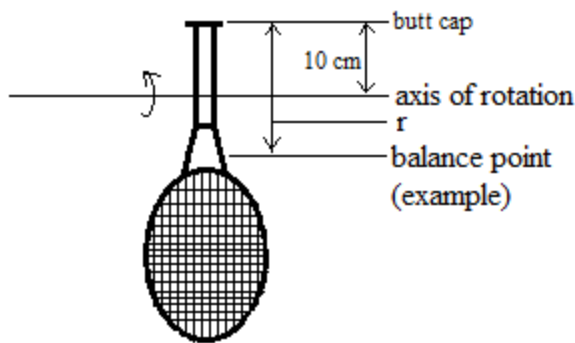## The Dream Team: Assignment 1
Product Name: RacQual ("Evaluate and trade tennis racquets with RacQual!")

Introduction:
Racquet quality index is a physics-based concept that was delivered to the tennis world by a man named Wilmot McCutchen more than a decade ago. According to McCutchen, the quality of a racquet is a function of its mass, its balance point from the butt cap, and its swingweight. The swingweight of a racquet is its moment of inertia as it rotates about an axis 10 cm from the butt cap of the racquet. This axis is parallel to the face of the racquet but perpendicular to the racquet lengthwise.

It is computed as follows:

$$Q = Mr^2/I$$

where M is the racquet's mass in kgs, r is the distance in cm between racquet's balance point and butt cap, and I is the racquet's swingweight in kg·m². It is a unitless ratio.

According to McCutchen, if Q < 1.10, a racquet is good, meaning that there are low if not no chances of developing tennis elbow as a result of playing with the racquet. If Q > 1.17, a racquet is bad, meaning that it is very unsafe to play with the racquet due to risk of developing serious arm problems. Values of Q between 1.10 and 1.17 represent a grey area. For the purposes of RacQual, racquets whose quality indexes fall between 1.10 and 1.17 shall be considered mediocre racquets.

Problem Statement:
Although racquet retailers such as Tennis Warehouse and Tennis Express have written documents to help amateurs choose tennis racquets, none of these resources take racquet quality index into consideration.

Product Objectives:
We aim to enable recreational tennis players to evaluate, rate, and trade tennis racquets, while staying aware of quality indexes of the racquets that they are considering. As far as racquet trading is concerned, RacQual will be much more a Craigslist-like trading utility than an Ebay or Amazon of tennis racquets.
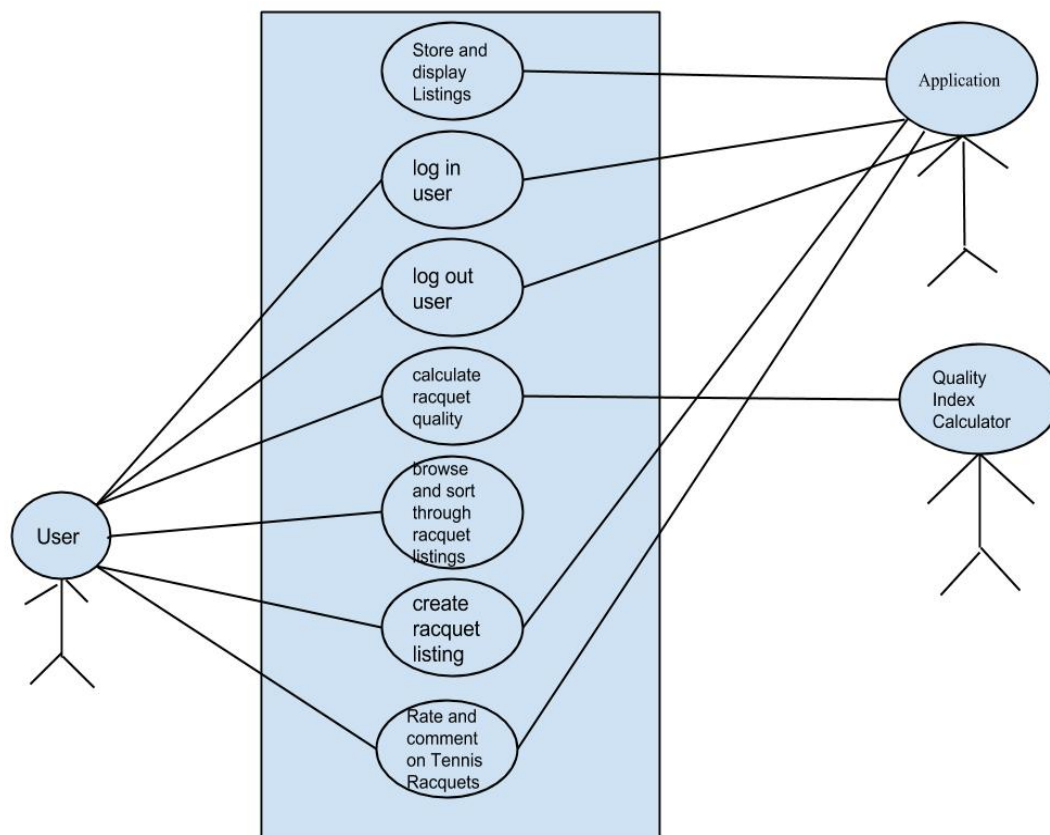
Functional Requirements:

1. User shall be able to calculate the Racquet Quality Index of Tennis Racquets.
2. User shall be able to create, use, and maintain a user account with login credentials.
3. User shall be able to create Craigslist-style racquet listings, enforcedly complete with the technical specifications that are needed for computing the quality index.
4. User shall be able to browse through listings.
5. User shall be able to sort listings based on quality index, length, mass, balance point, and swingweight.
6. User shall be able to express interest in racquet listings.
7. User shall be able to rate and comment on racquet listings.
8. User shall be able to rate and comment on sellers.

Non-Functional Requirements:

1. System should be able to perform any task within 15 seconds of time frame.
2. System should be mobile friendly (have a mobile version of the Web Application)
3. Web application should support major browsers like Safari, Internet Explorer, Chrome, and Firefox.
4. System must be available 24/7.

UML use case diagram

Use Case Description 1

Use Case name:	Racquet Quality Index Calculator
Product name:	RacQual
Team:	The Dream Team
Date:	09/12/2014

1. Goal

To calculate the quality index of the racquets based on Tennis Racquets provided information.

2. Summary

We aim to provide a one stop web application for users to calculate a quality index of any tennis racquet given that they provide specifications of the racquet which are easily found.

3. Actors

- Amateur tennis players
- The Racqual index calculator application

4. Preconditions

- Racquet details filled out

5. Trigger

Actors click the calculate button

6. Primary Sequence

Step	Action
1	User fills out the data for the racquet quality to be calculated
2	User clicks the calculate button
3	System Calculates the Quality Index
4	Quality index is calculated and returned

7. Primary Postconditions

- Quality index is calculated

8. Alternate Sequences

System replies that incomplete information was filled in, and Quality Index will not be computed

Alternate Trigger

Step	Action
1	User does not provide all the required information.
2	User clicks calculate button
3	System replies that there are missing information

Alternate Postconditions

	System will create red outline in unfilled form cells.

9. Nonfunctional Requirements

- Must be compatible with modern web browsers
- Must be mobile friendly

10. Glossary

- **Quality Index Calculator**: A tool that computes quality index of Tennis Racquets from provided specifications.

USE CASE Description #2

Use Case name:	Improved Classified Racquet listing
Product name:	RacQual
Team:	The Dream Team
Date:	09/12/2014

1. Goal

One stop portal for users to trade racquets

2. Summary

RacQual aims to provide a one stop classified directory for selling racquets. Whether users are already experienced tennis players or just beginners who have just started playing tennis, RacQual is the place to trade racquets with any kind of player.

3. Actors

- Amature tennis players
- Experienced tennis players

4. Preconditions

- Must have a RacQual account and be logged in to the site
- Account must contain the contact information of the user

5. Trigger

User clicks the "Post Listing" button.

6. Primary Sequence

Step	Action
1	User fills the information of the racquet they wish to list
2	User clicks the post listing button
3	System store listing information
4	Listing is posted into the racquet listing section

7. Primary Postconditions

- Listing is posted into the Listing section to be seen in public

8. Alternate Sequences

The user could input incomplete information for their listing and system will reject.

Alternate Trigger	

Step	Action
1	User inputs incomplete information
2	User clicks the post listing button

3	System shows error, asks for information to be filled out
Alternate Postconditions	
System will create red outline in unfilled form cells.	

9. Nonfunctional Requirements

- Must be compatible with modern web browsers
- Must be mobile friendly

10. Glossary

- Racqual Index Calculator = A web application that calculates the racquet quality index and stores it into our database

USE CASE Description #3

Use Case name:	User account registration
Product name:	RacQual
Team:	The Dream Team
Date:	09/12/2014

1. Goal

Allow users to register / login to RacQual.

2. Summary

Interested visitors can create RacQual account. New users will have to register for the first time, and regular users will be provided login credentials.

3. Actors

1. Interested Users
2. Current Users of RacQual

4. Preconditions

- Must have an active Email address.

5. Trigger

User clicks the register button

6. Primary Sequence

Step	Action
1	User fills out email and password and optional contact information
2	User clicks register button
3	System verifies required information, and stores into the database
4	New user account is successfully created

7. Primary Postconditions

- User Account is created. Welcome to RacQual message, and Home page is displayed to the user.

8. Alternate Sequences	When registering for a user account the user might enter incomplete information such as a incomplete email and system will reject.
Alternate Trigger	
Step	**Action**
1	User provides wrong information in one of the form cells.
2	User clicks register button
3	System verifies for entered details.
4	System asks user to reenter the wrong data.
Alternate Postconditions	
System will create red outline in wrongly entered form cells.	

9. Nonfunctional Requirements

- Registration form must be mobile friendly
- Registration form must work with all modern browsers

10. Glossary

- User = People who use our Racqual site whom register for an account
- User Account= An entity for a user that allows them to comment on different posts and buy/sell racquets

Resources:

http://www.racquetresearch.com/complete_idiot.htm