────────┬────────┘
                 │
                 ▼                              ┌──────────────────┐
        ╱─────────────────╱                    │ Set type of      │
       ╱  Click on the   ╱                     │ prompts needed   │
      ╱  "Training Mode" ╱                     │ (audio/visual)   │
     ╱   in the menu bar╱                      └────────┬─────────┘
    ╱─────────────────╱                                 │
                 │                                       ▼
                 ▼                              ╱──────────────────╱
        ┌─────────────────┐                    ╱  Click to save   ╱
        │ Set speed of    │                   ╱   information    ╱
        │ play            │                  ╱──────────────────╱
        └────────┬────────┘                          │
                 │                                    ▼
                 ▼                           ╱──────────────────╱
        ┌─────────────────┐                 ╱  Click to exit   ╱
        │ Set intensity   │                ╱  "Training Mode" ╱
        │ of play         │               ╱       tab        ╱
        └────────┬────────┘              ╱──────────────────╱
                 │                               │
                 ▼                               ▼
        ┌─────────────────┐            ╱──────────────────╱
        │ Set what exactly│           ╱  Click to end    ╱
        │ the athlete     │          ╱  training mode    ╱
        │ needs help with │         ╱   when done.      ╱
        └────────┬────────┘        ╱──────────────────╱
                 │                          │
                 ▼                          ▼
        ┌─────────────────┐       ┌──────────────────┐
        │ Set to step-by- │       │ Restart or       │
        │ step breakdown  │       │ continue to      │
        │ if needed       │       │ training session │
        └─────────────────┘       └────────┬─────────┘
                                           │
                                           ▼
                                  ┌──────────────────┐
                                  │       End        │
                                  └──────────────────┘
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