The All-Star R.E.C. Center

By

Mandell Jackson

Submitted to
the Faculty of the Information Technology Program
in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science
in Information Technology

University of Cincinnati
College of Applied Science

June 2011
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Mandell Jackson

Date

Prof. Annu Prabhakar

Date
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Abstract

The All-Star R.E.C. Center is a three-in-one Web application that focuses on the history, purpose, and educational aspects of professional basketball. The “R.E.C.” portion of the project’s title is an acronym for Reference, Education, and Communication. The referential segment showcases the statistics and profiles of every All-Star player to play in the National Basketball Association (NBA) and Women’s National Basketball Association (WNBA). The educational segment teaches users what the basketball statistics mean and their purpose in the game. This application also educates users on the various mathematical operations used to calculate basketball statistics, offering the ability to practice exercises on their own. Users may also test their basketball IQ by participating in the application’s trivia games. The communication segment enables users to become members, maintain their member profile and chat with other members in the discussion forum.

The All-Star R.E.C. Center focuses on user friendliness and simple navigation, enabling users to find links to all available sections quickly. This application will provide statistical help to users in every statistical-related section, via quick links provided in a consistent page location. All sections also provide users with clear direction and indication of what their purposes are. Visual Studio 2010 and SQL Server 2008 were used for web design/programming, and data access/storage, respectively. Overall, The All-Star R.E.C. Center provides users of all ages with an entertaining, yet educational online experience.
The All-Star R.E.C. Center

1. Project Description and Intended Use

1.1 Statement of the Problem

The official Web sites of the NBA and WNBA are NBA.com and WNBA.com. According to a 2009 study, of the four major North American sport league Web sites (MLB, NBA, NFL, and NHL), NBA.com is the most popular amongst the worldwide audience (5). In the statistics section of NBA.com and WNBA.com, there is no statistical help link of any kind to inform visitors on what the statistical categories are and how the statistics are calculated (14, 18). The WNBA.com Web site has a Glossary of WNBA terms visitors can get the definition of statistics in. However, it forces visitors to navigate to the news/about us section to see it. The Glossary of Terms does not show how the statistics are calculated, and does not provide a link to access it directly from the statistics section (18). A segment of the Glossary of WNBA terms is shown below in Figure 1.

![Figure 1: Glossary of Terms in WNBA.com]
Both NBA.com and WNBA.com have fine-line links at the bottom of its pages to its Hoopedia section, where Common Basketball Terms can be found (14, 18). The statistics listed in the Common Basketball Terms page show no examples of how they are calculated. The average visitor wouldn’t find this section in a quick and simple manner, because of the entire search one would need to do to find it. The arrangement and lack of information prevents the statistical section of the aforementioned Web sites from being user-friendly. This can be a challenging and confusing experience for visitors who are unfamiliar with basketball and want to learn about the statistical categories of the sport quickly and easily.

Another problem is in the players section in NBA.com and WNBA.com. In the players section of NBA.com and WNBA.com, there is a “compare players” tool that allows visitors to compare the same set of statistics between the currently viewed player, and another list-chosen player (14, 18). The same set of statistics refers to a player’s game averages for the preseason, regular season, or postseason (playoffs) of the current year. However, the comparison is limited to just two players at a time, and the same set of statistics of the current year. This limits the visitor’s view on what player statistics he or she can compare. For example, if a visitor wanted to compare the regular season statistics of one player for the current 2010-2011 season to the regular or postseason statistics of a second player from the 2004-2005 season, they will not be able to perform this action. An example of the “compare players” tool is shown below (See Figure 2. page 3).
Another problem that arises from the limited player statistical comparison tool in NBA.com and WNBA.com is the inability of visitors to compare the statistics of NBA players versus WNBA players. Neither site has an option available for visitors to view the statistics of NBA players against their WNBA counterparts. In further research, no available Web site related to basketball statistics shows this capability.

1.2 Description of the Solution

The solution for these issues is The All-Star R.E.C. Center. R.E.C. is an acronym for reference, education, and communication. This application serves as an outlet for basketball enthusiasts and novices alike to search for statistics of their favorite NBA and WNBA all-stars, learn about the statistics and how to calculate them, and chat about basketball in a discussion forum. It is suitable to visitors of all ages, from children in grade school who are just starting
basic math and learning the game of basketball, to adults who want to participate in the site’s basketball discussion forum.

The R.E.C. Center enables visitors to reference career statistics of every all-star player in NBA and WNBA history. The reason for reducing the group of players researchable to just all-stars, is to show novices of the sport of basketball who the top players of each league are. With all due respect to every current and past player in the NBA and WNBA, this segment of chosen players will show visitors the best of the best when it comes to both leagues. In regards to this, the “All-Star Game Search” sub-section includes information about every all-star game in NBA and WNBA history, such as the final score, the players and players’ game stats, and head coaches.

The R.E.C. Center includes profile pages of players with their career statistics and personal information, such as their playing position, height, weight, and college. The Web site also enables visitors to compare various statistics of players. The statistics section includes rankings of each player in different statistical categories. Visitors have the ability to perform NBA, WNBA, and interleague (NBA vs. WNBA) player comparisons.

While there are already a number of basketball stat referential Web sites that exist, such as databasebasketball.com and basketball-reference.com, the feature that separates The All-Star R.E.C. Center from the rest is its functionality to teach mathematics via basketball statistics (1, 3). The Web site educates visitors on what the basketball statistics mean and how they are calculated. Math games are provided to enable visitors to sharpen their math skills. Tim Moore, School Director of the Hamilton County Mathematics and Science Academy, shared that his students usually begin to learn fractions, decimals, and percentages between kindergarten and third grade (13). This is ideal for children who are learning the basic operations of math.
Anyone, children, teens, or adults can learn various math operations through use of the all-star players’ statistics. While using pencil and paper is still a key concept for learning math, it is agreed that interactive Web tools are a good source for practice as well (13, 16). Statistical trivia games are available for visitors to compete in as well.

In addition to the referential and educational aspects of The All-Star R.E.C. Center, the application also offers a discussion forum for communication amongst basketball fans. The site’s forum requires membership, with an age check of at least 18 years old to participate. Once visitors sign up and become members of the site, they have their own profile pages, similar to the all-star players. Members have the ability to upload their personal photo, choose privacy settings, and view other member profiles.

The All-Star R.E.C. Center also offers visitors with help to statistics wherever and whenever they need it. The application has links for quick access to any information about statistics. The links for quick access also serve as shortcuts to the “Stats Help” sub-section. These features are included to keep the Web site user-friendly and easy to navigate for visitors.

1.2.1 User Profile

The three users of The All-Star R.E.C. Center Web site are the administrator, visitors, and members. The three users are also the project’s primary actors, along with the back-end database system that is a system actor. Further details about the roles actors play in the application are described in the next section.

2. Design Protocols

2.1 Use Case Diagram

The use case diagram for this project is shown below in Figure 3.
2.1.1 Administrator

The administrator has full control over the maintenance of The All-Star R.E.C. Center application and back-end database. The administrator is responsible for updating and backing up
database files. The administrator manages and updates the application’s content thru web programming and information accessed from the back-end database. The administrator keeps application data secured with validation controls and protection against SQL injection attacks. The administrator corrects any errors that affect user functionality. The administrator can add or remove members of the application at their own discretion. The administrator moderates the members-only chat forum. Lastly, the administrator provides help to end users, providing feedback to any questions and suggestions the end users submit. I serve as the administrator of the application and back-end database.

2.1.2 Visitors

Visitors of The All-Star R.E.C. Center include everyone from grade-school children to adults. Visitors can search for all-star players, and then view player profile pages. Visitors can also search all-star games and view box scores of every NBA and WNBA all-star game in history. Visitors have the ability to view the rankings of players in each statistical category and compare player statistics (in either league or combined). Visitors can learn about basketball statistics and how they are calculated in Statistics help section. Visitors can learn and perform math operations and play basketball trivia games. Visitors can share their questions and suggestions with the administrator. Lastly, visitors have the option to become members of the site, creating member profiles that mirror the player profiles.

2.1.3 Members

Members are entitled to the same permissions visitors have on the application. Members are also able to log in and out of the application. Once members join the site, they can create their member profile. Members have the options of uploading their photo, submitting information such as their favorite all-star player, and specifying privacy settings for who can
view their profile. Members are able to view other public member profiles. Members who are 18 years of age or older can participate in the member discussion forum as well.

2.2 Database Diagram

The foundation of The All-Star R.E.C. Center will be its back-end database. The database for this project was created in Microsoft SQL Server 2008. SQL Server’s Management Studio tool was used to create the database tables, table relationships, stored procedures, and database backups. The database diagram for this project is shown below (See Figure 4. page 9).

**Figure 4. Database Diagram.**

There are eleven tables in The All-Star R.E.C. Center’s database. The “players” table holds the personal information of every player in the Web site. The “seasonStats” table stores the career regular season statistics of every player. The “teams” table includes all the NBA and
WNBA teams, current or past, to have participating all-star players. The “playerJerseys” table stores the jersey numbers of every player. The “allstarGameStats” table holds the career all-star game statistics of every player. The “allstarGames” table includes the main information of every all-star game in NBA and WNBA history.

In addition to the tables created for player/stat/game information, there are also three tables dedicated to the members of the Web site. The “members” table stores the personal information of each member. The “forumThreads” table saves the data for each new thread a member creates in the site’s discussion forum. The “threadReplies” table saves the data for each post a member submits in a thread.

Finally there is a “triviaQuestions” table for storing the questions and correct answers. The “triviaFalseAnswers” table stores alternate answers of the trivia questions. Every database table shares a relationship with at least one other table as a means to provide end users with required application data.

The All-Star R.E.C. Center includes seven main sections for end users to navigate thru (six if user is a visitor). The end user comes to the “Home” page once they enter the site. The other six main sections are “Members”, “Search”, “Stats”, “Math Practice”, “Trivia Games”, and “Comments”. Each section and sub-section is available at the top of each page in a navigation bar. When the section name is hovered by the computer mouse, the section’s sub-sections appear for the end user to choose from. Visitors who want to access the “Members” section have to either sign up to become a member, or log in as an existing member. Once the end user is verified as a member, they can go to the members’ discussion forum, edit their personal profile, or view other member profiles.
The “Search” section includes two sub-sections, “Player Search” and “All-Star Game Search”. End users can select the “Player Search” sub-section to search for players and view the selected player’s profile page for personal info and career statistics. The “All-Star Game Search” section allows end users to search for every NBA and WNBA all-star game, and view the statistics (or box scores) of every player and team for the chosen game. The “Stats” section include three sub-sections, “Compare Player Stats”, “Stat Rankings”, and “Stats Help”. In the “Compare Player Stats” sub-section, users compare player statistics of any all-star player from the NBA and WNBA, current or past. In the “Stat Rankings” sub-section, end users can view the rankings of selected players in each statistical category.

The “Stats Help” sub-section is not only available here, but also as a quick link in every other section of the site. The quick links instantly show end users what the basketball statistics mean, unique facts about them, and how they are calculated. The “Stats Help” section and quick links help end users by providing them with the statistical information they need in a fast and easily accessible manner.

In the “Math Practice” section, end users can learn about the math operations used to calculate basketball statistics. End users can study the definitions and examples of each math operation used in basketball in the “Learn Math” sub-section. End users are able to practice each math operation in the “Practice Math” sub-section. End users can learn how common basketball statistical figures, such as decimals and fractions are converted. This section serves as an online mathematical learning session for the end user.

End users can test their basketball knowledge in the “Trivia Games” section. End users can test themselves with math questions that focus on basketball statistics, resulting in a final
score upon completion. The “Name that player?” sub-section provides end users with a multiple choice trivia quiz that results in a final score as well.

In the “Comments” section, end users can e-mail the site administrator any comments or concerns they have about the site. In addition to the seven main sections, there is also an “Admin” section accessed by the administrator only. In the “Admin” section, the administrator can complete tasks such as adding new all-star players, updating statistics, and changing trivia game answers. The navigational flowchart for this Web site is shown below in Figure 5.
2.3 User Interface

The interface of The All-Star R.E.C. Center was created using a master page developed in Microsoft Visual Studio 2010. The master page consists of regular html coding elements as well as CSS for layout and structure. The “Home” section is shown below in Figure 6.
The black bar located at the top of the page includes two elements. The element located at the left in white text is the current weekday and date, shown as a friendly reminder to the user. The element located to the right in white text is the linkbutton control that will navigate the user to the “Login” section to access their membership if they are a member. The logo is located below the black bar. Underneath the logo, is the application’s navigation bar. The navigation bar consists of the seven main sections. When the end user hovers one of the navigation bar menu items for all except “Home” and “Comments”, the sub-section menu items show immediately. The background color of the menu items turn from gray to orange when hovered to indicate to the user which section or sub-section they are highlighting. This is shown below in Figure 7.

Figure 6. “Home” section of The All-Star R.E.C. Center.
The color scheme for The All-Star R.E.C. Center is black, blue, gray, orange, and white. White is the color used for the background of the main-content area of the master page. Black is the text color within the main-content area. This color combination makes reading the material on the screen easy for users. The footer of the application is orange, while the border on the left, right, and bottom sides of the header, main, footer sections are blue.

As a main feature for help in the application, the Stat quick links are located in the top-right corner of every main-content section except “Home” and “Comments” (these two pages do not show numbers or statistics, making the need for the quick links within them unnecessary). When the end users encounter any stats they are unfamiliar with, they can click on the link button that corresponds to the stat they desire to view. The link button opens the “Stats Help” sub-section in a new window with the chosen statistical category shown. The Stat quick links table is shown below (See Figure 8. page 15).

| Stat Quicklinks - Choose a statistical category below for more information. |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| MIN | FGM | FGA | FG% | 3PTM | 3PTA | 3PT% | FTM | FTA | FT% |
| OFFR | DEFR | TOTR | AST | STL | ELK | TO | PF | PTS |
| To view the full names of statistics, click Stats Legend.
In addition to the quick links, a Stats Legend is also located in the third row of the Stat quick links table. The Stats Legend shows end users the full names of the stats and their abbreviations. The abbreviations are the column header titles of the stat grid views located in various pages. When end users click the Stats Legend link button, the Stat Legend opens in a new window. The Stats Legend appears after an end user clicked the link in the “All-Star Game Search” sub-section as shown below in Figure 9.

![Figure 9. The Stats Legend window.](image)

In the “Practice Math” sub-section of the “Math Practice” section, help is provided to direct users on how to answer problems and generate new problems when practicing the various operations. Below the problems of each math operation, users will find a list that helps them understand how the controls work. An example of this help list for the Addition operator is shown below in Figure 10.
Figure 10. Help list for addition operator in "Practice Math" sub-section.

3. Deliverables

The deliverables of The All-Star R.E.C. Center include Database, Digital Media, and Web Technology requirements. The deliverables involving video development of the tutorial video were excluded from the final deliverables in consultation with the technical advisor. The following is the set of completed deliverables The All-Star R.E.C. Center consists of:

1. A Web application created in Microsoft Visual Studio 2010. Web programming completed was with HTML and C#, while the design was completed with CSS.

2. A Web site logo created using Paint.NET.

3. A back-end RDBMS that stores and provides data to the Web site. The RDBMS was developed using Microsoft SQL Server 2008 and holds the following objects:
   - Database schema
   - Tables
• Table relationships  
• Stored procedures  
• Database backups  
• Transaction log backups


5. Web site validation controls for security and clarification purposes.

6. Ability for Web site members and visitors to:
   • Search and view profiles of any NBA and WNBA all-star player in history in the “Players Search” sub-section.
   • View the statistical rankings of selected players in the “Stats” section.
   • Compare the statistics of two to five players, from either league, in the “Stats” section.
   • Search for and view all-star game box scores of every NBA and WNBA all-star game in the “All-Star Game Search” sub-section.
   • Learn basketball-related mathematical operations in the “Math Practice” section.
   • Practice basketball-related mathematical problems in the “Math Practice” section.
   • Play basketball trivia games in the “Trivia Games” section.
   • Access help on the basketball statistics from the “Stats Help” sub-section, or each section previously identified.
   • Contact the Web site administrator with questions or suggestions via e-mail in the “Comments” section.

7. Ability for Web site members to:
• Log in and out of Web site.
• Request forgotten username thru e-mail and create new password if password is lost.
• Edit member profile in the “Members” section.
• Upload a profile picture.
• View other public member profiles in the “Members” section.
• Post in discussion forum in the “Members” section.
• Delete Web site membership at any time.

8. Ability for Web site visitors to set up member account.

4. Project Planning

4.1 Timeline

There are a total of 20 tasks in the project timeline. Important milestone dates include 11/29/10, when the final proposal and presentation were due. The second milestone was 3/7/2011 when the project design freeze was presented. The third milestone was 6/6/2011 when the final presentation was given. The timeline of this project is shown below in Figure 11.
4.2 Project Resources

The majority of hardware and software programs needed to complete The All-Star R.E.C.
Center project was used in the 4th floor lab of the University of Cincinnati’s College of Applied
Sciences’ Administration building. The following shows each item needed for completion of
this project:

4.2.1 Hardware

- HP ProLiant DL145 Server – The server that powers the workstations of the 4th floor lab,
  where majority of project was created.
- HP xw4400 Workstation – The computer models on the 4th floor lab that the project’s
  work was completed on.
- Lexar 512 Mb JumpDrive Pro 80X USB 2.0 Flash Drive – The flash drive used to save
  all Microsoft Visual Studio project files for this project (before its migration to the web
  server).

4.2.2 Software

- Microsoft Windows 7 Enterprise N – The version of the operating system installed on 4th
  floor lab workstations. Includes the following software used to complete this project.
• Microsoft SQL Server 2008 R2 Standard Edition – The database server used to create the database with use of its SQL Server Management Studio tool.

• Microsoft Visual Studio 2010 Ultimate – The Integrated Development Environment (IDE) software tool used to program and test the Web site files of this project.

• Microsoft Internet Information Services (IIS) – The Web server provided in the 4th floor lab for hosting the project. There is no cost involved.

• Paint.NET – The free graphic editing tool that was used to create The All-Star R.E.C. Center’s logo. Also used for modifying various images.

4.3 Budget

The budget includes hardware and software items, descriptions of their current availability, retail cost, and actual cost to me. The total for the retail cost and actual cost are shown in the 3rd and 4th columns of the last row. This budget is shown below in Table 1.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Retail Cost</th>
<th>Actual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP ProLiant DL145 Server</td>
<td>Available in 4th floor lab</td>
<td>$1,759.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>HP xw4400 Workstation</td>
<td>Available in 4th floor lab</td>
<td>1,089.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Lexar 512 Mb JumpDrive Pro 80X USB 2.0 Flash Drive</td>
<td>Purchased</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microsoft Windows 7 Enterprise N</td>
<td>Available in 4th floor lab</td>
<td>7.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Microsoft SQL Server 2008 R2 Standard Edition</td>
<td>Available in 4th floor lab</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microsoft Visual Studio 2010 Ultimate</td>
<td>Available in 4th floor lab</td>
<td>11,899.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Paint.NET</td>
<td>Available in 4th floor lab</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Microsoft IIS Web server</td>
<td>Available in 4th floor lab</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$22,293.57</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

Table 1. Budget Analysis (6, 7, 8, 9, 11, 12, 15, 20).
The HP ProLiant DL145 Server located in the 4th floor lab is no longer available on the market. However the retail cost of a similar item, the HP ProLiant DL160 G6 Server is currently $1759 (6). The HP xw4400 Workstations located in the 4th floor lab are no longer available on the market, but the model’s most recent replacement, the Z400, currently starts at $1,089 (7). The Lexar model that I own is no longer on the market. A similar Lexar flash drive, the Lexar JumpDrive FireFly USB Flash Drive, is currently on the market for $13.99 (9).

The Microsoft Windows 7 Enterprise operating system is only available through volume licensing with no existing retail versions (4). However, Microsoft Windows 7 Ultimate, which includes the same features as Enterprise, is available to students in the University of Cincinnati Clifton Bookstore for $7.00 (17).

5. Proof of Design

The following figures and descriptions display how The All-Star R.E.C. Center solves the problems discovered on NBA.com and WNBA.com. The “Home” section is shown below (See Figure 12. page 22).
The end user decides to navigate to the “Players Search” sub-section located under the “Search” section by selecting the link from the navigation bar as shown below in Figure 13.

After the user clicks the “Player Search” link, the “Player Search” sub-section appears as shown below (See Figure 14, Page 23).
Figure 14. The "Player Search" sub-section.

The end user is instructed to show players by choosing from the NBA, WNBA, or both leagues in step 1, and choosing the players’ last name initials in step 2 to populate the empty listbox. Once the end user chooses their desired values from the two dropdown lists, they press the “Show Players” button, populating the listbox with players from the chosen league(s) with the chosen last name initials, as shown below (See Figure 15. page 24).
Figure 15. Listbox fills with players from both leagues with last name initial "B".

The end user chose to populate the listbox with players from both leagues whose last names start with the letter “B”. If a player has an “A” by their name, it means he/she is currently active in the NBA or WNBA. If a player has an “F” by their name, it means she is a female player from the WNBA. If a player has an “M” by their name, it means he is a male player from the NBA.

After highlighting a player’s name for the player profile view, the end user presses the “Select Player” button. The “Select Player” button navigates the end user to the “Player Profile” view of the selected player, as shown below (See Figure 16. page 25).
Figure 16. "Player Profile" view of selected player.

The end user views the selected player’s photo, personal information such as position, height, weight, and years played. The end user also sees the player’s worn jersey numbers, career regular season statistics, and career all-star game statistics in the three indicated grid views. The Stat quick links table is located in the top-right corner of the main-content area. The end user would like to know more about the statistical category “APG”, so the end user navigates to the “Stats Help” sub-section, as shown below (See Figure 17. page 26).
Figure 17. End user hovers "Stats Help" sub-section.

The end user is taken to the “Stats Help” sub-section of the “Stats” section. The statistical category that is currently showing by default is “Games”. The end user clicks on the statistical category links that take the user directly to that category without leaving the page. Finally, the end user clicks on “Assists”, where the definition for “APG” is located, as shown below (See Figure 18. page 27).
Stats Help

View the definition and purposes of all basketball statistics.

Choose a link below to be taken directly to that statistical category:
Games | Minutes | Points | Field Goals | 3-Point Field Goals | Free Throws
Rebounds | Assists | Steals | Blocks | Turnovers | Personal Fouls

Assists

Definitions:
Assist (AST) - A pass by a player that directly leads to a field goal made by the player's teammate.
Assists Per Game (APG) - Average amount of assists a player passes a game.

Facts:
When a field goal is made, if the field goal maker received the ball from a teammate, then the teammate is rewarded with an assist.

Ticha Penicheiro is one of the best assist passes in the WNBA.

Math Equations:
Assists Per Game = Total Assists divided by (-) Games Played
Example: 800 Total Assists ÷ 80 Games = 10 Assists Per Game

Figure 18. "Stats Help" sub-section with focus on "Assists".

The end user views the definition of not only “APG”, which is the abbreviation for “Assists Per Game”, but also related statistics, in this case “AST” for “Assist”. The end user also has the ability to view facts about the statistical category, a pictorial example of a player known for excelling in or performing the statistical category, and the math equations used to calculate the chosen statistic.

Once the end user is done in the “Stats Help” sub-section, the end user navigates to the “All-Star Game Search” sub-section of the “Search” section as shown below (See Figure 19, page 28).
Figure 19. End user hovers "All-Star Game Search" sub-section.

In the “All-Star Game Search” sub-section, the end user is presented with two listboxes. The listbox on the left has a link to every all-star game in NBA history. The listbox on the right has a link to every all-star game in WNBA history. The end-user selects the 1992 NBA all-star game as shown below (See Figure 20. Page 29).
Figure 20. An all-star game selected in the "All-Star Game Search" sub-section.

The All-Star game information is displayed for the selected game. It includes information such as who won the game MVP award, the two head coaches, and the location of the game. It also shows the statistics of all players from each team in the box scores. The All-Star game information is shown below (See Figure 21. page 30).
The end user is curious about the “FT%” stat initial. To see what the full name equivalent of the stat initial, the end user presses the Stats Legend linkbutton located in the third row of the Stats quick links table. The Stats Legend opens in a new window, where all the stat initials and their full name equivalents are read, as shown below (See Figure 22. page 31).
Figure 22. The Stats Legend window.

After reading the Stats Legend, the end user closes the window and navigates to the “Compare Player Stats” sub-section of the “Stats” section, as shown below in Figure 23.

Figure 23. End user hovers "Compare Player Stats" sub-section.
The “Compare Player Stats” sub-section appears. The end user is instructed to choose players by choosing from the NBA, WNBA, or both leagues in step 1, the players’ last name initials in step 2, a player in step 3 with the last name initial from step 2, and a selected player’s statline to compare in step 4. After choosing player one, the end user presses the “Show Players” button, but is alerted with a required validator that they have to choose two players to compare, as shown below in Figure 24.

![Figure 24. Required field validator of the "Compare Player Stats" sub-section.](image)

The end user follows the same instructions for choosing player two. Once the requirement is satisfied, the end user presses the “Show Players” button again, this time passing the validation. The end user is taken to the “Comparison Results” view where the photo and statline of player one is displayed against the photo and statline of player two. In this case, Jason
Kidd of the NBA’s 2001-2002 statistical campaign is compared against Betty Lennox of the WNBA’s 2007 statistical campaign, as shown below in Figure 25.

The end user has the option to view the player profile of one of the players by selecting their name beneath the picture, but instead the end user is interested in the “STL” statistical category. This time, the end user clicks the “STL” link button in the Stat quick links table. A new window opens with the “Stats Help” sub-section focused on the “Steals” statistical category. This page includes the definition, facts, and math equation for “Steals Per Game”. “Steal” is also indicated as the full name equivalent of the “STL” abbreviation, as shown below (See Figure 26. page 34).

---

**Figure 25.** "Comparison Results" view of two selected players.

The end user has the option to view the player profile of one of the players by selecting their name beneath the picture, but instead the end user is interested in the “STL” statistical category. This time, the end user clicks the “STL” link button in the Stat quick links table. A new window opens with the “Stats Help” sub-section focused on the “Steals” statistical category. This page includes the definition, facts, and math equation for “Steals Per Game”. “Steal” is also indicated as the full name equivalent of the “STL” abbreviation, as shown below (See Figure 26. page 34).
Figure 26. "Stats Help" sub-section with focus on "Steal" category after selection.

After closing the “Stats Help” window, the end user decides to navigate to the “Stat Rankings” sub-section of the “Stats” section as shown below in Figure 27.

Figure 27. End user hovers "Stat Rankings" sub-section.
The end user is instructed to choose from the NBA, WNBA, or both leagues in step 1, and choose individual player positions or all positions from step 2. The end user decides to choose all shooting guards from the WNBA. After pressing the “Show Rankings” button, the grid view is display with all shooting guards from the WNBA and their career stats ordered by the stat columns, as shown below in Figure 28.

**Figure 28. Stat Rankings of all-star shooting guards from the WNBA.**

The end user selects the points column (“PTS”) column to sort the players by. After sorting occurs, a label appears to inform the end user which stat column they selected. Along with the label, a button with the text “Cancel Sorting” appears to send the grid view back to its default order as shown below (See Figure 29, page 36).
Figure 29. The points column of the Stat Rankings grid view is currently sorted.

The end user decides to navigate to the “Learn Practice” sub-section of the “Practice Math” section as shown below in Figure 30.

Figure 30. End user hovers "Learn Math" sub-section.

In the “Learn Math” sub-section, the end user views the definition and examples of each math operation used to calculate basketball statistics. The end user clicks on the mathematical operation links that take the user directly to that operation without leaving the page. The end user views “Decimals” as shown below (See Figure 31. page 37).
Figure 31. "Learn Math" sub-section with focus on "Decimals".

The end user notices the “Practice Decimals” link, shown below the definition. After clicking the link, the end user is taken to the “Practice Math” sub-section of the “Math Practice” section, with focus on the “Decimals” exercises, as shown below (Figure 32. page 38).
Figure 32. "Practice Math" sub-section with focus on "Decimals".

The end-user decides to solve problem 1, which prompts the user to add two decimal numbers. The end user enters a letter then presses the “Submit” button. The validator appears specifying that only numbers and decimals are acceptable for the answer, as shown below (See Figure 33, page 39).
Figure 33. Validator thrown for numbers and decimal points only.

The end user types the value “7.9” and presses the “Submit” button again. A message appears specifying that the answer is incorrect and to try again, as shown below in Figure 34.

Figure 34. Message that indicates incorrect answer.

The end user attempts to answer a third time, entering the value “8.7” and presses the “Submit” button again. A message appears specifying that the answer is correct, as shown below (See Figure 35. page 40).
As shown in the previous dialog and figures, The All-Star R.E.C. Center supplies its users with links to statistical information in every major section of the application. The application enables users to find statistical information clearly and quickly. The application also provides users with the mathematical tools needed to learn and practice calculating statistics. End users also have the ability to compare any set of stats of any player from the NBA and WNBA.

The end user navigates to the “Name That Player” sub-section of the “Trivia Games” section as shown below in Figure 36.

Figure 36. Message that indicates correct answer.

As shown in the previous dialog and figures, The All-Star R.E.C. Center supplies its users with links to statistical information in every major section of the application. The application enables users to find statistical information clearly and quickly. The application also provides users with the mathematical tools needed to learn and practice calculating statistics. End users also have the ability to compare any set of stats of any player from the NBA and WNBA.

The end user navigates to the “Name That Player” sub-section of the “Trivia Games” section as shown below in Figure 36.

Figure 36. End user hovers "Name That Player" sub-section.
The “Name That Player” sub-section appears. The section is currently blank, with the exception of a list of numbers (1-5). The end user finds the “Start Trivia Quiz” button and presses it, populating the blank section with questions at each number and four multiple choice selections beneath each question as shown below in Figure 37.

![Figure 37. List of generated questions and answers in "Name That Player" game.](image)

The end user selects an answer for each question, then presses the “See Score” button. The end user’s score is calculated, and for each question the end user got wrong, a label with the wrong question and correct answer appears as shown below (See Figure 38. page 42).
Figure 38. Final score and incorrect questions in "Name That Player" trivia game.

The end user decides to navigate to the “Comments” section, as shown below in Figure 39.

![Comment Section]

Figure 39. End user hovers "Comments" section.

The end user is instructed to provide their e-mail address and comment or question in the two textboxes located above the “Submit” button. Once the end user completes and submits their comment, they are redirected to a confirmation page as shown below (See Figure 40. page 43).

![Confirmation Page]

Figure 40. The confirmation page that e-mail was sent to the administrator.
The end user navigates to the “Become Member” sub-section of the “Members” section, as shown below in Figure 41.

Figure 41. End user hovers "Become Member" sub-section.

The end user is taken to the “Become Member” sub-section, where they are instructed to enter information such as their username, password, and e-mail into the form. The credentials in bold text are required for registration. The sub-section is shown below (See Figure 42. page 44).
Figure 42. The "Become Member" sub-section.

After the end user completes the form, they press the “Submit” button. The end user is taken to a confirmation page which then redirects them to the Login page, as shown below in Figure 43.

Figure 43. The Login page for members.
The end user logs in with their username and password and presses the “Log in” button. The end user is redirected to the “Login Confirmation” page, where they have to specify their security question’s answer as shown below in Figure 44.

![Login Confirmation page](image1.png)

**Figure 44. The "Login Confirmation" where security question is asked.**

The end user enters their security answer the presses the “Submit Answer” button. The answer is correct, and the end user is redirected to the “Home” section. In the black bar located at the top of the page, the end user, now a authenticated member can see a greeting message with their username and a linkbutton that reads “Log out” in orange. The “Log out” linkbutton has replaced the “Log in” button since the user has been authenticated as a member, as shown below in Figure 45.

![Greeting message and Log Out linkbutton](image2.png)

**Figure 45. The greeting message and "Log Out" linkbutton for member.**
After successfully logging in, the member navigates to the “Edit Member Profile” sub-section of the “Members” section, as shown below in Figure 46.

![Figure 46. Member hovers "Edit Member Profile" sub-section.](image)

The “Become Member” sub-section appears with a form that includes options for privacy settings like showing the member’s name and e-mail address in their public profile. It also includes a form for member’s to modify their credentials such as their username, password, and favorite all-star. The “Become Member” sub-section is shown below (See Figure 47. page 47).
The member’s current favorite player is Scottie Pippen. The member decides to change their favorite player to Shaquille O’Neal. The member selects Shaquille O’Neal’s name from the dropdownlist under the “Favorite All-Star” section of the form and presses the “Save All-Star” button. The section indicates that that update has been completed successfully, as shown below (See. Figure 48. Page 48).
Figure 48. New favorite all-star selection is updated successfully.

The member presses the “View your Profile” link button at the top of the sub-section.

The member gets a look at how their public member profile appears with their saved information, as shown below in Figure 49.

![Figure 49. The member's public profile.](image)

The member views their public accessible information, as well as their selected favorite player with several career stats and a link to their player profile page. The member can also reference the Stat Quicklinks for the stats shown for their favorite player. The member navigates to the “View Member Profiles” sub-section of the Members section as shown below (See Figure 50. page 49).
Figure 50. Member hovers "View Member Profiles" sub-section.

The member is taken to the “View Member Profiles” page. A gridview appears with an alphabetical ordered list of all the members with public access to their member profiles. The gridview includes their picture (if uploaded), their username, and their role, as shown below (See Figure 51. page 50).

Figure 51. Search Members grid view of "View Member Profiles" sub-section.
The member selects Mandizi84’s username to view his profile. The member profile of Mandizi84 is shown below (See Figure 52. page 51).

![Member Profile]

**Figure 52. Selected member's public profile.**

Just like the currently logged in member’s viewed profile under the “Edit Member Profile” sub-section, the “View Member Profiles” views show a member’s public information, and favorite all-star player with their career stats. After a look at a fellow member, the logged in member hovers over the “Members Forum” sub-section as shown below (See Figure 53. page 52).
Figure 53. Member hovers "Members Forum" sub-section of "Members" section.

The member is taken to the “Members Forum” sub-section where they see the grid view that shows all the forums created. The grid view includes the thread title, the username of the member who created the title, how many replies the thread has received, and the last reply. The threads are ordered by last reply descending, as shown below in Figure 54.

Figure 54. The thread grid view of the "Members Forum" sub-section.

The member selects a thread to view and is taken to the thread grid view to read the opening post and replies. The first row of the selected thread’s grid view is always the opening post, followed by the thread’s replies, as shown below (See Figure 55. page 53).
Figure 55. The selected thread's grid view with new reply textbox below.

The member decides to respond with a new reply to the selected thread. The member enters their comment into the “Post new reply” textbox and presses the “Submit New Reply” button. The thread grid view is then repopulated with the current member’s new reply as shown below in Figure 56.
As shown in the previous dialog and figures, The All-Star R.E.C. Center supplies its users with links to statistical information in every major section of the application. The application enables users to find statistical information clearly and quickly. The application also provides users with the mathematical tools needed to learn and practice calculating statistics. End users also have the ability to compare any set of stats of any player from the NBA and WNBA.

6. Testing

6.1 Unit Testing

1. Test to assure that all Web site elements (font, labels, grid views, images) are easily visible with proper size and layout.

   - Results: CSS can still use improvements in navigation bar, which tends to run off the edge of body when zooming out to a smaller browser view. All text in the site
elements are sized appropriately. Some player images were decreased to match
the majority of other image sizes.

2. Make sure menu item and sub-item links successfully navigate user to the correct chosen
section and sub-section.
   - Results: All active menu item and sub-item links navigate user to the correct
     chosen section and sub-section.

3. Make sure users not signed in as members are disabled access to the “Admin” and
   “Members” section.
   - Results: Users that are not authenticated as a Member or Administrator do not
     have access to the “Members” and “Admin” only sections.

4. Verify that data controls such as dropdown lists, submit buttons, and grid views for
   search of players, statistics, and scores in the “Search” and “Stats” sections work
   properly, showing accurate information from the back-end database.
   - Results: Dropdown lists, submit buttons, and grid views show accurate
     information in each of the sections and their sub-sections.

5. Test the quick links to assure for correct information related to the chosen statistic, and
   direct access to that statistic in the “Stats Help” sub-section from other sections is
   available.
   - Results: Stat quick links correctly navigate user to chosen statistical category and
     work on every page the link tables are located in.

6. Test form validation controls on textboxes to assure that user-input is correctly entered
   and exists (if required) in the “Math Practice”, “Trivia Games”, and “Members” sections.
• Results: Form validation controls work correctly in the “Math Practice” section.
Validation controls work correctly in the “Trivia Games” and “Members” sections.

7. Make sure form validation controls work properly for member login authorization.
• Results: Validation controls in the “Members” section work correctly.

8. Confirm that users who desire to become members can successfully insert the required data into the textboxes of the “Become Member” sub-section, save their information to the back-end database, and gain access to their member profile and member discussion forum.
• Results: Members are able to complete all these actions.

9. Confirm that members, who want to delete their account, can delete their information from the back-end database.
• Results: Members are able to delete their account membership.

6.2 User Acceptance Testing
Each question in the survey was presented with a grading scale of 1 through 5 (Poor =1 and Good = 5). Individual surveys can be found in Appendix A. Below are the questions users answered and their average grade.

1. “Home” section fully explains the purpose of The All-Star R.E.C. Center

• Average grade: 5

2. Overall look of user interface is well designed

• Average grade: 4.5

3. Text font is easy to see and read
• Average grade: 5

4. Functionality of the navigation bar for different sections

• Average grade: 5

5. Ease of use/clarification of directions in “Search” section

• Average grade: 5

6. Ease of use/clarification of directions in “Stats” section

• Average grade: 4.6

7. Ease of use/clarification of directions in “Math Practice” section

• Average grade: 4.6

8. Ease of use/clarification of directions in “Trivia Games” section

• Average grade: 4.6

9. Ease of use/clarification of directions in “Comments” section

• Average grade: 5

10. Ease of use/clarification of directions in “Members” section (if joined)

• Average grade: 4.6

11. Overall grade

• Average grade: 4.9
7. Conclusions and Recommendations

7.1 Conclusions

The All-Star R.E.C. Center took a lot of research, time, and execution in order to complete. This project is dedicated to providing users with easy-to-use navigation and functionality, without the need to search across multiple pages for desired information. It provides new features such as the math learning and interleague stat comparisons that are currently unavailable from other basketball sites. Ultimately this project was worth the effort involved in completing it, and proof that a Web application can be simultaneously valuable from an entertainment and educational standpoint.

7.2 Recommendations

Although The All-Star R.E.C. Center strives to provide users with simple navigation and functionality, with more time this aspect could’ve been stronger. Due to limited resources, I was not able to implement Microsoft AJAX control toolkit. This toolkit enables web interfaces to have features such as page popups and accordion panes which simplify the way an interface is displayed.

For the “Practice Math” section of the project, a downloadable link to worksheets with math operations would be an addition worth implementing in this project. Another feature this project could’ve benefited from was analysis of how NBA player stats compare to WNBA player stats. Analysis could be summarized in plain text, as well charts and other diagrams.
References


   November 15, 2010.


16. Torsella, Joni, PhD. Associate Professor, School of Engineering Education, College of
    Engineering & Applied Sciences, University of Cincinnati. E-mail interview.
    October 29, 2010.


Appendix A.
User Acceptance Testing Survey Results

The All-Star R.E.C. Center
User Acceptance Testing Survey

Please circle gender:
- Male
- Female

Please circle age group:
- 12 yrs or under
- 13 yrs – 19 yrs
- 20 yrs – 29 yrs
- 30 yrs – 39 yrs
- 40 yrs – 49 yrs
- 50 yrs or older

For each question please enter a number from the grade scale as follows:

Poor = 1  Below Average = 2  Average = 3  Above Average = 4  Good = 5

"Home" section fully explains the purpose of The All-Star R.E.C. Center - 5
Overall look of user interface is well designed - 5
Text font is easy to see and read - 5
Functionality of the navigation bar for different sections - 5
Ease of use/clarification of directions in "Search" section - 5
Ease of use/clarification of directions in "Stats" section - 5
Ease of use/clarification of directions in "Math Practice" section - 4
Ease of use/clarification of directions in "Trivia Games" section - 4
Ease of use/clarification of directions in "Comments" section - 5
Ease of use/clarification of directions in "Members" section (if joined) - 5

Overall grade
Comments:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
The All-Star R.E.C. Center
User Acceptance Testing Survey

Please circle gender:
- Male
- Female

Please circle age group:
- 12 yrs or under
- 13 yrs – 19 yrs
- 20 yrs – 29 yrs
- 30 yrs – 39 yrs
- 40 yrs – 49 yrs
- 50 yrs or older

For each question please enter a number from the grade scale as follows:

**Poor = 1**  **Below Average = 2**  **Average = 3**  **Above Average = 4**  **Good = 5**

“Home” section fully explains the purpose of The All-Star R.E.C. Center = 5
Overall look of user interface is well designed = 5
Text font is easy to see and read = 5
Functionality of the navigation bar for different sections = 5
Ease of use/clarification of directions in “Search” section = 5
Ease of use/clarification of directions in “Stats” section = 5
Ease of use/clarification of directions in “Math Practice” section = 5
Ease of use/clarification of directions in “Trivia Games” section = 5
Ease of use/clarification of directions in “Comments” section = 5
Ease of use/clarification of directions in “Members” section (if joined) = 4

Overall grade = 48

Comments:

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

61
The All-Star R.E.C. Center
User Acceptance Testing Survey

Please circle gender:  
[ ] Male  [X] Female

Please circle age group:  
[ ] 12 yrs or under  [ ] 13 yrs – 19 yrs  
[X] 20 yrs – 29 yrs  [ ] 30 yrs – 39 yrs  
[ ] 40 yrs – 49 yrs  [ ] 50 yrs or older

For each question please enter a number from the grade scale as follows:

Poor = 1  Below Average = 2  Average = 3  Above Average = 4  Good = 5

“Home” section fully explains the purpose of The All-Star R.E.C. Center =  
Overall look of user interface is well designed =  
Text font is easy to see and read =  
Functionality of the navigation bar for different sections =  
Ease of use/clarification of directions in “Search” section =  
Ease of use/clarification of directions in “Stats” section =  
Ease of use/clarification of directions in “Math Practice” section =  
Ease of use/clarification of directions in “Trivia Games” section =  
Ease of use/clarification of directions in “Comments” section =  
Ease of use/clarification of directions in “Members” section (if joined) =  
Overall grade =  

Comments:

Very straight forward – easy to use.
Nice job!
The All-Star R.E.C. Center
User Acceptance Testing Survey

Please circle gender:  Male  Female

Please circle age group:  12 yrs or under  13 yrs – 19 yrs
                       20 yrs - 29 yrs  30 yrs – 39 yrs
                       40 yrs - 49 yrs  50 yrs or older

For each question please enter a number from the grade scale as follows:

Poor = 1  Below Average = 2  Average = 3  Above Average = 4  Good = 5

“Home” section fully explains the purpose of The All-Star R.E.C. Center = 5

Overall look of user interface is well designed = 3

Text font is easy to see and read = 5

Functionality of the navigation bar for different sections = 5

Ease of use/clarification of directions in “Search” section = 5

Ease of use/clarification of directions in “Stats” section = 5

Ease of use/clarification of directions in “Math Practice” section = 5

Ease of use/clarification of directions in “Trivia Games” section = 5

Ease of use/clarification of directions in “Comments” section = 5

Ease of use/clarification of directions in “Members” section (if joined) = 4

Overall grade = 5

Comments:

Under Test: very bad 1 2 3 4 5:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
The All-Star R.E.C. Center
User Acceptance Testing Survey

Please circle gender:  (Male)  (Female)

Please circle age group:  12 yrs or under  13 yrs – 19 yrs
                      20 yrs – 29 yrs  30 yrs – 39 yrs
                      40 yrs – 49 yrs  50 yrs or older

For each question please enter a number from the grade scale as follows:

Poor = 1  Below Average = 2  Average = 3  Above Average = 4  Good = 5

"Home" section fully explains the purpose of the All-Star R.E.C. Center
Overall look of user interface is well designed
Text font is easy to see and read
Functionality of the navigation bar for different sections
Ease of use/clarification of directions in "Search" section
Ease of use/clarification of directions in "Stats" section
Ease of use/clarification of directions in "Math Practice" section
Ease of use/clarification of directions in "Trivia Games" section
Ease of use/clarification of directions in "Comments" section
Ease of use/clarification of directions in "Members" section (if joined)
Overall grade

Comments:

There is room for use of graphics! That would make this app more attractive. Use the same site template
to show messages/announcements instead of showing them
on blank paper.
The All-Star R.E.C. Center
User Acceptance Testing Survey

Please circle gender: 

- Male
- Female

Please circle age group: 

- 12 yrs or under
- 13 yrs – 19 yrs
- 20 yrs – 29 yrs
- 30 yrs – 39 yrs
- 40 yrs – 49 yrs
- 50 yrs or older

For each question please enter a number from the grade scale as follows:

Poor = 1  Below Average = 2  Average = 3  Above Average = 4  Good = 5

"Home" section fully explains the purpose of The All-Star R.E.C. Center

Overall look of user interface is well designed

Text font is easy to see and read

Functionality of the navigation bar for different sections

Ease of use/clarification of directions in "Search" section

Ease of use/clarification of directions in "Stats" section

Didn't realize I had to choose at least two

Ease of use/clarification of directions in "Math Practice" section

I thought it would be right under "Math Practice" menu

Ease of use/clarification of directions in "Trivia Games" section

It can be a bit confusing switching between games.

Ease of use/clarification of directions in "Comments" section

Cool.

Ease of use/clarification of directions in "Members" section (if joined)

Overall grade

Comments:

The main thing that seems to pop out to me is that on certain pages, it appears too "busy." I had difficulty focusing, and forget where I'm at in the application. But a ton of work clearly went into this project.
The All-Star R.E.C. Center
User Acceptance Testing Survey

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Male  Female

Please circle age group:  
12 yrs or under  13 yrs – 19 yrs
20 yrs – 29 yrs  30 yrs – 39 yrs
40 yrs – 49 yrs  50 yrs or older

For each question please enter a number from the grade scale as follows:

Poor = 1  Below Average = 2  Average = 3  Above Average = 4  Good = 5

“Home” section fully explains the purpose of The All-Star R.E.C. Center = Good
Overall look of user interface is well designed = 4
Text font is easy to see and read = Good
Functionality of the navigation bar for different sections = 5
Ease of use/clarification of directions in “Search” section = 5
Ease of use/clarification of directions in “Stats” section = 5
Ease of use/clarification of directions in “Math Practice” section = 4
Ease of use/clarification of directions in “Trivia Games” section = 5
Ease of use/clarification of directions in “Comments” section = 5
Ease of use/clarification of directions in “Members” section (if joined) = Good
Overall grade = Good

Comments:
The math section should have some topics like algebraic equations, linear equations etc. The homepage should have some backgrounds designs which signifies what the website is all about.
The All-Star R.E.C. Center
User Acceptance Testing Survey

Please circle gender:  Male  Female

Please circle age group:  12 yrs or under  13 yrs – 19 yrs
20 yrs – 29 yrs  30 yrs – 39 yrs
40 yrs – 49 yrs  50 yrs or older

For each question please enter a number from the grade scale as follows:

Poor = 1  Below Average = 2  Average = 3  Above Average = 4  Good = 5

"Home" section fully explains the purpose of The All-Star R.E.C. Center = 5
Overall look of user interface is well designed = 4
Text font is easy to see and read = 5
Functionality of the navigation bar for different sections = 5
Ease of use/clarification of directions in "Search" section = 5
Ease of use/clarification of directions in "Stats" section = 4
Ease of use/clarification of directions in "Math Practice" section = 5
Ease of use/clarification of directions in "Trivia Games" section = 5
Ease of use/clarification of directions in "Comments" section = 5
Ease of use/clarification of directions in "Members" section (if joined) = N/A
Overall grade = 5

Comments:

- For the UI, very good, but to get a 5 would just have to be a little more aesthetically pleasing.
- Stats: legend at top is pretty functional, but for those unfamiliar, a mouse-over definition pop-up for short tables would've gotten a 5 rating.
- Overall, very nice.