

Assignment 3: Evaluation – GUI Group 50

Section 1: Summary of the evaluation

A heuristic evaluation was carried out for the weather application, targeted towards University students that played football. The evaluation was done in several stages and involved 4 evaluators. At first each evaluator used and analysed the application, listing problems based on the 10 heuristics. The results of the evaluators were collated, and the combined problems were used to redesign the weather application.

The evaluation process was efficient and discovered a large number of issues with the application, and provided severity ratings so that the issues could be prioritised. Furthermore, listing problems based on heuristics and with severity ratings also made finding solutions to the problems raised easier.

The application, as it was submitted, was found to have many faults. Some were issues regarding its core functionality and others were problems that made its use cumbersome and inefficient, other problems yet involved improving non-functional features in the application to be more useful to the target audience. The final redesign produced after the evaluation is a massive improvement on the original submitted design, in both aesthetics and function.

Section 2: Evaluation Process

The evaluation was carried out individually by each group member (evaluator) based on the 10 heuristics (usability principles).

First the evaluators used the completed product freely, during the first evaluation phase, experimenting with features and buttons to test the usability of the application without any general aim.

This was followed by the second evaluation phase, beginning with evaluators being briefed by the project manager on the 10 heuristics and being asked to keep those in mind when using the application. The evaluators then completed specific tasks within the application (e.g. view current temperature) and detected problems relating to each of the ten principles. Each problem was given a severity rating based on its effect on the usability of the application. This being done by each evaluator individually produced several individual tables of problems, each with severity ratings.

The evaluators were then debriefed. They collaborated on producing a single table from their many, collating their findings and agreeing on severity ratings where similar problems had different severity ratings for the different evaluators. Problems were also merged and shortened where several issues seemed to be related to the same fault in the system. Doing this produced a complete list of problems with the application and led to the final phase in the evaluation, fixing the problems. The evaluators collectively discussed one or several possible solutions for each identified problem. These possibilities were combined to produce several redesign ideas for the weather application which would improve its usability based on the 10 heuristics.

Section 3: Findings

The following is the table that was produced at the end of the debriefing phase in the evaluation. Each problem has a severity rating agreed upon by all evaluators and is linked to the heuristic it violates.

Problem	Severity	Heuristics violated
1. There is no status display on the screen so the user might not be able to know if the weather service sites are down, and as such might get irrelevant information.	1	Visibility of system status
2. There are no notifications displayed when the user isn't connected to the internet.	1	Visibility of system status
3. The system should provide information specific to football students, such as a statement of whether the weather is suitable for outdoor practice.	1	Match between system and real world
4. Users cannot go back after clicking the 'Find Pitch' or 'Event Calendar' buttons unless they close out of the browser. This calendar and map should be embedded within the application screen – with a back button to the main screen.	2	User control and freedom
5. Application should allow more options for pitch locator such as 'within a 5-mile radius', 'indoors' etc.	1	Flexibility and efficiency of use
6. Event calendar should be able to store events with an option for the user to add new events to the list such as upcoming football practices or matches.	2	Flexibility and efficiency of use
7. Certain features need to be added to allow a user to see weather for multiple hours ahead on the same day, and several days following. This can be implemented with simple buttons in the blank space of the application.	3	Aesthetic and minimalistic design
8. Event calendar page has a lot of extra information that may not be required.	2	Aesthetic and minimalistic design
9. The pop up for suggested equipment could be integrated better; the popup does not go with the general sporty theme of the application does not change based on the weather.	2	Aesthetic and minimalistic design
10. The background of the application could be changed to a plain background or a gradient to reduce distraction from the necessary information.	1	Aesthetic and minimalistic design
11. The system does not display any error messages.	2	Help users recognise and recover from errors

Visibility of system status:

Several evaluators noted that there was no system status displayed to tell the user if a weather service site is down or if they are disconnected to the internet, either of which could make any weather information provided outdated or irrelevant.

This violates the first heuristic as it does not inform the user of the system status. The severity rating is 1, as even without a system status the application was perfectly usable during all tests. The issues considered that would require a status are theoretical and were not experienced during testing.

Match between system and real world:

One evaluator suggested the system does not provide enough information specific to its target audience (Students that play football). The system could provide a statement on the main page beneath the temperature stating if the weather is suitable for outdoor practice. This could be calculated by the application using data for rain forecast, temperature and wind speed. For example, if there was a large amount of rain forecasted on that day, or if the wind speed or temperature was over a given amount the application could say "Practice today unadvisable". Further data would have to be gathered for this, to work out how much rain or wind would make outdoors football unpractical.

It is the second heuristic violated as the problem refers to the application not using audience specific language and providing audience specific information. The severity rating given was 1, as while this feature would add usability to the application for the user, it is not necessary for the function of the application (providing weather information).



This is where a statement relating to football playing conditions could be added.

User control and freedom:

Problem 4 concerns the 'Find pitch' and 'Event Calendar' button, as when the user clicks them, they lead the user to websites in an external browser. The 'Find Pitch' button shows the user all football pitches around their current location, and the Event Calendar leads to an external website with a weather based calendar. These features would be far more useful if they were embedded within the application so the user didn't have to leave the application to view upcoming events or find football pitches nearby.

All evaluators agreed that find pitch and event calendar buttons violated the ‘User control and freedom’ heuristics as they did not provide a way for a user to go back to the application. The same problem also violates the ‘Flexibility and efficiency of use’ heuristic as it is inefficient for the user to leave the application for services, and then return manually when they wish to do something else within the application. The severity rating given for this issue was 2, as while the application can be used as it is, use is inefficient and cumbersome.

Page opened when Find Pitch is clicked

Page opened when Event Calendar is clicked

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Snow	2 Snow	3 Rain				
Actual: 10° 0° 0.00 mm	Actual: 10° 2° 0.00 mm	Actual: 9° 0° 0.20 mm				
Average: 8° 2° 0.20 mm	Average: 8° 2° 0.20 mm	Average: 9° 2° 0.20 mm				
4 Rain	5 Party Cloudy	6 Party Cloudy	7 Rain	8 Rain	9 Rain	10 Rain
Actual: 8° 2° 0.00 mm	Actual: 8° 4° 0.00 mm	Actual: 10° 1° 0.00 mm	Actual: 10° 3° 0.00 mm	Actual: 10° 4° 0.00 mm	Actual: 10° 0° 0.00 mm	Actual: 10° 0° 0.00 mm
Average: 8° 2° 0.20 mm	Average: 8° 2° 0.20 mm	Average: 9° 2° 0.20 mm	Average: 9° 2° 0.20 mm	Average: 9° 3° 0.20 mm	Average: 9° 3° 0.20 mm	Average: 9° 3° 0.20 mm
11 Rain	12 Rain	13 Rain	14 Fog	15 Rain	16 Party Cloudy	17 Snow
Actual: 10° 5° 0.00 mm	Actual: 11° 5° 0.00 mm	Actual: 10° 4° 0.00 mm	Actual: 12° 3° 0.00 mm	Actual: 10° 7° 0.00 mm	Actual: 14° 8° 0.00 mm	Actual: 8° 2° 0.00 mm
Average: 9° 3° 0.20 mm	Average: 9° 3° 0.20 mm	Average: 9° 4° 0.20 mm	Average: 10° 4° 0.20 mm	Average: 10° 4° 0.20 mm	Average: 10° 4° 0.20 mm	Average: 10° 4° 0.20 mm
18 Snow	19 Party Cloudy	20 Rain	21 Scattered Clouds	22 Party Cloudy	23 Rain	24 Rain
Actual: 2° 1° 0.00 mm	Actual: 8° 0° 0.00 mm	Actual: 8° 1° 0.00 mm	Actual: 11° 2° 0.00 mm	Actual: 10° 8° 0.00 mm	Actual: 10° 8° 0.00 mm	Actual: 10° 8° 0.00 mm
Average: 10° 3° 0.20 mm	Average: 10° 5° 0.20 mm	Average: 11° 4° 0.23 mm	Average: 11° 4° 0.23 mm			

Flexibility and efficiency of use:

Two violations of ‘Flexibility and efficiency of use’ were identified by the evaluators. The first was that the pitch locator didn’t allow the user any options as to which sort of a pitch the user is looking for. The map that appears upon clicking the button shows nearby football pitches but doesn’t allow a radius to be set within the application (e.g. show pitches within 5 miles) and it doesn’t allow the type of pitch to be set (indoors, plain grass field, outdoor pitch etc.). This problem is mainly due to the map being an external website, the features suggested by the evaluators could be better implemented if the map was embedded within the application. The severity rating for this problem was 1 as the map still shows football pitches near the user, the application just doesn’t allow the search to be tailored within it, something judged as a minor issue.



Maps page when Find Pitch is clicked, does not show radius or other filtering options for football pitches nearby.

The second violation was the event calendar not allowing events to be added and not showing the user any upcoming events. This too is an issue borne of the fact that event calendar is an external website opened in a browser window. For the event calendar to be a useful feature that benefits the user, it must be a part of the application, and must allow the user to add events like upcoming practice or match dates. The severity rating for this was agreed to be 2, as while the issue prevents the user from using the 'Events' feature properly, the feature itself is not necessary for the core functionality of the application. The application is primarily designed to show the weather and an events calendar is an optional addition.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Snow	2 Snow	3 Rain				
Actual: 8° 2° Avg: 8° 2° 0.00 mm	Actual: 11° 4° Avg: 9° 2° 0.00 cm	Actual: 8° 2° Avg: 8° 2° 0.20 mm				
4 Rain	5 Party Cloudy	6 Party Cloudy	7 Rain	8 Rain	9 Rain	10 Rain
Actual: 8° 2° Avg: 8° 2° 0.20 mm	Actual: 8° 4° Avg: 8° 2° 0.00 mm	Actual: 10° 1° Avg: 9° 2° 0.00 mm	Actual: 10° 3° Avg: 9° 2° 0.00 mm	Actual: 10° 4° Avg: 9° 3° 0.20 mm	Actual: 10° 0° Avg: 9° 3° 0.20 mm	Actual: 13° 7° Avg: 9° 3° 0.20 mm
11 Rain	12 Rain	13 Rain	14 Fog	15 Rain	16 Party Cloudy	17 Snow
Actual: 10° 5° Avg: 9° 3° 0.30 mm	Actual: 11° 5° Avg: 9° 3° 0.30 mm	Actual: 10° 4° Avg: 9° 4° 0.30 mm	Actual: 12° 3° Avg: 10° 4° 0.30 mm	Actual: 10° 7° Avg: 9° 4° 0.00 mm	Actual: 10° 4° Avg: 10° 4° 0.20 mm	Actual: 8° 2° Avg: 10° 4° 0.00 mm
18 Snow	19 Party Cloudy	20 Rain	21 Scattered Clouds	22 Party Cloudy	23 Rain	24 Rain
Actual: 2° 1° Avg: 10° 3° 0.20 mm	Actual: 2° 0° Avg: 10° 3° 0.20 mm	Actual: 8° 1° Avg: 10° 3° 0.20 mm	Actual: 11° 0° Avg: 10° 3° 0.20 mm	Actual: 12° 2° Avg: 10° 3° 0.00 mm	Actual: 13° 6° Avg: 10° 4° 0.00 mm	Actual: 10° 6° Avg: 10° 4° 0.23 mm

Events calendar screen, shows forecast for each day, does not show upcoming events and does not let user add events.

Aesthetic and minimalistic design:

The evaluators listed several violations of this heuristic. The first problem was listed by all evaluators, though there was some discussion over which heuristic it violated. The application does not show the weather for the upcoming day, or the weather for future days within the application screen. To view this information, one must go to the events calendar screen. It was decided that the problem was one of 'Aesthetic and minimalistic design' because the lack of core functionality was judged a design issue as the design does not show important information to the user. The severity was rated as 3. For the application to be considered a complete weather application and useful to the user, this functionality needs to be added; hence the high severity.



Application shows only current weather, no way to view future weather on main screen.

Another problem identified was that the pop up for suggested equipment did not go with the overall sporty theme of the application, and should be integrated better. The pop up also did not change based on the weather, which is what would make it useful for the user, for example, if the weather forecast showed rain the suggested equipment could suggest a rain coat and other rain gear. The severity given was 2 as although the pop up window is a small non-functional feature, it is badly implemented and should be redone.

Suggested Equipment:
-Football shoes
-Shin-guards
-Goalkeeper gloves
-Rain-jacket (just in case)
-And of course... you need a Football

OK

Dialog box that opens when 'suggested equipment' button is clicked.

Two other problems within the same heuristic were the background and the lack of any error messages. The background of the application showed a sports stadium to fit in with the bright and sporty theme of the entire application, as it was aimed at footballing youths. The evaluators found this distracting from the key information being displayed to the user and suggested that it be replaced with a plain colour or gradient. This change would make the application more minimalistic and would make it easier to focus on the data the application is presenting to the user. The severity rating was agreed to be 1, as while a plainer background might be more minimalistic, the current layout is arranged such that all text and buttons are plainly visible over the background, making the issue a minor one.



Sports stadium wallpaper, may distract from information displayed.

The lack of error messages could be an issue as the user is not alerted when there is no internet connection or other problem, the data that should be displayed simply isn't there. This could confuse a user who might not know the source of the problem. The severity rating here is 2. Good error messages are crucial to the functioning of a good application, a user may not have the knowledge to identify the source of a malfunction of the application. The rating is not higher, as the application did not malfunction in any of the tests so long as it was connected to the internet.

Section 4: Proposed improvements

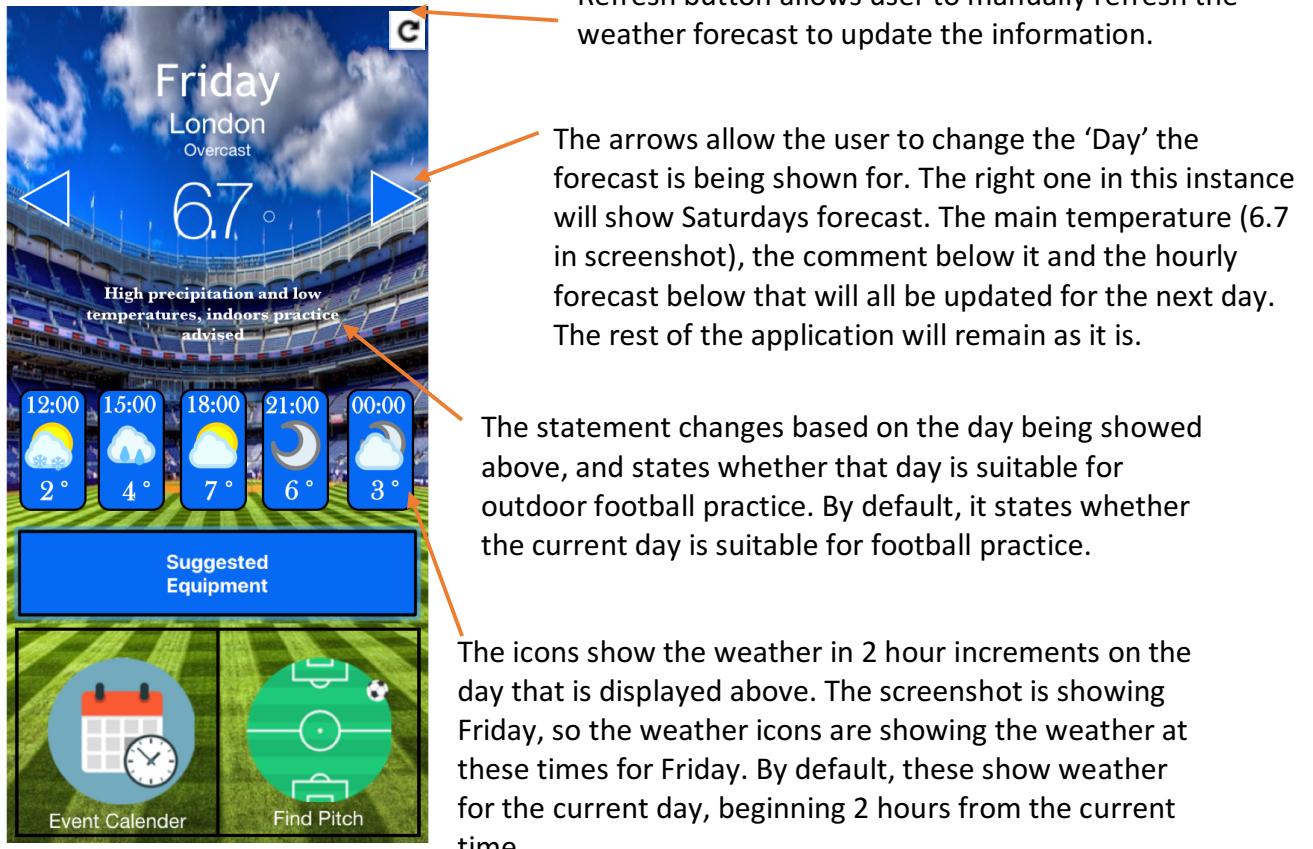
Redesign 1:

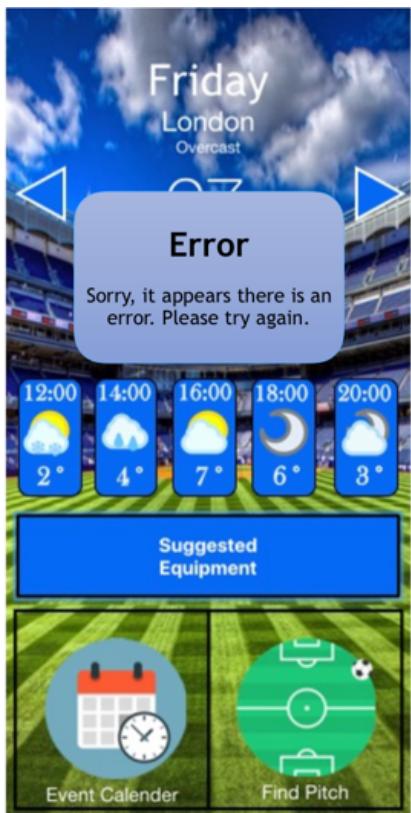
The first redesign by the evaluators sought to begin with fixing the largest issue first. That was the 7th problem in the table, given a severity rating of 3 (the highest of any issue). The problem was that the application did not allow users to view the weather forecast for future days, or for future hours of the current day, only showing the current temperature and weather conditions.

The application screen needed to include weather forecast for several hours of each day. Fitting all this information on the main screen would become overwhelming for the user, so the redesign uses large arrows to allow the user to move between days displaying the weather for up to 5 days ahead of the current one. For each day, beneath the current temperature, icons were added showing, in 3 hour increments, time, temperature and the weather conditions for that time on the selected day. By default, the icons will show the weather in 3 hour increments from the current time (to the nearest hour) and when the forecast day is changed (by the arrows) the icons will show the weather from 8am to 8pm, the average working and socialising/sporting hours for a university student.

The third problem states the system violates the “Match between the system and real world” heuristic and should prove the target audience with relevant information. Below the current temperature, the screen now displays whether the current (or selected) day is suitable for outdoor football practice. This is judged by precipitation levels, wind speed and temperature.

The system allows the user to manually refresh the screen to update data if outdated, and the system also includes error messages when something goes wrong (shown in 2nd screenshot). This fixes the 11th problem, which complains of the lack of error messages for the user.





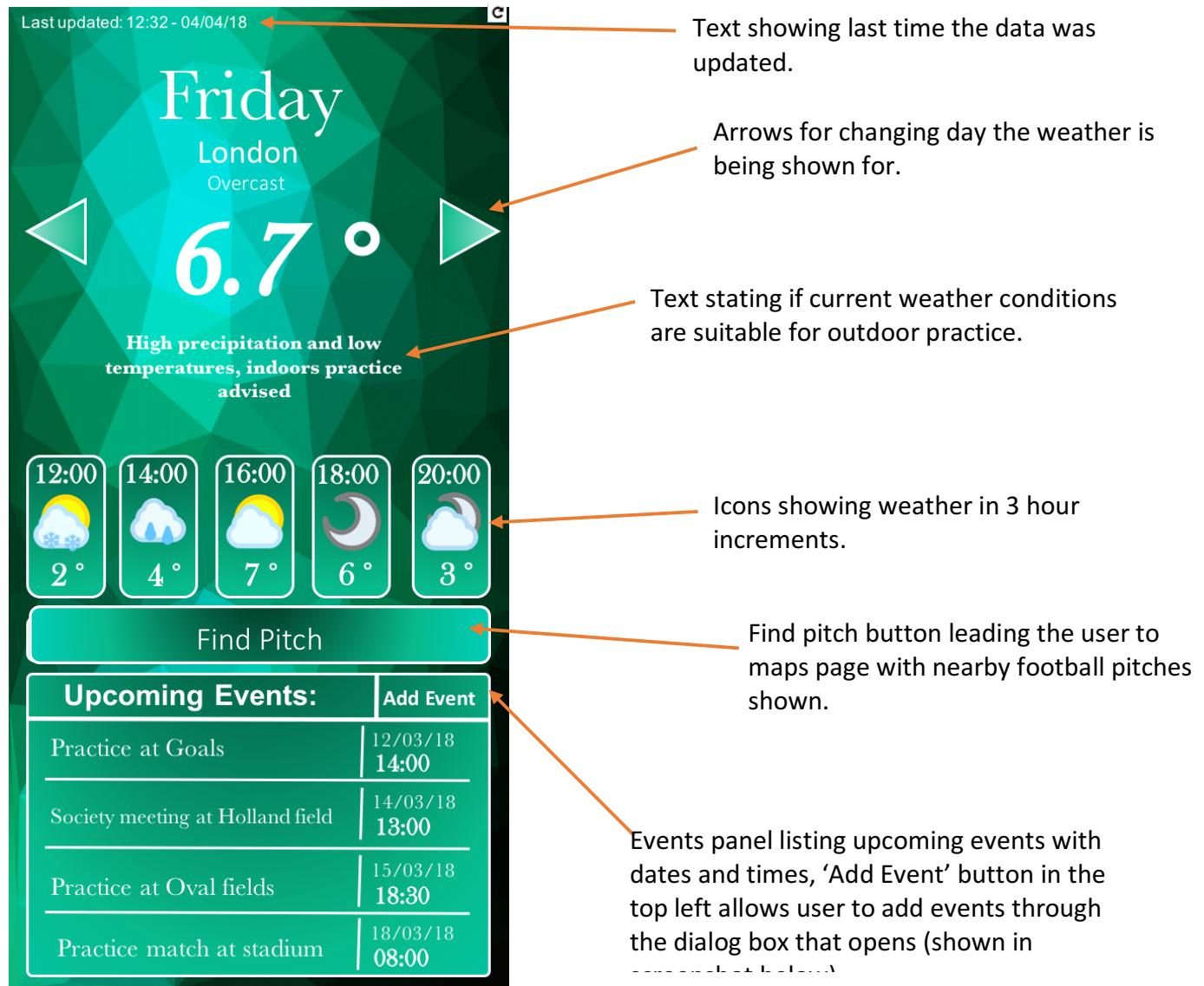
Error message: An error message adds further functionality to the app. It informs the user that an error has occurred. Without the error message the user might view information which is incorrect or has not been updated. With the implementation of the error message, it allows for better communication with the user and improves usability. The error message occurs when the user is not connected to the internet or if the API site providing the weather data is down.

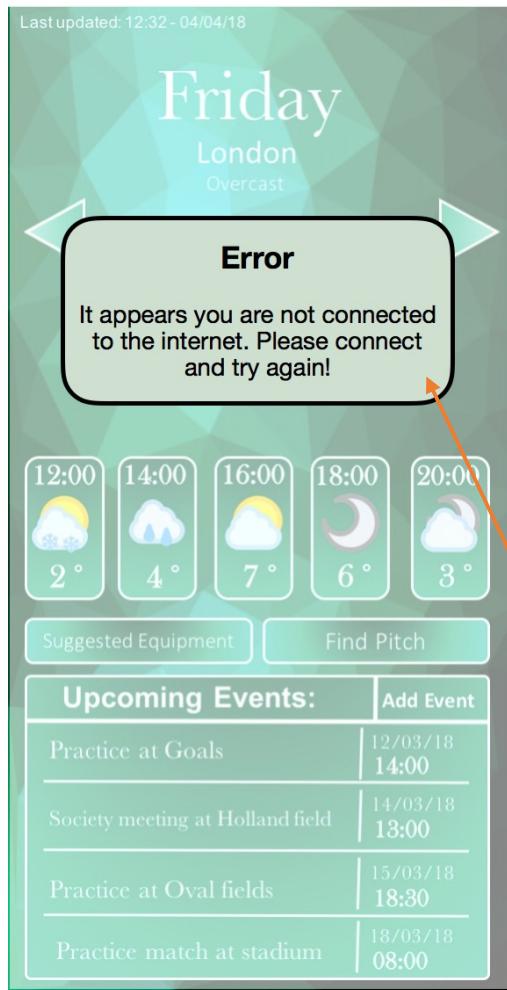
Redesign 2:

The second redesign uses the first one and tries to fix the remainder of the problems raised by the evaluation. The largest visible change is that of the background. A plain background took away from the energetic/sporty of the application, and an image distracted too much, so after several tests a material design green background was chosen and the rest of the application was changed to fit the new material theme. This made the application look minimalistic but the green theme with bold shapes kept the refreshing design that would appeal to young sports players.

Another major overhaul was the events panel. An issue raised by several evaluators was that the maps and events buttons should have led to features embedded within the application. Since the application is a single page, a map within it would overcrowd the screen, and the link to google maps showing the nearest pitches achieved the function required by the user. The calendar however was not useful as it did not allow the user to add or view events. The redesign includes a new calendar section, which shows the users upcoming events in a scrollable chronological list within the application. The closest events can be viewed at first glance and new events can be added through the add event button (which will open a dialog window allowing new event to be added). This feature will be hugely beneficial to the target audience, football playing university students, as they can add their education related events as well as football related ones to the panel. Being able to add and view events was one of the matters discussed in data gathering surveys, and the majority of participants claimed they would use an events calendar in a weather application.

The top of the screen now shows the time the weather was last updated, so the user can see if data is outdated. The error messages are also now more specific, telling the user exactly what is causing the issue.





Add event

Enter event details:

Event name:

Event date:

Event time:

The add event dialog box allows users to add new events to the scrollable upcoming events panel. The dialog is opened by clicking the add event button.

The error message here tells the user what the problem is, instead of only alerting them to the fact that something is wrong.