



UNIVERSITY OF  
BIRMINGHAM

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## Human Computer Interaction

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### Unified Sports Booking System

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Rebecca Devney,  
Assima Pathan,  
Josh Wainwright,  
Andrew Walker

#### Group 5

*Supervisor:* Robert Henley

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#### Abstract

If you currently want to book sports facilities, the only way to search is directly through the individual sports center's websites, or through direct communication. If someone is flexible in the location or choice of sport, they are required to search multiple locations to find the best compromise.

In addition to the difficulties of checking multiple websites, often each of these websites are unintuitive and difficult to use, requiring the user to know exactly when and where they want to use the facilities and often not giving clear information about other possible factors such as cost.

Here, we propose a new, unified interface for finding a time, location and the cost for playing any of a number of sports, at any of the available locations within a given distance or relative to a different location.



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# 1 First Generation Prototypes

The design process is aided by the generation and evaluation of a number of first and second generation prototypes. These will be assessed against several specific criteria as well as the user personas defined in Section ???. Using the results from these evaluations, the best aspects of the first prototypes will be used to inform the second generation.

When evaluating the initial designs, each of the potential scenarios are examined and the prototype tested to see if it provides the required or desired functionality. In addition to these real world situations, the designs are tested against a set of heuristics called Nielsen's heuristics which

**Visibility of system status** the activity that is currently being performed should be clear to the user, and the status of that activity should be clear. For example, if a process is running, waiting, or completed.

**Match between system and the real world** using standard conventions for ordering items makes them easier to search through and select. Also the wording of buttons, labels and information should be familiar to the user. However, the computer system should not try to immitate a physical object directly, i.e. skeuomorphism.

**User control and freedom** the user should be in control of the system. The system should work for them, but provide the ability to undo mistaken actions.

**Consistency and standards** any methods for interacting with the system should be uniform accross different platforms so that users do not need to relearn to use the system.

**Error prevention** reducing the possibility of errors, and the ability for the user to provide data that could cause an error is better than recovering from errors. If an error does happen, then giving the user information is generally better than leaving them without knowing what happened.

**Recognition rather than recall** having navigational elements clearly visible and reachable means that the user does not need to remember how to use the application, instead the instructions are effectively onscreen.

**Flexibility and efficiency of use** catering to advanced users without distracting or confusing the novice allows the system to be used by a wider range of people.

**Aesthetic and minimalist design** including irrelevant data, or information that is only needed infrequently can be distracting. Reducing the number of visual stimuli presented to the user can increase speed and efficiency.

**Help users recognize, diagnose, and recover from errors** easy to read, simple error messages, briefly explaining what happened can help the user to not get into the same situation again.

**Help and documentation** providing documentation in a well structured way can help the tentative user to use the basic functionality and the advanced user find more.

### 1.1 Prototype 1

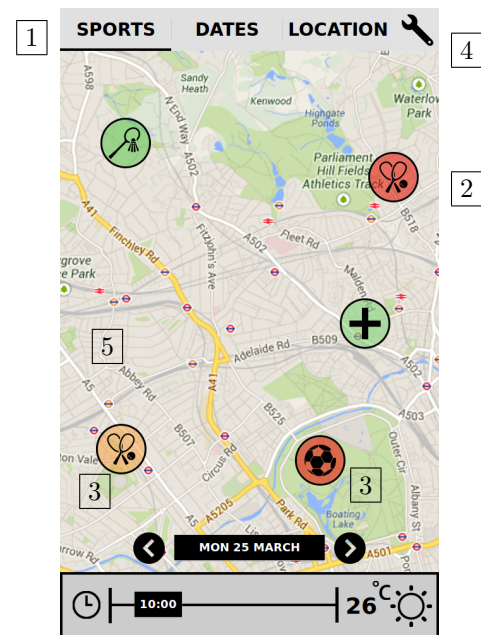
#### 1.1.1 Presentation

**Tools:** proto.io

**Rationale** This prototype focuses on a content driven display showing users immediately what is available local to them with interactive tools for adjusting their search.

**Home Map** On opening the application, the user is immediately shown this map home screen with the date and time set to the current time and the location centred on the user's location.

1. The tab bar links to pages where the user can decide which sports and dates to filter into the search. The location tab will prompt the user to enter a new postcode to centre the map on or ask them if they would like to reset to their current location.
2. Icons represent locations to play sport. Where a single sport is available to play at a location, a picture for that sport is shown. Where more than one sport is available, a plus sign is shown to indicate that several sports are available at that location. When a user presses a sports icon, they are shown the book now screen.
3. Colour shows, using a traffic light scale, either:
  - (a) availability of courts/facilities. Green indicates there is full availability at the location where red indicates there is only one booking left at this time.
  - (b) price of bookings at this location. Green indicates all bookings are free at this location and red indicates prices are expensive (in comparison to other activities in the area).
4. Settings button brings up a small drop down box to ask the user which of the two options they would like colour to indicate, availability or price.
5. Map is navigable in the same way as the phone's native map application. The user can zoom in and out with finger gestures and pan left, right, up and down. As the user changes their location/zoom level, the sports icons update to cover the new area.



**Figure 1:** The home map screen

6. The current day being shown, with arrows to navigate through all days which are selected in the dates tab. By default, this is all dates, but the user can filter the dates via the dates tab.
7. A time slider which can be moved in hour increments. The icons shown on the map will change to accurately show what bookings are available for the hour following whatever time this slider is set to by the user.
8. A weather prediction for the date and time currently selected.

**Sports filter** A page to filter which sports are shown on the map home page.

1. Buttons for quickly selecting or deselecting all sports.
2. Checkboxes; when ticked, the chosen sports are included in the search.
3. A bar that can be either pressed or dragged up to close the sports selection tab and return to the map home page.
4. The tab bar remains so the user can navigate between sports, date and location selection without having to do so via the home screen.

**Dates filter** A page to filter which dates are included in the search. Dates which are highlighted are included in the date navigation on the map home page. (no 4 on the home screen)

1. Arrows to move between months of the year.
2. Days of the month. A user can press a number to highlight it, or swipe around the screen to highlight several dates in one swipe, e.g. swiping across a whole row to highlight an entire week.
3. Days of the week. A user can press one of these days, such as M for Monday, to highlight every occurrence of that day in the month.
4. A bar that can be either pressed or dragged up to close the dates selection tab and return to the map home page.
5. The tab bar remains so the user can navigate between sports, date and location selection without having to do so via the home screen.

**Book now screen** This screen appears when a user selects a sports icon on the home page. The screen does not cover the whole of the previous page, allowing the user to still see the date of the booking and the weather prediction for that time. The user can press the x to close this screen and return to the search.

1. The sport available at this location. If several sports are available at this location, a drop down arrow is show next to the sport name to allow the user to select other sports at that location.

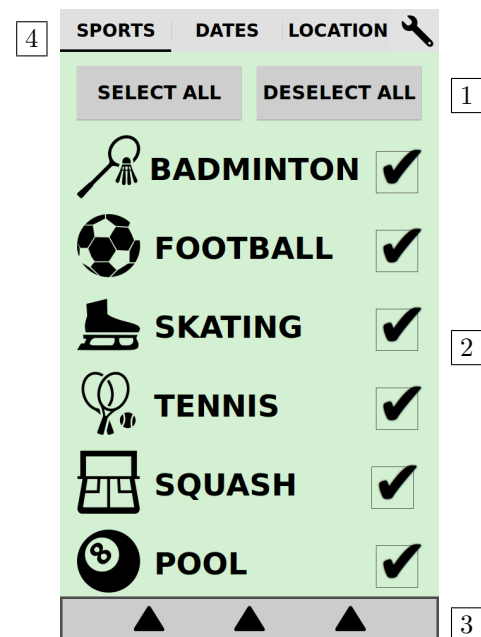


Figure 2: Sports filter screen

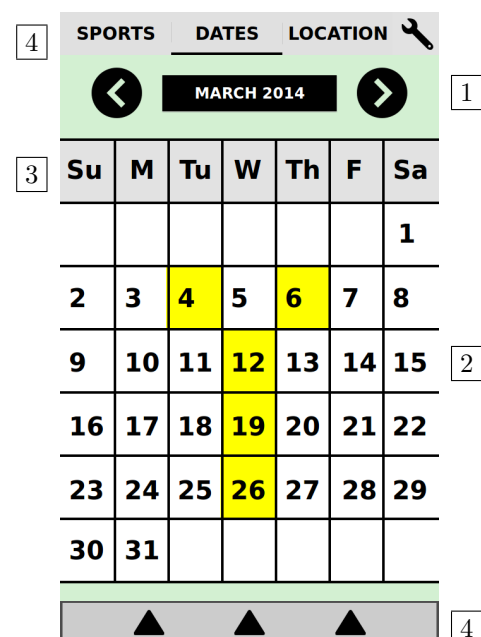


Figure 3: Dates filter screen

2. User can get directions through their phone's native map application, call the reception of the offices to get more information or navigate through pictures of the facilities.
3. The user can still attempt to change the time or date on the screen. If a booking slot is available at the newly selected time then details on the book now screen will change to reflect the change in time and price (if applicable). If a booking is not available then the text between the sport name and 'Location Details' will be replaced by a message telling the user no booking is available at this time.
4. The 'Book Now' can be pressed to take the user to an external pay site or the website of that sports facility to pay for the booking.

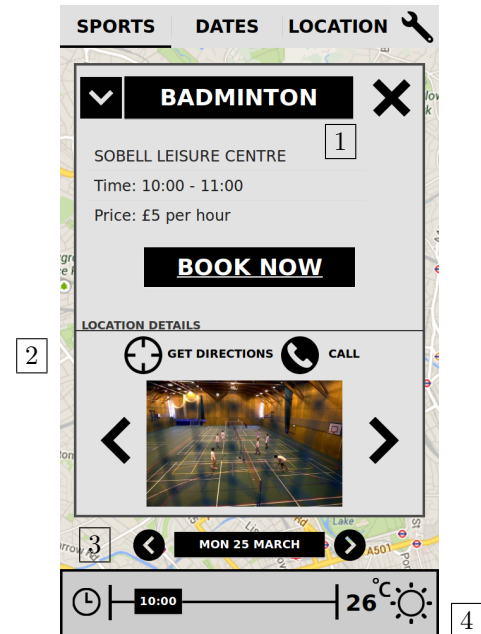


Figure 4: Book now screen

### 1.1.2 Evaluation

Criteria	Rating	Comment
Visibility of system status	+	The time and date of the current results are always shown on the home screen.
Match between system and the real world	+	Map applications have become ubiquitous so use of the map should be intuitive.
User control and freedom	0	There are intuitive ways to return to previous screens and navigate between screens. However, an undo or return button could be added to return a user to a previous page they were on.
Consistency and standards	–	May not be clear that the dates on the map screen correspond to those in the dates filter tab.
Error prevention	0	Relatively few screens reduces the number of places an error can be made. Ensure there is a confirmation message before letting the user book facilities.
Recognition rather than recall	0	Clear icons are used to indicate each sport. No indication on map screen of which dates they can scroll through unless they go to the dates tab to see selected dates.

## 1 First Generation Prototypes

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Flexibility and efficiency of use	0	Swiping on dates filter tab can speed up date selection. No bulk booking, if user knows they want to make several bookings, they have to search and process each individually.
Aesthetic and minimalist design	+	Keeping sports and date filters tabs separate from map results and grouping icons when several sports are available leaves map search results clear from clutter.
Help users recognize, diagnose, and recover from errors	—	If a user changes time or date on the booking screen they will be shown a message if a booking is not available at that time. However, there is no undo button to return to the original selection.
Help and documentation	—	Currently no descriptions or tutorials telling the user how to use they system. Could add a help icon which allows users to see what each page does or an initial tutorial on first use of the application.

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Scenario	Rating	Comment
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### Elderly

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Searching for new sports in the area and notifying his wife of the booking.	0	Howard is given an immediate visual representation of what sports are available near him when opening the application. However, with his lack of experience with technology, use of the map may not be intuitive to him and he may prefer options to read results as a list. There is no facility to send information about the booking to his wife.
Racquet sport with 4 friends on Friday	0	Howard could tick only racquet sports on the sports filter tab and Fridays on the dates tab. However, there is no way for him to bulk book if he wants to regularly play.
Swimming nearby with knee pain	—	There is currently no way to search for facilities that have disabled access. This could be included in the description of the facility on the booking page but Howard would still have to look at each search result individually.

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### Working

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## 1 First Generation Prototypes

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Team sport on Friday including screen sharing with friends	+	Janet can select the relevant sports and dates to show relevant results. Could have quick buttons on the sports tab screen to quick select all team sports to speed this up. There is no quick way to share a set of search parameters.
Change/cancel booking at late notice	–	As booking payments are held outside the application there is currently no way to cancel bookings or even see previous bookings. Could add a screen to add favourite booking slots to so users can potentially see previous bookings.
Outdoor sport early on Saturday	+	Janet can select the relevant sports and dates to show relevant results. Could have quick buttons on the sports tab screen to quick select all outdoor sports to speed this up. The weather prediction on the map screen also helps inform her search here.

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### Student

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Tennis court at specific times	+	Jenny can select tennis from the sports tab and all preferred dates from the dates tab and then quickly browse through her options on the map across different times at the weekend.
Weekday evening session must be on clay	0	Jenny can select all days from the date tab then set the time to evening on the map and scroll through each day seeing which day suits her best. There is no way to specify the type of court or facility being booked.
Weekly practice with friend with reminders	–	Can navigate through different weeks but no option to bulk buy and no facility for reminders.

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### Child

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Outdoor sport close to home or on a bus route with coach	0	If Joe chooses his preferred outdoor sports from the sports tab, he will be shown those close to him straight away. However, there is no indication of bus routes on the map. An option could be added to overlay local bus routes on the map. There is no way to include coaching requirements in the search, but this information may be displayed in the information for individual centers on the book now screen.
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## 1 First Generation Prototypes

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Booking several squash courts for after school tournament	—	There is no way for Joe to book several courts at one time or several dates at one time. Could add an option on the booking screen to book several courts at once or add a basket function so users can select all the bookings they want and then pay for them together. Could have some kind of rating system to the location description on the bookings page and some way to search for highly rated locations.
Looking for high quality tennis court	—	There is currently little indication of the quality of each location. Could have some kind of rating system in the location description on the bookings page and some way to search for highly rated locations.

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## 1.2 Prototype 2

### 1.2.1 Presentation

**Tools:** balsamiq

**Rationale** This prototype is a hierarchical design displaying each screen as a series of steps which the user must progress through before searching. This prototype also focuses on a very simple, easy to use interface.

Choose all criteria before searching

**Home Screen** The home screen offers a choice of three menus

1. Make a booking; takes users to the hierarchy of search screens to enter their criteria
2. Change a booking; takes the user to a screen which allows them to change their criteria if alternative results permit it
3. Cancel booking; takes the user to a screen of their current bookings and the user can select which booking they would like to cancel. Whether a refund is possible would depend on the sport centre

**Search screen 1** On selecting 'Make a booking', the user will be directed to the initial search screen which will be the first step in their search

1. The help button takes the user to a guide on how to complete the current page along with FAQ's.
2. The progress bar shows the user how far along they are in the search process.
3. The user can choose which sport they would like to play from a drop down menu. The drop down menu shows recent search results at the top, then list all available sports in alphabetical order.
4. The user must press on the calendar icon which will present them with a calendar to select which date they would like to play.
5. The time is chosen by selecting the hour and minutes from drop down bars.
6. The user can select how long they would like to play for, chosen from a drop down bar with half hour intervals.
7. Takes the user to the next step in the search process.

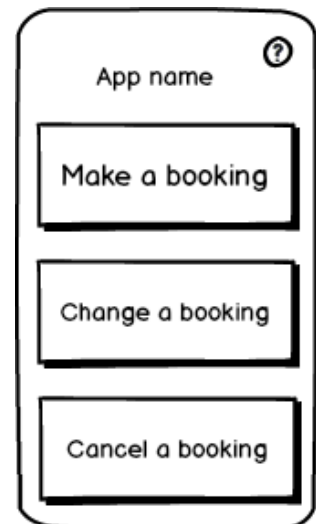


Figure 5: The home screen

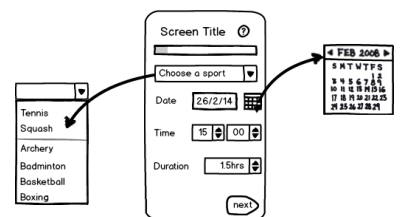


Figure 6: First search screen

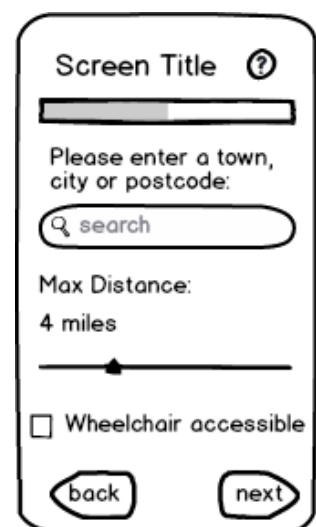


Figure 7: Second search screen

**Search screen 2** The next screen focuses on location.

1. The search box allows the user to specify their location by either town, city or postcode. When the user begins to type a location, the system will suggest locations based on what they have already typed
2. The user can use a horizontal slider to specify how far they are willing to travel to play the sport
3. If the user requires disabled access they can tick the checkbox and the results will only show sports centres which are wheelchair accessible

**Search Screen 3** The user is then brought to the final search screen where they may be able to get discounts

1. Numeric stepper to specify how many people the booking is for.
2. The user may be eligible for discounts if they are a child, student or pensioner. They can tick the suitable checkboxes if they fall into any of these categories.
3. If the user has a strict budget, they can choose to only see results which do not exceed a particular price.
4. Pressing the search button takes the user to a screen displaying the results of the search.

**Results Screen** Screen showing the results of the search

1. The user can sort the results by distance, price or time.
2. If the results are not suitable, the user may wish to change their search criteria, the 'amend search' button will take them back to the first search screen where they can alter their original preferences.
3. Each result informs the user of the time, date, venue name, distance from the venue and the price. The price shows the total price for all people. The user can scroll down the page to view all matching results.
4. Pressing the buttons displaying the price will take the user to a more detailed description of the booking and a link to an external pay site or the website of that sports facility to pay for the booking.

Figure 8: Third search screen

Venue	Distance	Price
Venue1	3.2miles	£5.50
Venue2	2.9miles	£5.50
Venue3	1.7miles	£7.20
Venue4	4.0miles	£10.00

Figure 9: Results screen

### 1.2.2 Evaluation

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Criteria	Rating	Comment
Visibility of system status	+	Each screen shows the user their progress in the search process
Match between system and the real world	+	Each field is self explanatory and is clear what is asked of the user.
User control and freedom	—	The hierarchical nature of the system prevents the user from switching screens easily. If they choose to go back they will lose the information they have already typed on the screen they left. Freedom is also restricted as the user is required to fill all fields. For example they must pick a particular sport at a particular time.
Consistency and standards	—	The way users specify their criteria varies throughout the search, for example horizontal sliders and steppers to achieve numerical values. Although this would not reduce the clarity of what is asked of the user.
Error prevention	+	Due to the large buttons and very simple interface, there is very little chance of user error. Although the drop down menus could get a little fiddly. If the user does accidentally book the wrong option, they may have the opportunity to change or cancel this booking.
Recognition rather than recall	+	Information required on the current search screen does not depend on information on the previous screen.
Flexibility and efficiency use	0	Lacks efficiency due to the fact that the user must progress through all search screens filling in all fields before they can search.
Aesthetic and minimalist design	+	The design is very simple so as not to cause any confusion to the user
Help users recognize, diagnose, and recover from errors	+	If the user tries to move to the next screen having not filled a field or filled it incorrectly, they will be shown a descriptive error message in red above that field
Help and documentation	+	The help button displayed on every screen takes the user to a guide on how to complete the current page along with FAQ's

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Scenario	Rating	Comment
<b>Elderly</b>		
Searching for new sports in the area and notifying his wife of the booking.	–	Howard may find using the drop down menus difficult with his osteoarthritis. There is no feature to notify people of the booking
Racquet sport with 4 friends on Friday	0	Can select four people to play using drop down menu. Would have to specify which racquet sport he wishes to play. No bulk book feature.
Swimming nearby with knee pain	+	If Howard does not wish to travel far he can either filter the results by distance or specify a maximum distance he is willing to travel (search screen2). If Howards knee pain is particularly bad he may wish to swim somewhere which doesn't require climbing any stairs. He can do this by ticking the wheelchair accessible checkbox.
<b>Working</b>		
Team sport on Friday including screen sharing with friends	–	The app would not support this scenario as there is no option to search for just team sports. There is also no current feature to support screen sharing but this could be incorporated into the final design.
Change/cancel booking at late notice	0	Janet has this option on the home screen. Although the app cannot guarantee the venue allows cancellations
Outdoor sport early on Saturday	0	Useful as Janet can specify a time. But again, there is no flexibility in choosing a sport.
<b>Student</b>		
Tennis court at specific time	+	This scenario is tailored this prototypes design. Jenny can specify that she would like to play tennis at a particular time on a particular day and how long she would like to play for
Weekday evening session must be on clay	0	This could be something to incorporate on the screen showing the booking in more detail, along with other information such as court number

## 1 First Generation Prototypes

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Weekly practice with friend with reminders	—	There is no notification feature with this prototype. The regular weekly booking feature could also be something that is incorporated in the screen showing more detail about the booking.
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### Student

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Outdoor sport close to home or on a bus route with coach	—	No feature showing any transport routes. Joe would also have to specify which outdoor sport he is interested in playing
Booking several squash courts for after school tournament	—	With the current design, Joe would have to use the number of players field (4 people = 1 court) to portray how many courts he needs. He can specify how long they need the courts based on how long they think tournament will last. However he would need to choose a particular day.
Looking for high quality tennis court	—	There is currently no way of finding the quality of the sport facilities. Pete can however, use the sliders to increase the maximum distance and price they are willing to pay.

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## 1.3 Prototype 3

### 1.3.1 Presentation

**Tools:** proto.io

**Rationale** This prototype is based on the ‘flat’ design of other booking apps. The search criteria is spread across a number of pages and results are displayed as a list.

**Home Screen** The home screen is also a search page. Users are able to search by sport, location, distance, date and time or a combination of these options; all of these have the default value of ‘Any’ if the user decides not to enter a specific value or range.

By selecting a search option, such as ‘sport’, the user will be directed to another page where they can specify a sport or combination of sports using a checklist interface similar to the previous prototypes. The ‘date’ section would allow the user to select a specific date, a variety of dates or between two dates using a calendar interface. The user can select a timeframe. E.g. after 5pm, before 12pm or between 4pm and 8pm using the ‘time page’. Distance can also be selected by range (e.g up to 5 miles) Location can be selected from a drop-down list of cities, the user can also type their location or use GPS for their current location.

Once the user has selected their options they can use the ‘Search’ button to see their results.

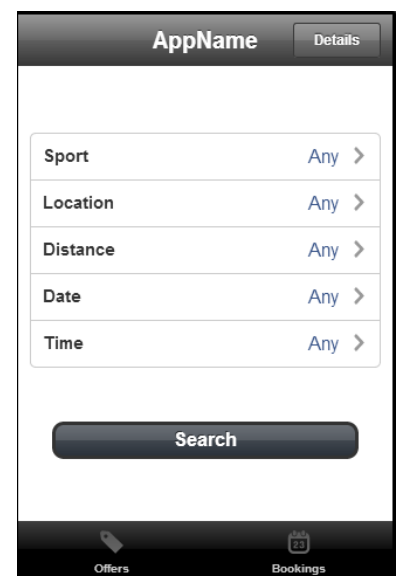
**Details** The ‘Details’ button in the navigation bar can store information about the user such as their age, which can help them to find offers that are relevant to them or discounts can be applied to the price during the search

Basic information about the user can be stored locally to apply discounts and include relevant offers

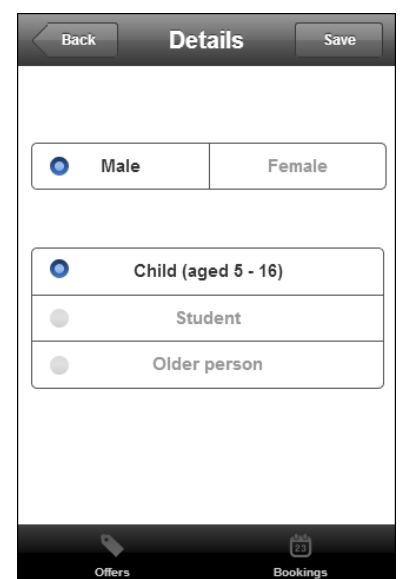
**Results** The results page allows the user to see their search criteria as well as a list of available facilities. These can be sorted by price or distance.

The user can go back to change the search criteria using the ‘Back’ button on the navigation bar or select one of the results in the list for more information.

Once the user chooses an available result, they can see further information on the facilities selected such as pricing, address, location and contact information. The user can choose to ‘share’ this information with others or ‘book’ the facilities using the buttons at the bottom of the screen.



**Figure 10:** Home screen is also the search page



**Figure 11:** Details screen



The user can find out more about their current bookings by selecting them from the main ‘bookings’ page. For previous bookings, the ‘cancel’ button could change to ‘book again’.

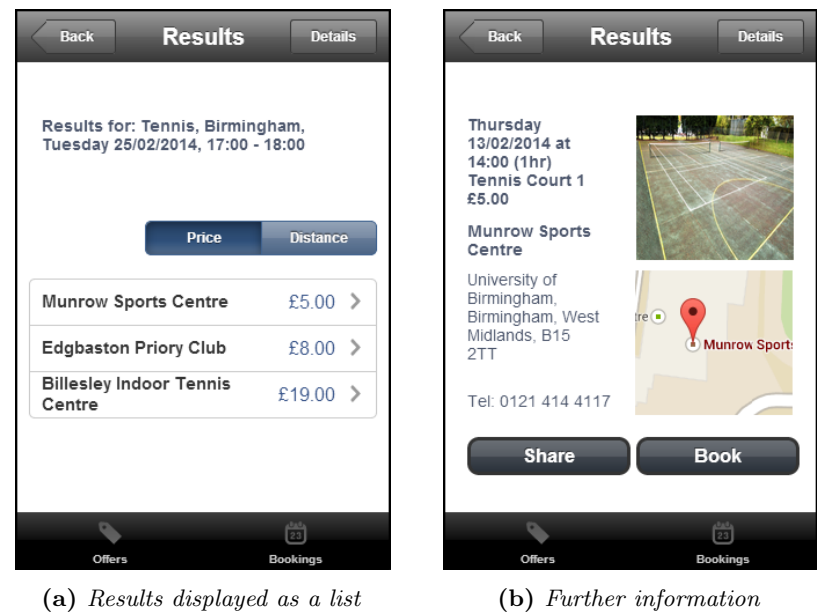
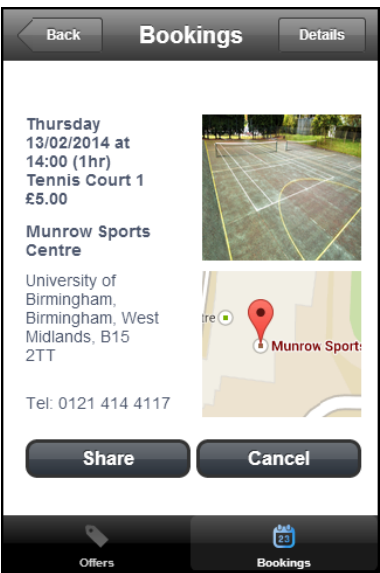
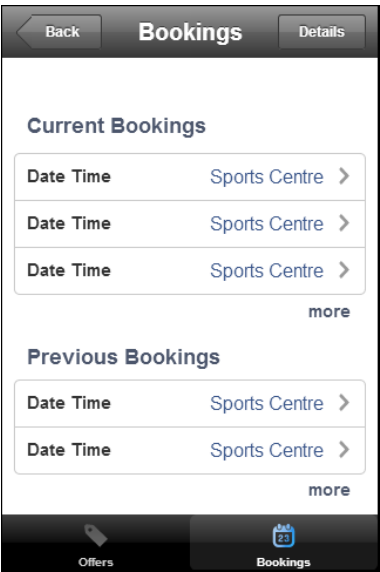


Figure 12

**Tab bar** There are two tabs on the bar at the bottom of the screen;

- ‘Offers’ tab, shows available offers. A user could choose to use this to search for facilities by available offers
- ‘Bookings’ tab, users can keep track of their current and previous bookings



### 1.3.2 Evaluation

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Criteria	Rating	Comment
Visibility of system status	+	There are only two states in this application — the search screen and the results page.
Match between system and the real world	+	Most other booking applications have a similar layout of a search page followed by a list of results (E.g. trainline, redspottedhanky). It should be easy for a user who is familiar with this format to use this design.
User control and freedom	+	‘Back’ button in the navigation bar allows the user to change elements of the search criteria.
Consistency and standards	+	Information is displayed in a similar way throughout the application. Eg. Bookings and Results both use lists and selecting a particular item in the list leads to a page with more specific information.
Error prevention	–	There is no way for a user to tell if they have made a mistake or where the errors are. A pop-up notification could supply this information when the user presses the ‘search’ button.
Recognition rather than recall	+	Search criteria is displayed on the main page and in the results section.
Flexibility and efficiency of use	0	Novice users may not find this format easy-to-use without instructions. Experienced users could also search for offers, or their current/previous bookings using the tab bar in addition to using the home screen.
Aesthetic and minimalist design	0	Keeping the search options on different pages prevents the home screen from becoming cluttered. However, presenting the results as a list may not be helpful for users who do not select a specific sport, date, time or location.
Help users recognize, diagnose, and recover from errors	–	There is no way for a user to tell if they have made an error. The only option available is to go ‘back’ and change the search criteria.
Help and documentation	–	Currently there are no instructions available on how to use the app.

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Scenario	Rating	Comment
<hr/> <b>Elderly</b> <hr/>		
Searching for new sports in the area and notifying his wife of the booking.	+	Howard can search using the location and distance criteria for searching for sports facilities locally. He can also send the details of his bookings to his wife by using the 'share' button.
Racquet sport with 4 friends on Friday	0	Howard can select the individual sports from a list, there is no option at the moment for racquet sports. He can also choose a Friday, but wouldn't be able to bulk book for a regular session in-app.
Swimming nearby with knee pain	—	It isn't possible to search for facilities that have disabled access, this could be something to include in the 'details' section and in the information pages of individual sports centres.
<hr/> <b>Working</b> <hr/>		
Team sport on Friday including screen sharing with friends	—	Janet can select individual sports like netball, football, etc. as there is no option for 'team sports' and dates. She wouldn't be able to share all the results with her friends but could share individual bookings she selects.
Change/cancel booking at late notice	0	Using the 'Bookings' tab, Janet could find her booking and cancel it using the 'cancel' button, or use the information to contact the sports facility to change her booking.
Outdoor sport early on Saturday	+	Currently no quick filters for 'outdoor' sports, Janet would have to go through the list of all possible sports and select those that she knows are outdoors. Or it could be easier for Janet to select Saturday and mornings using the date and time sections and see what sports are available.
<hr/> <b>Student</b> <hr/>		
Tennis court at specific times	0	Jenny can select tennis only but may have to search a few times to find suitable slots for the different times she is free.

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Weekday evening session must be on clay	0	Jenny can select the whole week and hours in the evenings in the 'date' and 'time' sections. She would have to check individual sports facilities to see the types of courts available.
Weekly practice with friend with reminders	0	There isn't a way for Jenny to book weekly sessions but could book one session a week and share the information with a friend using the 'share' button.

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### Child

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Outdoor sport close to home or on a bus route with coach	0	It currently isn't possible to select 'outdoor' sports but he could choose a variety of sports in the sports section and can sort by distance. It wouldn't be possible to know if the facilities are close to a bus route but could check with the facilities by contacting them.
Booking several squash courts for after school tournament	0	It isn't possible for Joe to book several courts at one time. Could have some kind of rating system to the location description on the bookings page and some way to search for highly rated locations.
Looking for high quality tennis court	0	It could be possible to include other users ratings of each facility and sort results by these ratings.

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## 2 Second Generation Prototype

### 2.1 Evaluation of Tools

#### 2.1.1 Proto.io

To do:

Evaluation of proto.io

#### 2.1.2 Balsamiq

To do:

Evaluation of balsamiq

### 2.2 Presentation

**Home** (Figure 15)

The user is at first presented with three main options to choose from.

1. Make a new booking - this button takes the user to a page to input their search criteria. (Figure 18)
2. View their bookings - this button allows the user to see past and present bookings. (Figure 16)
3. Input their details - this page allows the user to specify a number of details about themselves:
  - (a) Their concession status so they potential offers and discounts can be highlighted in the search results.
  - (b) Default search preferences if they regularly search for the same sport, location or time when looking to make a booking.
4. The home button is repeated on every page and provides the user with a quick way to return to this home screen.

**My Bookings** (Figure 16)

This page shows scrollable lists of current and past bookings the user has made. This allows the user to find details about past bookings if they want to repeat a search or contact the location. The user may also be able to cancel a current booking if the particular location they have booked allows them to.

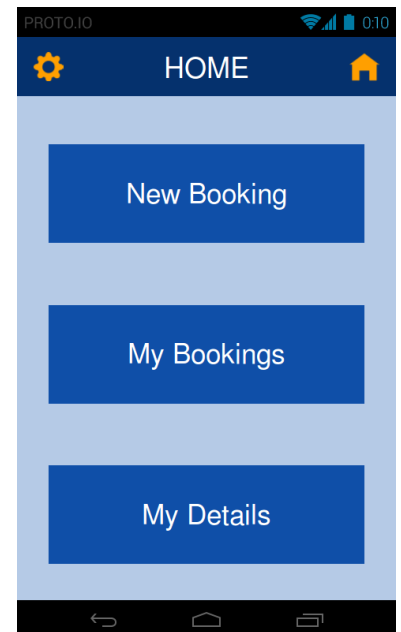


Figure 15: The Home screen

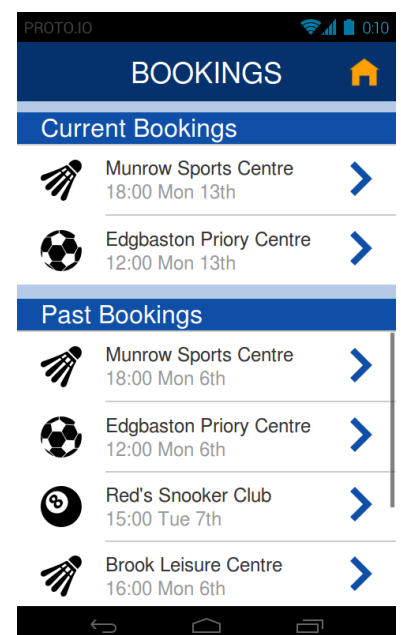


Figure 16: The main search screen

### Individual Current Booking Page (Figure 17)

This page displays information for a current booking.

1. A share button - this will display the phone's default share options. Typically this will allow the user to share information about the booking through other applications on the phone such as email or other messaging services.
2. If the location of this booking allows customers to change booking times, this will bring up a search results page, similar to figure 23, showing available booking slots at similar times at this location.
3. The details tab has buttons to call the location, visit their website, get directions to the location and also highlights if the location has parking facilities. In addition to this, the weather prediction for this location at the time of the booking is displayed.
4. An button to cancel the booking - a prompt will be displayed asking the user to confirm that they definitely wish to cancel the booking. If the location does not allow booking cancellations, this button will be greyed out and attempts to press the button will result in a message explaining the reason a cancellation cannot be made.

### Search (Figure 18)

This is the main search screen which displays the current criteria in the search and allows the user to change this criteria viewing the results that match this criteria. The user can choose to search after defining any number of the four criteria.

1. Help button - displays hovering annotations describing what each part of the page is for.
2. Reset search button - this resets the search criteria to the default settings chosen on the My Details page. If the user has not entered these details before then the sport selection will be default to all, location to 5km within the user's current location, date to today and time to all.
3. Past booking button - this brings up a drop down list of previous bookings. If one of these bookings is chosen, all the search criteria will change to match that booking apart from the date which will remain unchanged.
4. Sport selection button with icons that show what is currently selected. Pressing this leads to figure 19.
5. Location button leading to figure 20.
6. Date button leading to figure 21.
7. Time button leading to figure 22.

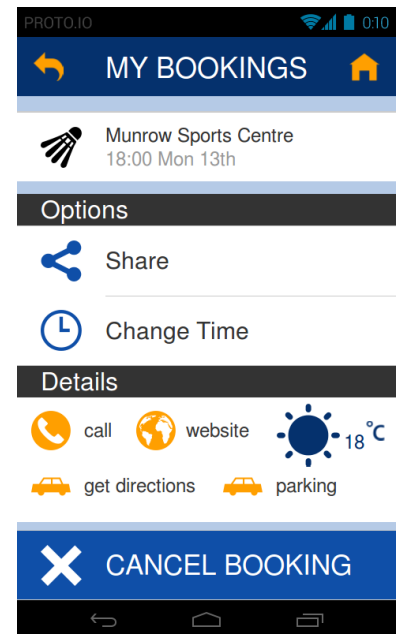


Figure 17: The main search screen

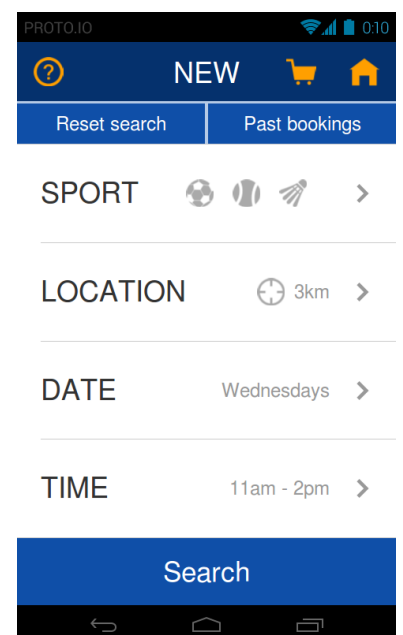


Figure 18: The main search screen

8. Search button leading to figure 23 to display results matching the current search criteria.
9. A basket icon which leads to the basket page which displays all booking slots a user currently has added to their basket but have yet to confirm and pay for.

### Sport Selection (Figure 19)

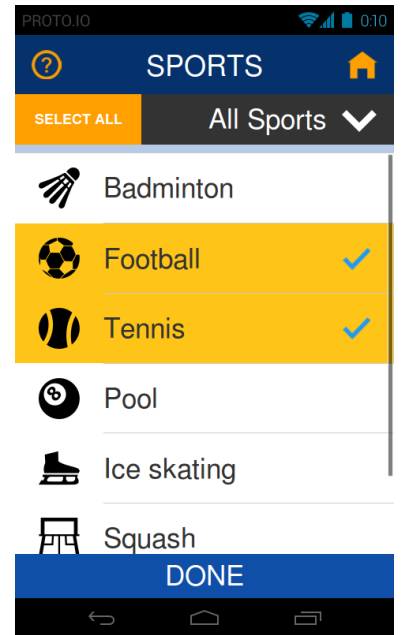
The user can choose to search for as many sports at once as they wish.

1. Drop down to choose to display different groups of sport such as outdoor sports, indoor sports, teams sports and favourites which are defined on the My Details page.
2. Select all button - this will check all sports currently displayed on the page. If all sports are selected, this button changes to clear all instead.
3. Each sport toggles between selected and unselected when pressed.
4. Done button - this returns the user to the search page. This the same for all specific search criteria pages. (Figure 18)
5. Help button - displays hovering annotations describing what each part of the page is for.

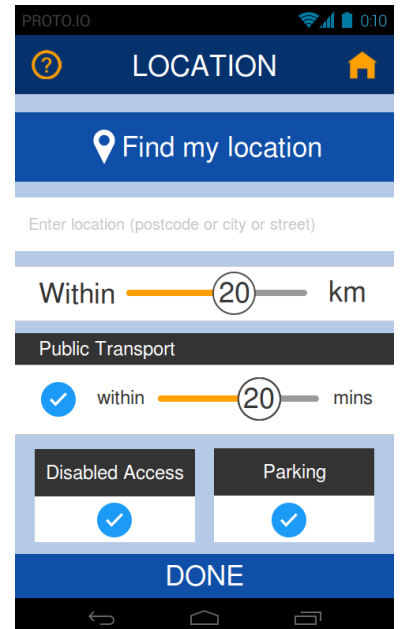
### Location Selection (Figure 20)

The user can choose to search within a distance from their current location or specify a particular location via its postcode or area name.

1. Find location - a button which sets the location using the user's current location.
2. Location input text field - when the chooses the first button, this is automatically changed to the postcode of their current location. The user can also type in this field. As they are typing, suggestions will appear in a drop down box to help speed up their search.
3. A slider bar to determine how far from the chosen location the user would like to search.
4. Public transport - if the checkbox is ticked, the user can choose to search for locations which are within a specified journey time on public transport such as local buses and trains.
5. Checkboxes for including in the search only those locations which have disabled access and parking facilities.
6. Help button - displays hovering annotations describing what each part of the page is for.



**Figure 19:** The sport selection screen



**Figure 20:** The location selection screen

**Date Selection** (Figure 21)

All dates which are highlighted on this page will be included in the search.

1. Select all - highlights all dates in the shown month. This button changes to clear all when all dates are already selected.
2. Day headings - when a day is pressed, all the dates on the page for that day are highlighted.
3. The user can either touch a date to highlight it or swipe across multiple dates to highlight many dates in one go.
4. Help button - displays hovering annotations describing what each part of the page is for including instructions on using swiping gestures to select multiple dates.

**Time Selection** (Figure 22)

All hours which are highlighted on this page will be included in the search.

1. AM and PM buttons - when the am is pressed all morning hours are toggled on or off, likewise for pm.
2. The user can either touch an hour to highlight it or swipe across multiple times times highlight many times at once.
3. Help button - displays hovering annotations describing what each part of the page is for including instructions on using swiping gestures to select multiple times.

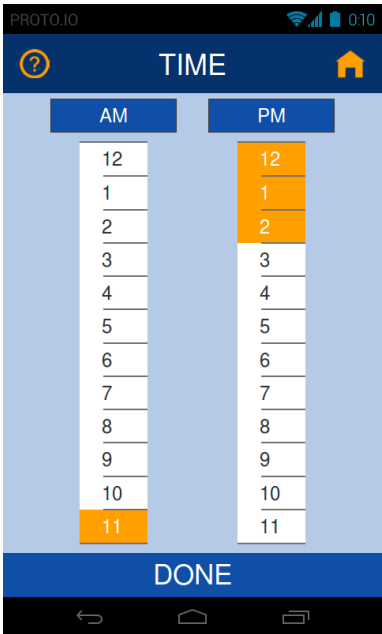
**List Results** (Figure 23)

This is the default view for search results. Results can be sorted by distance, time or price and grouped by sport or location. The user can change the default sort and grouping options on their my details page.

1. Button to return to the search page and amend the search criteria.
2. Toggle buttons to change how the results are sorted.
3. Toggle buttons to change how the results are grouped. By default, the results are not grouped. An example is shown in figure 24 of results grouped by sport. When grouped, a user can expand a chosen sport to see all results for that particular sport. These items will be also be sorted by the chosen sort option.
4. Scrollable list of results. The user is shown an icon for the sport, the name of the location, the time and date of the booking, the price and the distance of the location from their chosen search location. Selecting a particular booking slot takes the user to the page in figure 25b.



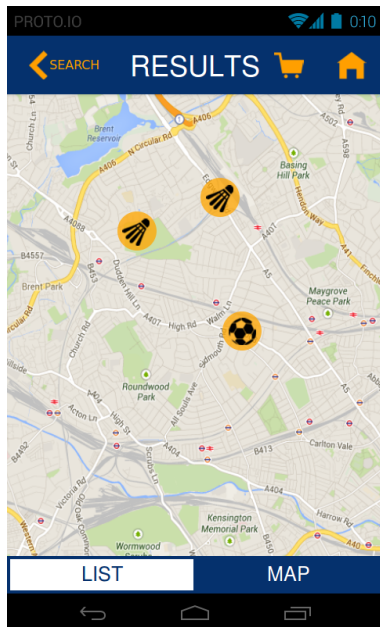
**Figure 21:** The date selection screen



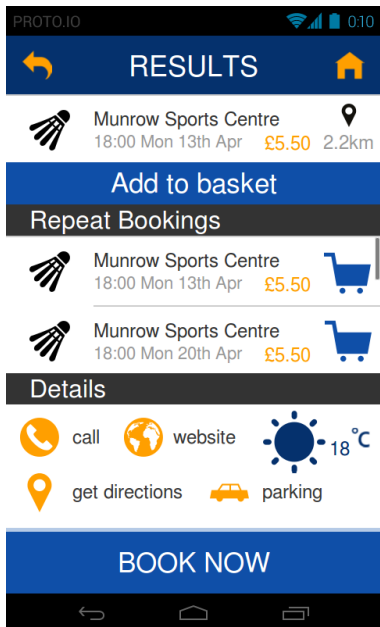
**Figure 22:** The time selection screen



5. Toggle bar for switching between list and map search view. (Figure 25a)



(a) The map results screen



(b) Screen for a booking slot

Figure 25

**Map Results** (Figure 25a)

Results can also be viewed on a map which is navigable in the same way as the phone's native map application.

1. Icons on the map represent a specific venue. If only one sport is available at that venue then the picture icon will represent that sport. If more than one sport is available, then there will be a plus sign to show that multiple sports are available. When pressed, a scrollable list is displayed on the screen similar to that in figure 24.
2. Toggle bar to navigate back to the list view in figure 23.

**Individual Result** (Figure 25b)

1. Button to add the displayed booking to the user's basket so they can continue searching before paying.
2. Scrollable list of bookings for the same sport and location at the same time in future weeks so the user can purchase several weeks at once if they know they want to play weekly. The basket icon adds the booking to the basket.

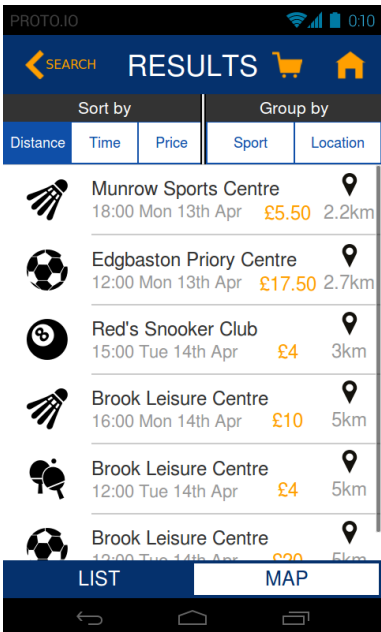


Figure 23: The map results screen

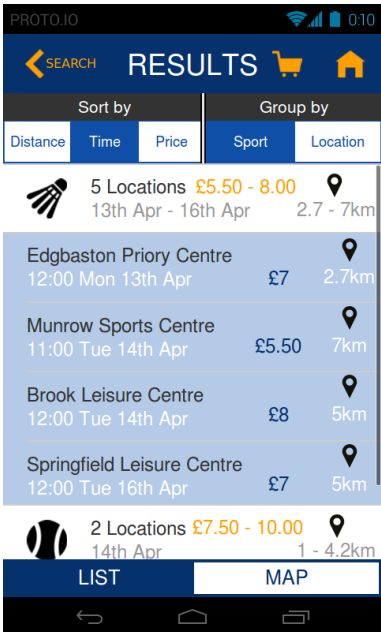


Figure 24: The map results screen

3. Details about the location and a weather prediction for the time of the chosen booking.
4. Book now button - takes the user an external pay application to pay for booking before returning them to this page. The book now button will then change to a link to the page for this current booking as in figure 17 so they can make amendments to their booking at share details to their friends.

## References