UNIVERSITY OF BIRMINGHAM

Human Computer Interaction

—

Unified Sports Booking System

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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.

Contents

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 theses real world situations, the designs are tested against a set of heuristics called Neilsen'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. skewomorphism.

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 stimulii 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 show 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.
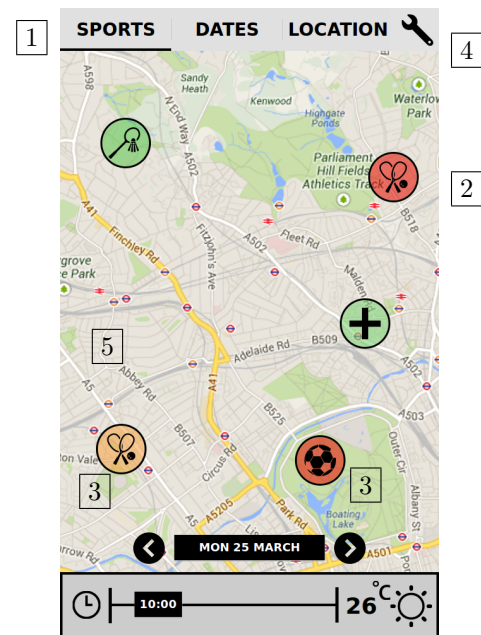

Figure 1: *The home map screen*

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 map 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 map 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.
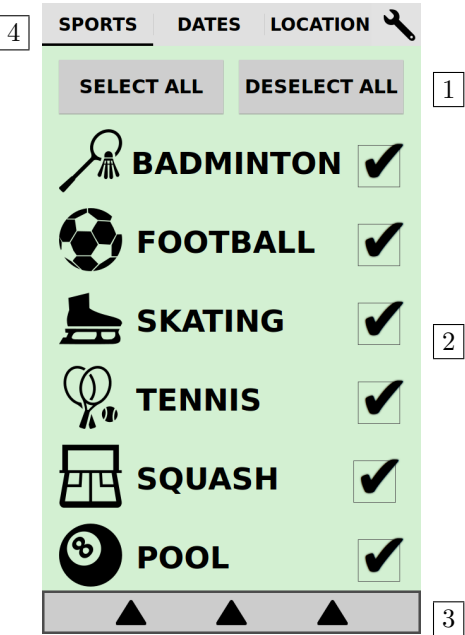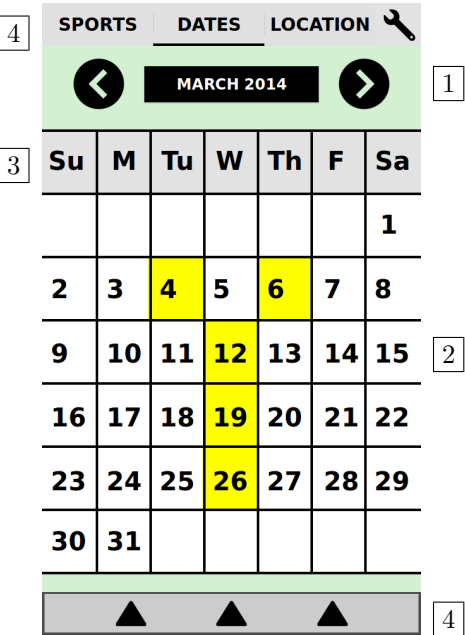
Figure 2: *Sports filter screen*

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.
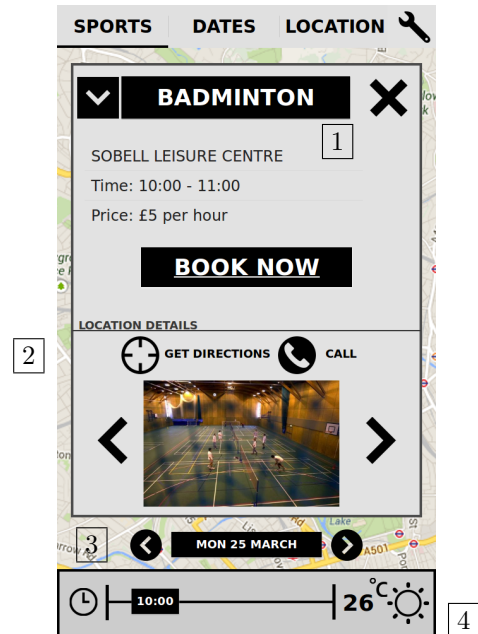

Figure 4: *Book now screen*

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.
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.

User	Scenario	Rating	Comment
Elderly	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.
Working	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.

Student	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.
Child	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.
	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.

1.2 Prototype 3

1.2.1 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 calandar 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.
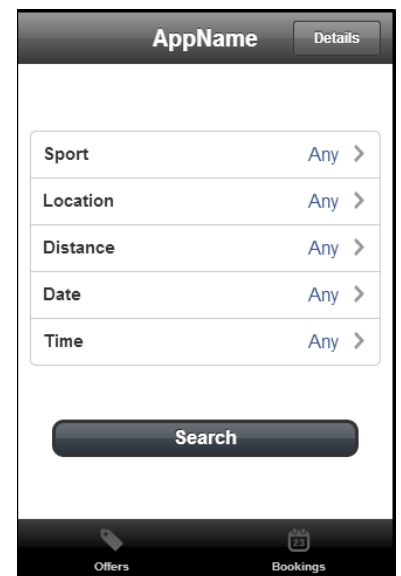
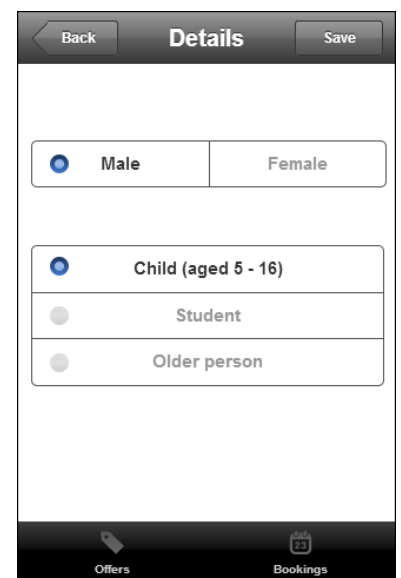**Figure 5:** *Home screen is also the search page.*

Figure 6: *Basic information 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'.

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

1.2.2   Evaluation

Figure 7: *Results displayed as a list.*
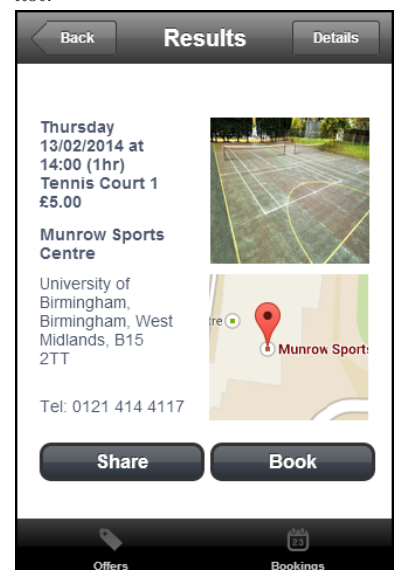
Figure 8: *Further information is available.*

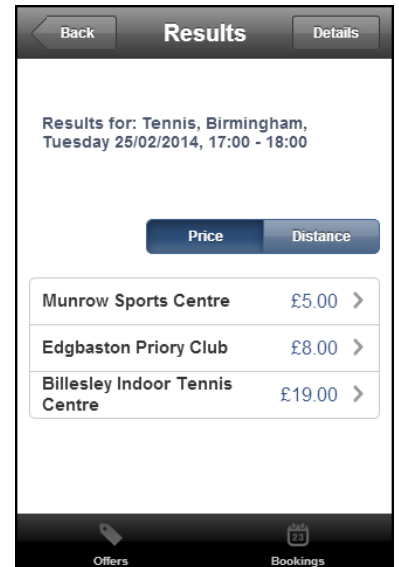| Criteria	Rating	Comment
Visibility of system status	+	There are only two states in this application — the search screen and the results page.
Match between system and the real world	+	Most other booking applications have a similar layout of a search page followed by a list of results (E.g. trainline, 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.

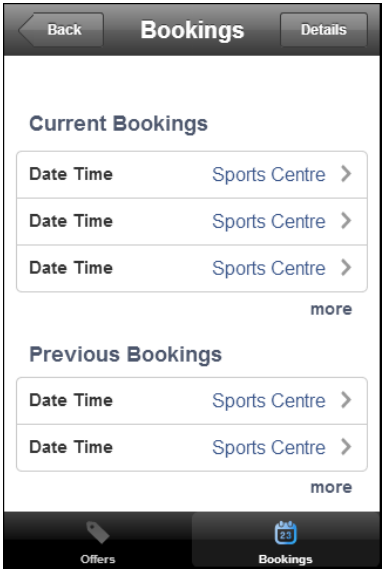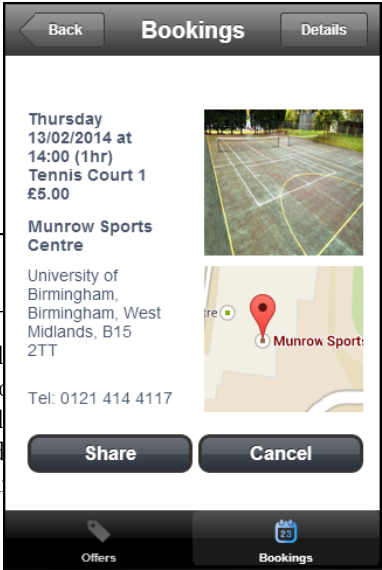|		
Flexibility and efficiency of use	0	Novice users may not find this format easy-to-use without instructions. Experienced users could also search for offers, or their current/previous bookings using the tab bar in addition to using the home screen.
Aesthetic and minimalist design	0	Keeping the search 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.

Figure 9: *The bookings tab*

User	Scenario	Rating	Comment
Elderly	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 sorts 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.

Figure 10: *Further information is available.*

	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.
Working	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 availabe.
Student	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.
	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.
Child	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.

References