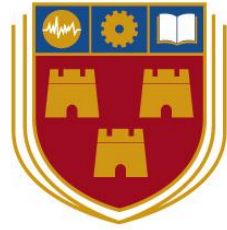


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INSTITUTE *of*
TECHNOLOGY

CARLOW

At the heart of South Leinster

Research Manual

Please Sleep Here

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Date: 21 November 2012

This document will discuss available applications available to mobile / web users which allow them to rent a room for one or more nights. We will then discuss the mobile market to see which type of operating system is most popular to the 18 to 24 age group. The document will compare Android and iOS and the possibility of using a non –native technology such as HTML5. We will then compare Google App Engine against Amazon Web Services cloud technologies. In the conclusion I will justify the technologies that I intend to use.

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Introduction

This paper will discuss a number of applications currently available on the market at this present time. I will be looking closely at 3 applications and discussing the features which they provide to their users. The features differ slightly depending on whether the user is a renter seeking accommodation or a home owner who wishes to rent out a spare room. The first area that will be discussed in the paper will be mobile application followed by online application. The first application which will be discussed is provided by yChatter (yChatter.com). This company offers a website, Android and iPhone application. Another company Yeswici LLC [6] offers an Android application which is available from the Google Play Store. Also I will be discussing the features offered by companies which offer a website application, mainly because I believe that they offer functionality which is very useful to users. These websites include Airbnb [3], room4theight [2], trulia [8] and I will be discussing them later in the paper.

I will be discussing the use of native (Android) technologies against using Non-Native (HTML5) technologies. Along with the means to store the data. I will also be talking about the need a website and if it would be beneficial to include one with the project.

Application Reviews

1. Mobile Applications:

1.1. YChatter

Features

This application [7] can be used across multiply platforms. Due to my Geo location I was unable to download the Android application form the Google Play Store. However the same features are offered online, so I will be discussing the features offered through their website application. The user can be a Renter or a Letter, and I will be discussing the features offered to both. The application also offers the option to link to other social accounts such as Twitter.

Renter

7 features provided:

- Update Renter Profile
- Properties in Watch List
- Messages
- Proposed Property Viewings
- Booked Property Viewings
- Property Offered
- Declined Property

The renter has the ability to:

To view all properties matched to their user profile. Add properties to their watch list. If a renter adds a property to their watch list they will have the ability to send a message to the owner of the property to request a viewing. If the owner agrees to a viewing then the agreed viewing time will be stored in the Booked Property Viewings. Renters may decide to decline an offer from an owner, by doing so the property will be moved to the Declined Property.

If a property is on a renters watch list and the property is no longer available they the system will move the property to the Declined Property. Since the user does not actually place the property in to Declined and may be still interested in the property in the future. It's not clear from the site if the property will be placed back in the renters watch list once it is available again. I believe it would be a better idea to have a status field on the property profile.

The renter details form allows the application to create a tailored search algorithm to only show properties matching the renter's criteria.

The screenshot shows a web interface for creating a renter profile. On the left is a navigation menu with options: 'Create a Renter Profile', 'My Renter Workroom', 'Search Properties', and 'Update User Account'. The main form is titled 'Renter Profile' and is divided into two sections: 'About You' and 'Preferred location for accomodation'.

About You

- Gender: Male
- Age: 15
- Orientation: Not Disclosed
- Occupation: Student
- Smoker: Not Disclosed
- Have a Pet: No
- I have a Child living with me: Not Disclosed
- Desired move in date: 07/NOV/2012
- Duration of Stay: 12 (selected: Weeks)
- Rent Amount per week: €
- Share Accommodation: No

Preferred location for accomodation

- Address: Calle de la Madre de Dios, 20, Univ
- Map view showing a satellite image of the location with a red pin.
- Dwelling Type: Doesn't Matter
- Preferred Number of Rooms: 1

At the bottom left, there are two advertisements: 'Roommates In Your Area' and 'Ask a Solicitor Online'.

<http://www.ychatter.com/owners/createproperty>

Letter
Again there are 7 features provided:

- Property Profile
- Followers
- Messages
- Declined Potential Renters
- Proposed Property Viewings
- Booked Property Viewings
- Status

The Letter will have the ability to search and view other properties to allow them to see how other home owners are laying out their ads. Letter has the ability to view renter who are following their properties. If the renter sends a message or proposed viewing time the letter has the ability to offer the property for rent. I believe that Messages and Proposed Property Viewings could be combined into one feature, where by means of message they can accept viewing time or respond with a different time.

My opinion on the application

Letter may decline the potential renter for any reason and the renter will then be placed into Declined Potential Renters, but unfortunately if a renter declines an offer from the letter, they will also be placed in the same folder as the unwanted renter. I think it would be better practice to distinguish between the two declined renters for the possibility of future business. Even the name “Declined Potential Renters” is not very clear given the purpose of the feature.

The site allows for a large amount of information to be entered about the property details, costs, type of renter that is acceptable, and amenities. This feature has been well design to the extent that radio buttons and drop down menus have been provided for the user to minimise entry errors. The drawn back to this form is the size, the length of the form is quiet long and contains six different sections. I believe that the form could be broken up into six separate forms, where each form must be completed before continuing on to the next stage.

The address section for either renter or letter makes use of Google maps. This could be a pretty useful feature and it can help the renter to find the accommodation. This may raise some security issues but it could be possible to give an approximate location to the renters.

Update User Account

First Name :

Surname :

New Password :

Verify New Password :

Users email address :

Email me occasionally about yChatter : Yes No


Contact Phone Number :

Preferred Currency :

Phone Number visible to others : Yes No

Are you a Renter : Yes No

Deactivate my Account : Yes No

Upload Image :  [Update Image](#)

Link to : or

Property Details

Available from :

Minimum Stay : Days Weeks

Share Accommodation : Yes No

Property Status : Active Inactive

Dwelling Type :

Room Type :

Number of Rooms :

Number of Rooms available :

Number of Bathrooms :

Preferred Renter Gender :

Preferred Renter Age :

Preferred Renter Orientation :


Preferred Renter Occupation :

Couples Acceptable :

Children Acceptable :

Address

Address :



Cost exclusive of utilities

Cost Per week : \$

Utility Costs per week : \$

Bond Amount : \$

Cleaning Fee : \$

Ancillaries about the property

Smoking : Yes No

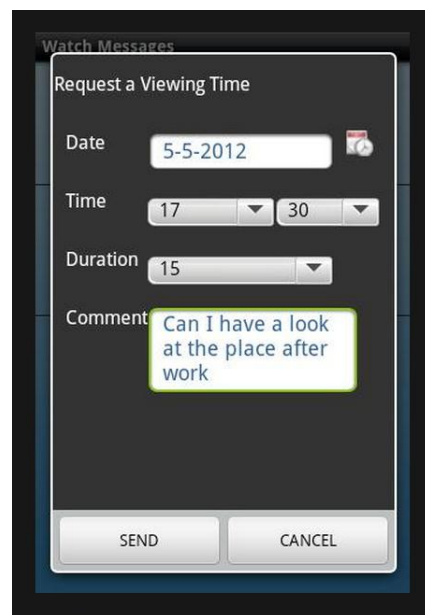
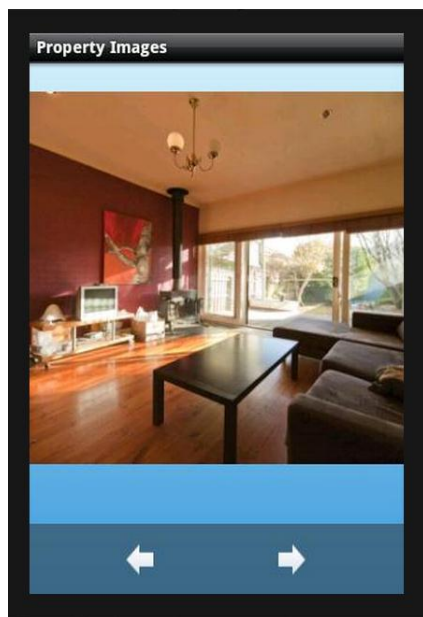
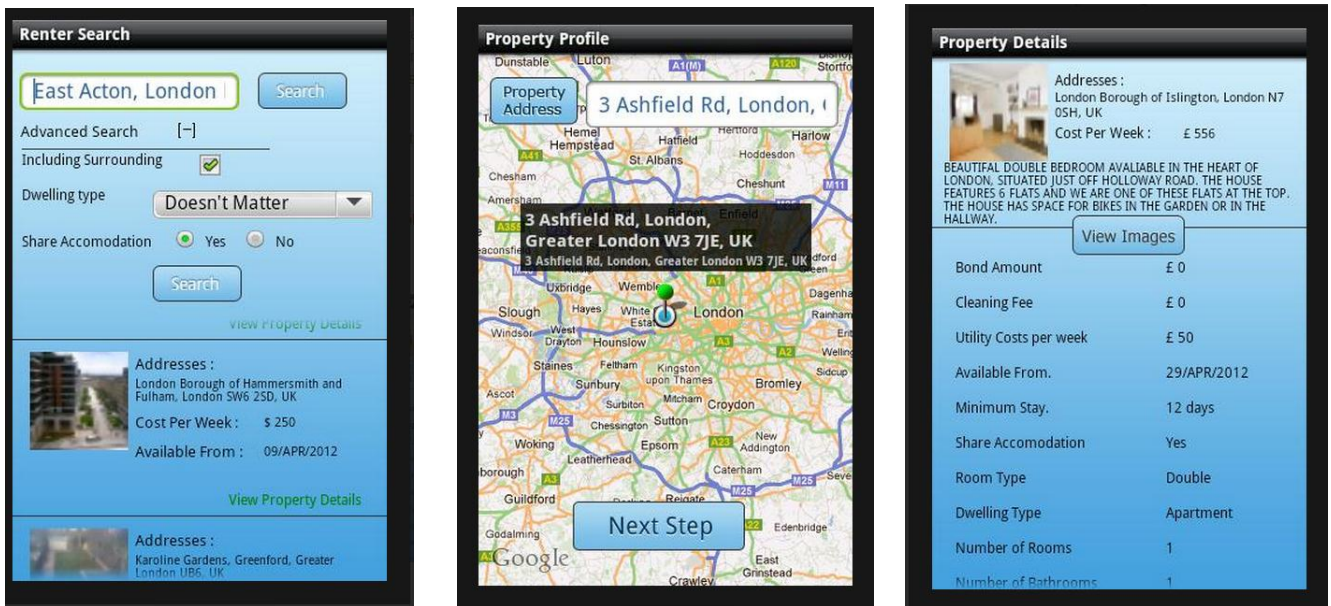
Pets allowed : Yes No

Accommodation amenities

<input type="checkbox"/> Fully Furnished	<input type="checkbox"/> Yard
<input type="checkbox"/> Washing Machine	<input type="checkbox"/> Air conditioning
<input type="checkbox"/> Dryer	<input type="checkbox"/> Heating
<input type="checkbox"/> Fridge	<input type="checkbox"/> Alarm System
<input type="checkbox"/> Dish Washer	<input type="checkbox"/> Gas
<input type="checkbox"/> Cable/Sat TV	<input type="checkbox"/> Balcony / Patio
<input type="checkbox"/> TV	<input type="checkbox"/> Elevator
<input type="checkbox"/> Shared Bath Room	<input type="checkbox"/> Doorman
<input type="checkbox"/> Parking	<input type="checkbox"/> Gym
<input type="checkbox"/> Phone jack	<input type="checkbox"/> Pool
<input type="checkbox"/> Internet	

<http://www.ychatter.com/owners/createproperty>

yChatter provide the following pictures of the features provided by their Android application. I cannot verify how the features work due to fact I am unable to download the application in Ireland.



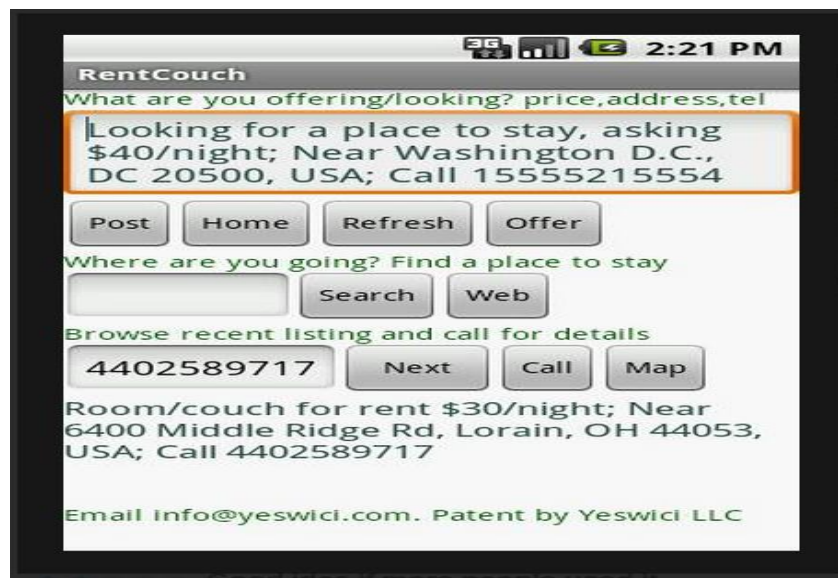
<https://play.google.com/store/apps/details?id=com.ychatter.ychatter&hl=en>

Just from reviewing the layout of the images it seems to be designed correctly. Each feature is clearly separated and the forms are not cluttered with too much information.

1.2. RentCouch

Features

This application [6] has been developed for the Android market. The application provides one form where the user can enter their room or couch for rent, search for a particular location, and if there is a room in the entered location the means to contact the owner. For this application to work it requires the GPS to be active on your mobile device.



https://play.google.com/store/apps/details?id=com.yes.rc.ui&feature=search_result#?t=W251bGwsMSwyLDEslmNvbS55ZXMucmMudWkiXQ..

This application can be broken down into 3 features, place an ad, search for an ad, and call the owner of an ad. The 3 features of this application are separated only by text; there is no distinction between them.

Place an ad

A user may enter their own message or the application will generate a message for you with the use of the Offer button. Then by pressing the Post button the ad will be uploaded somewhere. Unfortunately the application gives the user no indication that an event has happen and the property has been added to some form of database. The user's text also remains in the text field. The Home button will return you to Google play page belonging to the developer but displaying a different application. The Refresh button will reset the page to its default setting.

By generating the user address by using GPS is an interesting idea, but I believe that the address could be generated without the need for the button. When the users submit their ad there is no feedback telling the user that the ad has been uploaded, the users message is still remaining in the text field. A simple pop up message could be used to alert that the event has occurred and since there is a Refresh button, the user message could be cleared from the text field, whenever an upload has been successful.

Search for an ad

A user may search a location for a place to stay by entering an address into the second text field. If a place to stay is available within the entered location the address will be display at the bottom of the form. A phone number will also be displayed in the third text field; if no accommodation is available then 'no ads' will be displayed in the third text field. The Web button returns us to the developers website page Yes List which displays a search field. If I search for a known accommodation it will return that item along with garble from a twitter feed.

The search feature will return a list of accommodations to the user but only displays them one at a time to the user. Considering that the application returns a list of items it is possible to display the entire list to the user. The Web button, I am still unclear to the use of the button, the name of the button is very vague and should be renamed.

Call owner of an ad

Let's say our search returns a number of rental locations, the list will be hidden in the background, and will display one accommodation at a time. The details of the property will be displayed under the property and the owner's phone number display in the third text field. The user may move on to the next element by pressing the Next button. To view the location of the accommodation the Map button will give you the option to use Google maps online or the built in map application on the mobile device. To call the owner a Call button has been provided. To move on to the next accommodation the user needs to press the Next button.

My opinion on the application

I like that the feature will display the accommodation location on Google maps, or at least an approximate location for security reasons to the user. The feature does not allow the user to scroll back through the previous accommodations meaning they would have to restart the search in order to see a previous property. Again as in the second feature I believe that it would be better to provide the user with a list of properties to scroll through, and allow them to move back and forward through the accommodations as they wish.

Overall I have found the GUI to be poorly developed. The form is badly cluttered and hard to understand what to do, each feature should be separated by giving each feature a form of its own and providing a menu for the user to navigate between them. The second and third feature could be combined by the search providing a list of accommodations, each list item could be expanded to display the property details and buttons to call the owner or view the properties location. Also there is no clear distinction between owner and renter.

The wrong type of text fields were used for the application as the first and second text field fills down and the third text field expands to the right. All text fields when expanded push the elements in the expanding direction off screen. There is no way to scroll the form to access the buttons other than refresh the page.

The user receives no notification of an event taking place, such as a status bar to indicate an entry been added or a search taking place.

The application offers no means to vet the renter or owner, and the owners number is visible to anyone searching through the application.

2. Website Applications

These websites offer certain features which I believe would be beneficial to my project.

2.1. Airbnb

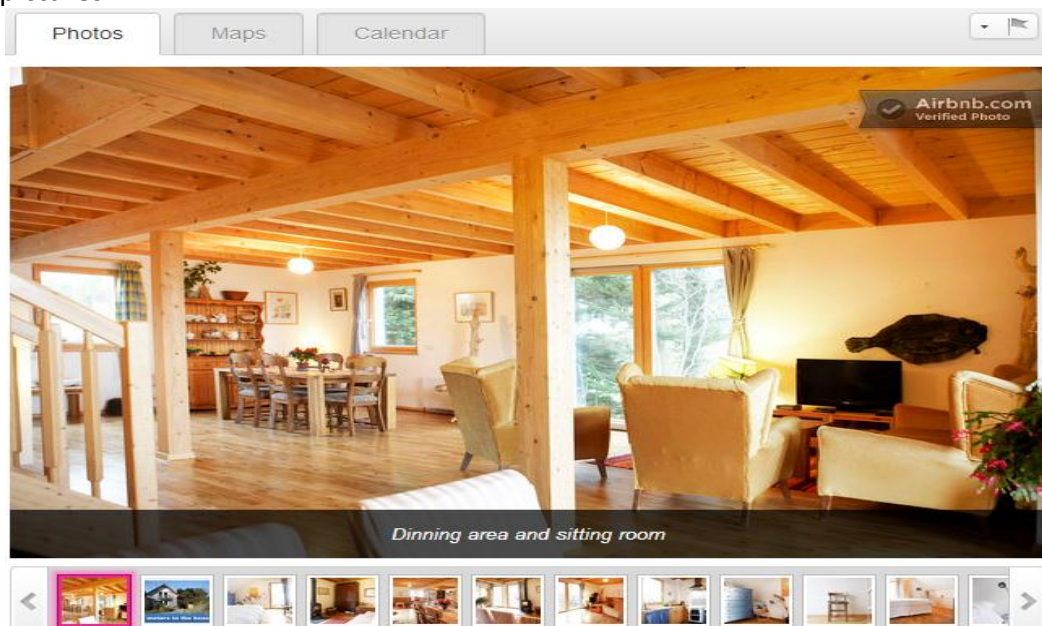
Features

Airbnb [3] is a web application which is used worldwide. It offers users a rich interface to interact with, and a high level of support is offered to user through demos, advice FAQ's, plus more which is contained in the Help Centre.

From a renters perspective they are offered more than enough information about a single property. I will be discussing the features which an actual member Paul [4] has used to attract renters to his property.

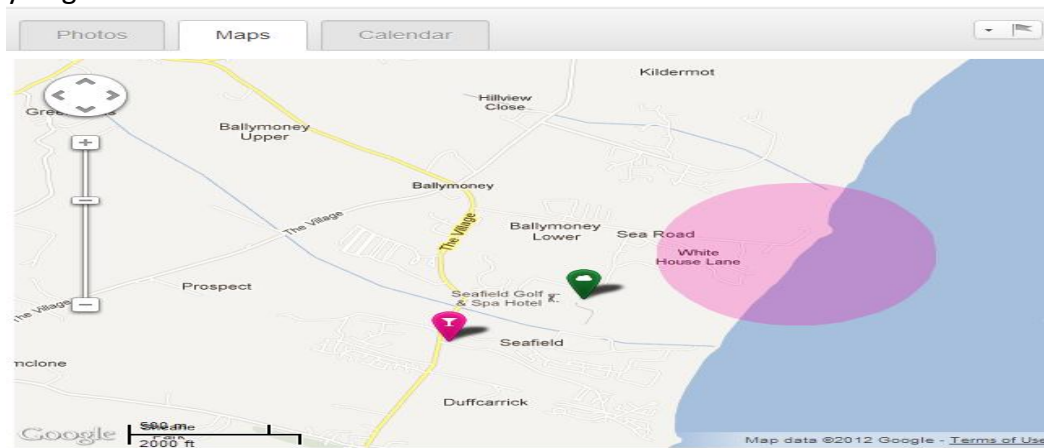
A widget is one of the first features shown which displays Photos, Map and a calendar. This small amount of space has been utilised to deliver 3 key items of information to the potential renter.

The photo frame displays the first photo in the centre and a scroll bar below of all the pictures.



[4]

The map frame is very impressive as it displays a map with a circle giving an idea to you general location.



[4]

The calendar frame displays a list of approximate available days to the user.

Select Month:

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13 £24	14 £24	15	16	17
18	19	20	21	22	23 £40	24 £40
25 £24	26 £24	27 £24	28 £24	29 £24	30 £40	1 £40

■ Available
 ■ Unavailable
 ■ Past

The calendar is updated every five minutes and is only an approximation of availability. We suggest that you contact the host to confirm.

The prices listed are per day.

[4]

The next widget displayed to the user contains Description, Amenities and House Rules. Again the space is properly utilised and the different features clearly defined.

With the description feature it is split into two panes. The left pane allows the user to enter his own description to describe the property in his own words, and any local features about his area to try attract potential renters. On the right pane general questions have been answered such as minimum stay, price, deposit, cleaning charge, etc.

Description	Amenities	House Rules
<p>Please note: minimum booking 2 people. Thank you.</p> <p>Enjoy the experience of a Griffner Coillte wooden home (Austrian design and build) on the Wexford coast, 30m from Ballymoney's golden beaches.</p> <ul style="list-style-type: none"> - half acre of private, mature garden - TV with satellite dish - gas fired central heating - Jotul wood stove <p>Suitable also for winter vacations where you will arrive at a toasty warm and dry house by the sea with a log fire burning in the Jotul stove. Beds made up with cotton damask and feather/down quilts.</p> <p>Ground floor open plan, this A rated house also has its own Solar panels. Outdoor shower beside basement, to the back of the house. The basement is ideal for small boats, canoes etc.</p> <p>At the end of Sea Road, Ballymoney, just meters from the beach, this house enjoys all the sounds and sights of the natural environment. The waves, the stream and an abundance of birdlife with balcony overlooking the sea and dense thicket. The refreshing sea air and clear night skies are added pleasures coming with this unique house built to the highest specs.</p> <p>The stream and large pond attract all kinds of wild life, a foot bridge leading from the house and immediate garden to woodland including four smaller ponds. Heaven on earth for adults and children. The only house of its kind in the area.</p> <p>Weekend or monthly renting to be negotiated. Special rates for 2 families with children including some meals, wines and or fresh juices from local grown fruits.</p>		<p>Room type: Entire home/flat</p> <p>Bed type: Real Bed</p> <p>Accommodates: 6</p> <p>Bedrooms: 3</p> <p>Bathrooms: 1.5</p> <p>Extra people: £16 / night after the first guest</p> <p>Minimum Stay: 3 nights</p> <p>Security Deposit: £165</p> <p>Cleaning Fee: £41</p> <p>Check In: 3:00 PM</p> <p>Check Out: 12:00 PM (noon)</p> <p>Country: Ireland</p>

[4]

The amenities feature displays services which are and are not provided within the accommodation.

Description	Amenities	House Rules
<ul style="list-style-type: none"> <input type="checkbox"/> Smoking Allowed <input checked="" type="checkbox"/> Pets Allowed <input checked="" type="checkbox"/> TV <input type="checkbox"/> Cable TV <input type="checkbox"/> Internet <input type="checkbox"/> Wireless Internet <input type="checkbox"/> Air Conditioning <input checked="" type="checkbox"/> Heating 	<ul style="list-style-type: none"> <input type="checkbox"/> Lift in Building <input checked="" type="checkbox"/> Handicap Accessible <input type="checkbox"/> Pool <input checked="" type="checkbox"/> Kitchen <input checked="" type="checkbox"/> Free parking on premise <input type="checkbox"/> Doorman <input type="checkbox"/> Gym <input type="checkbox"/> Hot Tub 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Indoor Fireplace <input type="checkbox"/> Buzzer/Wireless Intercom <input type="checkbox"/> Breakfast <input checked="" type="checkbox"/> Family/Kid Friendly <input checked="" type="checkbox"/> Suitable for Events <input checked="" type="checkbox"/> Washer <input checked="" type="checkbox"/> Dryer

[4]

The House Rules feature is where the owner clearly sets out the rule for the accommodation.

Description	Amenities	House Rules
<p>Minimum booking 2 people. There are three bedrooms. Two have a double bed. One has a single bed plus babies cot (an additional bed can be arranged). Two of the bedrooms also have lofts that can sleep an additional two people each on inflatable mattresses (supplied). The house can therefore sleep a maximum of 10 people comfortably.</p>		

[4]

The next feature is provided for previous renter to enter a review of their experience while staying with the owner.

The screenshot shows the 'Reviews (6)' and 'Friends (0)' tabs. Below them is a summary of 'OVERALL GUEST SATISFACTION' with five stars. A table lists various categories with their respective star ratings:

ACCURACY	★★★★★	COMMUNICATION	★★★★★
CLEANLINESS	★★★★★	LOCATION	★★★★★
CHECK IN	★★★★★	VALUE	★★★★★

Below the table is a review by a user named 'Sean' (profile picture shown). The review text reads: 'Fantastic! My family (wife & 2 kids under 4) stayed here last week. The house is beautiful, just as advertised. Spacious and cosy. The beaches are spectacular, in any weather (we got stormy and sunny over the 3 days!). It is such a peaceful location. We explored the coastline, the wonderful gardens, and ventured into the sea. My two little boys had great fun roaming around the place, feeding the hens and playing with Lilly the dog. Paul was the perfect host. He had the stove lighting for us when we arrived. We had delicious freshly laid eggs from his hens & juicy raspberries from his garden. I would definitely recommend staying here if you want a relaxing break by the sea. We will be returning!' The review is dated 'September 2012'.

[4]

A renter has the option to add the property to their wish list

The screenshot shows a button with a heart icon and the text 'Save to Wish List'. Below the button, it indicates 'Saved 551 times'.

[4]

A small widget in the top right corner is used to book a property.

The screenshot shows a booking widget with the following details:

- Price: From **£24** Per Night
- Check in: dd-mm-yyyy
- Check out: dd-mm-yyyy
- Guests: 1
- Subtotal
- Book it! button

[4]

One of the impressive features offered by Airbnb is their Trust & Safety Centre. It contains 5 sections which can advise and answer most questions that a user may ask. The features include Features, Safety Tips, FAQ, Personal Safety and Online Security.

Trust & Safety Centre

Your guide to a positive Airbnb experience

Nothing is more important than your safety and peace of mind.

We believe that providing the right environment allows you to make safe, informed decisions. That's why we're constantly building a world-class set of systems, tools, and communication channels to give you full confidence. And if you ever need us, we're a phone call away.



Features

Safety Tips

FAQ

Personal Safety

Online Security

Your safety is our most important feature.

We're committed to building a trusted, collaborative marketplace. That's why we've built best-in-class tools and services to help you make the right decisions. We want you to have a wonderful experience. Here's how.

- [Core Elements of Trust and Safety](#)
- [Platform Tools](#)
- [Reputation And Research Tools](#)
- [Supporting You Behind the Scenes](#)

[25]

My opinion on the application

I found the site to be really well designed, with very well structured forms which allows the user to access the information regarding the property, and the surrounding area from one form. With the use of a number of tabs on the webpage, they can provide the user with a vast amount of information without cluttering the page. The map which displays the approximate location of the owner's properties with the use of a shaded circle is a very interesting idea, as it provides a certain level of security to the owner while given the potential renter an idea to the general location of the property.

2.2. Trulia

Trulia [8] does not offer a nightly rental application; it has been designed for the property rental market. However after reviewing some of the sites features, I found that's its search feature was worth mentioning.

When a user enters a desired location a map is display showing markers which represent all the available homes for rental as shown below in Fig 1. When the user

then selects the property a form is display with 2 menu options Home details and Map & Nearby.

Home Details in Fig 2. displays a scrollable view of different photos of the property and below those details of the property along with a button to contact the owner.

Map & Nearby in Fig 3. displays a map with the details of amenities in the surrounding area of the property.



Fig 1. [26]

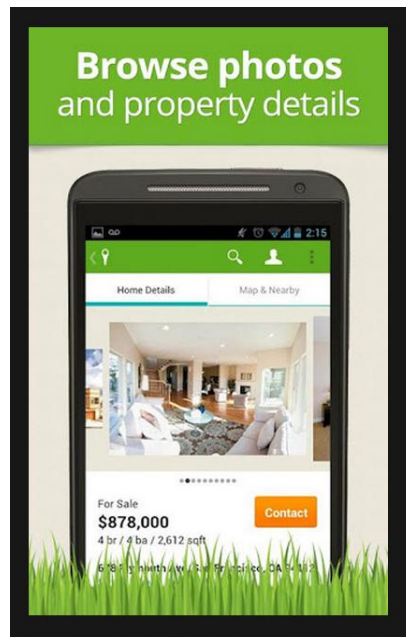


Fig 2. [26]

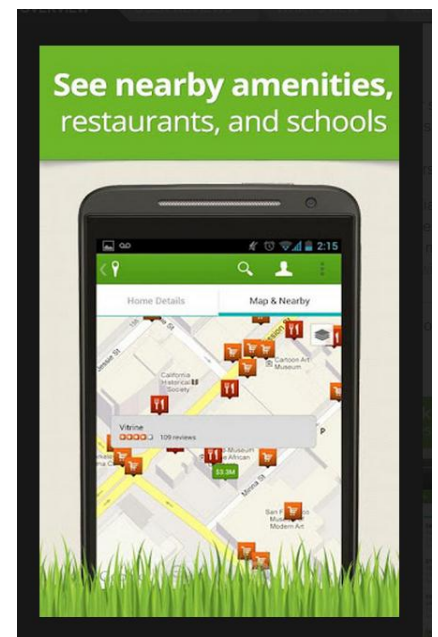


Fig 3. [26]

2.3. Room4TheNight

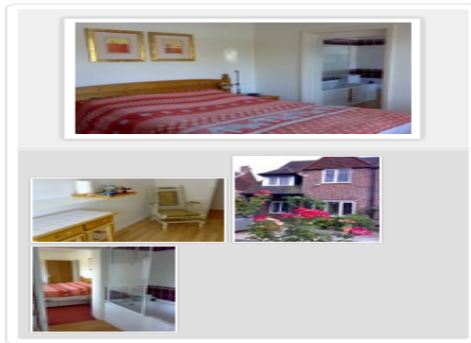
Features

Room4TheNight [2] offers a website application for people who wish to rent a room for one or more nights. It is professionally designed and offers a clearly laid out application which is easy to navigate as a user. When a renter connects to the site the home page displays different categories of properties from featured to newly listed. I will be using an existing property belonging to the member basing [1] to discuss the features offered to the potential renter.

The focus of the frame is on a widget containing a group of photos belonging to the property, information about the property, and a description from the owner about the property and local area.

Hampton Court

From £25 per night



City/Town/Village: Thames Ditton
County: Surrey
Postal Code: KT70Nx
Low Season Rent Per night £: £25
High Season Rent Per Night £: £25
Bedrooms: Double Bedroom
Bathrooms: En-Suite Bathroom
Room Features: Central heating, WiFi/Internet, Parking, Non smoking, Quiet Area, Breakfast available, Tea/coffee making facilities, hairdryer, toiletries
Room sleeps?: Sleeps 2 People
Disabled Friendly: No
Local Amenities: Local pub, Local store, Restaurants, Train station, Historical sites, Airport, Bus routes, Golf nearby, Fishing nearby, Horse riding nearby

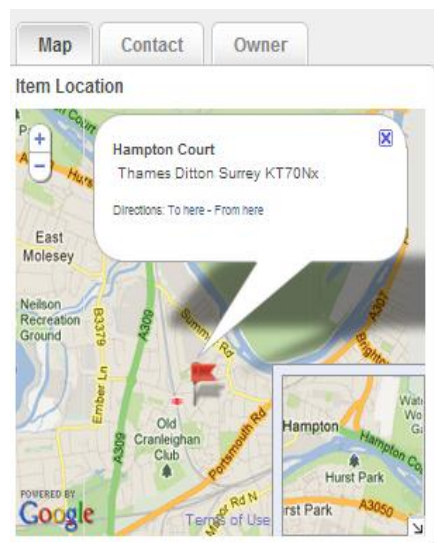
Description

Quiet house in cul de sac 3 minutes from Thames Ditton train station to Waterloo, Wimbledon etc., Single occupancy in double room with en suite bathroom and separate kitchen. Breakfast provided but self serve please. Parking outside house. Close to all amenities and theatres. Good location for transport to central London (30mins) Non smoker please. Wifi.

[1]

To the left of the property description is a widget containing a menu with 3 options, which are Map, Contact, and Owner.

The map shows a Google map detailing the location of the property, pin showing the location of the house, and a bubble with the address.



[1]

The contact tab provides a secure means to contact the owner of the property without any numbers or email addresses be swapped. I found this to be the most interesting feature of the site; it even requires a security question to prevent bots.

Map Contact Owner

To enquire about this room listing, complete the form below to send a message to the room owner.

Name:

Email:

Subject:

Message:

Sum of 4 + 9 =


[Send Inquiry](#)

[1]

The last tab contains the owner's name, duration with the site and any other listings owned by the owner.

Map Contact Owner

Information about the room owner

 > Listed by: [basing](#)

> Member Since: November 3, 2012

Other rooms listed by basing

> No other rooms are listed by this poster found.

[View all rooms listed by basing »](#)

[1]

My opinion on the application

The map gives too much information to people viewing the page, by providing the address and actual location of the property. My main issue with this problem is that non-members of the site have access to this feature. The contact tab provides a secure means of communication so email or phone numbers do not have to be exchanged

Mobile Technology

1. Market Research

In the article Worldwide market share for smartphones [9] they mention that Android and iOS dominate the market *“Android and Apple devices dominate in smartphones, with 85 percent of the worldwide market combined”* and that Android operating system is my multiply manufactures whereas iOS is used by Apple solely.

Android and Apple operating systems are the leaders of the mobile market with the likes of Microsoft starting to catch up. If we refer to the online article *“Worldwide market share for smartphones”* and review the markets sales for both android and iOS for the second quarter of 2012 it is quite clear that android devices are out selling iOS devices. The unit sales for Android were *‘104.8 million units’* and for IOS were *‘26.0 million units’* and finally Microsoft were *‘5.4 million units’*.

By looking at the third quarter for 2012 [10] it is quite clear that android devices are clearly dominating the market as Androids took an outstanding 75 percent of the world’s smartphone market share while iOS only managed 14.9 percent. By looking at these figures it is clear that more people are purchasing Android devices compared to iOS.

If we examine a Survey carried out by Keynote [11], which asked 25 to 50 questions which focused on mobile habits to 5,388 candidates. This survey shows that The Android operating system is more popular that iOS operation system, the margin is close as Android took 43% where IOS took 37%.

2. 18 to 24 Market Statics

In a report issued by Nielsen, The MOBILE MEDIA REPORT [12], they point out that the two leading operating systems for smartphones are iOS and Android. Given that Android operates across a wide variety of devices it is easy to see why they control the largest share of the market. *“Apple is the top smartphone manufacturer in the U.S. with 28.6 percent of the smartphone market, and Android is the most favoured operating system by manufacturers, with the largest share of the smartphone market at 44 percent.”* On page 10 and 11 of the report they outline using a graph, that Android and iOS are the leaders in all age groups. In the groups 18-24 and 25 to 34, the graph shows that they have the highest use of smartphones, and that Android is the most favourable operating system.

3. Top Applications for Android

If we take a look at pages 16 and 17 in the report *“THE MOBILE MEDIA REPORT”* [12] it gives the top apps for Android users, in the age groups which we are interested. As pointed out in the article *Most Popular Android Apps? Facebook, Android Market* [13] which references the Nielsen report, the Facebook app is the second most

popular app and used by 80 percent of Android phone owners. Considering that Facebook was the second most popular app I believe that it would be worthwhile to examine this in more detail.

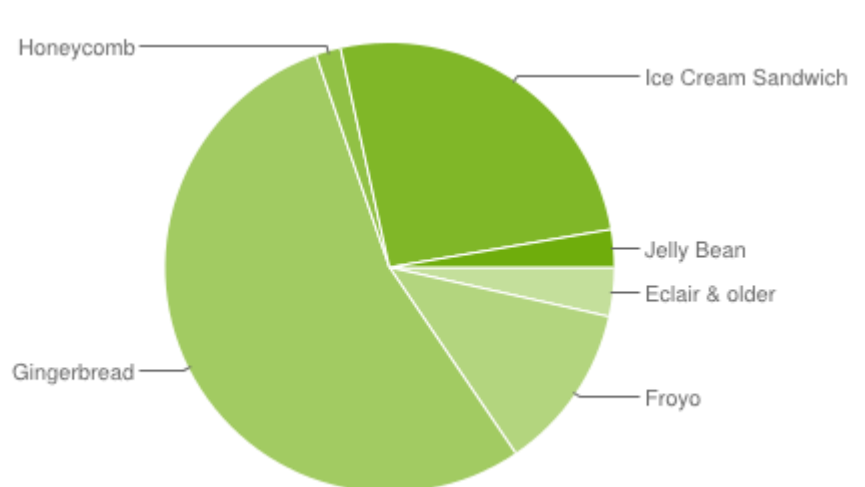
If we examine an article written by Protalinski [14] he also begins by pointing out that Android still has a bigger market share *"Google's Android operating system has a larger market share than Apple's iOS market share."* But to a surprising result the article states that more users are accessing the Facebook through mobile web rather than native applications. Which is backed up by Facebook CEO Mark Zuckerberg's interview, with the Today's show Matt Lauer which was discussed in an article written by **Matthew Panzarino** [15]. He discusses the statement which Mark Zuckerberg made that more people using Facebook on mobile web than Android and iOS apps combined. The article also brings up the question are mobile users moving away from native apps *"Are mobile users continuing to transition to native apps on the two major platforms, or have they been moving away from apps like those on iOS which offered a sub-par experience to the mobile web version?" considering the strong developments in non-native technologies such as HTML5.'*

4. Android Versions

In an article written by Michael Dorf [16] he mentions the most current statistics available at the time (August 1st, 2011) for the different Android versions which accessed the Android Market. He states that 81 percent of users were using Android version 2.2 or higher compared to the latest data collected [17] on November 1, 2012 shown in the diagrams below where 85 percent are using version 2.3 or higher. At the time of Michael Dorf's report 15 percent of android devices were using version 2.1 whereas in the latest figures it has falling to 3.1 percent. If the market follows the same pattern I believe that a fair statement would be that the users of version 2.2 (Froyo) which is currently at 12 percent will drop over the next year.

Version	Codename	API	Distribution
1.5	Cupcake	3	0.1%
1.6	Donut	4	0.3%
2.1	Eclair	7	3.1%
2.2	Froyo	8	12%
2.3 - 2.3.2	Gingerbread	9	0.3%
2.3.3 - 2.3.7		10	53.9%
3.1	Honeycomb	12	0.4%
3.2		13	1.4%
4.0.3 - 4.0.4	Ice Cream Sandwich	15	25.8%
4.1	Jelly Bean	16	2.7%

[17]



[17]

5. Native (Android)

Google developers Meier, Reto and Mahemoff, Michael in 2011 gave the presentation titled *HTML5 versus Android: Apps or Web for Mobile Development?* [5] Where they discuss the benefits for both native and non-native.

Access to device hardware which allows closer integration optimised for hardware, which allow greater control over the following:

- speed
- power
- control
- integration

Native API's have the ability to:

- Listen for system events
- Communicate with other apps
- Leverage functionality from other apps
- Offer functionality for use to other apps

Cloud to device messaging for server based events. Native apps have the ability to run in background while other apps are running. The applications do not need to be running continuously, they can be in a standby or sleep mode until an event happens to wake the application such as a server side push which will notify the user there is an update available.

Native Apps Strong Points

- 1 Integrated : Deep hardware/platform integration
- 2 Current: Supports latest hardware innovations
- 3 User Experience: Native look and feel

6. Non-native (HTML5)

HTML5

- css
- JavaScript
- HTML

Semantic tags provides API like feature, to design the html pages CSS3 decorate style can be applied, and for graphic Canvas can be used. This will allow you to write code once and tweak it to run on all platforms, which would give access to a larger market.

If the application needs to be updated the user is not required to do anything as the update will be performed on server side once, and the user will just need to open the application to benefit from the update.

Web Apps Strong Points

- 1 Mobile: Near-universal coverage
- 2 Capable: Advanced UI and beyond
- 3 Open: Standards-based and well-understood

7. Cloud

7.1. Google App Engine (GAE)

Google App Engine allows you to develop and run your web applications on Google's infrastructure. And if we examine the Google App Engine article from Google Developers [18] they go on to describe the following features provided with GAE.

7.1.1. Price

Google offer a free account to potential users, to get started, there is no setup cost or recurring fees, you pay for what resources your application uses. With a free account it is possible to register up to 10 applications. Each application is allowed up to 1GB of storage and 5 million page views per month. If your application grows beyond these limits then charges will come in to play.

7.1.2. Data Storage

App Engine Datastore [27]

"provides a NoSQL schemaless object datastore, with a query engine and atomic transactions" [18]

Google cloud SQL [28]

" provides a relational SQL database service for your App Engine application, based on the familiar MySQL RDBMS." [18]

Google Cloud Storage [29]

"provides a storage service for objects and files up to terabytes in size, accessible from Python and Java applications." [18]

7.1.3. Supported Languages

Java runtime environment

Python runtime environment

Go runtime environment

7.1.4. Possible issues

In an article written by Garrett Rogers [19] he brings to light some possible concerns associated with GAE. If Google was to go bankrupt they your application is gone too, or he brings up a more possible question *" if the Google App Engine goes down for an hour, you are also down for an hour -- and you will have no idea what happened."* And how do you explain this to users of your applications. He also raises the point that it is very difficult to move your data from GAE, as there data storage doesn't follow a traditional relational database. Last issue is that it is free for now but there is nothing to stop Google in say 10 years to start charging for services.

7.2. Amazon Web Services (AWS)

Amazon has been around for years and has a proven track record when it comes to large scale data storage. Amazon provides the following information concerning its free tier package [20]. Information is taken from the amazon web services site about the type of databases used and supported languages [21].

7.2.1. Price

Amazon offers 12 months free usage tier to new customers, which will give users access to a variety of services including storage, backup storage and different platforms to work on. If a user exceeds the limits or the free tier account expires then you start to pay the standard pay as you go rates.

7.2.2. Data Storage

Amazon Relational Database Service (Amazon RDS)

“is a web service that makes it easy to set up, operate, and scale a relational database in the cloud” [30]

Amazon DynamoDB

“is a fully managed NoSQL database service” [31]

Amazon ElastiCache

“is a web service that makes it easy to deploy, operate, and scale an in-memory cache in the cloud.” [32]

7.2.3. Supported Languages

A wide variety of languages are supported, as long as the language has server support, the developer can use it. Amazon also allows the developers to choose the operating system to deploy on the cloud, ranging from versions of windows, Linux, and Solaris.

7.2.4. Possible issues

You only get 12 months free usage, and care has to be taken when setting up the environment as the user has greater control over the environment.

7.3. Windows Azure (WA)

Windows Azure has been developed by Microsoft as a cloud technology. If we refer to the Windows Azure website [22], which outlines the following information concerning their technology.

7.3.1. Price

Windows Azure offers a 90 day free trial, where you can create up to 10 applications. If you then choose pay as you go, cloud services and virtual machines are charged by the hour of usage and storage is charged by the gigabyte.

7.3.2. Data Storage

SQL Database

SQL Azure

“is a cloud-located database offering. While it uses T-SQL like SQL Server, it is not a full SQL Server instance” [23] but it does have the ability to integrate with SQL Server.

7.3.3. Supported Languages

Under the Development Center section [24] on the Windows Azure website they state the following *“You can build applications using any language, tool or framework.”*

7.3.4. Possible Issues

After the 90 day trial period, regardless of the size of your application or even the volume of traffic that the application receives you will be required to pay for the resources used.

Conclusion

I plan on developing my mobile application using Android’s Operating System, where the minimum version supported will be Gingerbread 2.3. We have made our decision due to the following research carried out:

With the market research that we carried out it was quiet evident that Android and iOS were dominating the smartphone market, with Android clearly ahead. This may be explained due to the fact that more mobile manufactures are using a version of Androids Operating System for their smartphones, while iOS is used only by Apple. If we look at this from a developer point of view Android is an open source technology, given developer’s complete access to source code, along with an extensive set of libraries and tutorials. Whereas iOS are more restrictive in the access which they give to developers. Apple also have an approval process for applications to be released on their App Store, and this could be an issue as updates or bug fixes would have to go through this approval process each time. Our target market for this application is the 18 to 24 age group, and we have shown in this document that Android is their favoured mobile operating system. Gingerbread was chosen due to the fact that 85 percent are using this version as a minimum, and it is my believe that at the time of this applications release the figure will have grown. We have decided to use a native application as it will be able to sleep in the background while listening for server based events, such as new message. Users are also aware of Google’s Market which allows them to search on one site for their required application.

As a cloud technology we have chosen to use Google’s App Engine. Considering it offers a free service for the foreseeable future as long as the application remains under the limits. With App Engine applications are easy to build, deploy and maintain. Google will take care of your database, and Google removes the responsibility of maintaining servers.

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