Revised Project Description

The Problem

- The Amherst College Athletic Department is currently using Catapult GPS units to monitor the performance of its athletes
    - The wearable units track metrics such as Total Distance, Top Speed, Total Sprint Distance, and Power (among many others)
- The Strength and Conditioning team is currently in charge of managing the data and presenting it to coaches/trainers
    - They lack an efficient means to both organize and engage with the data

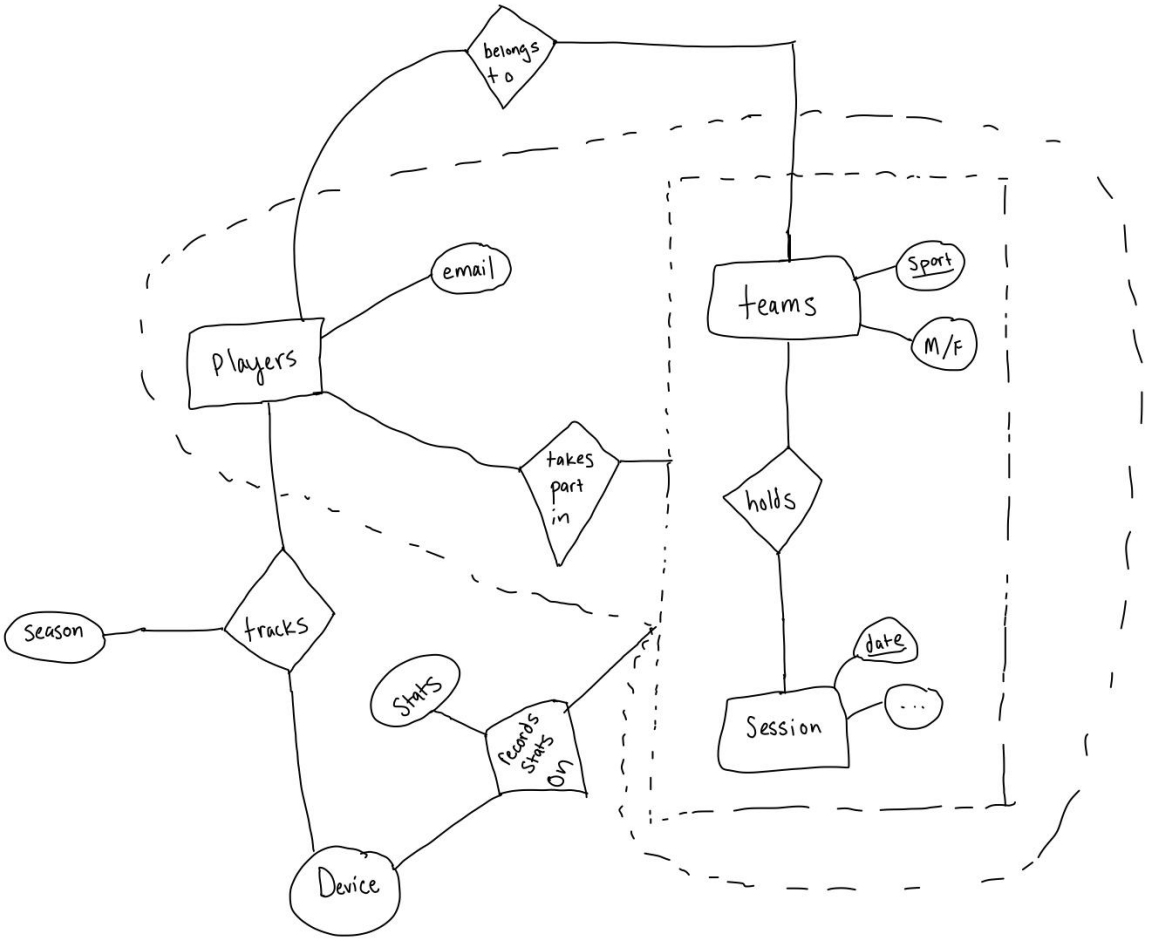
Our Solution

- Create a web-app/interface that uses recorded GPS data to provide varsity coaches, athletic trainers, strength and conditioning coaches, and athletes themselves
    - This product will shape how Amherst athletes continue to train, recover, and perform and provide unprecedented insight to coaches
- The interface will display individual data as well as display overall team performance and metrics with graphical and numerical summaries

The Data

- To break it down by the numbers:
- For one session, an individual GPS Catapult tracker records >10 meaningful performance-related metrics (i.e. distance ran, distance sprinted, top speed, distance / min, etc)
- The following teams are currently using the product to keep data on their athletes:
    - Men's/Women's Soccer (Fall 2023)
    - Men's/Women's Lacrosse (Spring 2023/2024)
- With almost 100 athletes actively tracked by GPS Catapult software in every training session and game throughout their season, we will have access to thousands of data points from which to provide the athletic department with performance analytics

Tentative Final ER Model



Initial Relational Schema

Entities to Tables

```
CREATE TABLE Team(
        teamID CHAR(5) NOT NULL,
        record CHAR(7) NOT NULL,
        goals INT NOT NULL,
        shots INT NOT NULL,
        shotsOnGoal INT NOT NULL,
        saves INT NOT NULL,
        headCoach TEXT NOT NULL,
```

```
    assistantCoach TEXT NOT NULL,
    PRIMARY KEY (teamID)
)

CREATE TABLE Player (
    email TEXT NOT NULL,
    name TEXT NOT NULL,
    position CHAR(3) NOT NULL,
    class INT NOT NULL,
    gamesPlayed INT NOT NULL,
    gamesStarted INT NOT NULL,
    goals INT,
    assists INT,
    shots INT,
    shotsOnGoal INT,
    goalsAllowed INT,
    saves INT,
    PRIMARY KEY (email)
)
#Question here: How do we want to format/organize all the tracked stats? Given these will be a quite vast collection of attributes… How do we fit these into our ER diagram and relational model?

CREATE TABLE Session(
    date CHAR(5) NOT NULL,
    type TEXT NOT NULL,
    isGame BOOLEAN,
    …
    PRIMARY KEY (date)
)
#See in TJ sheet how the devices seemingly have a 5 digit int/char string for the date; might as well use this formatting
#Do we want the isGame tag to be a boolean (true if game, false otherwise)? Or a string (‘game’ or ‘training’)?

CREATE TABLE Device(
    deviceID CHAR(3) NOT NULL,
    PRIMARY KEY (deviceID)
)
```

Relationship Sets to Tables

```
CREATE TABLE Holds (
        teamID CHAR(5) NOT NULL,
        date CHAR(5) NOT NULL,
        PRIMARY KEY (date, teamID),
        FOREIGN KEY (teamID) REFERENCES Team,
        FOREIGN KEY (date) REFERENCES Session
)


CREATE TABLE ParticipatesIn (
        email CHAR(20) NOT NULL,
        date CHAR(5) NOT NULL,
        teamID CHAR(5) NOT NULL,
        PRIMARY KEY (email, date, teamID)
        FOREIGN KEY (email) references Player,
        FOREIGN KEY (date, teamID) references Holds
)

CREATE TABLE RecordsStatsOf (
        deviceID CHAR(3) NOT NULL,
        email CHAR(20) NOT NULL,
        date CHAR(5) NOT NULL,
        teamID CHAR(5) NOT NULL,
        stats (what data type)?
        PRIMARY KEY ()
        FOREIGN KEY (email, date, teamID) references ParticipatesIn
)
#a little unsure of primary key for this one

CREATE TABLE Tracks (
        deviceID CHAR(3) NOT NULL,
        email TEXT NOT NULL,
        season CHAR(6) NOT NULL,
        PRIMARY KEY (season, email, deviceID)
        FOREIGN KEY (email) references Player,
        FOREIGN KEY (deviceID) references Device
)
#I think the primary key can be either (season, email) or (season, deviceID) as well, given that both email and deviceID are primary keys with respect to their own entities
```

Initial Role Assignment for Phase 3

- Andrew:
    - Complete the conversion of the ER schema into the relational schema, ensuring that it is in a normal form.
- Ryan:
    - Devise (preliminary) example SQL queries that showcase the different ways that the user would interact with your database;
- Niall:
    - Create and populate the database and the tables needed by your project;
- Wyatt:
    - Start implementing the app or website, to the point that it should be able to perform the example SQL queries;

Of course, all group members will collaborate on all components of phase 3, the assigned roles just delegate each member's focus.

Installed Software

Node.js

- Backbone for React and installation/configuration of many front-end technologies. We are not 100% sure if we will use React yet but wanted to install relevant dependencies in case

Tailwind CSS

- CSS framework that simplifies styling by allowing it to be done within HTML

Python3

- Programming language useful for parsing spreadsheet data (format of our client's data) with package support for data visualization; debating between using Python or R for data analysis and visuals

R

- Statistical language for data analysis and graphics; debating between using R or Python for data analysis and visuals

Questions

Do we need to install/configure front-end software (Node.js, React, Tailwind CSS, …) on the remote server or can we work on that development locally? We've installed Node.js and Tailwind (installations seem successful) but are struggling with React.

Are the files for the project going to exist on the remote server (not locally on our computers) s.t we remotely pull them when working on development?

Might we need additional software to simplify the visualization (graphing and the like) of data? I feel like it'd be reasonably straightforward to implement with normal

HTML/CSS/JavaScript but some software that makes it really easy probably exists? R might also be useful for this…

How do we integrate our ER and relational models with postgres database? Is this all through SQL?

How do integrate database with development directory?