Technical Report

Working Title: Serv-Otel

Robert O'Grady
x08871965
robert.ogrady@student.ncirl.ie

Supervisor
Paul Hayes

BSHBISE4
BSc (Hons) in Business information Systems

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1.0 Executive Summary

2012 is a very different place to 20, 15, 10, even 5 years ago…. Why? The power of and the innovation with which the Internet is being used, is at the heart of the new world we live in. Social Networking has become a way of life; mobile phones are in every pocket. It is with this in mind that 'Serv-Otel' is being developed, to bring the power of the Internet, social networking and mobile phone technology together to enhance a residents hotel stay.

Exploiting the gap between other industries and the hotel industry in terms of Internet innovation, 'Serv-Otel' allows a hotel resident to have access to all the key elements of the hotel on their mobile phone as opposed to in-room documents, having to speak to someone on the telephone or having to physically visit a location within the hotel for further information.

Achieved using technologies such as Xcode, Cocoa Touch, a web server and JSon the user will be able to access various information, from TV channel listings to the latest restaurant menus or perform certain functions such as accessing 'live' account information or looking for a running partner using the 'in-hotel' social network function. It allows hotel residents to be put in touch with one another and sharing each other's experiences of their stay.

This mobile application truly has the potential to revolutionise the hotel industry. This technical report will detail the components that will allow this application to work effectively.

2.0 Introduction

Operating under the working title 'Serv-Otel' this software college project is to look at the possibilities, the potential of and to attempt to produce an application for iPhone mobile devices that will give users access to information they require about their hotel stay. I'm attempting to address several questions through this project but ultimately; is such an application feasible and could it be a viable option for the hotel industry? Hopefully I can answer both positively.

2.1 Background

Lets go back 5 years – the world we live in was a different place. The Internet was something we used, perhaps still in some ways was changing from web 1.0 to web 2.0. In March of 2007 just 17.1% or 1.23bn of the worlds population were accessing the Internet. Fast-forward 5 years to the latest results in March 2012 and we see this has practically doubled (it has in terms of physical numbers if not quite percentage due to a growing population) – 32.7% or 2.28bn and continues to grow at an alarming rate. This is due largely to the rapid pace of technological change, leading to improvements in broadband speeds and the same or reduced costs, which in turn make it more viable for broadband companies to roll out – reaching more and more people. In addition improvements in technology have also meant there are numerous ways with which to access the Internet now. Users who would have been intimidated and frightened away from purchasing a PC or iMac find it much less daunting to dabble with the Internet on their mobile phones.

Couple these trends with some mobile phone statistics I heard recently when attending a supply chain conference. A Vodafone presentation stated that 5.3bn of the worlds estimated 7bn population had access to a mobile phone and this number continues to grow! Incredibly only 4.2bn in the world have access to sanitation!! (Internet Usage Stats, 2011 and Supply Chain Conference, 2012) While this statistic may sit uncomfortably with me and for many, it is no doubt impressive how mobile phones have quickly become standard, 'can't live without' items to people.

There is no doubt that this figure is being added to by the phenomenon that is the Apple iPhone. We had heard of but not actually handled the iPhone 5 years ago; the 5th anniversary of when the iPhone was unleashed on the eager but naïve public is next month, June 29th. (Honan, 2007) I say naïve, for the public had no idea just how much the iPhone was going to impact on their lives, both the phone itself, and for how it trail blazed and dramatically shook up the market. Apple in the 1st quarter of 2012 ALONE sold 37million iPhones (DeWitt, 2005) bringing the total iPhone sales to somewhere close to 200million in total since it's birth, but as you can gather by recent results the upwards curve of sales is staggering! The Apple iPad in 2 years has now sold 55million units. It is widely accepted that there will be approximately 1 billion Smartphone's in existence by 2015.

With the iPhone brought the birth of the term 'apps', short for applications. An app is a piece of software that allows a user to perform a function on their iPhone, be it to entertain, educate or to assist in users daily lives. Just this year, 5 years on, the 25 billionth app was downloaded from the iTunes app store! The question "Is there an app for that?" yields 223,000 Google search results (Google, 2012). People's mindsets have changed so much that when they need to do something the first thing they ask is "Is there an app for that…?" There is a huge and growing dependency on mobile phones as people get busier, are constantly on the move and need to connect, communicate, receive information wherever they are and whenever they need to.

Social Networking was another recent phenomenon very much in its infancy. Twitter, although created in 2006 was small until a 'South by Southwest Interactive' conference 5 years ago in 2007 where the daily number of tweets went from 20,000 per day to 60,000 per day. It has grown dramatically ever since – in Feb 2012 the average number of tweets per day was 290million!! (Carlson, 2011 &Cherry, 2011) Facebook was just 3 years old, having launched in February 2004 although it was in 2007 that Facebook's worldwide popularity surged from 60th to 7th in terms of worldwide traffic (Alexa.com, 2012). In 2012 it sits at number 2, behind only Google (Alexa.com, 2012). All in all 1 out of every 7 people on the planet have a social media profile.

It's not just individuals however who are using social media, it's becoming a must and a source of competitive advantage for those companies using also. There are thousands of surveys each offering their own statistics and views on the usefulness on social media, it is a hot topic, but the fact is social media is being used by companies now for many purposes, including marketing, increasing short term sales, offer customer support or even recruiting new staff members. Advertising firm MDG Advertising recently released some interesting statistics that showed that 76% of businesses are using social media for business objectives with 74% of that 76% believing, according to their Chief Marketing Officers, that they'll tie their social media efforts to hard return on investment. (Kallas, 2012)

All these facts and figures point to one thing – these markets are viral and are only going to keep growing for the years ahead. The opportunity to get into such a potential market is absolutely huge and cannot be ignored.

The hotel industry has been affected by the recent recession, like many other industries and the industry has gone through something of an industry shakeout since 2007. Articles about the hotel industry in Ireland have been littered with dreaded mentions of 'NAMA', 'administration', 'losses', 'ghost' (And not in a haunted house way) and receivership! There have been a number of closures and there has certainly been a drop in the number of hotels open in Ireland from 915 in 2009 down to 883 in 2011 (Failte Ireland, 2011) – A drop of 32, but alone by Jan 2011, more than 50 hotels were closed or in receivership as a result of the

recession. (Corr, 2012). There was also a drop in room capacity, which peaked in 2010.

It's not all a downwards spiral, however there are signs of growth – The Tourist Industry Confederation reporting a 7% increase in tourist numbers in 2011, ending what the confederation described as "three most horrific years". (Kelly, 2012) In addition bed occupancy has increased throughout Ireland but particularly in Dublin, with occupancy increasing by nearly 6% to 71%. (Deloitte, 2012) This increase is in keeping with the wider European performance with occupancy increasing by 2% on average. (Panayottis, 2012) Things appear to be on the up again.

Regardless of whether this downward spiral had been arrested or not I still see this as an optimum time for a hotel/hotel chain to invest in an app such as this. Any hotel in this difficult time with intense industry competition for customers, will need to differentiate, offer something unique, gain competitive advantage, all while trying to reduce costs in its pursuit of customers. I believe this app can bring all of these things. And if the market is improving then that only ensures that there is a bigger market for this app to potentially be available to. In addition if looking at the size of the market, if for example the Hilton group in it's entirety (this group contains 10 brands) were interested in rolling out such an application worldwide, they have over 3,800 hotels in 88 countries resulting in over 630,000 rooms (Hilton.com, 2012)… this is the potential market if just one chain, albeit a global leader, took an application such as this on board. The Hilton honours reward scheme has over 29million members. If just one arm, the Hilton hotels and resorts elements that have hotels in Dublin such as the Hilton Kilmainham, the market is still potentially huge with over 540 hotels in 78 countries. (Hilton.com, 2012)

Personally while travelling over the past year I've found myself being increasingly frustrated with hotel stays despite staying in predominantly 4 star hotels. I'm frustrated by the lack of quality information in hotel rooms, in fact the trip that really kick-started this whole idea was in a 4 star hotel in London where I had no in room information. I had to make a call to room service to get an information booklet delivered to the room. When this booklet was delivered I found it had no real information about the restaurants, of which there were 2 on site, meaning I had to go downstairs to look at menu's. I had no information about how to use the air conditioning system and actually found it didn't seem to make any difference no matter what I did to it…..and when it came to Wi-Fi? Yes they had it but I had to pay £10 for 24 hours access! I found that technology didn't seem to play any part in my experience at all and in 2012 with all the capabilities that we now had at our disposal I felt that there must be a better way.

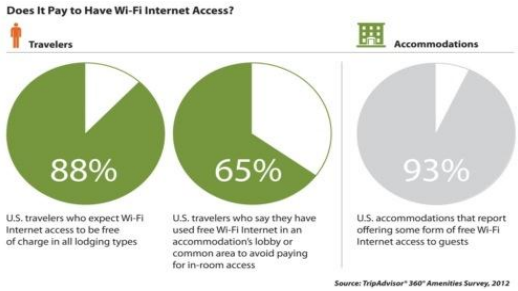
While it is hard to keep up with the ever-growing technology market, it is clear that the hotel industry is struggling more than most and as such has yet to really embrace technology. There are some exceptions. For example, Yotel, see www.yotel.com. Yotel has embraced technology in various ways, for example in

it's rooms with the 'techno-wall' ensuring connectivity to multiple devices, to it's hotels with free Wi-Fi offered throughout and self service style check ins. It also has the Yobot, an automated luggage handler. It's developing some mobile applications for both iPhone and iPad and working on how it can harness the potential of social networking (Quotation from Nigel Buchanan - Yotel).

Many other hotels are at least launching mobile applications such as Jury's or Premier Inn. However, in my opinion these are at best limited. They are brand focused and are very much looking to advertise the brand and to promote bookings. The hotel industry is facing a battle with the booking websites such as booking.com or expedia.com that have become something of a necessary evil. That is, they ensure a fee for some hotel rooms, and offer them a form of advertising particularly as these websites are so popular. It would be major decision not to utilise them however, it leaves them with a loss of control over their rooms, their fees and ultimately their profits. Hotels are currently looking to flex their muscles and regain some of this control by increasing the amount of bookings they take directly with a customer. They therefore are pushing out mobile applications in the hope that this helps as well as to use social networking sites such as Facebook. I'm unconvinced - not that these tools shouldn't be used but rather that they are being used in the wrong way or without real thought exactly what each element is achieving. I would be interested to know if hotel groups are measuring how many customers they are gaining using these methods. I feel they could use more.

Even within hotels technology is often neglected. For example, take something like Wi-Fi.

In a recent survey by Tripadvisor (Rauch, 2012) Free Wi-Fi was seen as the most desired element by the 1200 participants when deciding where to stay with a whopping 88% making this choice.



Yet the reality is somewhat different. Some hotels do not offer Wi-Fi at all although admittedly this is decreasing. Some just offer wired access. That's fine if you have a laptop but with the huge increase in the sale of mobile devices, such as those offered by Apple and Samsung, wired internet is in effect useless….in addition….you're likely to be charged for it. Then when Wi-Fi is offered – it's not always free. Many have written about this blight on the hotel industry including James Cridland who wrote about Hilton hotels charging anything up to the equivalent of €40 per night for Wi-Fi but not detailing these costs when booking. The 'Hotelchatter Hotel Wi-Fi report' also singled out those hotels charging extortionate amounts using the excuse they simply have to charge because it's so expensive. The report goes on to show that the real cost of installing and maintaining a Wi-Fi network – anywhere from the US equivalent of €1.90 to

€3.45 per room per month…. Many however are offering free Wi-Fi now; Yotel is an example of this. A recent stay in Premier Inn saw that they offered the first 30 mins of every day free with a not extortionate £3 charge for the following 24 hours.

The point I'm making is that Wi-Fi and in particular free Wi-Fi is increasing in hotels, 99% of hotel managers in the same survey noted free Wi-Fi as the most desired element and that makes the type of app I'm advocating much more feasible and much more attractive. With technology costs reducing and the growing consumer pressures this app is now possible where 5 years ago it simply wasn't….

Using mobile apps has changed the way customers think. They want to do more while on the move. They want to interact with friends and family while they are doing it. The hotel industry is struggling with technology, struggling with intense competition, struggling to get customers to stay loyal, struggling (whether they are aware of it or not) with an inefficiency and lack of joined up thinking when it comes to resident information. Serv-Otel as an application has the potential to be a win-win for a hotel or even a chain – it can give customers exactly what they want, that is all the information and the options to make choices in the power of their hand, and it can give hotel owners what they want, that is it differentiates from what other hotels are offering therefore becoming a selling point and helping to garner customer loyalty, it provides customer with choices and it does that while potentially reducing costs.

2.2 Aims

The aim of this project is to try and capitalise on the opportunity that I feel is present right here and now. I feel there is a huge void in this market but by following blogs within the industry I feel this void is slowly being eroded – this is an app that would impact the industry right now.

As a result of this process in an ideal world I would like to have an app that is as close as possible to a releasable app, but with limited programming skills, and where I'm starting from I'm realistically looking to develop an app that conveys the key ideas and concepts, almost a basic prototype, to allow further more advanced programming before promoting to an industry insider to work with.

From a user perspective a finished 1st release app would allow them to achieve several things and empower them to make choices to enhance their hotel stay. It would allow a user to do some or all of the following tasks:

- The ability to view any in room device (E.g., air conditioning) instructions on the application
- The ability to view TV listings on the application
- The ability to contact room service on the application
- The ability to contact the concierge on the application
- The ability to 'chat' to other hotel residents on the application
- The ability to view in-hotel restaurant menus on the application
- The ability to make in-hotel restaurant bookings on the application
- The ability to view in-room breakfast menu
- The ability to order breakfast for delivery to the room
- The ability to view in-hotel Gym/Spa facilities on the application
- The ability to make in-hotel Gym/Spa bookings on the application
- The ability to see a running 'bill' for the room
- The ability to express check out on the application
- The ability to access a help section which includes contact numbers

From a hotel owners perspective any app needs to bring value to the hotel. The aim would be to do that by:

- Allowing a hotel to differentiate amongst an intensely competitive market with a unique selling point
- Giving users an unique interactive experience and putting them in control of their hotel stay using their mobile phone.
- Creating a community amongst it's residents by putting them in touch with each other and sharing information about places to go, routes to travel and experiences to avoid – which should reflect postively on the hotel -
- Saving on costs, eg through printing
- Increase in return customer and customer loyalty - a positive experience becomes a reason to return.

2.3 Technology

When I started this project I was conscious that there are numerous technologies out there, multiple portable devices, multiple mobile platforms. Initially I can't cater for all and this does mean the impact for a hotel initially may be reduced. However, it was important to design in such a way that as many elements as possible could be re-used across multiple platforms and were not coupled with the platforms own code.

iPhone:
Initially I have decided to develop on the iPhone platform with the primary reason being the size of the market held by this single phone and it's extraordinary growth that shows no signs of abating. Recent figures for Q1 2012 show that Samsung are slightly ahead in the Smartphone market (though numbers are estimated) however this is over a catalogue of phones compared to the iPhone offered by Apple. Also, we should take account of Apple's huge iPhone sales figures of 37million for Q1 2012, and the fact that iPhone apps can be used on iPad's also, with 55million sold in the first 2 years since launch. (25)

Xcode (Objective C & Cocoa Touch):
Using the iPhone platform dictates some of the technology used - the developer environment is made up of Xcode, the Interface builder and the iPhone simulator. When using Xcode, we are using the Objective C language, which allows us to write the code. Objective C provides us with the structure for our iPhone application and allows us to implement logic and decision-making. Cocoa Touch however is the set of classes that we can access with our objective C to perform certain functions or to display certain interface elements.

From experience of using iPhone applications, albeit with no experience of coding, I know that these technologies can facilitate the functionality we are looking to achieve and a Graphical User Interface that's both intuitive and easy for the user to navigate.

Web Servers (Amazon S3, Amazon EC2, Buzztouch)
In addition to the iPhone technologies we need to have a web server on which to host the data necessary for the application. There are many ways to do this. However I am ultimately looking at a combination of Amazon Software and a website called Buzztouch.

Firstly the beauty of Amazon EC2 is that the power of Amazon's services can be utilised giving ultimate reliability and power, as well as expanding in size to the applications space needs and requirements. I've set up an instance of EC2 called Serv-Otel Web Server currently operating on the free tier. We can host a version of Buzztouch on the Amazon server, there is a cost to this and as such this isn't maintained at this stage. Using Buzztouch gives us several advantages. It is in effect a content management service and allows us to host our app either on their servers or on our own web server (e.g., Amazon EC2 Web server).

Regardless this app remains completely owned by me and I am free to modify this app, or use this app in any way, I.e. publish through iTunes stores, without any restriction. One particular feature that was a key selling point is the refresh feature. One thing that I have to remember with residents using this app is that they may download the app just before or upon arrival and use it for their stay in the hotel. This could be 1 night, 3 nights, a week but they are very unlikely and will be unwilling to keep downloading updates from the iTunes stores when new data became available. A key feature of the Buzztouch service is that the app can be 'refreshed', i.e., new content added, such as the latest menu's and this automatically updates across all the devices that contain the app without having to download an update through iTunes. I think this is absolutely vital to the success of the app. Any major changes to the structure of the app can be released periodically through the iTunes store, however any data changes such as a new menu for example can be 'refreshed' in an instant.

Amazon S3 is a document management service offered by Amazon, allowing the uploading of documents into a 'bucket'. Access and permissions can be managed around these documents. This may or may not be required in a live environment as I would anticipate being able to tailor the EC2 web server/Buzztouch in a way to allow each prospective hotel to upload their own unique documents as and when they want to change them. Currently however I have the application pulling certain documents from the Amazon S3 solution, as and when the application requires them. These, once accessed, are cached by the app until the user 'kills' the application. This allows the application to be smaller in size for the end user and ensures that as the hotel updates their documents, e.g. a daily restaurant menu, that the user will see the latest version.

JSON:

In order to access the web server, and to query and retrieve information we also need to use JSon. JSon stands for JavaScript Object Notation. This is a text-based solution, light in functionality but does all that is required - It is highly portable and allows interchange of data. As the name suggests JSON is JavaScript based.

Network:

In addition there are the Hardware elements. A mobile device will be required to use the app of course, and initially this will be the iPhone, however other devices would be developed for subsequently. Also it is very desirable and I would state a must that a free Wi-Fi service is offered by the hotel. This ensures maximum potential use of the app without the resident worrying about hotel Wi-Fi charges or their own data usage limits or roaming charges. A hotel investing in such an application needs to ensure the maximum return on investment and offering free Wi-Fi is not just a key selling point to residents on its own, it ensures residents have no barriers to making use of this application - a further key selling point for the hotel. However, one of the advantages of this app to a resident is the ability to use this app "on the go" - that is, outside the hotel on another Wi-Fi or even their own network, in order to say book a meal or check for the nearest doctor's details, or in future releases, set the TV to record a program or change the room temperature.

QR Codes:
In order to facilitate those residents that were not aware of the application prior to arrival, although it should be advertised on the hotels website as well as perhaps in any confirmation mails to the resident, I will use QR codes, that should appear on the back of a room key card (unless the hotel has advanced to mobile phone key cards). Other options could be available down the line like pushing the app as soon as the device joins the Wi-Fi network for example though this is outside of the project.

QR codes, which stands for 'Quick Response' codes are becoming more and more popular in everyday life. They are appearing in shop windows to magazines to bus stop shelters. Effectively a QR code is a mobile phone readable bar code that can store URL's, some text or some contact details for example. It can store any alphanumeric data. The user scans the QR code with a bar code reader on their mobile phone such as 'Scan' or 'RedLaser', although there are countless available. The bar code reader interprets the data and diverts the user to the appropriate application to read the data, such as the website address stored.

The QR code to the right points the user to the Hilton mobile phone application when scanned. With our application the user would scan a QR code upon arrival (if they didn't already have the app installed) and it would take the user to the download screen for the application. The QR code could appear on the back of the room key card for example.

Also outside of the scope of the project, but something to be cognisant of, is the existing hardware/technologies within the hotel. There will be a need to link to existing hotel systems, particularly when accessing account details and 'live' billing. Aside from this however, in order to update the application with some data, such as menus the hotel could do this directly by accessing a personal section on their web server designed for their app exclusively, and uploading the latest menus. This simply requires an iMac or PC and Internet connection so there would be no huge hardware investment or maintenance costs for running this application.

2.4 Structure (Brief Overview of each chapter)

The document structure can also be seen from the table of contents above but in summary:

- The first section contains the Executive Summary giving an overview of the report.
- The second section contains the background information for the project, specifying the idea, the background, the potential market and oportunity and the technologies capable of achieving success for this application.
- The third section contains information on the various requirements of the application including functional and non-functional, user requirements, environmental requirements etc. It also looks at elements such as testing and evaluation.
- The fourth section looks to draw some conclusions upon the completion of the project.
- The fifth section details further development of the application / project.
- The sixth section looks at the bibliography
- The seventh and final section contains the appendix which encloses the original project plan and requirements specification. Monthly logbooks are also enclosed here as well as any other documents.

3 System

3.1 Requirements

3.1.1 Functional Requirements

Functional Requirements:

- The application should be able to display information about aspects of the room to the user
- The application should be able to display TV listings to the user
- The application should be able to display information the hotel restaurants to the user
- The application should allow the ability to book a table in the restaurants
- The application should be able to display information about the hotels leisures facilities to the user
- The applicaton should be able to allow users to search local maps and giving users current position
- The application should allow users to exchange information with other users.
- The application should allow a link to popular social networks
- The application should allow users to view a 'live' bill for their stay.
- The application should connect and interface with the iPhones native applications
- The application should be capable of being updated to reflect the latest data
- The application should provide some form of help to the user

Non-Functional Requirements:

- In keeping with mobile applications in general the system should be fast and responsive
- The application should not crash during use or cause a reset
- The application should, where possible, not require network access but this is unavoidable for some aspects of the app. This will reduce a dependancy on the W-Fi, and allow access to some information when away from the hotel.
- The application if interrupted by a native application such as a phone call should continue to run in the background and when returned to should be in the same state as when the user left it.
- The application should be able to pass information securely, particularly when passing sensitive account information.
- The integrity of the information in the system needs to be maintained in order to offer reliable output – this needs to be considered for residents currently staying at the hotel and for those just checking in.
- The application should require absolute minimum navigation.
- The application should be operable with the minimum of help.
- System needs to be maintainable

3.1.2 Technical Requirements

There are a number of technical requirements for both end users and the hotel however these are relatively basic requirements. The user initially will require an iPhone in order to make use of the application. Also in addition, they will need a iTunes account and a bar code reader. One can be recommended by the hotel if required – this is something that the hotel can enter into a symbiotic relationship with the bar code reader provider, perhaps offering mutual advertising.

In order to download the app some network connectivity will be required, and I'm advocating strongly that the hotel should offer free Wi-Fi to do this. The main reason for this is to remember that a high proportion of the hotels visitors may be from another country (30% in 2010, however, in Dublin 45% of visitors were from overseas) (20). Should a visitor have to pay large roaming rates with their phone provider or anyone having to pay large fees for hotel Wi-Fi access is only going to reduce the buy-in for the application.

The app should work in such a way that any data accessed from a web server should be cached in the iPhone until the application is 'terminated'. Other data such as app icons should be packaged within the application. This offers a balance between network access and application size.

For the hotel, other than providing a Wi-Fi network, an internet enabled iMac or PC is required, so that they can upload those documents they want to update. This would be done on a specially designed portal using Amazon webservers (Be it EC2 or S3) Any set up will be managed for them.

3.1.3 Data Requirements

Most data provided for the application will originate from the hotel itself by uploading documents providing room information, restaurant information and menus, local facilities information etc. This should be provided onto a web server provided for them and this information will be updated on the users application automatically.

The user will need to provide an e-mail address in order to be signed up for certain elements of the application. This allows an element of control on the application by the hotel and ensures private data such as account details is kept confidential under data protection acts. A password will be assigned to the user upon check in.

Other than this the user will only submit data they want to do so using a facility such as chat for example. All data would be submitted using the format allowed by the mobile app.

3.1.4 User Requirements

Any potential user would need to download the application and from there will need to log into the application in order to access certain elements such as their account details or reward scheme data. Once they have signed in they will have full access to all elements of the application. Someone not signing in would only have limited access.

3.1.5 Environmental Requirements

In terms of environmental requirements there are few if any. From a computing perspective the application initially will only run on Apple iPhone although an android version could be produced relatively quickly. From a wider environmental perspective, the drain on the iPhone's own power should be minimal. I suspect this because there is only the local map section where any location services are required. These are known to drain an iPhones battery if using over a prolonged period. With the absence of these it should reduce the need for having to charge the iPhone constantly and draining electricity.

3.1.6 Usability Requirements

A particular advantage of touch screen technology such as that used by the iPhone is that it is relatively simple to use. Any user using this application will already have an iPhone and therefore will be familiar with how an application works in terms of navigating through it. There are no particularly new or difficult elements within this app, using existing tools that iPhone users should be familiar with. Where icons are used, I have tried to comply with good usability heuristics to ensure a user can quickly and easily find the information they require.

3.2 Architecture & Design

*(*Describe the design, system architecture and components used. Describe the main algorithms used in the project. (Note use standard mathematical notations if applicable))

The intention when designing the application was to keep the look and feel of the app as close to the iPhones own GUI as possible. The app needed to be as simple and stress free as possible for users, bearing in mind that a stay in a hotel should be as relaxing and easy to use as possible. (A survey last year amongst 3000 adults in the UK found that "40% of those polled said that technology issues were more stressful to them than family or financial issues"). It should be usable by any user with an iPhone regardless of technical ability.

In thinking about the design of the app presented here I've tried to model the app on the Hilton Dublin Kilmainham, as if they have decided to take up the ServOtel application for their hotel. For an idea of the style used please see http://www.hiltondublinkilmainham.com/ Certain information such as restaurants etc have been used from this site also to add to the authenticity.

When the user downloads the app and presses the ServOtel icon they will be presented with a splash screen followed by a login screen. The user has to be registered by the hotel in order to use the app in full, therefore allowing the user to access certain live account information. The user logs in with their registered e-mail address and a password.

Upon login the user is presented with the main menu with the following options:

Room:
This section contains information about the customer's room, such as the TV Channel list, the Air Conditioning, Fire Escapes as well as information about local services. This section is designed to take the place of the standard in room booklet users would normally receive.
Dining:
This section displays information about the hotel's dining facilities as well as offering the chance to book a table.
Leisure: This section displays information about the hotels leisure facilities such as the Gym or
Social: This section allows the user to link to social networks Facebook and Twitter as well as a section to allow residents to get in touch with other residents. This can be considered to be like a 'virtual bar' but will allow customers to get in touch with each other, share information about local facilities, share information about places to go to or avoid, or put together people for a run in the morning, or in the gym, or going to the theatre….
Account: This section contains information about the customer's account, with a live balance, taking into account elements such as the mini bar.

Help: This sections offers some assistance to the customer on the app but also offers sections allowing contact via phone or e-mail with the hotel, or to access the hotels website. In addition it allows access to a feed on the hotel groups latest news.

Each section has a set of submenus for the user to navigate through but each press of a submenu leads to the information required. For example at the main menu:

- Select Dining – returns the dining submenu
- Select Breakfast – returns the breakfast menu.

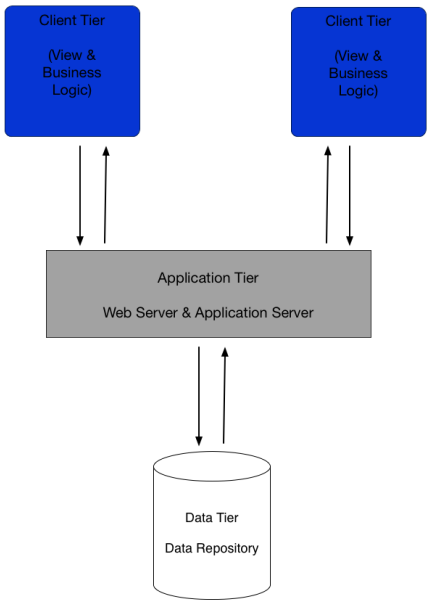
So from the main menu a user only has to make 2 button presses to achieve the desired information. This is good practice in iPhone development and helps to retain the users attention.

Serv-Otel is based on 'Three Tier Architecture' with the following tiers:

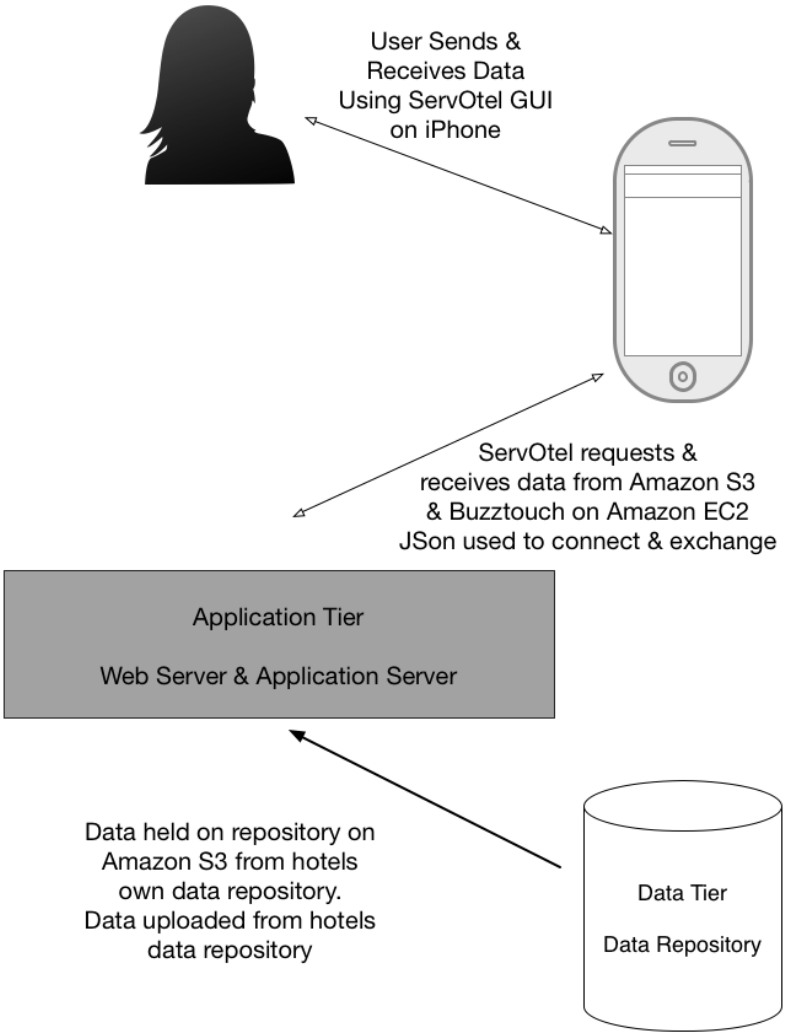
Client Tier: This is the user view tier, where the user accesses the application on the iPhone. There is some business logic at this level.

Application Tier: This is where the main business logic is completed, on the web server and application server. In the case of this app we're referring to Amazon EC2 and Buzztouch.

Data Tier: The Data provided by the hotel for the app to display, on Amazon S3 in this apps case.



Below is a demonstration of the communication process in Serv-Otel:



3.3 Implementation

One key element to the success of this app, and for using the Buzztouch server is the ability to have certain data 'refresh' for the user while using the app, without having to download an update from iTunes, either over Wi-Fi or by plugging into a Mac/PC.
This piece of code is key in this element:

```
//downloader delegate methods. Called when refreshing app
data.
-(void)downloadFileStarted:(NSString *)message{
    [BT_debugger showIt:self:[NSString
stringWithFormat:@"downloadFileStarted: %@", message]];
}
-(void)downloadFileInProgress:(NSString *)message{

//[BT_debugger showIt:self:[NSString
stringWithFormat:@"downloadFileInProgress: %@", message]];
}
-(void)downloadFileCompleted:(NSString *)message{
    [BT_debugger showIt:self:[NSString
stringWithFormat:@"downloadFileCompleted%@", @""]];
    [self hideProgress];

    //NSLog(@"%@", $message);
    //message returns from downloader is the application data
or an error message
    if([message rangeOfString:@"ERROR-1968"
options:NSCaseInsensitiveSearch].location != NSNotFound){

     [BT_debugger showIt:self:[NSString stringWithFormat:@"the
download process reported an error?: %@", message]];
     [self showAlert:nil:NSLocalizedString(@"downloadError",
@"There was a problem downloading some data from the internet.
If you're not connected to the internet, connect then try
again.")];

    }else{

     //save the version we just downloaded...
     if([BT_fileManager
saveTextFileToCacheWithEncoding:message:[self
saveAsFileName]:-1]){

          //the data we just got must be valid
          if([self.rootApp validateApplicationData:message]){

               //delete previously cached data (this does not
remove the config file we just created)
               [BT_fileManager deleteAllLocalData];

               //rebuild environment using the data we just
got
               [self
configureEnvironmentUsingAppData:message];

          }else{

               [BT_debugger showIt:self:[NSString
stringWithFormat:@"error parsing downloaded app config
```

```
data%@", @""]];
                    [self
showAlert:nil:NSLocalizedString(@"appParseError", @"There was
a problem parsing the app's configuration data. Please make
sure that it is well-formed.")];

            }

      }else{

            [BT_debugger showIt:self:[NSString
stringWithFormat:@"error saving downloaded app config data%@",
@""]];
            [self
showAlert:nil:NSLocalizedString(@"errorSavingData", @"There
was a problem saving some data to the devices cache?")];

      }

     }//no error
```

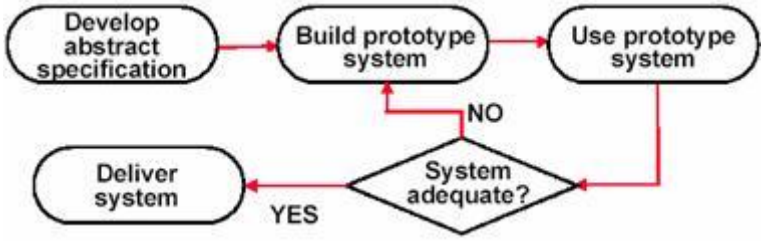
The following method is what kickstarts the whole application:

```
/*
didFinishLaunchingWithOptions
this method fires when the application first launches.
*/


-(BOOL)application:(UIApplication *)application
didFinishLaunchingWithOptions:(NSDictionary *)launchOptions{

     //set the configuration file name
     configurationFileName = @"BT_config.txt";

     //show debug in output window?
     showDebugInfo = TRUE;

     //init the allowed input characters string. ONLY these
characters will be allowed in input fields.
     allowedInputCharacters =
@"abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ01234567
89_-.@!$";

            if(getenv("NSZombieEnabled") ||
getenv("NSAutoreleaseFreedObjectCheckEnabled")){
            NSString *message = @"";
            message = [message
stringByAppendingString:@"\n##################################
##########################################################
####################"];
            message = [message
stringByAppendingString:@"\nZOMBIES ENABLED, TURN THIS OFF
BEFORE RELEASING THIS APPLICATION!"];
            message = [message
stringByAppendingString:@"\nDouble click executables > [app
name] > arguments: Remove NSZombieEnabled = YES"];
            message = [message
stringByAppendingString:@"\n##################################
##########################################################
```

```
####################\n\n"];
            NSLog(@"%@", message);
      }


      //initialize a temporary buzztouch app to assign to the
rootApp property
      BT_application *tmpApp = [[BT_application alloc] init];

      //initialize a temporary window to assign to the window
property
      UIWindow *tmpWindow = [[UIWindow alloc]
initWithFrame:[[UIScreen mainScreen] bounds]];
      self.window = tmpWindow;
      [tmpWindow release];

      if(!tmpApp){

            //show error message
            UIAlertView *alertView = [[UIAlertView alloc]
initWithTitle:NSLocalizedString(@"errorTitle",@"~ Error ~")
            message:NSLocalizedString(@"appInitError", @"There
was a problem initializing the application.") delegate:self
            cancelButtonTitle:NSLocalizedString(@"ok", "OK")
otherButtonTitles:nil];
            [alertView show];
            [alertView release];

      }else{

            //assign the local app property
            self.rootApp = tmpApp;
            [tmpApp release];

            //make the window active
            [self.window makeKeyAndVisible];

            //init audio player in background thread. Do this
before building the interface in case home-screen has audio.
            [NSThread detachNewThreadSelector:
@selector(initAudioPlayer) toTarget:self withObject:nil];

            //load sound effect players in background thread.
Do this before building the interface is case home-screen uses
sound effects.
            [NSThread detachNewThreadSelector:
@selector(loadSoundEffects) toTarget:self withObject:nil];

            //load the applications data
            [self loadAppData];


      } //tmpApp

      //return
      return TRUE;

}
```

3.4 Testing

This project has been carried out as a rapid software development using evolutionary prototyping. The initial prototype is developed, built up and refined until the point of delivery.



This approach brings numerous advantages, one of which is the continuous testing throughout the process, testing each element as it's developed. Moving on to a subsequent element is not normally done until the previous element is complete. This testing method ensures that final testing is not such a big job as it might be in say a waterfall development approach.

The Apple development environment Xcode gives access to a simulator that can be used throughout the process. This is an incredibly useful tool to the developer and replicates virtually all elements of the iPhone itself. There are exceptions, such as with the location services, and there is no substitute for using on the device itself. However any change that is made in code can be quickly checked using the simulator, fitting in nicely with the evolutionary approach. Again, testing using the simulator should ensure that there are minimal problems when tested on the actual device and reduces the amount of final testing on the live device.

There are several phases of testing, on each occasion a full run through of tests will is conducted and the results recorded. The slightest change in 1 section of code can have a knock on effect across other sections of code inadvertedly. Therefore it is important that after any set of changes to address an issue, a comprehensive round of testing takes place:

- This starts with ensuring the new code set builds successfully in Xcode. A successful build means the code is syntactically correct.
- Then the app functionality is tested on the simulator to address whether the code change is having the desired effect, all the time ensuring that no knock on effect has taken place.

There will be a substantial amount of black box testing, looking at the results and seeing if they match the expected outcomes, but also white box testing as it's important to ensure that each component of our code is actually performing a function, performing as expected and contributing to the overall deliverable. It is important to also note, that all errors in performance or code should be addressed before new code/functionality is commenced.
A summary of the test cases can be found below with separate documents detailing the test cases:

Test Case TC1: Installation of application onto iPhone device via QR code
Test Case TC2: Installation of application onto iPhone device via iTunes Link
Test Case TC3: Launching of application
Test Case TC4: Establishing an Internet connection
Test Case TC5: Does Splash Screen appear?
Test Case TC6: Entering an invalid User Name/Password Combination
Test Case TC7: Entering a Valid User Name/Password Combination
Test Case TC8: Launching the 'Main Menu'
Test Case TC9: Launching the 'Room' Submenu
Test Case TC10: Launching the 'Air Conditioning Instructions'
Test Case TC11: Can I navigate the 'Air Conditioning Instructions' without restriction?
Test Case TC12: Launching the 'TV Channel List'
Test Case TC13: Can I navigate the 'TV Channel List' without restriction?
Test Case TC14: Launching the 'Local Services' List
Test Case TC15: Can I navigate the 'Local Services' List without restriction?
Test Case TC16: Launching the 'Fire Escape Plan'
Test Case TC17: Can I navigate the 'Fire Escape Plan' without restriction?
Test Case TC18: Launching the 'Dining' Submenu
Test Case TC19: Launching the 'Breakfast Menu'
Test Case TC20: Can I navigate the 'Breakfast Menu' without restriction?
Test Case TC21: Launching the 'Cinnamon Restaurant Menu'
Test Case TC22: Can I navigate the 'Cinnamon Restaurant Menu' without restriction?
Test Case TC23: Launching the '4 Corners Restaurant Menu'
Test Case TC24: Can I navigate the '4 Corners Restaurant Menu' without restriction?
Test Case TC25: Launching the 'Leisure' Submenu
Test Case TC26: Launching the 'Social' Submenu
Test Case TC27: Launching the 'Facebook' link
Test Case TC28: Can I log into 'Facebook'?
Test Case TC29: Does a default status appear for upload to 'Facebook'?
Test Case TC30: Can I change the status I upload 'Facebook'?
Test Case TC31: Can I upload the status I upload 'Facebook'?
Test Case TC32: Launching the 'Twitter' link
Test Case TC33: Can I log into 'Twitter'?
Test Case TC34: Does a default status appear for upload to 'Twitter'?
Test Case TC35: Can I change the status I upload 'Twitter'?
Test Case TC36: Can I upload the status I upload 'Twitter'?
Test Case TC37: Launching the 'Local Map' link
Test Case TC38: Is user prompted to allow current location?
Test Case TC39: Result of saying OK? Result of saying 'don't allow'?
Test Case TC40: Can user see current location (if allowed)
Test Case TC41: Can user zoom in and out of map?
Test Case TC42: Can user see local places of interest (Red Pins)?
Test Case TC43: Can user get further information regarding a red pin?
Test Case TC44: Can user view satellite or hybrid maps?
Test Case TC45: Launching the 'Account' Submenu

Test Case TC46: Launching the 'Help' Submenu
Test Case TC47: Launching the 'About App' link
Test Case TC48: Launching the 'Hilton' link
Test Case TC49: Launching the 'News' RSS Feed
Test Case TC50: Can user navigate from RSS feed link to full story?
Test Case TC51: Launching the 'E-Mail Us' link
Test Case TC52: Does user have full functionality with native E-Mail application
Test Case TC53: Launching the 'Call Us' link
Test Case TC54: Is phone call activated?
Test Case TC55: Launching the 'Hilton Website' link
Test Case TC56: Can user navigate the 'Hilton Website' without restriction?
Test Case TC57: Can user launch the 'Hilton Website' in Safari as opposed to in-app?

Further tests:
Test Case TCX: Do the app icons appear correctly at every stage?
Test Case TCX: Does the back icon always take the user one screen back?
Test Case TCX: Can the user pinch to zoom in and zoom out of data if required?
Test Case TCX: Do test adverts appear on screen?
Test Case TCX: Can adverts be launched?

3.5 Graphical User Interface (GUI) Layout

This iPhone application will be using the same touch screen technology now commonplace on mobile phones. It has become the standard navigational tool on Smartphone's, as it is the most accessible, intuitive and easy to navigate for users. The application sticks to the style and format of most iPhone applications and this makes it very easy for users to just pick up and use. Users will traverse through the application by selecting the icon they desire and using the back button if they want to revert to the previous screen. This is common throughout the app.

3.6 Customer Testing/Evaluation

In the requirement specification a focus group was put together to act as consultants and testers for my project. Unfortunately it wasn't ever possible to bring the group together to discuss with each other however there was opportunity to have some one to ones to check on progress. Xcode was installed on the machines of Mr. Edgar Holmes and Mr. Alan Graham to allow them to view the application on the simulator. Both Mr. Graham and Mr Holmes would ultimately be end users of this application. I have been unable to get Mr Nigel Buchanan, Operations Director of Yotel to test and evaluate the application this week, but I am hoping to get him to review before the showcase if not the presentation. Unfortunately Nigel's availability currently isn't great. It is fair to say that as development commenced later than expected the history of customer testing and evaluation is not as deep as I would have liked. Some comments are below:

Date: 31st March 2011
Name: Mr. Edgar Holmes
Communication Method: Skype
Summary of Comments:
Positive: The plan is excellent, and there are lots of ideas, with a clear direction for the app's development.
Negative: Would have expected to see a little more functionality in place by now
My Comment in response: Comments are fair, I completely agree, would have liked to see much more functionality by now. Unfortunately with delay in coding course and difficulty in learning progress has been slow. However, it should pick up now in coming days and weeks.

Date: 31st March 2011
Name: Mr. Alan Graham
Communication Method*:* In Person
Summary of Comments:
Positive: I have a clear idea of what I want to do and what I want the application to look like. Feels there is a real market for the application.
Negative: Thinks the scope of the project is too big and I need to drop some of the elements.

My Comment in response: Have taken concern for scope on board although I know now at this stage that I'm sadly not going to achieve what I thought I would. Discussion had about what elements to put back for now.

Date: 28th April 2012
Name: Mr. Edgar Holmes
Communication Method: Skype
Summary of Comments:
Positive: Huge amount of progress in a month and can now see things are beginning to take shape.
Negative: A discussion was had as to whether the social network element would be successful against Facebook or Twitter and whether there would be any uptake on it.
My Comment in response: Unlikely to achieve social network element before college deadline, however argued that this social network is not competing against Facebook or Twitter but will be a niche market. I point to the lack of success of Google Plus to date, and this is in no way going to eat into any market share but for those that stay within the hotel, particularly those travelling alone it's an opportunity to share with others. Even for those not alone it's a great opportunity to share information about the locality, places to avoid, places to go, ways to get there etc. Interesting conversation had but I'm convinced there is a market for this.

Date: 28th April 2012
Name: Mr. Alan Graham
Communication Method: In Person
Summary of Comments:
Positive: App is coming together, and should back up the concept I'm proposing. The dining section could be incredibly useful, as is the fact that the app can be refreshed with latest data without having to update through iTunes.
Negative: Not negative, but had discussion about business model and whether hotel would invest, why not just develop themselves?
My Comment in response: I would think that a hotel and the management would want to focus on how they take care of their customers, without getting bogged down in technology, therefore leaving that to others who specialise in that. I am sure that a hotel would be happy to pay a subscription (with a certainty around their technology expenses each month) in the knowledge that they can work together with Serv-Otel to tailor the application how they want it, making the application as customer centric as possible while minimising the workload on the hotel. All while providing a key selling point for the hotel, creating customer loyalty and reducing costs. I've spent quite some time thinking about a pricing model over the months.

3.7 Evaluation (How was the system evaluated and what are the results)

The app was evaluated with a paper-based questionnaire. This questionnaire is attached in the appendix. The questionnaire was submitted to all of the focus group as well as other individuals. Not all respondents were with me when they

filled the questionnaire or had access to iPhones or Xcode, and in some cases users had to rely on a series of screen images (A document with 17 screen images showing main features were supplied). In total 20 questionnaires have been returned. Some interesting statistics resulted:

About Hotel stays in General:

- 50% would not stay alone in a hotel
- Only 25% stayed in a hotel for business reasons
- 55% have stayed in a hotel 3-4 times in the last 12 months.

About Existing Hotel Apps:

- Only 25% stated that existing hotel apps would have at least a little influence on choosing to stay at a hotel
- More respondants have generic booking apps on their phone such as Tripadvisor (50%) and Booking.com (45%) than hotel/chain specific apps (20% have Premier Inn)

About Serv-Otel:

- 65% stated thay Serv-Otel would have at least a little influence on choosing to stay at a hotel.
- 75% stated they would find Serv-Otel Quite or Very Useful
- Live Billing Information (85%), Hotel Restaurant Info & Menu's (80%), and in room information (65%) were the most useful features
- Social Network Links and the Hotels own social network were seen as least useful (65% each)

Findings:
I have to be very careful making any presumptions about the results of the survey as the sample is very small, (20 questionnaires returned), however there is some food for thought. The finding that leaps out is that only 25% would say that their existing hotel apps have some influence over choosing where to stay but 65% have said that Serv-Otel would have some influence over choosing where to stay. I would be eager to dig deeper and see if this would be a wider view. With a wide range of ages responding this is encouraging, as it would not appear to be just a certain age bracket that would have felt this way. I would also love to dig deeper on other interesting trends, that I feel are important for a hotel to look at – for example, 95% stated they would return to a hotel again, yet only 5% stated they put up an online review. So here we have happy customers, who would return, but yet not actually advertise the fact. Perhaps that is something that future versions of Serv-Otel would look to address! I've mentioned a feedback form that would automatically prompts to a user, perhaps on the last day of their stay, and I think a chain should be brave enough to have this feedback form not only returned to their database but instantly uploaded to say Tripadvisor (the most popular booking app in this survey).

This has only wetted my appetite for more data, on a bigger scale and to use this data to shape future versions of Serv-Otel. (Copies of the questionnaire can be made available if required)

4: Conclusions

I'll start with an understatement – this project has been a huge learning experience. Regardless of failing to meet several objectives I know I've challenged and pushed myself greatly and learned a huge amount. There are several aspects to this conclusion. Firstly we can look at whether the application is a viable business option, secondly we can look at the project and thirdly we can look at myself on a personal level.

I think, although the application falls short of what I wanted to achieve or what I would approach any hotel with, I have at least proved that this is a viable application that has a lot of potential. The 'Further Development or Research' section that follows outlines the huge scope for subsequent releases. Someone who works in Apple recently told me that when the next big thing is put forward to the management it is also a requirement that the following 2 versions are presented at that time. It's how Apple constantly stays ahead of the game. I think there is something of this approach in this application. Not only is the scope that I set new and innovative now, the ideas and developments I've got in mind mean that this application could stay ahead of any competition in the future, and any hotel approached could see clearly the direction and possibilities of taking on such an application, as well as the benefits to them.

I realise looking back that I simply took on a huge project, and while working on the 6 other modules, exams etc, was simply too big for 1 person with little coding experience. For example, taking on Xcode from scratch was ambitious from the levels I was at. While I tried to control the scope of the project as much as possible, I realise now that things I thought I could achieve have been beyond my capability in this time scale however I do now have a base and an understanding of Xcode which I can build on and I would expect further learning and development to be accelerated as a result. I tried to teach myself Xcode development using multiple books and the Internet but realised I needed further assistance. As a result I took a costly 5-day introduction to Xcode course delivered by CompuB. These courses and others like them will hopefully run a couple of times of year but they were new to CompuB this year. It was also delayed from its original date on not 1 but two occasions. It eventually ran in March 2012 but this delayed me making real progress on my application until late in the timeframe which was far from ideal. While the course was excellent and gave me new understandings and new skills I found that the environment is huge, in constant flux (Xcode versions have changed dramatically since I started in Sept) and even this basic course came with a folder of several hundred pages of notes. Regardless I tried to achieve as much as I could but knew that some more advanced aspects such as chat for example would likely be beyond me at this stage, which is a little disappointing.

Also looking at apps in general, they can be very simple, focusing on just 1 or 2 particular functions. My application however is vast as far as applications go, attempting to encompass elements such as chat, online bookings, live account information alongside log-ins, information presentation and integration with Apples own native applications. Other apps may just focus on doing 1 of these elements very well. I underestimated the size of the task in hand.

In saying this, and remembering I'm a Business Information Systems student, and not a Software Student, on a personal level I'm delighted I took on a task of this size. It became daunting and overwhelming at times but I'm also excited about how it could develop and I'm passionate about seeing it through. I feel I could have taken an easier option, perhaps taken something everyone would be a bit more comfortable with and stayed within a comfort zone. But to do that I think would be missing the aim of this software project. I wanted to be challenged, I knew I would be with the very basic coding experience I have: I had none prior to this college course and even within the college the exposure I feel was limited – for example it's a long way from creating an array in Java to producing a full mobile application in Xcode. I've learned a whole host of new tools and new skills and would have no hesitation, even if ultimately disappointed with the physical app at this stage, of undertaking the same scale of challenge all over again.

5: Further Development or Research

There is huge scope for development with this application, and with a little creativity and innovation I can already see numerous new releases each bringing something new and valuable to the application. Further improvements include:

- Development of multiple languages for the application to be rolled out for, starting with Chinese, French and Spanish hitting the most commonly used languages immediately opening up the hotel to these markets.
- Opportunity to interact with guests from other hotels within the chain creating a Hilton Community which fosters ties with the chain increasing loyalty.
- Integration with a VOIP service such as Skype or Viber, providing the hotel with the opportunity to remove expensive in-hotel phone systems
- Opportunity to submit online feedback form for the hotel
- Integration with FourSquare Social Networking
- Opportunity to request wake up call
- Opportunity to order a Newspaper
- Opportunity to chat directly to the Concierge/Room Service
- Opportunity to control more aspects of the room such as the lighting or the room temperature
- Opportunity to interact with the television, including pausing live TV or recording a program/film onto Hard Drive
- Opportunity to play games against fellow guests perhaps using Apples Game Centre, reduces need for such facilities to be offered through the TV.
- Viewing any loyalty scheme rewards in the Account page.

NB: It's important to remember that these aspects could be used anywhere with a network, it doesn't need to use the hotels wi-fi, but for example when a customer is on the way back to the hotel after a day's sightseeing, or a meeting and want to adjust the room, record a tv program, arrange a meal etc etc.

A form of version control would be used and a minor change to structure could result in a 0.1 increment and release with a more major addition causing a 1.0 increment. These releases would be released through the app store.

Having started this project I am determined to bring it to a form of completion and to see if I can make an entry into the market, even in a single hotel on a trial basis, working with a hotel owner. It may be possible through Mr. Alan Graham, to gain access to someone who has a handful of hotels in Ireland. It has not been possible to involve this particular Gentleman in this project.

Now that the project has finished I will look for someone to work with to develop my coding skills and to develop the application as quickly as possible. I have just started down the road of Xcode and have a taste to keep learning and developing. Having registered and paid my fees to Apple to be a developer, as well as investing heavily in Xcode courses, I may also look to develop smaller apps with less functionality on different subjects, in the iTunes app store.

6: Bibliography

Some of the sources of information used are mentioned below:

Adams, D (2011) *Study Reveals Technology Makes Us Stressed Out* [Internet] USA. Available from: < http://www.bitrebels.com/lifestyle/study-reveals-technology-makes-us-stressed-out/> [Accessed 8th May 2012]

Carlson, N. (2011) *The Real History of Twitter* [Internet] USA. Available from: <http://articles.businessinsider.com/2011-04-13/tech/29957143_1_jack-dorsey-twitter-podcasting > [Accessed 5th May 2012]

Cherry, B (2012) *Twitter: On Twitter, how many tweets are there per second on average?* [Internet] USA. Available from: <http://www.quora.com/Twitter-1/How-many-tweets-per-day-are-there-on-Twitter> [Accessed 5th May 2012]

Corr, F (2011) *Can tourism grow again? - Dec/Jan 2011* [Internet] Ireland. Available from: < http://www.hotelandrestauranttimes.ie/index.html> [Accessed 7th May 2012]

Cridland, J. (2011) *Hilton Hotels should come clean about their internet charges* [Internet] USA. Available from: <http://james.cridland.net/blog/hilton-hotels-should-come-clean-about-their-internet-charges/ [Accessed 6th May 2012]

Deloitte (2012) *Dublin hotel performance significantly improves in 2011* [Internet] Ireland. Available from: <http://www.deloitte.com/view/en_IE/ie/news/ie-pressreleases-en/1e04b4e5073c5310VgnVCM2000001b56f00aRCRD.htm> [Accessed 8th May 2012]

DeWitt, Philip, E. (2012) *Transcript: Apple CEO Tim Cook at Goldman Sachs* [Internet] USA. Available from: <http://tech.fortune.cnn.com/2012/02/15/transcript-apple-ceo-tim-cook-at-goldman-sachs/> [Accessed 6th May 2012]

European Travel Commission (2012) *Ireland* [Internet] Available from: <http://www.newmediatrendwatch.com/markets-by-country/10-europe/69-ireland > [Accessed 7th May 2012]

Failte Ireland (2010) *Failte Ireland – Hotel Review 2011* [Internet] Ireland. Available from: <http://www.failteireland.ie/FailteCorp/media/FailteIreland/documents/Research%20and%20Statistics/Surveys%20and%20Reports/FI_Hotel_Review_2010_V2.pdf> [Accessed 7th May 2012]

Feiler, J. (2010) *Get Rich with Apps.* United States, McGraw Hill.

Forseman, C (2012) *Samsung, Apple continue smartphone market share tug-of-war* [Internet] USA. Available from: <http://arstechnica.com/gadgets/news/2012/05/samsung-apple-continue-smartphone-marketshare-tug-of-

war.ars?utm_source=rss&utm_medium=rss&utm_campaign=rss> [Accessed 7th May 2012]

Google. (2011) [Internet] Available from: <http://www.google.com/search?client=safari&rls=en&q=the+questions+%22is+there+an+app+for+that%3F%22&ie=UTF-8&oe=UTF-8v> [Accessed 5th May 2012]

Hilton (2012) [Internet] USA. Available from: <http://www.hiltonworldwide.com/about/ > [Accessed 8th May 2012]

Hilton (2012) [Internet] USA. Available from: <http://www3.hilton.com/en/destinations/index.html> [Accessed 9th May 2012]

Honan, M. (2007) *Apple Unveils iPhone* [Internet] USA. Available from: <http://www.macworld.com/article/1054769/iphone.html > [Accessed 5th May 2012]

Kallas, P (2012) *The ROI of Social Media [Infographic]* [Internet] USA. Available from: <http://www.dreamgrow.com/the-roi-of-social-media-infographic/> [Accessed 7th May 2012]

Kelly, O (2012) *Tourist numbers increased 7% in 2011* [Internet] Ireland. Available from: <http://www.irishtimes.com/newspaper/ireland/2011/1230/1224309632109.html> [Accessed 8th May 2012]

Panayottis, G (2012) *European hospitality results 2011: between satisfaction and a question mark | MKG Reports* [Internet] USA. Available from: <http://www.hsmaieconnect.org/news/154000370/4054695.html > [Accessed 8th May 2012]

Rauch, M. (2012) *Free Wi-Fi Rules as Most-Desired Hotel Amenity* [Internet] USA. Available from: <http://travel-industry.uptake.com/blog/2012/02/02/free-wi-fi-rules-as-most-desired-hotel-amenity/> [Accessed 7th May 2012]

Ray, J. (2011) *Teach Yourself iPhone Application Development.* Indiana, United States, Pearson Education.

Unknown. (2012) *Facebook.com* [Internet] USA. Available from: <http://articles.businessinsider.com/2011-04-13/tech/29957143_1_jack-dorsey-twitter-podcasting > [Accessed 5th May 2012]

Unknown (2012) *Google.com* [Internet] USA. Available from: <http://www.alexa.com/siteinfo/google.com> [Accessed 6th May 2012]

Unknown (2012) *Global* [Internet] USA. Available from: <http://www.alexa.com/topsites/global > [Accessed 6th May 2012]

Unknown (2012) *HotelChatter Annual WiFi Report 2012: FAQ* [Internet]. Available from: <http://www.hotelchatter.com/special/FAQ-WiFi-Hotels-2012> [Accessed 6th May 2012]

Unknown (2011) *Internet Usage Statistics* [Internet] USA. Available from: <http://www.internetworldstats.com/stats.htm> [Accessed 5th May 2012]

Yotel (2012) [Internet]. Available from: < http://www.yotel.com>[Accessed 8th May 2012]

7: Appendix

7.1 Project Proposal

Project Proposal

Working Title: Serv-Otel

Robert O'Grady
x08871965
robert.ogrady@student.ncirl.ie

BSHBISE4
BSc (Hons) in Business information Systems

September 2011

Objectives

At it's most basic the objective of this project is to produce a mobile application that a user staying in a hotel can use to access and interact with various information and services offered by the hotel. Ultimately this has to be an application that will lead to improvements in a hotel stay for both the hotel management who will ultimately be purchasing this application and the resident who's satisfaction in their stay is ultimately the lifeblood of the hotel. After all an unsatisfied resident is unlikely to return and worse are now capable of putting up poor reviews and ratings for all to see on the like of Trip Advisor etc. However these are just the overarching objectives, and many things have to be considered and achieved to reach this overall objective.

From a technical point of view, while I'm producing this application using an iPhone I will aim to use technologies in such a way as to make this application as portable across devices as possible, that is that whether the user has an Android phone, or whether it's a blackberry that they too will be able to use this application in time. As much data as possible will be required to be held on a cloud and passed to the mobile phone as and when required. This is critical to the success of the application in the commercial world.

For the hotel management the objective of the application will be to offer a much more complete and simple customer service mechanism to the resident than the hotel may currently offer. It will achieve time and cost savings for the hotel at the same time as increasing satisfaction levels. It will also do this with little extra knowledge of technologies and without the need to purchase expensive new equipment, which would require it's own storage space and maintenance.

It is important that the hotel resident has the ability to access any information or service offered by the hotel in as efficient a way as possible. This should be whether the resident is availing of the free hotel Wi-Fi or whether the resident is away from the hotel on business or on leisure. All the information that the resident requires should be in the palm of their hands and this is not currently the case.

This application should work as painlessly as possible for all parties, that is that it is accessible quickly, works smoothly, has a simple GUI that all users would instantly know how to navigate round and is available at little or no extra cost to at least the hotel resident and minimal cost to the hotel.

Background

I recently stayed in a 4* hotel in London. My experience was similar to others I've had, and experiences others have had. Upon arrival there was a lengthy check in which was fine, however sometimes not all the information given is taken in at the time. We went to the room and looked for the information pack. It was actually missing, checked the TV and other than the channel list coming on screen there was no further information. The door hanging breakfast order form was on the bed as usual. We found the tea/coffee making facilities but there were no teaspoons. So we rang down to room service but no answer. We eventually got hold of someone on reception, and they passed the query to someone who did bring the missing items to the room. The guest information pack when it arrived was limited, it was nicely printed, in a nice pricy hardback book and included some information but was limited. For example does anyone actually know how to use the air conditioning in hotels? And what's the situation with the Wi-Fi as there was no mention of it in the book? There were 2 restaurants in the hotel but if I wanted to see the menu I needed to go back downstairs again… and so it continued… and so I thought about other experiences I'd had… While I'm a fan of traditions and appreciate an old fashioned approach to service I do embrace new technologies and know that they can compliment traditions and improve standards for everyone concerned.

When you think about hotels and the experience you can have in a hotel it varies from hotel to hotel. Some provide guest information in printed format, some provide it on a very clunky and unresponsive TV format, it's often not in a language that can be understood by the resident, it is limited in that it's plain text. As a resident I can only get so much from this information. I still have to leave out my breakfast order on the door handle for someone to collect and process, I still have to call if I want to speak to room service and may not get anyone, there's still no one place to leave a message if I want to for the cleaner…it's hit and miss whether they see the note I leave. I still have to go downstairs to see the restaurant menus or I have to try and get someone on the phone if I want to make a booking. I'm dependant on the local knowledge of the concierge for information, which they may or may not have. I don't know how much my tab is unless I'm maintaining it somewhere myself. I may not even remember what facilities I was supposed to have received when I booked…. All of these variables can cause frustration for the resident of the hotel and as a resident I'm as likely to be on my mobile texting, calling or social networking my frustrations as I am to find someone in the hotel to sort out the issues.

Some hotels have tried to move on from the printed information guides and have an in-TV information system. These tend to also give limited information and more often seem to simply be glorified entertainment guides with TV channel listings with the option of ordering some movies perhaps. These systems can often be quite unresponsive and suffer time delays …there is further potential to advance these TV information services but it does require an investment both in

the software, the networking and the equipment and therefore becomes an expensive option for the hotel.
So what can be done? The hotel industry is suffering like a lot of other industries in Ireland and the UK, countries that are in the grips of a recession. Taking Ireland alone, total visitor numbers fell by "15% in 2010" and "profitability fell for 2 out of 3 hotels". (Ref: Failte Ireland Jan 2011) It is becoming increasingly difficult for hotels to operate and funds are tight. Cutbacks may be necessary in some areas to keep afloat yet competition is all the more intense as hotels compete to not only gain customers in short term, but ensure good word of mouth from those customers to ensure more customers and returning customers in the medium to long term. Failure to do so will lead hotels to join the expanding list of 'ghost' hotels. Therefore service levels cannot decrease and must in fact increase. Anything that helps increase customer satisfaction at limited cost, perhaps even cost neutral or even cost saving when all is considered, is something that has to be attractive to the industry.

Mobile technology has advanced at an alarming rate in the last few years. The birth of the iPhone in 2007 not only changed the mobile phone industry but also changed the way people used and perceived the mobile phone and subsequently changed our lives. 4 years ago we would never have dreamed that we could use the internet in the palm of our hands, that we could have the phone tell us how to get home through maps telling us exactly where we were, that we would be social networking all the way home from work, banking online, booking cinema tickets, sending video recordings to our friends… We are now very much in the world of the smart phone and all the benefits that brings, and users are very now comfortable with the technology.

The advancements continue and industries are continually trying to come up with new ways to use this technology. The travel industry is one such industry. While airlines embraced the Internet years ago, new and innovative ways to simplify the travel experience are taking place. For example, take the Heathrow Express and you will find you use a QR codes on your phone as your ticket, rather than a printout, completely eliminating the need for paper. The hotel industry is playing catch up with many hotels not even offering Wi-Fi to their guests. I think there are ways that the hotel industry can use technology to improve their service, give a competitive edge over other hotels/chains and cut costs and I feel I have a solution: Serv-Otel, a mobile phone application that the resident downloads from the hotel upon arrival via QR code and free Wi-Fi, in the language of their choice, which allows them a fully informed, customer satisfaction oriented and interactive experience while they stay at the hotel. It allows them the opportunity to have all the information and services they require from the hotel in the palm of their hands.

Technical Approach

Initially I'm going to create this mobile application for the iPhone. According to Apple's Third quarter results the iPhone is now the biggest selling phone in the world, with 20.34million alone sold in the 3rd quarter of fiscal year 2011. (Apple.com) Therefore iPhone users are the single dominant market so it makes sense to develop for the widest audience possible. However, it should be possible to quickly code for other mobile operating systems and where possible as much information will be stored using cloud computing and pulled down onto the mobile device when necessary.

The use of mobile applications has ballooned since the iPhone's creation, rarely has a technology grown so quickly. According to mobithinking.com over 300,000 apps are in the iTunes store (www.techcrunch.com report that in July 2011 it was up to 425,000) with nearly 175,000 for other platforms in 2010 and it's thought that app subscribers haven't peaked yet so we're looking at a growing market with huge potential. In July Apple reported that they'd achieved over 15billion downloads through the app store. Also it can be relatively cheap to produce an application compared to traditional software development.
The trick is finding new and innovative ways to use this technology in existing industries to add value but we are in an age where people are willing to adapt what they do as a result of technology.

I've identified several requirements that I want to achieve, both from my own observations and from observing and talking informally to others. I want this application to be the one access point for information and services offered by the hotel, whether its ordering your breakfast for the room, or booking a session in the sauna, to checking your running hotel bill, to an express checkout or even interacting with the concierge and other residents to get local recommendations using an in-hotel social networking chat tool. There are many other options that could be added to this. Perhaps connecting with Skype allows the replacement of desk phones in hotels but that is likely to be outside the scope of this project.

As discussed in the technical details this will be a 3-tier application approach with the user experiencing the application on a mobile device, accessing a database and a secure Web Server. The software envisaged to be used is discussed in the 'Technical Details' section.

The challenges are likely to come from my own coding limitations and the timeframes we are operating in. I am learning Xcode development for the iPhone and we'll have to see how that progresses as to how much we achieve bearing in mind I'm a business student and not a software student.

Special Resources Required

Throughout the project I expect several textbooks will be utilized to aid the coding process. Initially 'iPhone Application Development in 24 Hours' 2nd Edition by John Ray will be used and referenced. Other books and websites will be used as the coding continues where extra help is required.

In researching the hotel industry I am hopeful of having access to someone who owns hotels in Ireland with which to access information and feedback from. This will particularly help with understanding the requirements of the hotel management.

With regards the application itself an iPhone will be required for testing purposes.

Project Plan

Please see Microsoft Project document attached.

Technical Details

Developing on Apples iPhone involves using the Apple Developer suite (IOS SDK), which is used across the entire Apple range (iPod, iPhone, iPad and Mac). The Apple Developer Suite contains several components. Xcode 4 is the latest version of the apple developer suite and within Xcode we work with Objective-C and Cocoa Touch. Objective-C is the language that we will use to write the mobile phone application. It is within Objective-C that we will include our decision-making and logic code. Cocoa Touch is the framework for the objective-C code. Cocoa Touch is born from the more established Cocoa framework used for many years in Mac development. Cocoa Touch is for use solely with touch screens and handheld devices. Cocoa Touch gives us many tools and classes with which we can take advantage of. This combination will allow the production of an iPhone application that users will be instantly familiar with and be able to immediately pick up and use. It will allow us to create all the functionality that's required.

There are several other elements that are going to be required as we are looking at a 3-tier approach. It is necessary to store as much data within the cloud, thus negating a requirement for hard drives to be purchased and stored within the hotel and to make the application as small in size and as portable as possible for development across other platforms. To do this access to a secure Web Server such as Amazon EC2 storage server is required. The beauty of this service is that the power of the Web Servers services can be utilised giving ultimate reliability and power, as well as expanding in size to the applications space needs and requirements. This server will also be used to allow users to download the application wirelessly from.

A database may be required for certain information, in which case something such as MySQL 5.5 Community edition, which, is free and open source would be suitable for our needs. This will work well with the Amazon server. However SQLite, which tends to be used for mobile devices, will need to be considered.

In order for the application to query and retrieve information from a database, there are a number of options. 1 option is Java Database Connectivity (JDBC). JBDC will provide direct access to the database will be the link between the users mobile application and the database where the live information is going to be stored. Another option is REST (Representational State Transfer), which allows us to use HTTP to Create/Read/Update or Delete operations using a URL and a web server. A third option could be JavaScript Object Notation (JSon). This is a text-based solution, much lighter in functionality than the previous 2 options and as the name suggests is JavaScript based. It is however highly portable and allows interchange of data. Further research is going to be required here to see which approach to take.
For the end user, before they even see the application I am considering using QR technology, which is becoming more and more commonplace in the high street or in newspapers. QR or Quick response Codes are being used to direct customers to information, or special offers, or URLs etc. To generate a code is

very quick and simple and when read by a QR reader can point a user to the download site for the relevant language version of the hotels application.

Evaluation

Very early in this project a series of use cases and test cases will be generated and these will form a reference point for all testing throughout the lifecycle of this project. At an early stage there will need to be a series of Heuristic evaluations to minimize any usability problems. As each feature is programmed and developed, testing and evaluating will take place due to the prototype development being used. Each testing phase will feed back into a design and then development stage until the feature is working satisfactorily.
Once a testing phase is reached however formal tests will be carried out and need to be both of a technical nature and a user experience nature. On the technical side there will need to be tests for example to ensure that the QR code points to the download on the web server, that the download installs to the mobile device, that the application opens correctly. Each feature will need to be tested from a technical point of view, such as if there is a social network element that is open to all residents and staff within the hotel, that users have the ability to send and read chat messages uploaded. Every element, be it a scroll bar, or a push button will need to be tested to ensure that each component is working as expected. Therefore a comprehensive set of these unit tests will be performed before the application is ready for release. The results of these tests will be easily quantifiable and recorded. It will be important early on to try and identify a series of performance measures/metrics with which we can assess each element.

Also from a technical point of view tests will need to be conducted to test not only that each feature works as expected in isolation, but also if they work if accessed in particular sequences or if any particular action has a follow on effect to another action or feature. This forms the integration testing.

From a user experience point of view, tests will be required to ensure that the users understanding of a feature is immediately the same as that of the programmer (Heuristics), that the user understands why they feature is there, that the user feels each feature is as simple as it can possibly be. It is essential that different versions be released to a small group of people I've identified to get their feedback and input into the application. This group of people is made up of friends, family and colleagues from both sexes and across a span of ages from 13 to 75. All would be regular users of hotels and that is the criteria that I would simply be looking for. I would also be including a hotel owner in this feedback process. I would consider it important for the success of the application that anybody could use the application simply and easily. This feedback will be in the form of one to one interviews, observation and questionnaires. Observation will be important as it is necessary to view how easy or difficult it is for a user to navigate around the application to get the information they require. This evaluation is more qualitative and maybe more difficult to assess.

I know that having a test team made up of people I know may lead to feedback being withheld therefore I envisage having a Beta test version prior to the final release that I can have assessed by users completely independent to me. These users will either be random on street interviewing and/or, I am hoping that I will

be able to use my contact to link with a hotel which will allow me to receive feedback directly from hotel residents as well as the hotel management. I would like to think that this could develop into a full-blown pilot with the hotel for commercial purposes. However, on street interviewing will be equally valid, whether random or quota driven, perhaps limiting it to those who've stayed in a hotel in the last 3 months, as they will have an equally valid opinion on what they want to experience from a hotel. All feedback will need to be recorded and used to make any adjustments necessary to ensure a successful application.

Consultation 1

Consultation took place with Ron Elliot – summary of feedback below:

"This idea has a lot of scope for integration with emerging services in the sector. The idea is practical and I can see real value for both the user and the client. A comprehensive investigation of all the technologies involved and some good primary market research would make for interesting reading."

Monday 26th September 2011

Consultation 2

Consultation took place with Paul Hayes – summary of feedback below:

"A good idea with possibility of commercialisation. Very relevant for Business Information Systems.
However, do you know many hotel managers that you can use as customers? Can you do something similar for the health service which might make it easier for you to evaluate?"

My response to Paul on his questions:
I've been in touch with Paul on this, I am hopeful of having access to a hotel owner and would expect that he could put me in touch with other hotel owners as well as hotel management with which to get into more detailed discussion with. By evaluating with end users, i.e. those that stay as residents in hotels and if I receive favourable feedback, this is going to be a valuable tool in getting buy in from the hotel owners and managers themselves. After all it's a customer service industry and what the customer wants…

With regards the HSE there is definite merit and potential for some application, particularly to simplify things for clients of the HSE amongst the myriad of services and information. I have put considerable thought into this as this is my area of work however I've not been able to put together something that I think would be useful for an end user, add value to an end users experience of the HSE or be commercially viable.

Monday 26th September 2011

Proposed Supervisor

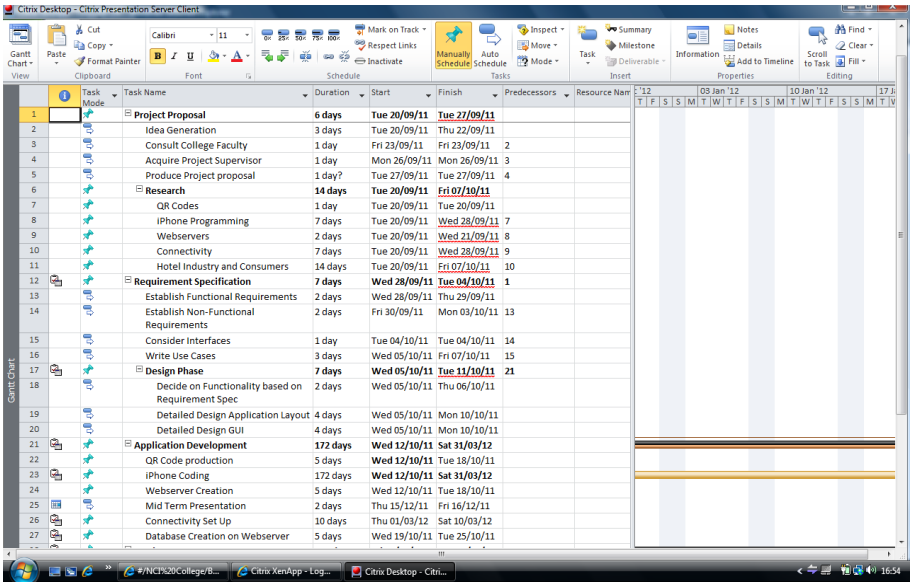
I have consulted with Ron Elliot and Ron has kindly agreed to act as my supervisor for my project.

Robert O'Grady
x08871965
BSHBISE4

7.2 Project Plan

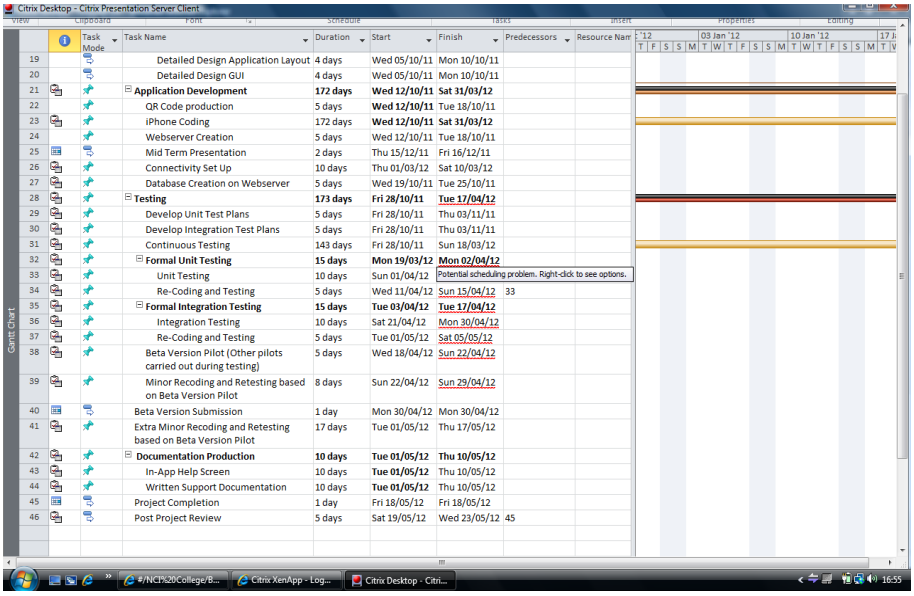
Original Plan:

To the right is a screen shot of the original project plan submitted with the project proposal. This is displayed using Microsoft Project



	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Project Proposal**	**6 days**	**Tue 20/09/11**	**Tue 27/09/11**	
2		Idea Generation	3 days	Tue 20/09/11	Thu 22/09/11	
3		Consult College Faculty	1 day	Fri 23/09/11	Fri 23/09/11	2
4		Acquire Project Supervisor	1 day	Mon 26/09/11	Mon 26/09/11	3
5		Produce Project proposal	1 day?	Tue 27/09/11	Tue 27/09/11	4
6		**Research**	**14 days**	**Tue 20/09/11**	**Fri 07/10/11**	
7		QR Codes	1 day	Tue 20/09/11	Tue 20/09/11	
8		iPhone Programming	7 days	Tue 20/09/11	Wed 28/09/11	7
9		Webservers	2 days	Tue 20/09/11	Wed 21/09/11	8
10		Connectivity	7 days	Tue 20/09/11	Wed 28/09/11	9
11		Hotel Industry and Consumers	14 days	Tue 20/09/11	Fri 07/10/11	10
12		**Requirement Specification**	**7 days**	**Wed 28/09/11**	**Tue 04/10/11**	**1**
13		Establish Functional Requirements	2 days	Wed 28/09/11	Thu 29/09/11	
14		Establish Non-Functional Requirements	2 days	Fri 30/09/11	Mon 03/10/11	13
15		Consider Interfaces	1 day	Tue 04/10/11	Tue 04/10/11	14
16		Write Use Cases	3 days	Wed 05/10/11	Fri 07/10/11	15
17		**Design Phase**	**7 days**	**Wed 05/10/11**	**Tue 11/10/11**	**21**
18		Decide on Functionality based on Requirement Spec	2 days	Wed 05/10/11	Thu 06/10/11	
19		Detailed Design Application Layout	4 days	Wed 05/10/11	Mon 10/10/11	
20		Detailed Design GUI	4 days	Wed 05/10/11	Mon 10/10/11	
21		**Application Development**	**172 days**	**Wed 12/10/11**	**Sat 31/03/12**	
22		QR Code production	5 days	**Wed 12/10/11**	Tue 18/10/11	
23		iPhone Coding	172 days	**Wed 12/10/11**	**Sat 31/03/12**	
24		Webserver Creation	5 days	Wed 12/10/11	Tue 18/10/11	
25		Mid Term Presentation	2 days	Thu 15/12/11	Fri 16/12/11	
26		Connectivity Set Up	10 days	Thu 01/03/12	Sat 10/03/12	
27		Database Creation on Webserver	5 days	Wed 19/10/11	Tue 25/10/11	

The project plan is continued here right.



	Task Mode	Task Name	Duration	Start	Finish	Predecessors
19		Detailed Design Application Layout	4 days	Wed 05/10/11	Mon 10/10/11	
20		Detailed Design GUI	4 days	Wed 05/10/11	Mon 10/10/11	
21		**Application Development**	**172 days**	**Wed 12/10/11**	**Sat 31/03/12**	
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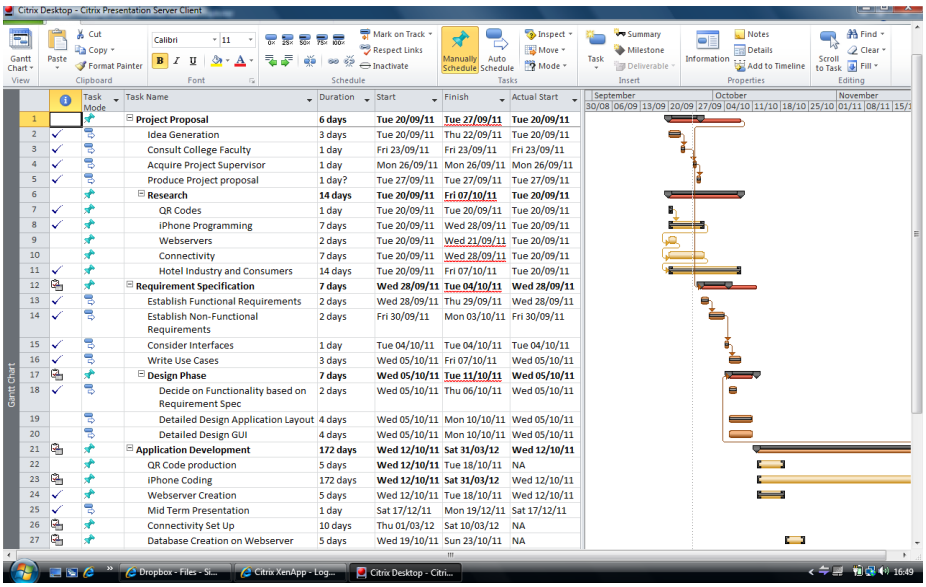
26		Connectivity Set Up	10 days	Thu 01/03/12	Sat 10/03/12	
27		Database Creation on Webserver	5 days	Wed 19/10/11	Tue 25/10/11	
28		**Testing**	**173 days**	**Fri 28/10/11**	**Tue 17/04/12**	
29		Develop Unit Test Plans	5 days	Fri 28/10/11	Thu 03/11/11	
30		Develop Integration Test Plans	5 days	Fri 28/10/11	Thu 03/11/11	
31		Continuous Testing	143 days	Fri 28/10/11	Sun 18/03/12	
32		**Formal Unit Testing**	**15 days**	**Mon 19/03/12**	**Mon 02/04/12**	
33		Unit Testing	10 days	Sun 01/04/12	Potential scheduling problem. Right-click to see options.	
34		Re-Coding and Testing	5 days	Wed 11/04/12	Sun 15/04/12	33
35		**Formal Integration Testing**	**15 days**	**Tue 03/04/12**	**Tue 17/04/12**	
36		Integration Testing	10 days	Sat 21/04/12	Mon 30/04/12	
37		Re-Coding and Testing	5 days	Tue 01/05/12	Sat 05/05/12	
38		Beta Version Pilot (Other pilots carried out during testing)	5 days	Wed 18/04/12	Sun 22/04/12	
39		Minor Recoding and Retesting based on Beta Version Pilot	8 days	Sun 22/04/12	Sun 29/04/12	
40		Beta Version Submission	1 day	Mon 30/04/12	Mon 30/04/12	
41		Extra Minor Recoding and Retesting based on Beta Version Pilot	17 days	Tue 01/05/12	Thu 17/05/12	
42		**Documentation Production**	**10 days**	**Tue 01/05/12**	**Thu 10/05/12**	
43		In-App Help Screen	10 days	**Tue 01/05/12**	Thu 10/05/12	
44		Written Support Documentation	10 days	**Tue 01/05/12**	Thu 10/05/12	
45		Project Completion	1 day	Fri 18/05/12	Fri 18/05/12	
46		Post Project Review	5 days	Sat 19/05/12	Wed 23/05/12	45

MidTerm Update:

In Dec with the Prototype Presentation an updated Project Plan was submitted. See Right:



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12		**Requirement Specification**	**7 days**	**Wed 28/09/11**	**Tue 04/10/11**	**Wed 28/09/11**
13		Establish Functional Requirements	2 days	Wed 28/09/11	Thu 29/09/11	Wed 28/09/11
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15		Consider Interfaces	1 day	Tue 04/10/11	Tue 04/10/11	Tue 04/10/11
16		Write Use Cases	3 days	Wed 05/10/11	Fri 07/10/11	Wed 05/10/11
17		**Design Phase**	**7 days**	**Wed 05/10/11**	**Tue 11/10/11**	**Wed 05/10/11**
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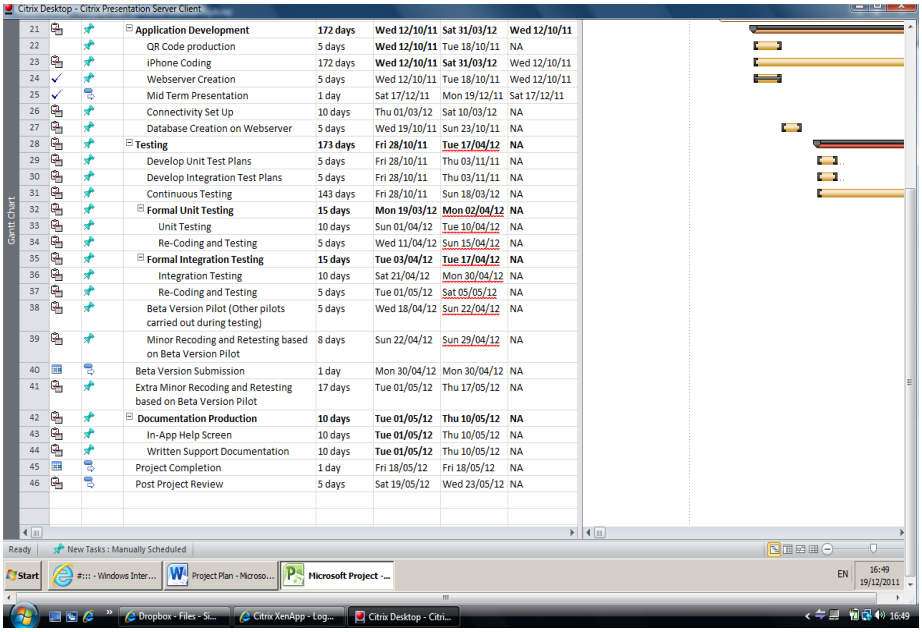
25		Mid Term Presentation	1 day	Sat 17/12/11	Mon 19/12/11	Sat 17/12/11
26		Connectivity Set Up	10 days	Thu 01/03/12	Sat 10/03/12	NA
27		Database Creation on Webserver	5 days	Wed 19/10/11	Sun 23/10/11	NA

This updated plan is continued right, again displayed via Microsoft Project.



	Task Mode	Task Name	Duration	Start	Finish	Actual Start
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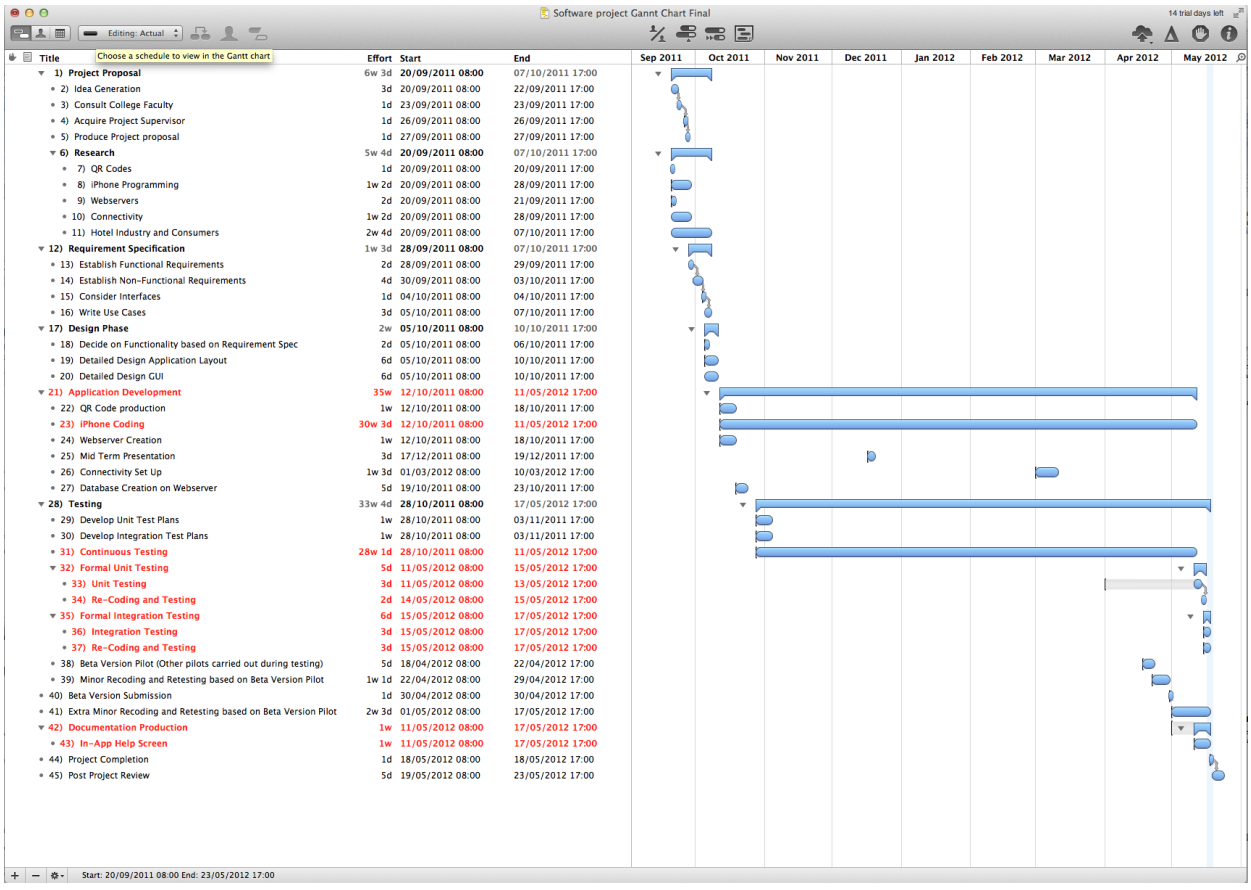
24		Webserver Creation	5 days	Wed 12/10/11	Tue 18/10/11	Wed 12/10/11
25		Mid Term Presentation	1 day	Sat 17/12/11	Mon 19/12/11	Sat 17/12/11
26		Connectivity Set Up	10 days	Thu 01/03/12	Sat 10/03/12	NA
27		Database Creation on Webserver	5 days	Wed 19/10/11	Sun 23/10/11	NA
28		**Testing**	**173 days**	**Fri 28/10/11**	**Tue 17/04/12**	**NA**
29		Develop Unit Test Plans	5 days	Fri 28/10/11	Thu 03/11/11	NA
30		Develop Integration Test Plans	5 days	Fri 28/10/11	Thu 03/11/11	NA
31		Continuous Testing	143 days	Fri 28/10/11	Sun 18/03/12	NA
32		**Formal Unit Testing**	**15 days**	**Mon 19/03/12**	**Mon 02/04/12**	**NA**
33		Unit Testing	10 days	Sun 01/04/12	Tue 10/04/12	NA
34		Re-Coding and Testing	5 days	Wed 11/04/12	Sun 15/04/12	NA
35		**Formal Integration Testing**	**15 days**	**Tue 03/04/12**	**Tue 17/04/12**	**NA**
36		Integration Testing	10 days	Sat 21/04/12	Mon 30/04/12	NA
37		Re-Coding and Testing	5 days	Tue 01/05/12	Sat 05/05/12	NA
38		Beta Version Pilot (Other pilots carried out during testing)	5 days	Wed 18/04/12	Sun 22/04/12	NA
39		Minor Recoding and Retesting based on Beta Version Pilot	8 days	Sun 22/04/12	Sun 29/04/12	NA
40		Beta Version Submission	1 day	Mon 30/04/12	Mon 30/04/12	NA
41		Extra Minor Recoding and Retesting based on Beta Version Pilot	17 days	Tue 01/05/12	Thu 17/05/12	NA
42		**Documentation Production**	**10 days**	**Tue 01/05/12**	**Thu 10/05/12**	**NA**
43		In-App Help Screen	10 days	**Tue 01/05/12**	Thu 10/05/12	NA
44		Written Support Documentation	10 days	**Tue 01/05/12**	Thu 10/05/12	NA
45		Project Completion	1 day	Fri 18/05/12	Fri 18/05/12	NA
46		Post Project Review	5 days	Sat 19/05/12	Wed 23/05/12	NA

Final Project Plan:

Final Project Plan below (In OmniPlan as opposed to Microsoft Project – I find this a much better program to use). The tasks in red denote a delay in the original planned start and end dates. This was primarily caused by the iPhone coding taking much longer than anticipated, caused in turn by the delays in getting onto an iPhone coding course. The result, in order to complete on time was to cut short on some of the testing periods, which in the 'real' world could cause many potential issues due to bug ridden code, ultimately ending in an increase in project cost and rework in order to get the application working effectively. The release date in this instance would have been pushed back. It depends what statistics you believe but anything up to 80-90% of projects fail to be completed on time or in budget.



7.3 Requirement Specification

Requirements Specification

Working Title: Serv-Otel

Robert O'Grady
x08871965
robert.ogrady@student.ncirl.ie

Supervisor
Paul Hayes

BSHBISE4
BSc (Hons) in Business information Systems

October 2011

Table of Contents

1.0 - Introduction

We're in strange times in the business world. We're in a state of constant flux. The global recession has caused many industries, many companies to change or die. The companies and industries that will survive will do so because they are agile and are able to look for new solutions, new ways of doing things, taking advantage of new trends and at the same time offering increased value and service to the end user – the customer. Customers are increasingly conservative with their spending and shrewd about it. They want value for money, they want good service! They want to feel that when they invest in something they feel it was a worthwhile investment.

The hotel industry is suffering along with many others. While it could be considered a more traditional service with good old-fashioned values, there is scope for using latest technologies along side the traditional values of comfort and service to accentuate them. It seems the industry in general is quite slow to use newer technologies. An awful lot of hotels still fail to offer Wi-Fi, or when they do the speeds can be inconsistent at best. Some lease out Wi-Fi to a company such as BT Openzone at a huge premium. Some have Internet access but only for laptops via cable. Very few hotels seem to offer their own application (app) even though 'there's an app for everything these days….'

However, we're in the world of the mobile device and there is scope for using users own mobile devices to enhance their experience and connection with a particular hotel or a hotel brand. Serv-Otel software will utilize mobile technology to drive efficiencies within the hotel and at the same time enrich the customer experience and give a hotel competitive advantage.

1.1: Purpose

The purpose of this Requirements Specification document is to give a breakdown and description of all the various requirements required by the application. It will also look at the data flow throughout the application as well as identify the important use cases. These use cases will form the basis of the test cases required at a later stage of the applications lifecycle. This is just one of the benefits of completing this Requirement Specification, others include providing a focus and clarity of what's required to bring the application to fruition as well as a reduction in the development effort.

1.2: Project Scope

The scope of this project is to develop an iPhone application known as Serv-Otel that will be accessible to a hotel customer upon arrival. The launch of the application will via a QR code which should be in the language of the customer. The application should download onto the users own iPhone. This application should be an all in one immersive, interactive application for the customer to use while residing in the hotel. It should give them access to a range of services offered by the hotel but via the app as opposed to using the traditional means of print, phone. It should have the ability to, amongst other features: order breakfast to the room, book a table at the hotel restaurant, display menu's,

display room facilities as well as offer a social networking facility. The focus will be on having a functioning application. I'm aware that hotels will have their own databases and systems and connecting to these individual systems is outside the scope of this application.

1.3: Definitions, Acronyms and Abbreviations

To be filled in

1.4: Overview

Describe what's to follow, describe how it's organized…

2.0 - User Requirements Definition

First of all it's important to define the users of this application.

- End User (Hotel Resident)
- Concierge
- Room Service
- Hotel Administrator

Ultimately however the hotel resident will be the main user of this application and their requirements are discussed here.

Users Objectives:

- Download of the application should be quick (somewhat dependant on Wi-Fi access quality)
- User should be instantly familiar with navigating around the application so that little or no learning effort is required.
- User should be able to use the application for information or interaction with all hotel facilities

Users Requirements

- The ability to view any in room device (E.g., air conditioning) instructions on the application
- The ability to view TV listings on the application
- The ability to order in-room movies or games on the application
- The ability to contact room service on the application
- The ability to contact the concierge on the application
- The ability to 'chat' to other hotel residents on the application
- The ability to view in-hotel restaurant menus on the application
- The ability to make in-hotel restaurant bookings on the application
- The ability to view in-room breakfast menu
- The ability to order breakfast for delivery to the room
- The ability to view in-hotel Gym/Spa facilities on the application
- The ability to make in-hotel Gym/Spa bookings on the application
- The ability to see a running 'bill' for the room
- The ability to express check out on the application
- The ability to access a help section which includes contact numbers

3.0 - System Architecture

This mobile application is being built initially for Apple iPhone and this dictates some of the choices. A 3-tier approach is being used.

The application will use the following languages/technologies:

- Xcode 4
- Objective-C
- Cocoa Touch

A web server will be used – likely Amazon Elastic Compute Cloud (EC2) storage server which allows integration and compatibility with several other software.

A database will be required – MySQL can be used in conjunction with Amazon EC2.

To connect the mobile application to the web server further consultation is required by me with a college lecturer. This will be brought to resolution in the 2nd week of October.

While the application will be developed ultimately for iPhone in this project, consideration will be given to how best to port this application to other mobile platforms. Therefore to ensure re-usability as much of the development as possible should be multiplatform.

4.0 - Requirements Specification

4.1: Physical Environmental Requirements

There are no particular or necessary physical environmental requirements. The functionality will be operating on an Apple iPhone initially so an iPhone will be required. I envisage this being any model of iPhone (3GS, 4 and 4S) For the hotel a PC/Laptop will be required as there will be a need to upload/submit data such as menu's etc. There will be no real resource demand on the PC. As a web server is being used there is no requirement for a physical server within the hotel and the environmental conditions that may have had to be operated in.

4.2: Interface Requirements

The end user will need to interface with:

- Ensuring connection to the hotel Wi-Fi via the settings section on the mobile device
- QR scanning software that should be on the mobile device
- A web page where they will be directed to via the QR code to download the application onto their iPhone
- The application GUI on the mobile device

The concierge will need to interface:

- The application on the mobile device

Room Service:

- The application on the mobile device

Hotel Admin:

- Upload onto web server/web page OR submit detail via e-mail

There are both various inputs and outputs of the application.
Effectively all input will be via the web server:

- Hotel Admin – uploading data such as restaurant menu's, room information, appliance instructions. These inputs will be made into the web server where this data will be held.
- Concierge/Room Service – will be inputting data in the form of replying to chat/text style messages from the end users.
- End Users – will be inputting data in the form of submitting requests to the various users / facilities within the hotel. For example by submitting requests to room service, by ordering breakfast to the room, by booking a table in the restaurant or requesting information via chat message

Output will be made to various systems, not all of which are going to be known within this project as hotels all run their own systems. What is known at this stage is:

- Data uploaded by Hotel Admin will be output to the GUI on the mobile device.
- Input from the concierge/room service will be output to the GUI on the mobile device.

- Input from the end user will be output both on the GUI of the application on the mobile device but also will need to be output on the various in-hotel systems, such as any table reservation system used by the hotel restaurant, or any reservation system used by the gym/spa facilities or any used by room service.

Any data uploaded via Hotel Admin is going to have to be in a prescribed format. This is as yet undecided.

4.3: Functional Requirements

The functional requirements for the mobile application include, but this isn't an exhaustive list:

- The ability to view any in room device (E.g., air conditioning) instructions on the application
- The ability to view TV listings on the application
- The ability to contact room service on the application
- The ability to contact the concierge on the application
- The ability to receive messages from the concierge/room service
- The ability to 'chat' to other hotel residents on the application
- The ability to view in-hotel restaurant menus on the application
- The ability to make in-hotel restaurant bookings on the application
- The ability to view in-room breakfast menu and order same
- The ability to view in-hotel Gym/Spa facilities on the application
- The ability to make in-hotel Gym/Spa bookings on the application
- The ability to request a wake up call
- The ability to see a running 'bill' for the room
- The ability to express check out on the application
- The ability to access a help section which includes contact numbers

I would consider these abilities of relatively equal importance; these are all functions that are desirable on the application. The application needs to have the ability to replace/supplement the existing services/information methods within the hotel. Therefore the more that the application can accomplish the more successful its going to be and the quicker the uptake is going to be. 1 or 2 not above have use cases below; such as the ability to order movies and games as this is something that the TV service may provide anyway. But those listed above I would consider essential to such an application.

As it's a mobile application the user will access all of these functions by pressing on the relevant icon. All functions should be accessible in no more than 4 button presses from the main menu.

As standard iPhone application functionality is being used throughout the development I don't envisage any major design or implementation issues. Layouts may change slightly from what's envisaged at this stage and ongoing feedback may force changes or removal of certain functions.

There may be a security risk with certain functions, such as the express check out or the accessing of a users account. The development will need to take cognizance of this and ensure a secure environment for this sensitive data. Failure to do so will lead to the removal of these functions from the application, which will lessen the impact of the application. It must also be noted that this application will be dependant on a Wi-Fi service and therefore it is important that this is available at all times. Some functions of the application will not require network access however.

Use Cases for these functional requirements can be found in 7.1

4.4: Documentation Requirements

Very little documentation will be required for this application for the end user. The reasons for this are as follows:

- Touch screen technology is very intuitive.
- End users will be using their own mobile device
- The application will be designed in a format that's approved by Apple and therefore will be familiar to any user of the iPhone
- Heuristics testing will also ensure user familiarity with the navigation process.

However, there may be a small help or tips section within the application itself and/or if possible, an in app tip system will be in place which will offer gentle hints to guide users. This will be minimal.

Documentation would be provided for the hotel admin team as to what is required for their part to manage the application data within their hotel. This would be in an electronic format.

4.5: Data Requirements

The hotel Administrator will be responsible for providing large amounts of data into the application regarding the hotel. Elements such as the room information will be relatively static and will not change often. The exact format of this information has not yet been decided and will somewhat depend on whether the data is uploaded by the Hotel Admin directly or whether this data is provided by the Hotel Admin to a 3rd party to upload. This decision ties into the business/pricing model. Further consultation with lecturers and contacts in the hotel industry is required before this is decided upon.

However there will be a requirement for real time information from the hotel for elements of the application such as accessing the latest bill for the end user or booking a table at the onsite restaurant. There will need to be a link between the mobile application and the hotels own database systems. These systems will likely dictate the data format. To ensure customer satisfaction this data needs to be in real time and accurate. Failure to have this will lead to frustration.

Finally other data within the application will be provided by the End Users themselves in the form of chat messages, either to room service, the

housekeeper, and the concierge or to fellow guests. As chat messages there is no specific data requirements though there may be a need to hold a chat history for the duration of the users stay so they can access information supplied to them via chat throughout their stay.

Finally it is important that the size of the application is as small as possible on the users iPhone. No particular target size has yet been decided on, as more research is required. Keeping the application smaller prevents potential issues for the end user having to remove 1 or more applications to fit the hotel one on the iPhone.

4.6: Non-Functional Requirements

4.6.1 Performance/Response time requirement

Mobile applications are fast, responsive, small reliable programs to perform specific tasks well. In light of this it's important that this application, be it on iPhone or across any mobile platform meets all of these characteristics.
For example there is little tolerance for failure and as a result this application should not freeze or crash during use and cause a reset. The application must be reliable and the rate of failure occurrence must be comparable to other applications on the market.

The application should load quickly using the hotels Wi-Fi but this is going to be dependant on the Wi-Fi. The application should be loaded and in use within an absolute maximum 5 minutes of receiving the QR code – any longer and the user may not be willing to pursue it. By the time the user enters the room, presuming the download started at the check in desk, they should be in a position to start using the app.

4.6.2 Availability requirement

The application is dependant on a working Wi-Fi, although the resident could use his or her own 3G network to use the application if required. This may incur a cost to the user however. Some functions however will be available without network access and the application shouldn't need network access to load.

4.6.3 Recover requirement

In the case of an interrupt, e.g., an SMS or a phone call, the application should continue to run in the background and when returned to should be in the same state as the user left it, with no loss of data. Failure to do this will lead to frustration for the end user.

4.6.5 Security requirement

There will need to be passing of sensitive information to access certain features and therefore this needs to be processed over a secure network.

4.6.7 Maintainability requirement

Maintaining this mobile application should be minimal. An expanding web server should be able to handle any increase in traffic and the only maintainability should be around updating any hotel data.

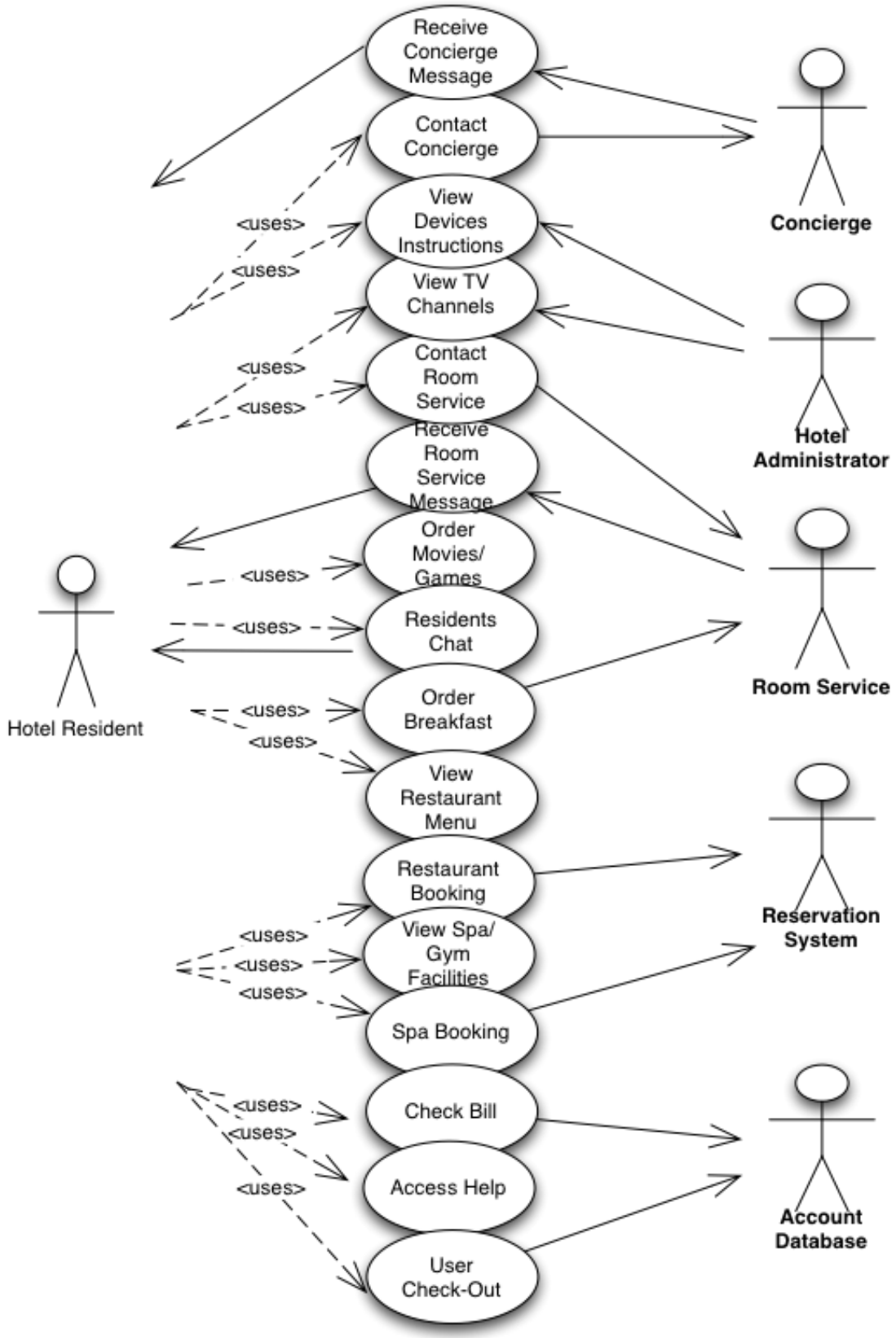
4.6.8 Portability requirement

Development will be with one mind on making the application as portable as possible to other mobile platforms.

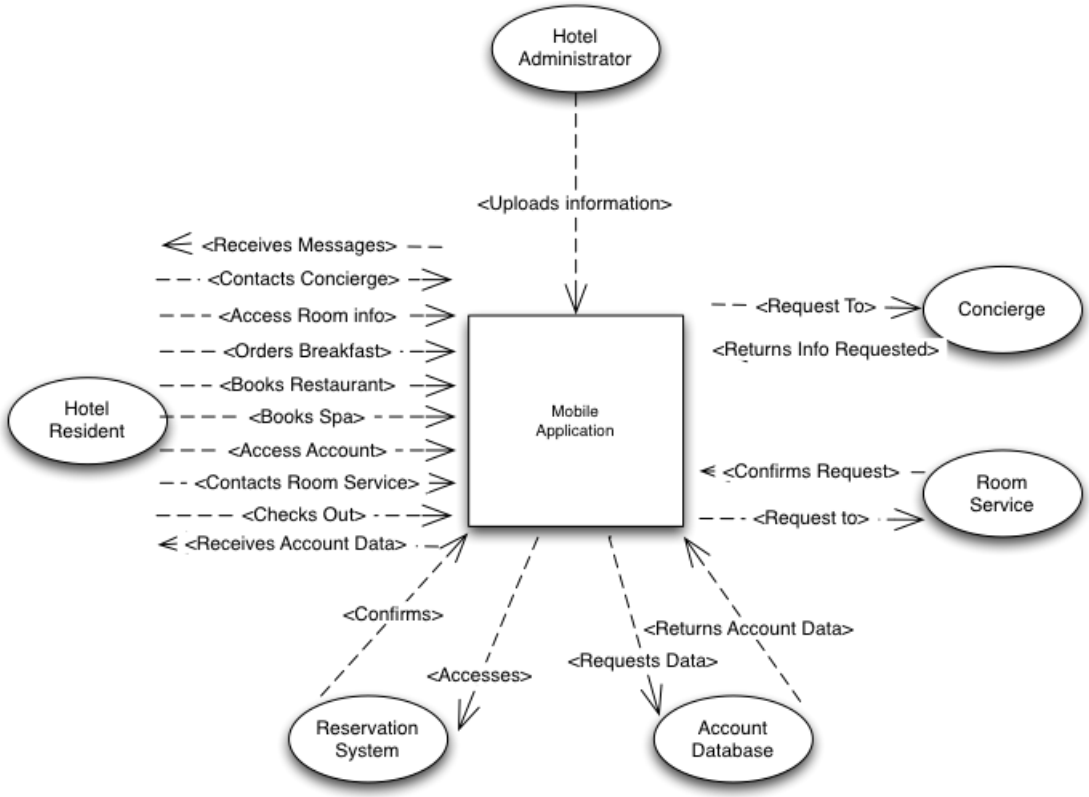
4.6.9 Extendibility requirement

It is important that it is quick and smooth for new versions to be implemented and if a new version is released while residents are using the previous version, which they can continue to do so without interruption to their service. New residents would receive the latest version as standard.

5.0 – System Models



Use Case Diagram for Hotel Mobile Application



Data Flow Diagram for Hotel Mobile Application

6.0 – System Evolution

There is huge future potential for this application and I can envisage new versions being released through time complete with extra functionality. Continuing feedback will be reviewed and new features added to meet customer requirements. However it is important that the application fits the non-functional requirements also.

The application would develop in the following ways:

- Across other mobile phones – to ensure usage the application would need to be accessible on other platforms other than the iPhone, such as Android or the Blackberry. In short there needs to be a version compatible for every smart phone so as to ensure complete customer coverage and maximize hotel efficiencies.
- Across other mobile devices – versions should be created for tablet devices such as the Apple iPad or the Blackberry Playbook. Some users may be more comfortable working on the larger screen that the tablet devices provide. Hotels may provide tablet devices in room as standard in the future or they may be available to rent. It may reduce some of the portability, as it may not be possible to remove the tablet from the room, however it is an option that should be explored.
- There are numerous functions that will not make the initial version being created. Some of these functions may be:
    - Using the application to replace the traditional key card issued by the hotel, and scanning the mobile device against a wall panel to access the room.
    - Using the application as a remote control for certain features in the room such as the Air Conditioning, lighting, electronic devices or windows. This could be done whether in the room or not. So if on the way back to the room and the end user wanted the temperature to be reduced in the room to say 18c they could request this on the application.
    - The application could be used to store and develop a travel history, remembering which hotels were previously stayed in, users own reviews of the hotel, price paid etc. This would be useful for booking future hotel stays or recommending hotels to a friend.
    - Although there is envisaged to be an in-hotel social networking element, the usual social network sites could be linked to, especially to update elements such as 'Places' on Facebook

7.0 – Appendices

7.1: Use Cases

Use Case:
UC1 - View Device Instructions

Scope
The scope of this use case concerns the accessing of the in-room device instructions

Description
This use case describes the process of the user accessing the in-room device instructions

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'room information' button on the main menu

Main flow
1. The user is selected with a secondary menu
2. The user selects 'In-room device instructions'
3. The user is presented with a further sub menu
4. The user selects the appropriate device for further information
5. Device instructions are displayed

Alternate flow
-

Exceptional flow
-

Termination
The user presses the in-app 'back' button or swipes the screen back to a previous menu/main menu

Post condition
The application is in an idle state waiting on further action.

Use Case:
UC2 - View TV Channels

Scope
The scope of this use case concerns the accessing of the TV Channel list

Description
This use case describes the process of the user accessing the TV Channel list

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'room information' button on the main menu

Main flow
1. The user is selected with a secondary menu
2. The user selects 'Entertainment'
3. The user is presented with a further sub menu
4. The user selects the 'TV channel List'
5. The TV channel list is displayed

Alternate flow
-

Exceptional flow
-

Termination
The user presses the in-app 'back' button or swipes the screen back to a previous menu/main menu

Post condition
The application is in an idle state waiting on further action.

Use Case:
UC3 – Order Movie/Games

Scope
The scope of this use case concerns the accessing of the in room movie/Game service

Description
This use case describes the process of the user accessing the in room movie/Game service

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'room information' button on the main menu

Main flow
1. The user is selected with a secondary menu
2. The user selects 'Entertainment'
3. The user is presented with a further sub menu
4. The user presses 'Order Movie' or 'Order Game'
5. A list of movies or games is displayed.
6. User selects appropriate movie or game

Alternate flow
-

Exceptional flow

E1. User doesn't complete order
1. User hits the back button instead of completing order

Termination
The user completes the selection process.

Post condition
User receives a pop up confirmation advising what TV channel to access to view.

Use Case:
UC4 – Contact Room Service

Scope
The scope of this use case concerns the contacting of room service

Description
This use case describes the process of the user accessing the messaging service to contact room service

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'contact room service' button on the main menu

Main flow
1. The user is presented with a message box and keyboard
2. The user types their message using the keyboard
3. The user hits submit

Alternate flow
-

Exceptional flow
-

Termination
The user presses the back to main menu button or swipes the screen back.

Post condition
User receives a pop up stating 'message sent to room service'

Use Case:
UC5 – Contact Concierge

Scope
The scope of this use case concerns the contacting of the concierge

Description
This use case describes the process of the user accessing the messaging service to contact the concierge

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'contact concierge' button on the main menu

Main flow
1. The user is presented with a message box and keyboard
2. The user types their message using the keyboard
3. The user hits submit

Alternate flow
-

Exceptional flow
-

Termination
The user presses the back to main menu button or swipes the screen back.

Post condition
User receives a pop up stating 'message sent to the concierge'

Use Case:
UC6 – Open message from room service

Scope
The scope of this use case concerns receiving a message from room service

Description
This use case describes the process of the user accessing the messaging service to read a message from room service

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) receives a pop up notification that a message has been received from room service

Main flow
1. The user presses 'view' to read the message
2. The message is displayed

Alternate flow
-

Exceptional flow
-

Termination
The user presses the back to main menu button or swipes the screen back.

Post condition
The application is in an idle state waiting on further action.

Use Case:
UC7 – Open message from the concierge

Scope
The scope of this use case concerns receiving a message from the concierge

Description
This use case describes the process of the user accessing the messaging service to read a message from the concierge

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) receives a pop up notification that a message has been received from the concierge

Main flow
1. The user presses 'view' to read the message
2. The message is displayed

Alternate flow
-

Exceptional flow
-

Termination
The user presses the back to main menu button or swipes the screen back.

Post condition
The application is in an idle state waiting on further action.

Use Case:
UC8 – User access twitter style chat to contact other residents

Scope
The scope of this use case concerns the using of a twitter style chat

Description
This use case describes the process of the user accessing the twitter style chat to ask advice from other residents

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'chat' button on the main menu

Main flow
1. The user is taken to a chat screen and can view the recent chat stream
2. The user clicks on the message box at the bottom of the screen to open the keyboard
3. The user types a message and presses submit

Alternate flow
A1, The user simply views the chat screen without submitting their own entry

Exceptional flow
-

Termination
The user presses submit

Post condition
The chat screen is in an idle state and waits for the chat message to be approved and appear on screen.

Use Case:
UC9 – User access restaurant menu

Scope
The scope of this use case concerns accessing the restaurant menu

Description
This use case describes the process of the user accessing the in-hotel restaurant menu

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'restaurant' button on the main menu

Main flow
1. The user is taken to a sub menu
2. The user selects 'menus' from the sub menu
3. The user is presented with a list of menus to choose
4. The user selects the appropriate menu
5. The menu is displayed

Alternate flow
-

Exceptional flow
-

Termination
The user presses the back to main menu button or swipes the screen back.

Post condition
The chat screen is in an idle state and waits for further action.

Use Case:
UC10 – User books table in restaurant

Scope
The scope of this use case concerns booking a table in the restaurant

Description
This use case describes the process of the user accessing the in-hotel restaurant reservation system

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'restaurant' button on the main menu

Main flow
1. The user is taken to a sub menu
2. The user selects 'booking' from the sub menu
3. The user is presented with a field for date, number of people and time to fulfil
4. The user fulfils the fields and presses submit
5. The user is presented with a message that table available and proceed with booking.
6. User presses 'ok'

Alternate flow
A1, Not Available
1. The user is presented with a message that table is not available but is displayed 3 other time slots that are available
2. User selects alternative time slot
3. The user is presented with a message that table available and proceed with booking.
4. User presses 'ok'

Exceptional flow
E1, Doesn't proceed

1. The user is presented with a message that table is not available but is displayed 3 other time slots that are available
2. User rejects alternative time slots and presses back button
3. User can re-enter field for date, number of people and time or return to main menu

Termination
User presses ok.

Post condition
User receives on screen confirmation that table is booked for Mr. X
The chat screen is in an idle state and waits for further action.

Use Case:
UC11 – User access breakfast menu

Scope
The scope of this use case concerns accessing the breakfast menu

Description
This use case describes the process of the user accessing the in-hotel breakfast menu in view of ordering to the room.

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'breakfast' button on the main menu

Main flow
1. The user is presented with a menu of breakfast items
2. The user scrolls down the menu, selecting the products they desire
3. When complete the user presses the 'submit' button
4. The user is presented with a summary of breakfast items
5. The user presses 'proceed'
6. The user selects a date and time for delivery to the room. User can also select an option to have breakfast delivered on multiple days
7. User presses 'complete my order'

Alternate flow
-

Exceptional flow
-

Termination
The user presses 'complete my order'

Post condition
User is presented with a message stating 'Breakfast ordered Mr X'

Use Case:
UC12 – User access Gym/Spa Facilities

Scope
The scope of this use case concerns accessing in-hotel Gym/Spa facilities

Description
This use case describes the process of the user accessing the in-hotel gym/spa facilities

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'Gym/Spa Facilities' button on the main menu

Main flow
1. The user is presented with a submenu
2. The user presses 'Gym' or 'Spa'
3. The user is presented with a list of the facilities in the gym or the spa

Alternate flow
-

Exceptional flow
-

Termination
The user presses the back to main menu button or swipes the screen back.

Post condition
The screen is in an idle state and waits for further action.

Use Case:
UC13 – User books spa facilities

Scope
The scope of this use case concerns booking the spa facilities

Description
This use case describes the process of the user accessing the in-hotel spa facilities

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'Gym/Spa Facilities' button on the main menu

Main flow
1. The user is presented with a submenu
2. The user presses 'Spa'
3. The user is presented with a list of the facilities in the spa
4. The user presses the make booking button at the bottom of the list
5. The user scrolls down the various treatments and prices, selecting the treatments they desire
6. When complete the user presses the 'submit' button
7. The user is presented with a summary of the treatments
8. The user presses 'proceed'
9. The user selects a date and time for the treatments.
10. The user receives a message to say the date and time are available
11. User presses 'complete my booking'

Alternate flow
A1, Not Available
1. The user is presented with a message that date and time are not available but is displayed 3 other time slots that are available
2. User selects alternative time slot
3. The user is presented with a message that treatments are available and to proceed with booking.
4. User presses 'ok'

Exceptional flow
E1, Doesn't proceed
1. The user is presented with a message that date and time is not available but is displayed 3 other time slots that are available
2. User rejects alternative time slots and presses back button

3. User can re-enter field for date and time or return to main menu

Termination
User presses ok.

Post condition
User receives on screen confirmation that treatments are booked for Mr. X
The screen is in an idle state and waits for further action.

Use Case:
UC14 – User checks current 'bill'

Scope
The scope of this use case concerns accessing the users account to check the current bill

Description
This use case describes the process of the user accessing the users account to check the current bill

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'My Account' button on the main menu

Main flow
1. The user is presented with 2 security fields to enter
    a. The last 4 digits of the credit card on their account
    b. The CVV number of the credit card on their account
2. The user is presented with a submenu
3. The user presses 'Current Bill'
4. The user is presented with the current bill, including all entries that make up the bill. The user is also presented with the date and time this was last updated.

Alternate flow
A1: Incorrect details
1. User enters the wrong details and the user is declined entry to the account section
2. User is presented with 2 security fields to enter

Exceptional flow
-

Termination
User presses the back to main menu button or swipes the screen back

Post condition
The screen is in an idle state and waits for further action.

Use Case:
UC15 – User checks out

Scope
The scope of this use case concerns accessing the express check out option

Description
This use case describes the process of the user using the express check out option.

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'Express Check Out' button on the main menu

Main flow
1. The user is presented with 2 security fields to enter
    a. The last 4 digits of the credit card on their account
    b. The CVV number of the credit card on their account
2. The user is presented with the express check out screen complete with current bill.
3. The user selects check out option
4. The user receives a message stating, "x (amount) will be charged to your credit card – are you sure?"
5. The user presses 'ok'

Alternate flow
-
Exceptional flow
E1: Disputed Charge
1. The user when presented with the current bill disputes some of the charges.
2. The user presses the dispute button
3. The user receives a message "Please proceed to reception to resolve bill"
4. There will be someone waiting on reception to deal with the query as a priority.

Termination
The user presses 'Ok'

Post condition
The user is presented with a message to say "we hope you enjoyed your stay Mr. X. Please leave the card in the express check out box in reception. Have a nice day"

Use Case:
UC16 – Access Help Section

Scope
The scope of this use case concerns accessing the Help Section

Description
This use case describes the process of the user using the Help Section

Flow Description
Precondition
The application has been opened and is lying in an idle state on the main menu screen.

Activation
This use case starts when the end user (hotel resident) presses the 'Help Section' button on the main menu

Main flow
1. User is presented with a sub menu with various options including app help, hotel help, hotel map, hotel contact numbers
2. User selects appropriate option
3. User views selected option.

Alternate flow
-
Exceptional flow

Termination
User presses the back to main menu button or swipes the screen back

Post condition
The screen is in an idle state and waits for further action.

Please note this isn't an exhaustive list of use cases - there are other use cases that could be displayed here, other features such as request a wake up alarm call, the hotel map with added feature to guide towards fire exit etc. There are use cases to be done for downloading the application in the first place and for any potential log in (may be required due to security issues).

Note, all use cases subject to change.

Focus/Advisory Group

This document has been created with input from a focus group I've put together. This group travels and stays in hotels regularly for both business and leisure purposes and is a cross section of ages and sexes. This group comprises of 5 individuals and will be involved in evaluation and testing of this application.

- Mr. Alan Graham – Administrator, Nelsons Natural World
- Mr. Edgar Holmes – Retired – Currently Magistrate and photographer and former Youth Orchestra Conductor (Involved worldwide travel)
- Ms. Claire O'Grady – Store Manager, Ernest Jones
- Mr. Keith Boylan – Office Manager, HSE
- Mr. Ken Egan/Mr. Mike Keane – Managing directors, SMX Consulting

In addition I've been able to make good contacts in the hotel industry, unfortunately due to the very tight deadlines involved I haven't been able to get the desired feedback back in time though would expect this to start during week 2 of October. I would be in touch with these contacts throughout the project process

- Mr. Nigel Buchanan, Operations Director, Yotel
  Nigel is working as the operations director of one of the most technologically progressive hotel brands in the world, changing traditions in the hotel industry and is the perfect person to offer input and advice into my project that too is looking to revolutionise the hotel resident's experience. Yotel have automated check in's, have a 'yobot' for baggage handling, and have recently opened 600+ 'cabin' hotel in New York which Nigel was heavily involved in. Yotel also have hotels in London Heathrow and Gatwick. Nigel has a career in the hotel industry. Nigel was general manager and opened the Brighton Hotel Du Vin hotel as well as working with other hotel groups including myhotel and the Capital Hotel Group.

You can read more about Nigel here:
http://www.hotelnewsnow.com/Articles.aspx/5851/Hospitality-Innovator-Nigel-Buchanan

I'm also establishing a contact in the Radisson Blu, Dublin and I have a third contact who owns hotels throughout the world including a handful in Ireland. Obviously to get feedback, support and input from these people is incredibly valuable but takes time to arrange and organize between all parties.

7.4 Monthly log Book

7.4.1 Reflective Journal Number 1

Working Title: Serv-Otel

Robert O'Grady
x08871965
robert.ogrady@student.ncirl.ie

BSHBISE4
BSc (Hons) in Business information Systems

October 2011

Progress to date:

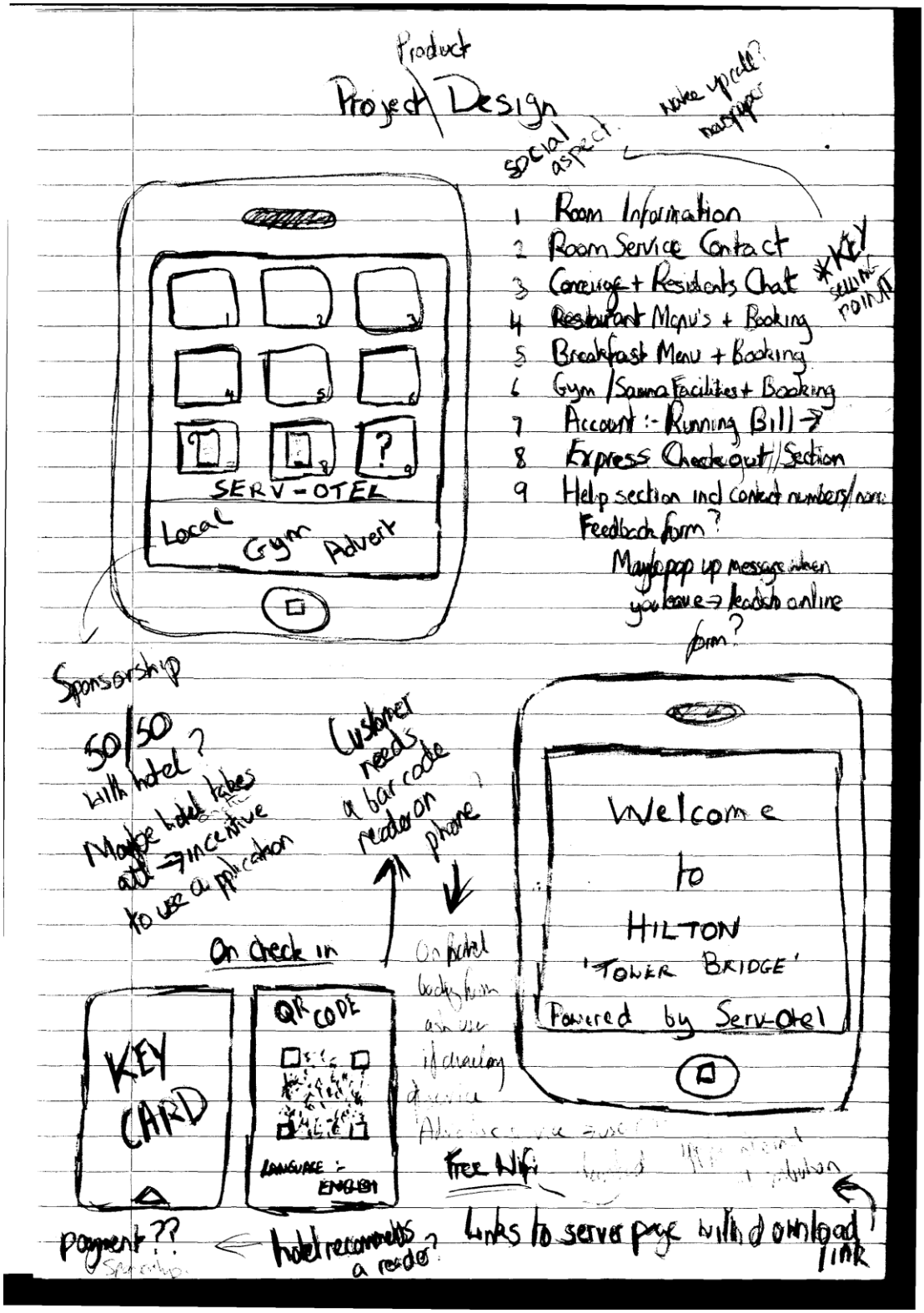
- Project Proposal Submitted
- Requirements Specification Submitted
- Mind Mapping style Journal being kept of thoughts/drawings/to-do's. (See sample below)
- Support tutor established

Thoughts/To-Do:

- Need to see what reading I can do around the subject:
    - Hotel Industry
    - iPhone development
- Establish contacts within the hotel industry
- Arrange regular meetings with my support tutor
- Further work to be done to narrow scope of project
- Commence coding learning

Initial fears are whether I can manage to develop all that I've set out to do within the application, bearing in mind that I've limited coding experience and I'm to teach myself coding for the iPhone with no previous experience. I'm already aware that the scope is large and I may have to refine.

Sample from mind mapping Journal I'm maintaining:



7.4.2 Reflective Journal Number 2

November 2011

Progress to date:

- Commenced teaching myself iPhone coding with the aid of a couple of books.
- Established contact with the hotel industry
- Had interviews with a member of the hotel industry
- Started meetings with support tutor
- Obtained copy of a previous submission to get an idea of what is expected.
- Subscribed to a couple of hotel industry blogs to keep up with latest news

Thoughts/To-Do:

- Need to continue reading I can do around the subject:
    - Hotel Industry
    - iPhone development
- Need to make further efforts to engage with a 2nd and 3rd potential contact
- Continue regular meetings with my support tutor
- Need to really push on with coding practice/learning
- Need to start coding for my prototype
- Need to start thinking about what I am going to present.
- Need to continue looking at my original plan and see the Plan V's Actual.

Unfortunately not as much progress has been made between reflective journal 1 and reflective journal 2 as I would have liked. This was due primarily to other assessments in college which has taken up time. The focus now between now and the 15th/16th December will be this piece of work. I need to work hard on the coding element as I know this is my biggest challenge and I need to start planning what I am going to present as a prototype.

7.5 Other Material

(Any other reference material used in the project for example evaluation surveys etc. CD containing code should be glued to the technical report.)

7.5.1 Questionnaire issed for feedback.

Questionnaire
on
'Serv-Otel'
Mobile Application

I am a 4th Year Business Information Systems student at the National College of Ireland conducting research into (the areas of) hotels, mobile phones and social networks. I'd be grateful if you would take a few moments to complete this survey. All answers will be treated in confidence and not be passed on to any other party.

Thank you for your time.

Please tell me a little about you…

Gender?

☐ Male ☐ Female

Age Group?

☐ Under 18 ☐ 18 – 30 ☐ 31 – 40
☐ 41 – 50 ☐ 51 – 60 ☐ Over 60

How often have you stayed in a hotel in the last 12 months?

☐ 0 Times ☐ 1-2 Times ☐ 3-4Times
☐ 5-6 Times ☐ 6 Times +

Generally what is the purpose of your stay?

☐ Business
☐ Leisure
☐ Mix of Both

How often would you stay alone?

☐ Never ☐ Rarely
☐ Occasionally ☐ Often
☐ Almost Always

What type of Mobile Phone do you currently have?

☐ Android Mobile Phone
☐ Apple iPhone
☐ I don't have a smart phone
☐ Other

(Please state) _____

What Social Network Sites do you regularly use?

- ☐ Facebook
- ☐ Google Plus
- ☐ FourSquare
- ☐ Other
- ☐ Twitter
- ☐ LinkedIn
- ☐ YouTube

(Please State) _____

What (if any) Hotel Related Apps do you have on your mobile phone (Tick all that apply)

General Hotel Search Apps

- ☐ Booking.com
- ☐ Expedia.com
- ☐ LateRooms.com
- ☐ Tripadvisor.com
- ☐ eBookers.com
- ☐ Hotels.com
- ☐ Otel.Com
- ☐ Trivago.com

Hotel/Chain Specific Apps

- ☐ AA Hotels
- ☐ Best Western
- ☐ Crowne Plaza
- ☐ Hyatt Hotels
- ☐ Marriot Hotels
- ☐ RitzCarlton Hotels
- ☐ Accor Hotels
- ☐ Club Carlsson
- ☐ Hilton Hotels
- ☐ Jurys Inn
- ☐ Premier Inn
- ☐

☐ Any other(s)

(Please State)_____

If you have used a Hotel/Chain Specific App in the past,
How would you rate it in each of the following areas:

Content:
- ☐ 1 – Very Poor
- ☐ 2 - Poor
- ☐ 3 – Average
- ☐ 4 – Good
- ☐ 5 – Excellent

Ease of Use:
- ☐ 1 – Very Poor
- ☐ 2 - Poor
- ☐ 3 – Average
- ☐ 4 – Good
- ☐ 5 – Excellent

Usefulness:
- ☐ 1 – Very Poor
- ☐ 2 - Poor
- ☐ 3 – Average
- ☐ 4 – Good
- ☐ 5 – Excellent

How much would this app influence your decision to stay at a hotel:

- ☐ 1 – No influence at all
- ☐ 2 - Unlikely to Influence
- ☐ 3 – A little influence
- ☐ 4 – Some influence
- ☐ 5 – Be one of the key influencing factors in my decision

Please think about your last hotel visit….

How long ago was it?

- ☐ 0 – 1 month
- ☐ 2 – 3 months
- ☐ 4-12 months
- ☐ Over 12 months

Did you make use of the following facilities?

- ☐ Express Checkout
- ☐ Concierge
- ☐ Gym
- ☐ Free Wi-fi
- ☐ In Room Info Booklet
- ☐ In-Room Telephone
- ☐ MiniBar
- ☐ Pay as you go Internet
- ☐ Residents Bar
- ☐ Restaurant
- ☐ Room Service
- ☐ Spa Facilities

Did you submit a feedback form to the hotel?

- ☐ Yes
- ☐ No

Did you review the hotel on an online forum after your visit?

- ☐ Yes
- ☐ No

Would you return to this hotel?

- ☐ Yes
- ☐ No

Please look at this app
(User gets handed mobile application to play with)

How useful do you think you would find this app?

- ☐ 1 – Not at all Useful
- ☐ 2 - Slightly Useful
- ☐ 3 – Moderately Useful
- ☐ 4 – Quite Useful
- ☐ 5 – Very Useful

Which feature(s) would you find most useful?

- ☐ In-Room Information such as TV channel list, room instructions
- ☐ Hotel Restaurant Info & Menus
- ☐ Hotel Restaurant Booking Facility
- ☐ Hotel Leisure Facilities Information
- ☐ Hotel Leisure Booking Facilities
- ☐ Social Network Links
- ☐ Hotels own social network called 'Neighbourly'
- ☐ Live room bill information
- ☐ Latest News and Information about the hotel
- ☐ Ability to contact the hotel and view hotel website

Which feature(s) would you find least useful?

- ☐ In-Room Information such as TV channel list, room instructions
- ☐ Hotel Restaurant Info & Menus
- ☐ Hotel Restaurant Booking Facility
- ☐ Hotel Leisure Facilities Information
- ☐ Hotel Leisure Booking Facilities
- ☐ Social Network Links
- ☐ Hotels own social network called 'Neighbourly'
- ☐ Live room bill information
- ☐ Latest News and Information about the hotel
- ☐ Ability to contact the hotel and view hotel website

How likely do you feel you would use the hotels own Social Network? (?)

- ☐ 1 – Not at all likely
- ☐ 2 - Quite Unlikely
- ☐ 3 – Neither Likely nor Unlikely
- ☐ 4 – Quite Likely
- ☐ 5 – Very Likely

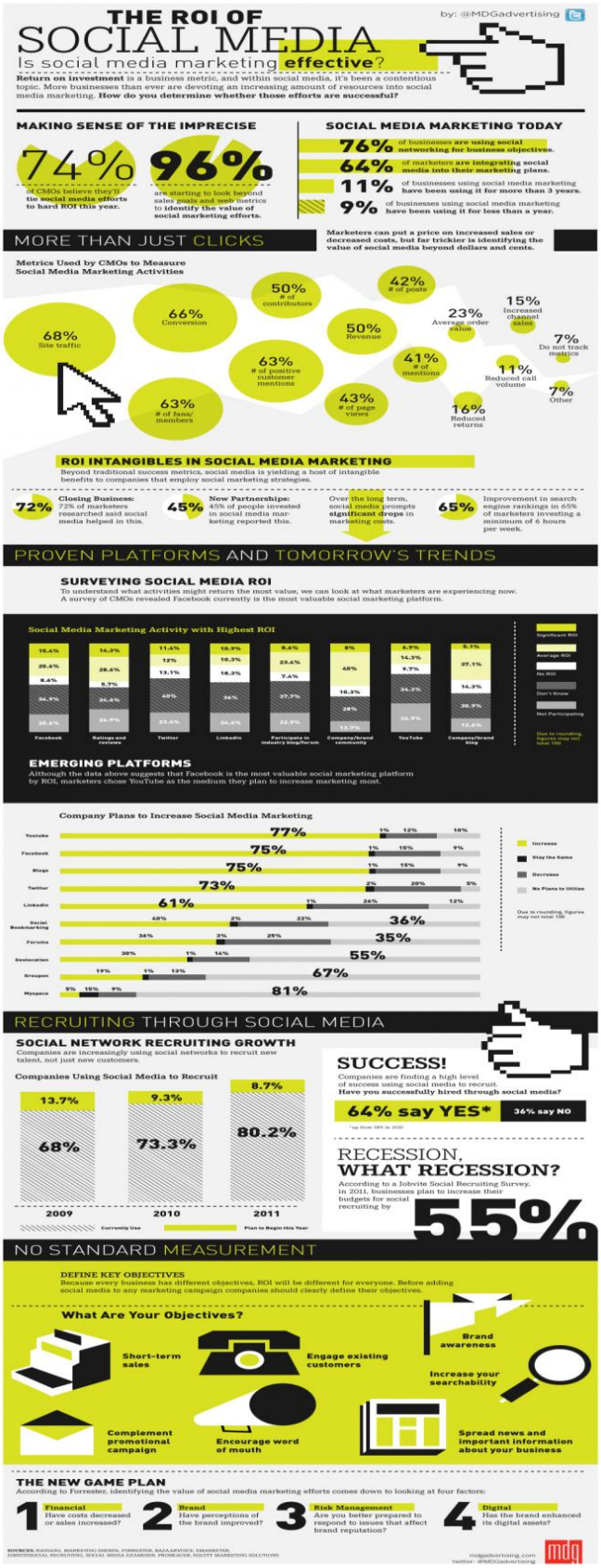
How much would this app influence your decision to stay at a hotel?

- ☐ 1 – No influence at all
- ☐ 2 - Unlikely to Influence
- ☐ 3 – A little influence
- ☐ 4 – Some influence
- ☐ 5 – Be one of the key influencing factors in my decision

Any other comments on the mobile application?

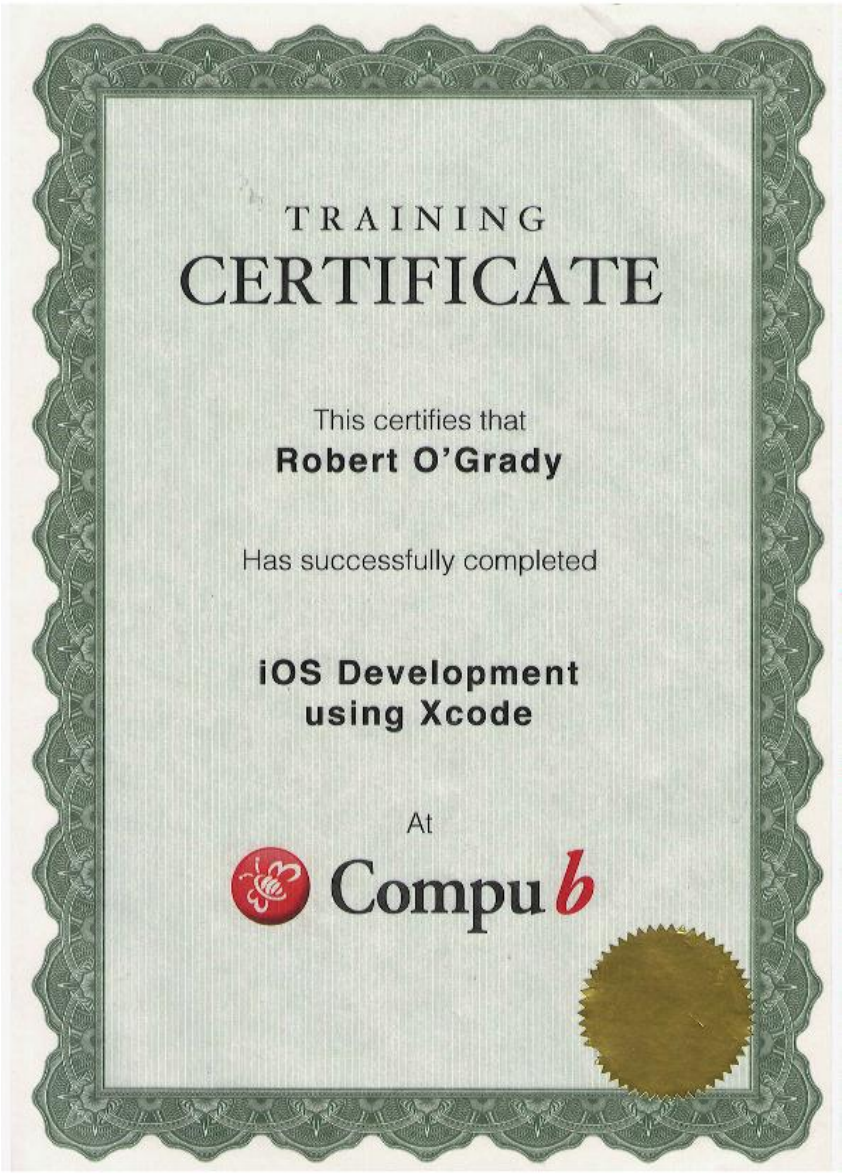
_____
_____
_____
_____
_____
_____
_____
_____

7.5.2 Infographic regarding Social Media V's Return on Investment (See 16 in Bibliography)



7.5.3 An Introduction to iOS Application Development with Xcode Training Course:

In March 2012 I completed a 5-day introduction course to Xcode delivered by CompuB. This was intended to be earlier in year however was put back on more than one occasion. This allowed me to build on the knowledge that I had taught myself through the use of coding books and gave me a platform to work on this project. The certificate to prove course was completed is below:



7.5.4 Hotel Key card including QR code

Below are images of the potential key card for the Hilton Hotel if they availed of Serv-Otel. This would allow a customer to check in, be handed key card and as a result of the hotels Wi-Fi (Or the customers own network) the app could be downloaded on the customers phone by the time they arrived in the room.

Front of Key card

Back of Key card

7.6 Source Code (Main Classes)

A few samples of source code can be seen below, further code can be made available if required:
One key element to the success of this app, and for using the Buzztouch server is the ability to have certain data 'refresh' for the user while using the app, without having to download an update from iTunes, either over Wi-Fi or by plugging into a Mac/PC.
This piece of code is key in this element:

```
//downloader delegate methods. Called when refreshing app
data.
-(void)downloadFileStarted:(NSString *)message{
    [BT_debugger showIt:self:[NSString
stringWithFormat:@"downloadFileStarted: %@", message]];
}
-(void)downloadFileInProgress:(NSString *)message{

//[BT_debugger showIt:self:[NSString
stringWithFormat:@"downloadFileInProgress: %@", message]];
}
-(void)downloadFileCompleted:(NSString *)message{
    [BT_debugger showIt:self:[NSString
stringWithFormat:@"downloadFileCompleted%@", @""]];
    [self hideProgress];

    //NSLog(@"%@", $message);
    //message returns from downloader is the application data
or an error message
    if([message rangeOfString:@"ERROR-1968"
options:NSCaseInsensitiveSearch].location != NSNotFound){

     [BT_debugger showIt:self:[NSString stringWithFormat:@"the
download process reported an error?: %@", message]];
     [self showAlert:nil:NSLocalizedString(@"downloadError",
@"There was a problem downloading some data from the internet.
If you're not connected to the internet, connect then try
again.")];

    }else{

     //save the version we just downloaded...
     if([BT_fileManager
saveTextFileToCacheWithEncoding:message:[self
saveAsFileName]:-1]){

          //the data we just got must be valid
          if([self.rootApp validateApplicationData:message]){

               //delete previously cached data (this does not
remove the config file we just created)
               [BT_fileManager deleteAllLocalData];

               //rebuild environment using the data we just
got
               [self
configureEnvironmentUsingAppData:message];

          }else{
```

```
                [BT_debugger showIt:self:[NSString
stringWithFormat:@"error parsing downloaded app config
data%@", @""]];
                [self
showAlert:nil:NSLocalizedString(@"appParseError", @"There was
a problem parsing the app's configuration data. Please make
sure that it is well-formed.")];

            }

      }else{

            [BT_debugger showIt:self:[NSString
stringWithFormat:@"error saving downloaded app config data%@",
@""]];
            [self
showAlert:nil:NSLocalizedString(@"errorSavingData", @"There
was a problem saving some data to the devices cache?")];

      }

     }//no error
```

The following method is what kickstarts the whole application:

```
/*
didFinishLaunchingWithOptions
this method fires when the application first launches.
*/


-(BOOL)application:(UIApplication *)application
didFinishLaunchingWithOptions:(NSDictionary *)launchOptions{

    //set the configuration file name
    configurationFileName = @"BT_config.txt";

    //show debug in output window?
    showDebugInfo = TRUE;

    //init the allowed input characters string. ONLY these
characters will be allowed in input fields.
    allowedInputCharacters =
@"abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ01234567
89_-.@!$";

            if(getenv("NSZombieEnabled") ||
getenv("NSAutoreleaseFreedObjectCheckEnabled")){
            NSString *message = @"";
            message = [message
stringByAppendingString:@"\n##################################
############################################################
####################"];
            message = [message
stringByAppendingString:@"\nZOMBIES ENABLED, TURN THIS OFF
BEFORE RELEASING THIS APPLICATION!"];
            message = [message
stringByAppendingString:@"\nDouble click executables > [app
name] > arguments: Remove NSZombieEnabled = YES"];
            message = [message
```

```
stringByAppendingString:@"\n##################################
##########################################################
####################\n\n"];
            NSLog(@"%@", message);
      }


      //initialize a temporary buzztouch app to assign to the
rootApp property
      BT_application *tmpApp = [[BT_application alloc] init];

      //initialize a temporary window to assign to the window
property
      UIWindow *tmpWindow = [[UIWindow alloc]
initWithFrame:[[UIScreen mainScreen] bounds]];
      self.window = tmpWindow;
      [tmpWindow release];

      if(!tmpApp){

            //show error message
            UIAlertView *alertView = [[UIAlertView alloc]
initWithTitle:NSLocalizedString(@"errorTitle",@"~ Error ~")
            message:NSLocalizedString(@"appInitError", @"There
was a problem initializing the application.") delegate:self
            cancelButtonTitle:NSLocalizedString(@"ok", "OK")
otherButtonTitles:nil];
            [alertView show];
            [alertView release];

      }else{

            //assign the local app property
            self.rootApp = tmpApp;
            [tmpApp release];

            //make the window active
            [self.window makeKeyAndVisible];

            //init audio player in background thread. Do this
before building the interface in case home-screen has audio.
            [NSThread detachNewThreadSelector:
@selector(initAudioPlayer) toTarget:self withObject:nil];

            //load sound effect players in background thread.
Do this before building the interface is case home-screen uses
sound effects.
            [NSThread detachNewThreadSelector:
@selector(loadSoundEffects) toTarget:self withObject:nil];

            //load the applications data
            [self loadAppData];


      } //tmpApp

      //return
      return TRUE;

}
```