



UNIVERSITY *of* LIMERICK

O L L S C O I L L U I M N I G H

Personalised Campus Guide for UL Students

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Declaration

I, *Kathryn Conway* declare that this project is entirely my own work, in my own words, and that all sources and quotations used are fully acknowledged and properly identified.

This final year project is presented in part fulfilment of the requirements for the Bachelor of Science in Digital Media Design. This project has not been submitted to any other University or higher education institution, or for any other academic award in this University.

Kathryn Conway

17th April 2013

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1. Project Summary

The aim of this project is to design and propose a personalised campus mobile application for students of the University of Limerick. With everyday tasks such as checking email or booking a ticket for concert now achievable with mobile devices, the need to know on the move and our reliance on accessing information wherever we are has increased dramatically. This has resulted in the rapid growth and development of the mobile device, be it a laptop computer, tablet or mobile phone. As a result, this project aimed to combine the availability of mobile and the information needs of students in UL to the prospects of a useful mobile application for students.

The project utilised secondary research in which current mobile applications targeted towards students and what educational institutes have on offer as solutions to their student needs was investigated.

Primary research in the form of a short survey was also utilised to grasp initial reaction to the concept, to provide a brief description of the student population in UL and their habits when using mobile devices and to gain an understanding of their needs at a glance.

The process surrounding this project is following a User Centred Design approach by which the target end users are heavily involved in the design and iterations of design of the application.

Based on initial primary research and knowledge gained from secondary research, an early low fidelity paper prototype of a possible design was created and tested on target users. Using the feedback provided, the first iteration of the User Centred Design approach was completed and adopted to create a high fidelity prototype offering more interaction. This high fidelity prototype then underwent testing in the form of Cooperative Evaluation with a group of ten target users before final design. A final prototype displaying a sleek user friendly navigation and interface design was developed for demonstration. This prototype was created using Adobe Flash ActionScript and was used as a tool to emulate the look, feel and interaction of the design.

Some considerations in designing this guide included not only what UL students think they need, but where does this information come from also and what needs to be prioritised as a necessity to effectively meet the needs of students.

The overall aim of the project was to produce a suitable user interface design and gather information regarding the provision of content ready to be handed over for development and in doing so further my own skills and knowledge in the relevant areas.

2. Introduction

2.1 Project Overview

As mobile computing has rapidly grown and become more pervasive in the last number of years, either through the use of laptop computers, mobile phones and recently tablet computers, the ability to access information on the move has become second nature in today's society in any given context and as observed by the CEO of Google, Eric Schmidt "the future of computing is mobile" (Kincaid, 2010).

Students, for example, are always on the move and in a university setting, change location on a regular basis and with that, their information needs change and can be unique to each student. As a result, the aim of this project is to successfully design a personalised mobile application for the students at the University of Limerick (UL).

Throughout the course of this project, a User Centred Design (UCD) approach was adopted in which user research and testing contributed greatly to the design process. The UCD approach is imperative to correctly understanding the target end users' actual requirements and to design to meet these needs. In this approach, prototyping is encouraged often to test the usability of a design. Prototyping can be as simple as paper prototyping in the early stages of the design process progressing to a high-fidelity prototype that offers more interaction as demonstrated in this project.

The current trends, habits and hacks of students in UL were investigated in the early stages of the project as well as mobile applications that are targeted towards university students elsewhere. Drawing on this, a shortlist of required functionalities was created and each to be considered for design. Such functionalities included a student timetable, assignment information and map for example.

With this early user research, a low-fidelity prototype was developed and tested in a focus group setting in which, the usability of this initial design was tested and a further understanding of the target end users was achieved. Following this first round of user testing an iteration of the design was created and the process continued again whereby another prototype was tested among users. In this instance, the prototype was created using the industry standard prototyping tool Axure offering a much higher fidelity prototype with interactivity. This prototype was then tested using cooperative evaluation whereby users were met individually and asked to complete a number of

tasks set by the facilitator and employing the ‘think aloud’ method, provide first hand impressions, feedback and suggestions regarding the design.

The final product resulting from this project was a high-fidelity prototype created using Adobe Flash ActionScript to demonstrate the features and information defined as a user requirement from testing. Adobe Photoshop CS6 was used to design the visual interface which is the bridge between functionality and the user interaction.

This project also investigated the topic of design as a whole. Design is not solely related to creating illustrations or Photoshop works. It encompasses the creation of a clear and structured layout and navigation of content required by the user as well as being aesthetically pleasing and an enjoyable experience for the user.

Both primary and secondary research are utilised during different stages of this project and contributed greatly to my understanding of current practices in design and methodologies regarding mobile applications.

The end goal of the project was the design of a mobile application for UL students in terms of determining user requirements and providing these in a usable and aesthetically pleasing manner. This final product will, ideally, be suitable to hand over to developers.

2.2 Motivation

The surge in mobile capabilities in recent years has resulted in a whole new window of opportunity regarding career choices, new interests and a new creative way of doing. We no longer need to consult with a desktop computer should we need to know any piece of information, merely take a glance at a mobile device generally living in our pockets. This is due to the increased availability of smartphones and tablets with growing computing power, connectivity and media capabilities and with this, a user can easily complete almost any task.

As a student in a large university, there can all too often be an instance where the “need to know” arises, be it the location of a class or information regarding assignments for example. Currently, the only way to find such information is for the user to use a desktop computer or through mobile internet access. However, the

current services offered by the University of Limerick, namely SULIS, the UL website, CSIS website and email, tend to offer a frustrating user experience and thus a simple task becomes somewhat laborious. As a result, the need for a mobile application tailored to the needs of UL students seems to be a reasonable solution and given the availability of technology, it is somewhat expected of today.

A further motivator for this project is my desire to understand design as a concept, develop skills in User Interface Design and building an enjoyable user experience in the use of mobile devices and applications. During cooperative education, I worked with an agency primarily involved in design and development of mobile applications for Android and iOS thus creating a new interest and possible career path. As a result, this expanded my knowledge of User Interface Design, wireframing and the development process involved in building a successful application. This opportunity was a stepping stone and coupled with the apparent need for a more mobile solution to information needs of students, sparked a desire to utilise these skills and develop an application or work on a project that would not only be to my benefit academically but also prove to be a useful daily tool to the students of UL.

2.3 Objectives

Throughout the timeline of this project, there are a number of objectives to complete, both personal and academic.

The overall objective is to design an effective personalised campus guide for UL students, taking on a User Centred Design approach that resulting in a visually rich and appealing user interface that is sleek and professional in providing the content required by users. To do so successfully, this project involves a thorough iterative process of prototyping and testing with target users to ensure that such a design provides a fluid user experience and successfully meet their information needs. In doing so I hope to achieve the following objectives:

- To investigate and understand the design process and each of the elements that lead to a successful design.

- To become familiar with design for mobile in creating effective user interfaces and provide more than suitable functionality.
- To understand the issues students in the University of Limerick currently face regarding their information needs and sourcing.
- To determine and prioritise what functionality should be included in the design of this application.
- To understand the information architecture of databases that could possibly be included in the application.
- To apply User Centred Design methods in carrying out initial user research.
- To successfully overcome the constraints associated with designing for mobile.
- To develop low and high fidelity prototypes that effectively convey the purpose of the application and in doing so, provide valuable feedback and insight on means of improving the design.
- To further develop skills in User Centred Design, wireframing and prototyping and research, both quantitative and qualitative.

3. Secondary Research

3.1 Universities go Mobile –Existing Products/Applications

The current growth in mobile technology has seen a huge rise in mobile internet use with “half of all college students used mobile gear to get on the Internet every day last year, compared with 10% of students in 2008, according to Educause, the educational-technology consortium” (Keller, 2011). However, many universities and institutes have neglected this move to mobile and treat their mobile websites as “low-stakes experiments” (Keller, 2011). It is clear that there is a great need and opportunity for the development of applications targeted towards students not only because of the incredible growth of mobile devices but because of the services that could be offered and utilised. Paterson and Low (2011) demonstrated the planned growth in numbers of students owning smart devices and that there is a “strong desire” (Paterson and Low, 2011) for library services to be available through mobile. This included the option to check book availability, due dates and book renewal as well as library room booking.

Currently many third level institutes have attempted to become more mobile with education companies such as Blackboard offering a mobile package at cost as well an open source option from the Massachusetts Institute of Technology and few opting to develop their own applications in house. In researching similar mobile applications targeted towards students in specific colleges, it became clear that most of the examples investigated are based in the United States due to the availability of packages such as Blackboard as mentioned earlier. Blackboard offers a number of mobile solutions for its clients across almost all platforms. Subject to licensing, the application offers features that students can benefit from such as a directory of staff, browse books in the library and maps in a usable manner. This mobile app came about from a group of students in Stanford University, ‘Terriblyclever Design, LLC’, who wanted to create an app that would allow students to do their everyday tasks from their pocket device. After rebranding to MobilEdu, the mobile solution was quickly sold to numerous institutes such as Duke University, Texas A&M and University of Washington to name a few (Crunchbase, 2011). Using this model, Blackboard acquired the students’ company for \$4 million (Crunchbase, 2011) and have since built up a number of clients including Stanford University, Florida State University

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and Pasadena City College (Blackboard, 2013). Since initially undertaking this project, some of these applications have been developed further to provide more services for their students as is the case with iStanford.

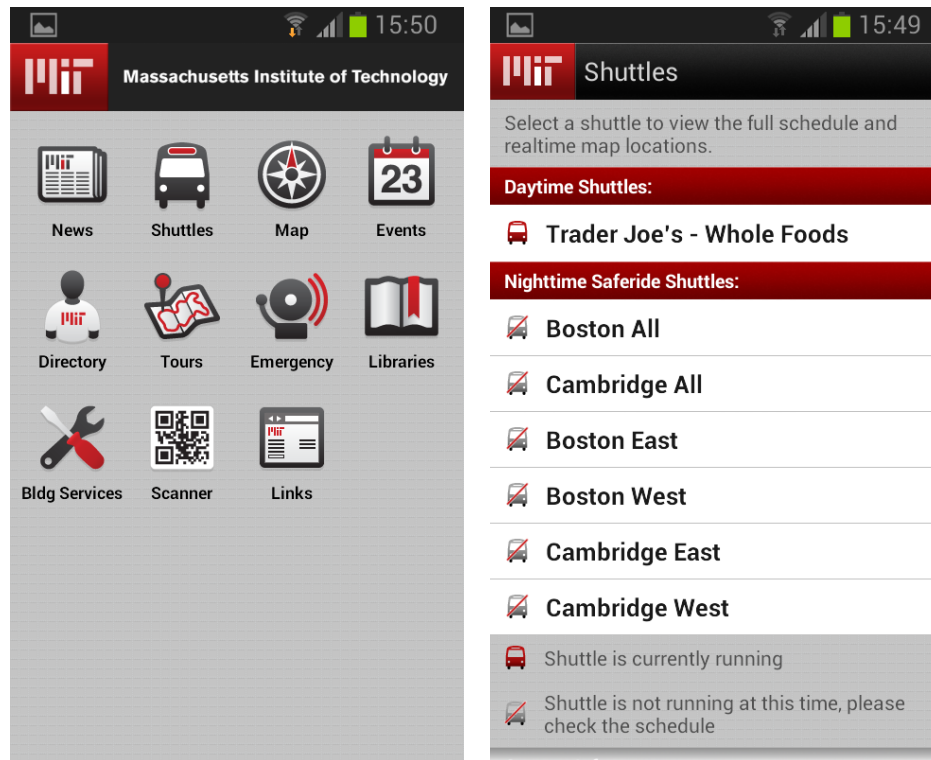


Pasadena City College Mobile Application from Blackboard



iStanford Mobile Application from Blackboard & Terriblyclever Design

The open source option from Massachusetts Institute of Technology is a free option for institutes with similar functionality; schedules, directory, maps and calendar of events. As this is an open source option, institutes have the opportunity to utilise this opportunity and tailor it to their own needs, look and feel by giving the development power to its own students. (Albrecht et al., 2009)

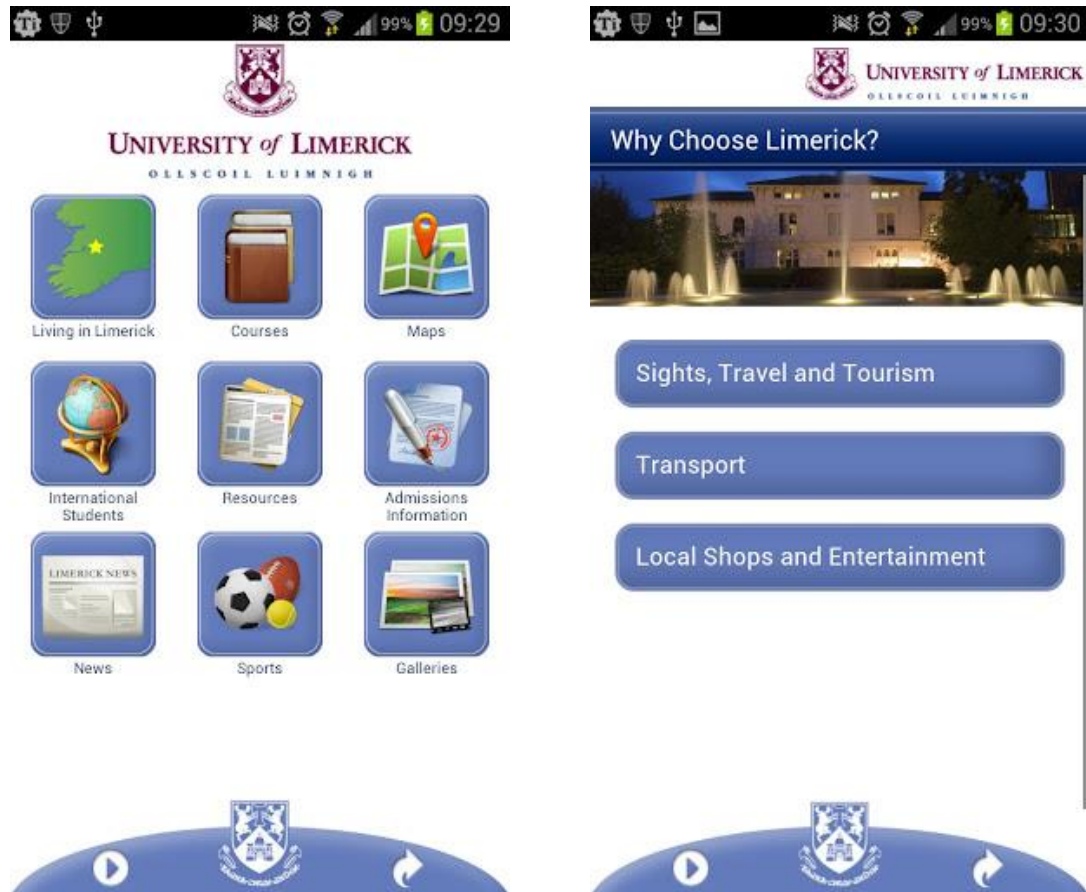


Massachusetts Institute of Technology Mobile Application

In the past 3 years, oMbiel is a company that has rapidly grown to become the United Kingdom's leading mobile application supplier to educational institutes. Their solution, CampusM, produces applications tailored to the institutes' needs and allow for expansion of an application. They also allow the institute to be in control of managing and customising the application and its content. All of the apps developed using the CampusM solution hold similarities across the board regarding layout and functionality and based on personal use, offer useful information such as PC availability followed up with directions and maps. (CampusM, 2013)

The University of Limerick currently has two mobile applications available to download. The first of which is 'University of Limerick', available for both iPhone

and Android. The application contains information about courses available in UL, accommodation, living in Limerick, admissions information and news about UL. While this is targeted towards current and prospective students, it seems to be a mobile version of the UL website, a marketing tool of little use to current students.

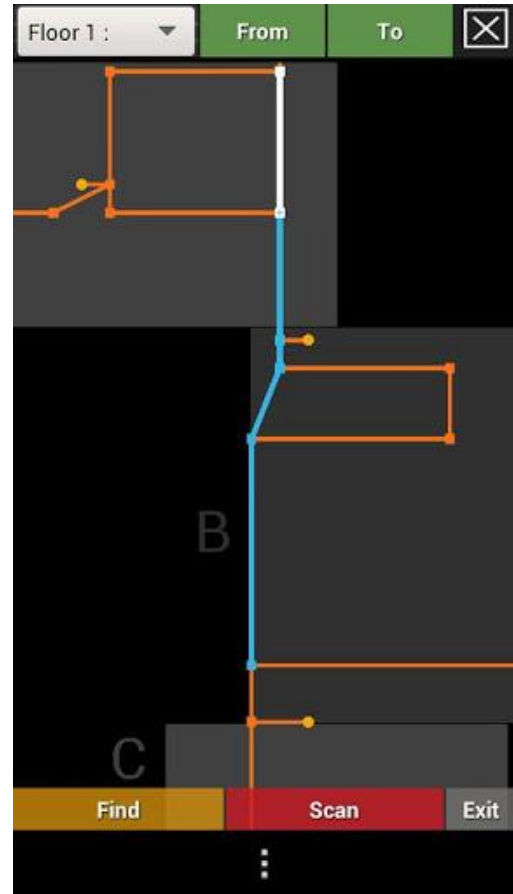


University of Limerick Mobile Application

‘UL First Seven Weeks’ is the second mobile available from UL. Part of the First Seven Weeks programme in UL, the aim of this app is to offer support to first year students coming to UL and to become comfortable and aware of their new surroundings. A joint venture between the Centre for Teaching and Learning and the Interaction Design Centre in UL, it contains new information weekly such as settling in, study, the campus and a map of each building. The idea is there but the application itself leaves much to be desired. Upon first glance the user interface already offers provides a poor user experience. The map feature, which could be useful, is very difficult to interpret with many users abandoning the application.

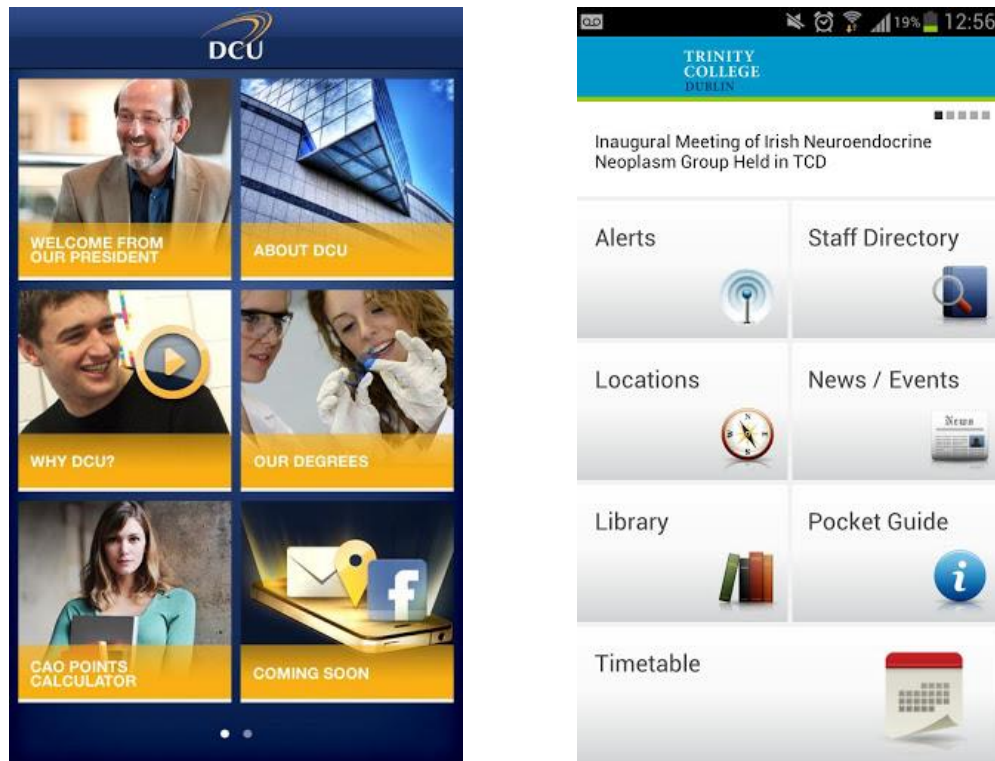


UL First 7 Weeks – Home Screen



UL First 7 Weeks - Map

There have also been other attempts at student based mobile applications closer to home. Here in Ireland, University College Dublin (UCD), and Dublin City University (DCU) all have launched mobile apps. Trinity College Dublin (TCD) has taken the CampusM solution as mentioned above. Although these apps were well received, there is mixed reviews with one review stating that the DCU app was “nothing more than a glorified prospectus” (Review - Google Play Store, 2013). The UCD application offered more useful functionality such as Blackboard learn, student timetable and workstation availability but again not without its pitfalls such as poor User Interface, size in memory and frequent crashing. Taking this research into consideration, the design of such an application for students of UL, will be dependent on the current daily needs of students on campus.



Dublin City University & Trinity College Dublin Mobile Applications

3.2. Design for Mobile

3.2.1. Devices and the User.

Weiss (2003) defines handheld devices as “extremely portable, self-contained information management and communications devices” which to be considered a handheld device must operate without wires or cables, bar charging and syncing, be usable in one’s hand and support some form of connectivity and applications. Today, such devices include Smart Phones such as Android and iPhone and tablets such as iPad. Each of these has a certain form factor, that being the relationship between a devices height, width and depth as well as display size, input and orientation (Weiss, 2003). While the definition of a handheld device is straightforward to understand, the term *mobile* can have many definitions depending on the context. Typically today, we do not use the phrase handheld device when referring to a mobile phone. Instead we must understand that due to the number of mobile devices available to us, that mobile “refers to the user, and not the device or the application” (Ballard, 2007).

The mobile user is someone who is at any given location at any given time. They are not necessarily focused on a set task on their mobile device, have different levels of

availability depending on their situation, social and more than likely multi-tasking (Ballard, 2007). Lumsden and Brewster, (2003) also point out that mobile users, in comparison to desktop users, cannot dedicate all of their visual resources when interacting with an application, but must focus on the primary task at hand such as walking. This also applies to the use of input methods as users must be able to interact with their device with ease whilst safely moving about a setting.

As a result, the everyday way of working and tasks are fast becoming mobile. Mobile computing as a whole is more pervasive than it has been and interface designers have to consider the key issue of usability with new constraints such as screen size, power, bandwidth, input methods, and user ability.

3.2.2. Design

Castledine et al., (2011) define design as “the process of organizing the information we want to present so that its structure is meaningful and instantly understandable...it’s about controlling the navigation and flow of our application in a way that is clear, minimizes uncertainty, and feels efficient” (Castledine et al., 2011). With this in mind, it is important to design an application that will provide the user with the content they are looking for and to be presented in a clear and navigational way using the interface as a means of translating this information. When transitioning from desktop to mobile, specifically in regards to web, there is a significant difference in capabilities, information that can be displayed and the users’ setting, therefore we must mobilise rather than miniaturise (Ballard, 2007).

Overcoming the lack of screen space on a mobile device, a phone in particular is one of the most common issues faced in designing a user friendly application. The average screen size of a mobile phone was 2.4 inches in 2011 (Phonearena, 2013) and is currently growing but these devices still are to be defined pocket sized, meaning the space available to designers is much less than that of a desktop computer but aim to hold the same amount of information. The issue here is that these small screens by comparison can easily become cluttered and off-putting for the user with widgets, buttons and menus and imagery (Brewster, 2002). Some means of overcoming this issue is for an interface designer to ensure a well-planned design, with the most

important information to the fore, easy and clear navigation and design for variable input methods, most likely the users' fingers (Mobile Usability ebook, 2013).

Hall et al., (1988) previously researched accuracy regarding the size of targets on touch screens. It showed that to reach accuracy greater than 99% when pressing a target, a target of 26mm² for seated users and 30mm² for standing users was required. That being said, due to increased functionality and information on a single screen, buttons now are often much smaller than those researched by Hall et al. Anything the user is expected to press should be a minimum 30 to 40 pixels in size and have sufficient whitespace around buttons to avoid user error and selection of the wrong item (Mobile Usability ebook, 2013). The popular iPhone creators, Apple, have their own set of guidelines regarding interface design and state that buttons should be no smaller than 44x44 pixels, even if the screen size differs across devices, the fingertip does not (iOS Human Interface Guidelines, 2012).

3.2.3. Usability

Usability has no one final definition but encompasses a number of different elements to be successful. The Nielsen Norman Group (2012) describes usability as “a quality attribute that assesses how easy user interfaces are to use” (Nielsen Norman Group, 2012) and refers to anything of which the target end user may interact with at any stage (Nielsen and Hackos, 1993). Usability has five common attributes. These include:

- **Learnability:** The system/product or service should be quick and easy to learn for the user so as not to impede any progress.
- **Efficiency:** The system should allow for a high level of productivity once learned by the end user.
- **Memorability:** The user should be able re-establish efficiency without issue after a period of not having used the system.
- **Errors:** The system should be low in errors, in that the user should make few or no errors when using it and be able to recover from them easily.
- **Satisfaction:** The user should be satisfied when using the system.

(Nielsen and Hackos, 1993)

Good usability is imperative for obvious reasons. If something is frustrating to use, the user simply stops using it and searches for a better solution. Something to consider is that the users' attitudes and ability may all differ regarding a system, be it a website or mobile application and that a designer must design for the user and not themselves.

Usability can be examined in a number of ways such as involving target end users in testing prototypes and evaluating designs. One of the more effective means of testing usability is the process of carrying out a heuristic evaluation. A heuristic evaluation, as described by Nielsen and Molich (1990) is an "informal method of usability analysis" (Nielsen and Molich, 1990) in which evaluators examine an interface against ten usability heuristics. Depending on the system being examined, not all usability heuristics may apply in the evaluation but it is important to have a number of evaluators examine the interface as "different people find different usability problems" (Nielsen, 2013).

Furthermore there is a number of technical issues that need to be considered also for design. Shorter battery life, processor speeds, available memory and connectivity are all elements that can negatively impact the use of an application. Poor performance will affect how the user perceives the responsiveness of an application and deter them from using it. If there is a means of making information available offline, as can be now done with HTML5, and not power or data hungry, then this can provide a better experience for the user in any context (Blackberry.com, 2013). In the case of this project for example, a better experience for students should be the availability of their timetable without the need for connectivity. Typically most students do not have access to online data all the time with the use of pre-pay mobile phones and as discovered in the survey carried out when beginning this research, the Wi-Fi offered on campus leaves much to be desired.

3.2.4. Aesthetics

Aesthetics, like usability, has numerous definitions including "beauty in appearance" (Lavie and Tractinsky, 2004), "visual appeal" (Lindgaard and Dudek, 2003), and "an experience" (Ramachandran and Blakeslee, 1998) all of which hold a theme of pleasure and harmony for a user (Lindgaard, 2007). Harmony can be defined as "a

pleasing arrangement of parts, whether it be music, poetry, or colour...in visual experiences, harmony is something that is pleasing to the eye” (Brady and Phillips, 2003).

It has become apparent that design features such as aesthetics play an important role in a product or applications’ overall user satisfaction in conjunction with usability. In Norman’s recent book “Emotional Design: Why we love (or hate) everyday things” he makes the point that “attractive things make people feel good” (Norman, 2004) and this positive attitude improves users’ ability to complete tasks even problematic ones. In contrast, users who are anxious to begin with get frustrated earlier and get stuck on problems they encounter and when they eventually complete the task, vocalise complaints about the difficulties encountered (Norman, 2004). There has been research linking aesthetics and perceived usability in which aesthetics has a positive effect on how users perceived the usability of an application or website (Sonderegger and Sauer, 2010; Brady and Phillips, 2003). This would suggest that to provide an overall enjoyable user experience, the designer must create something that is not only usable but visually appealing too. This is more so the case in today’s society where over 1000 applications hit the market daily as of 2010 and no doubt this has increased (Freierman, 2011). Those releasing the applications are competing in a very competitive and highly populated market and as a result, serving a need and looking the part are both elements to success in which a positive user experience is provided.

3.3 User Centred Design

From the beginning of this project, it was clear that taking a User Centred Design (UCD) approach would be of most benefit in designing a student based mobile application. Broadbent et al., (1997) believe that the UCD approach holds a “fundamental role in avoiding "ideal world" fallacies with respect to systems performance” (Broadbent et al., 1997). This term, first coined by Norman and Draper (1986) as the “human-centred approach”, is set on the basis that placing the target end user at the centre of the design process, including evaluation, ensures that the design is built to suit their needs. This approach is highly iterative with several cycles of design, testing and evaluation of prototypes and redesign (Broadbent et al., 1997).

To gain a better understanding of what the user requires, the designer must first carry out some user research. Ballard (2007) states that the “object of user research is to get a sophisticated understanding of users’ tasks, goals, and context, to make better design decisions throughout the design process” (Ballard 2007). Methods of user research include surveys, ethnography, scenarios, interviews and focus groups and forms of participatory design such as design games and cultural probes are becoming popular methods of unearthing user requirements.

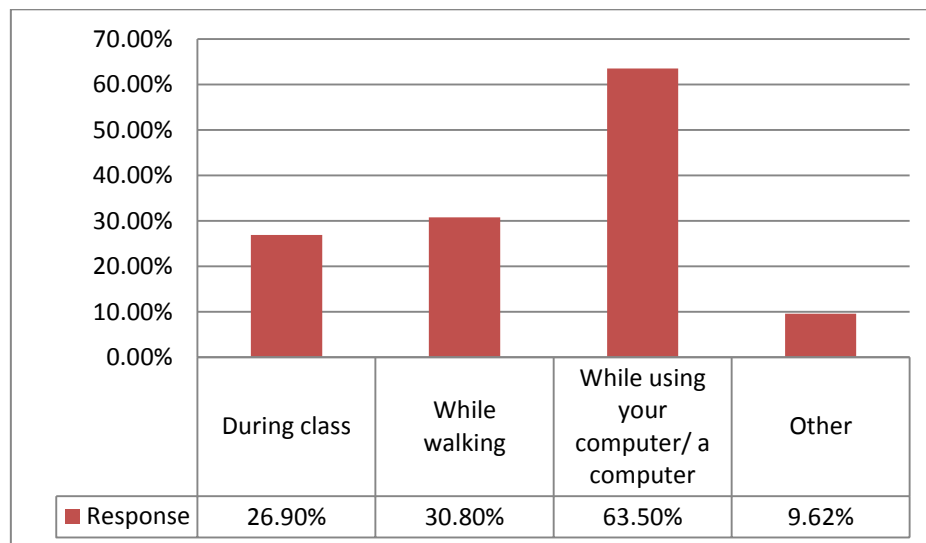
User testing is something that must be carried out on a regular basis and this involvement of target end users is not only of benefit to the designer but to the user too. The user can then fully understand the features and functionalities of the proposed design and “make meaningful interpretations” (Damodaran, 1996) and design suggestions that will influence the final design in a positive way.

4. Primary Research

4.1 Initial Survey

Having carried out initial research into similar products and applications, and some informal conversation with colleagues, a quantitative research method was applied, namely a survey to investigate the common habits of UL students regarding their access to mobile devices and information sourcing within UL.

Using the popular online tool, Survey Monkey, a ten question survey (Appendix 10.1) was drawn up and distributed to a number of UL students. Distribution methods included emails to class lists of Digital Media Students years one to four as well as through the social media sites; Facebook and Twitter targeting UL students. As with most surveys, the response rate can go either way. Of the 52 respondents it was found that 88% of respondents owned a personal mobile device that could be used to access the internet by some means. It was interesting to note that students of UL come across the need to check information at various points, quite often when on the move, as represented in the graph below.



Bar Chart - When do you most often come across the need to look online for information regarding UL, your course or the campus?

When asked “Does information sourcing impact you in anyway or prevent you from completing a task?” - 87% of respondents answered yes with various reasons. Such answers portrayed early frustration among students and this become more apparent as

the survey continued. Most frustration stemmed from the numerous online resources available from UL such as the UL website, SULIS and CSIS website, coupled with the poor usability of these sites and overload of content that require users' full attention to sift through.

“Often information that I seek cannot be easily sourced on the careers website, but will require me to go into my email and find the email and click the link.”

“Having to go between sulis, a wiki, emails, csis website. Too many different sources”

When asked what types of information students are looking for most frequently, respondents provided answers which were to be expected. This included timetable, information regarding assignments and lecture notes as well as some wanting to know the location of cafés and post boxes. The results of the survey can be read in Appendix 10.1.

4.2 Information Architecture

One element of the design of this project is to understand, to some degree, where the information included in the application is coming from. This is not only for the sake of the developers should it be developed in the future, but to better understand the overall design and ensure a thorough basis for good application that will not be large in memory and run smoothly providing a fluid user experience overall.

The campus map currently offered to students of the University of Limerick is available in a PDF document with a numbered legend of the buildings on the campus. This map is also handed out to incoming students during orientation week. While this may be useful to some degree, it offers no indication as to what buildings look like from the outside. What is more problematic, especially for new students is the building and room numbering system on campus which is not explained in the campus map. For example, the Main Building in the UL, is divided into 5 blocks, lettered A to E. To add to this confusion, the letter ‘G’ denotes the ground floor for blocks C, D and E, ‘O’ denotes the ground level of blocks A and B, while the following floor is ‘M’ for Mezzanine and only then do the remaining floors follow

normal numbering convention. As to be expected, students, especially first year students, often have trouble with finding their way around the Main Building as well as the numerous other buildings on campus.

As a result, a map feature in a mobile application would be of great benefit to both students and even visitors. One solution to implementing such a feature is the integration of Google Maps for iOS and Android. Google offers the API for Android and SDK for iOS free for developers provided they comply with the Terms of Service stated by Google. The package itself handles access to the Google Maps servers, display and gesture response. Developers also have the option to add their own icons, markers, overlays and user interactions (Google Developers, 2013).

Currently there is no one resource for anyone to look up the opening hours of any building on campus unless one carries out a specific internet search or know by word of mouth. Should a feature to view the opening hours of buildings on campus in UL be included, a database for managers should be created to allow the hours to be updated during holidays or allow for changes. The other option is to research the opening times of each individually and include them on a static page but this would not be updated if changes occur outside of term time.

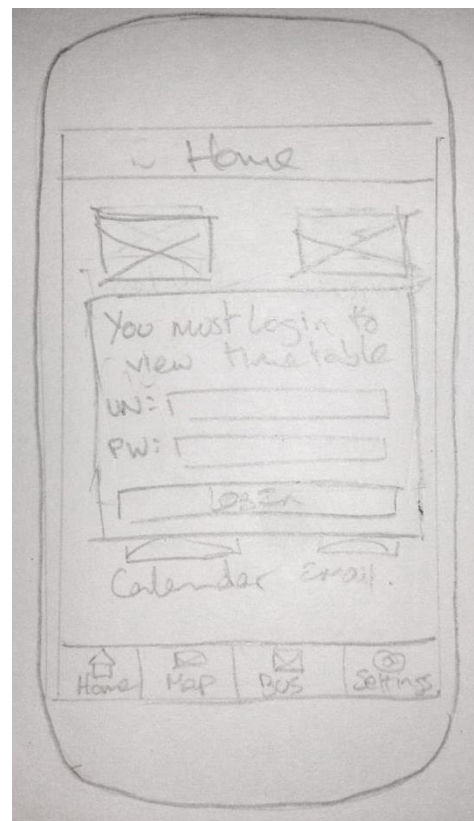
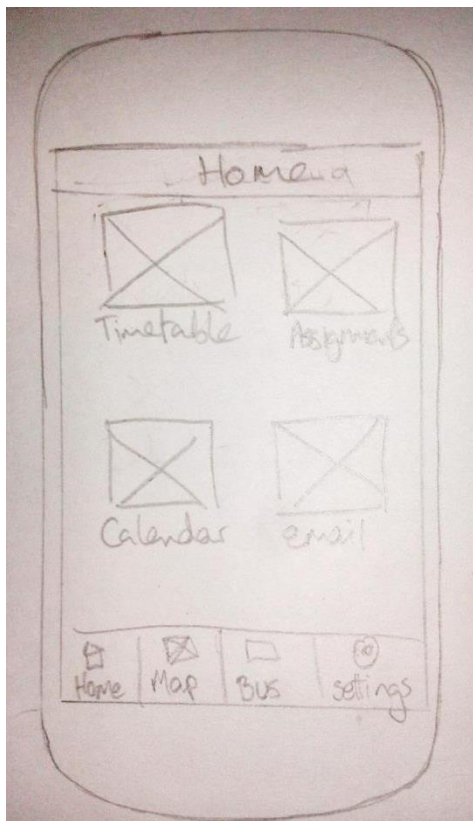
The UL student timetable is something which proved problematic with regards to implementing such a feature in this application. The current timetable available online through a desktop computer is an out dated feature created using Active Server Pages and Microsoft FrontPage to create dynamic pages. Because this resource is outdated, there is uncertainty of how the information displayed to the end user is created. For the purpose of this project, it was thought that a form of data scraping could be used in which the information would be extracted from this initial resource and output to a mobile friendly source such as an RSS feed. Research was carried out into this concept but as my own knowledge of such subject is limited, no definite results came about. Upon discussing this issue with a colleague, it was discovered that there is a means for someone more capable with programming knowledge to carry out this task. In my understanding, this would involve the creation of a database on Microsoft MySQL Server and then create an ASP.NET Web Application using Microsoft Visual Studio and publishing the results. Further research is required to fully understand each

element of such a task but as mentioned later in this report, the Information Technology Department of UL can improve and update current online resources.

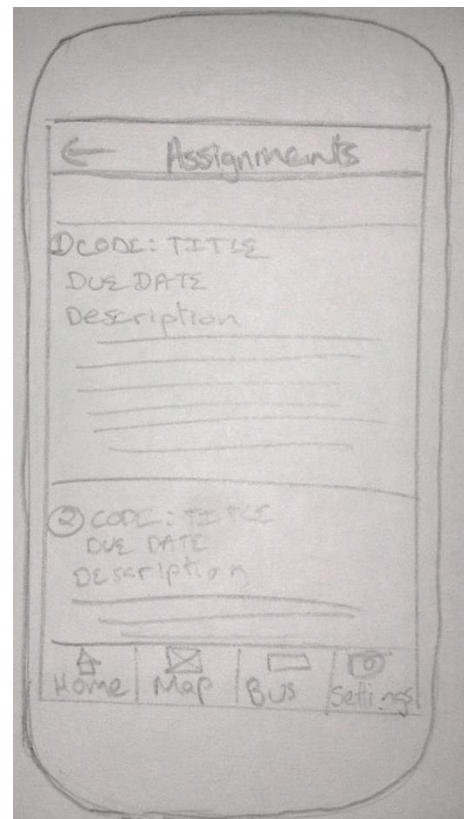
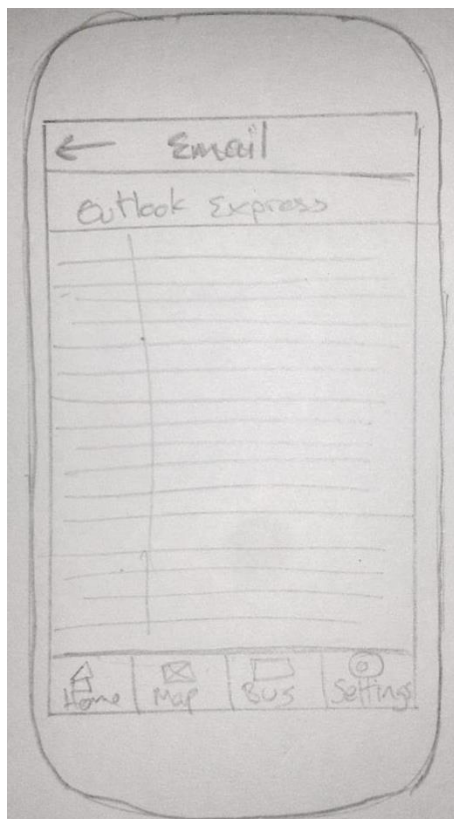
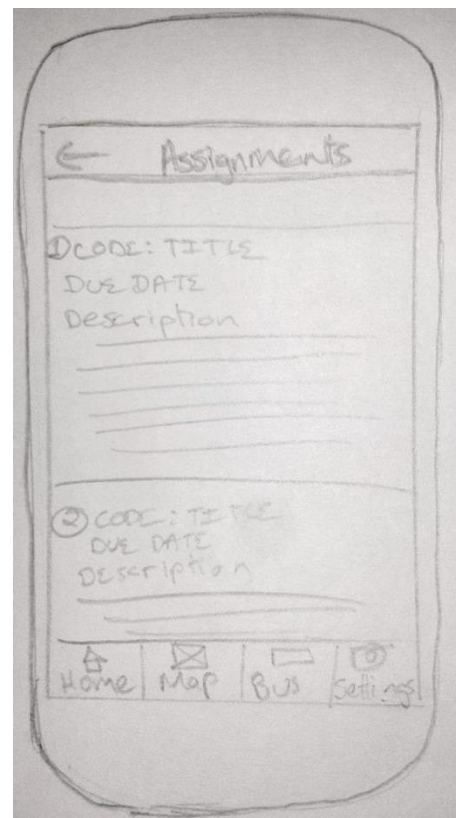
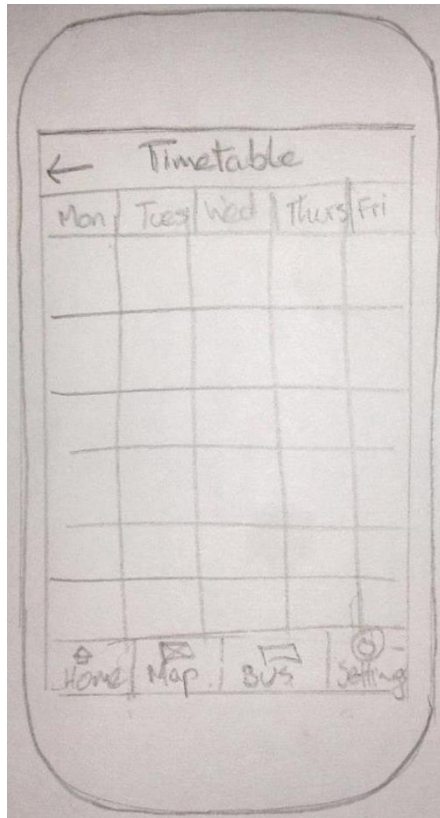
5. Design – User Interface

5.1 Initial Concept Creation

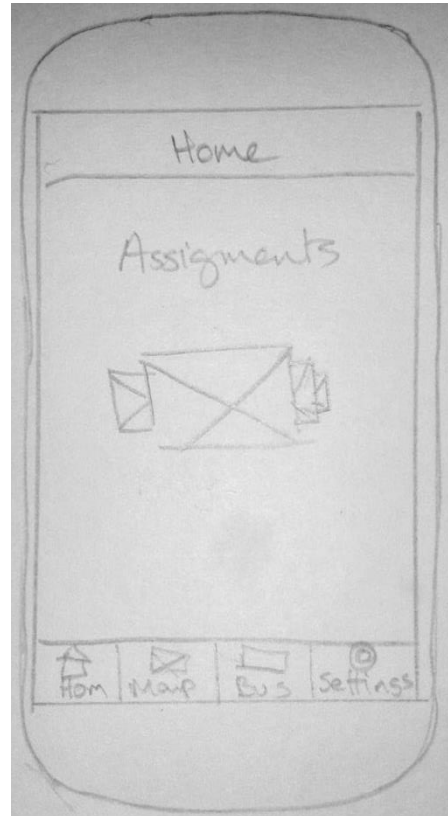
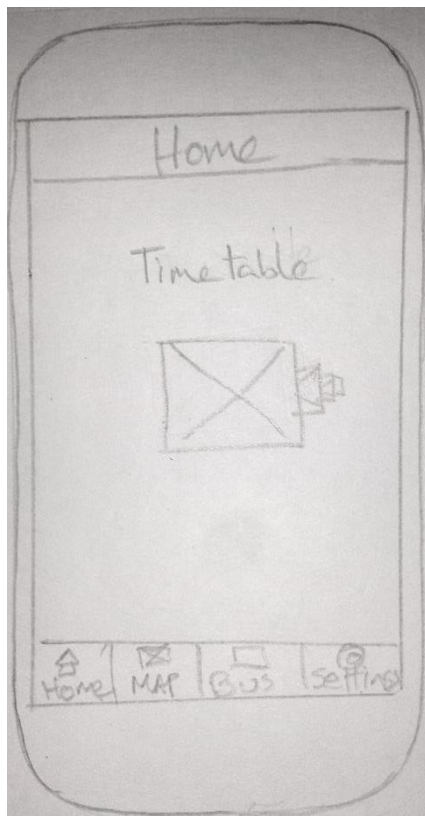
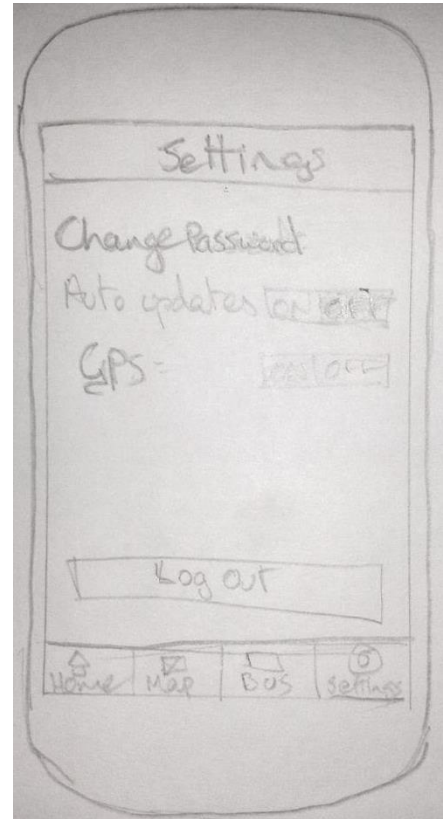
Having carried out the survey and initial research into existing mobile applications targeting student needs, a number of concepts were formulated. These early concepts included a number of rough sketches in order to get ideas down and experiment regarding layout and navigation. These rough sketches allowed for room to expand and build on the points made in the initial survey and comments made in informal discussions with colleagues. At this stage of conceptualisation, much of the focus was on interpreting the survey to determine what functionality was of most importance as to create a clear navigation for end users.



Rough Concept Sketches



Rough Concept Sketches



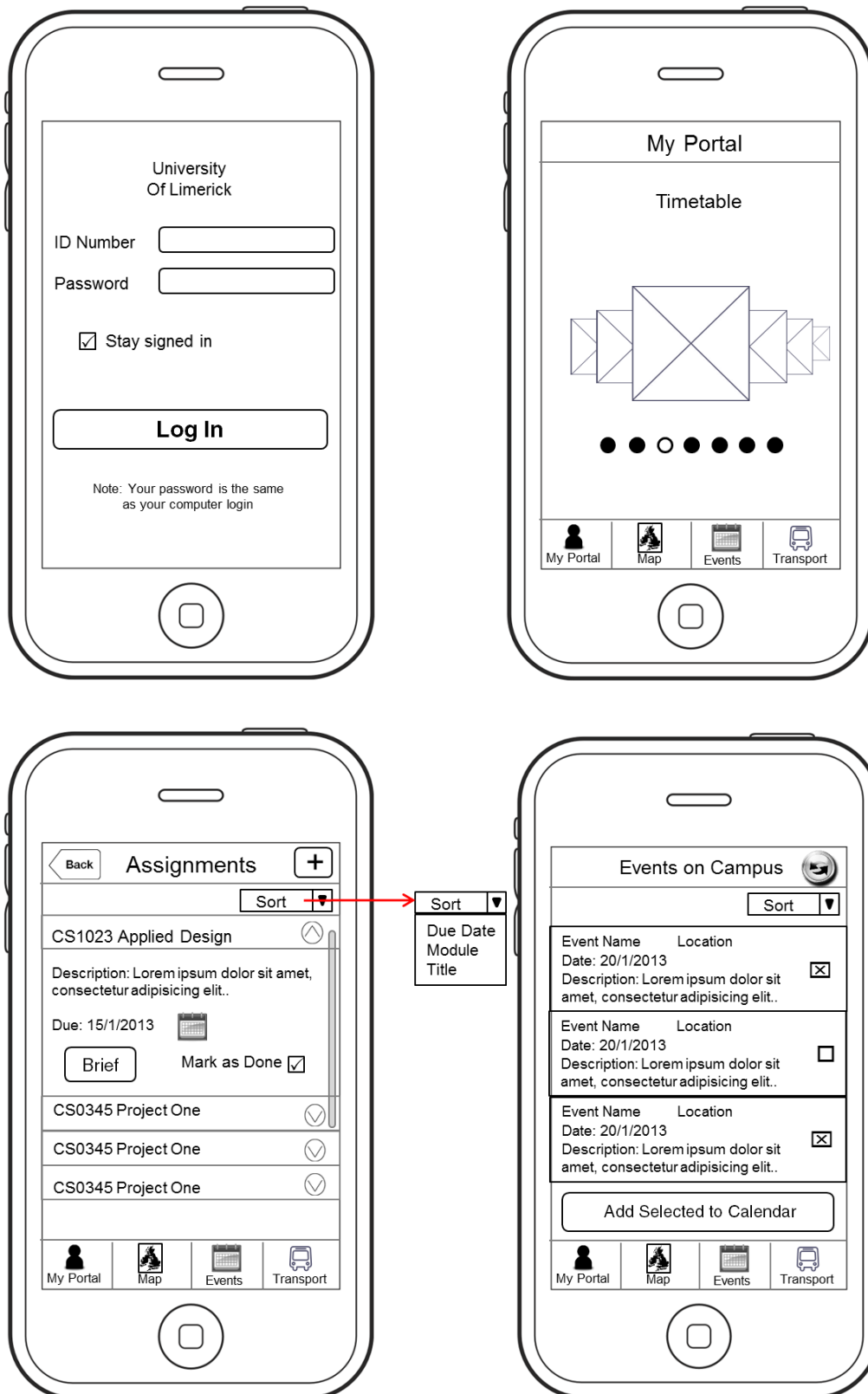
Rough Concept Sketches

Based on the survey it was clear to see that features such as timetable, assignment information, and a usable map were greatly desired by those surveyed. These features were included from the beginning of sketching concepts along with features of lesser importance such as transport around the University of Limerick and events on campus. Key to development was to decipher a layout and user flow that would be easy to understand while allowing for the above features to be included. Separately, each screen view sketch was explored and developed to create a view that would fit within the limits of the small screen size of mobile devices.

Having explored a number of possible design concepts and considered the functionality that needed to be prioritised, a set of wireframes (Appendix 10.2) was created. Wireframes act as a blueprint of any screen design and is a highly beneficial step in design. Devoid of colour, images or design elements, they force the designer to think of usability in terms of navigations, placement of buttons and features (Haas, 2011).

There are a number of wireframing tools available such as Mockingbird, Balsamiq and Gliffy to name a few. Many of these offer quick solutions to wireframing and collaboration among designers which is beneficial to a big team. For this project, I chose to use a wireframe library I had created during my time on Cooperative Education. This library was created in Microsoft PowerPoint and consists of a number of User Interface elements, both custom and standard for both iPhone and Android. Using this library meant that wireframes were quickly and easily created and allowed for efficient reiteration.

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Wireframes of initial concept.

5.2 Low-fidelity Prototype Development and Testing

Prototyping is a process that is strongly encouraged in any design process and should be carried out “early and often” (Moggridge, 2007). A useful tool, they are “created to inform both design process and design decisions” (Buchenau and Suri, 2000).

Low-fidelity prototypes, be it a paper prototype or computer based, offer limited or no functionality but effectively depict concept design ideas and screen layouts. They are useful in that they are quickly and easily made and can develop thoughts on the initial stages of the design without specifically building anything. Generally these are similar in size and sometimes weight of the device so the user can gain a better understanding of the user experience and in turn provide more accurate feedback in the early days of design (De Sá and Carricco, 2006). Low-fidelity prototypes are constructed early in the design process while being cheap to develop and can be used to evaluate a number of different ideas (Rudd et al., 1996).

For this project, a low-fidelity paper prototype was created using the wireframes created previously. While paper prototypes are of great benefit to the design process, they require compromise as they do not test the “intricacies of look-and-feel of the shape, tactile feel” (Weiss, 2002) and feedback. Regardless, they allow for faster iterations of design and experimentation. With this paper prototype, I decided to hold a focus group as a means of testing this early design. Kitzinger (1995) describes focus groups as “form of group interview that capitalises on communication between research participants in order to generate data”. They allow participants to engage in exploratory discussions about the subject at hand and provide insight into the attitudes and needs of participants. Using the data generated from a successful focus group the researcher will have gained a clearer understanding of user needs and experience and be able utilise this along with design ideas to further the design process.

The aims of this focus group were to provoke discussion regarding the initial concept of the application and unearth target end users’ opinions regarding the functionality that would be available on a high-fidelity prototype. Furthermore, to hear experiences from participants of their time in UL and the common issues they come into that could be fixed with such a mobile application as well as discovering features that may have been overlooked in the initial design concepts.

A group of 6 students were gathered for the focus group, meeting at a time and place that was convenient to them. Before commencing the focus group, participants were fully briefed on the nature of this project and their role in this focus group. They were provided with an information sheet (Appendix 10.3) and were invited to sign a declaration of informed consent (Appendix 10.4) if they were still willing to participate as required by the Ethics Committee.

Initially, participants were given the paper prototypes and allowed to examine and get familiar with them. As the students were not of a technical background, being involved in prototyping was something they were not familiar with therefore allowing them to explore the prototypes themselves encouraged them to relax and begin thinking about the prototype. The focus group was carried out in an informal manner as to ease participants and provoke more discussion rather than asking them to carry out tasks. This allowed for more idea generation regarding functionality and brought my attention to details that may have been overlooked by setting fixed tasks.

It became apparent that such an application was greatly favoured by participants and that the layout and navigation was clear to understand even in paper form. By allowing participants to familiarise themselves with the prototype, I, the facilitator, was able to demonstrate the general concept and ensure a clear understanding. During the discussions among participants, paper prototypes were edited with a pen to demonstrate ideas to the group which in turn provoked further thought.

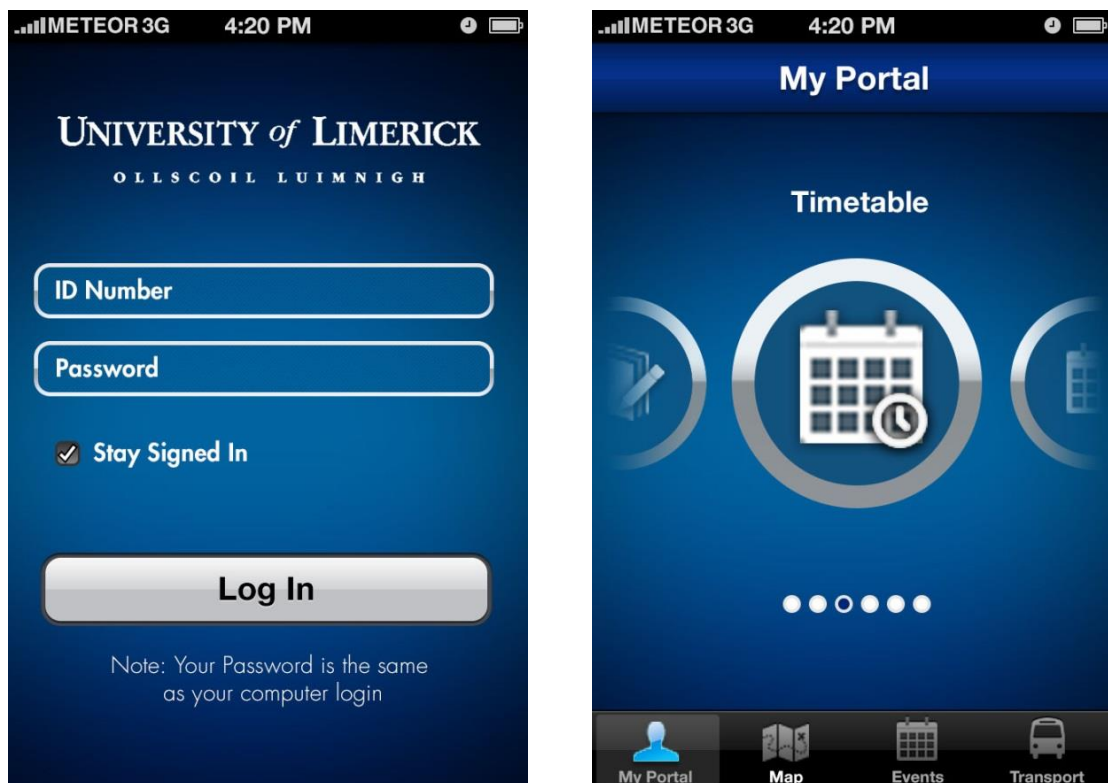
While a lot of the functionality provided was all deemed necessary, the focus group produced some more desires that were out of the scope of this project. Such suggestions included Clubs and Societies information, ATM locations and more social events in UL. While this would result in an ideal application, designing such would result in an application that would be overloaded with information and more than likely result in poor usability. However, some points brought up in discussion were considered for the next iteration of the design cycle.



Focus Group Users familiarising themselves with the paper prototype

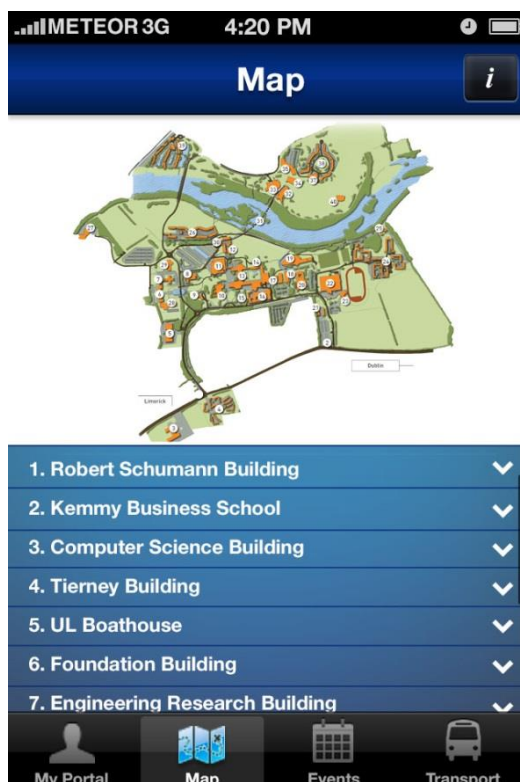
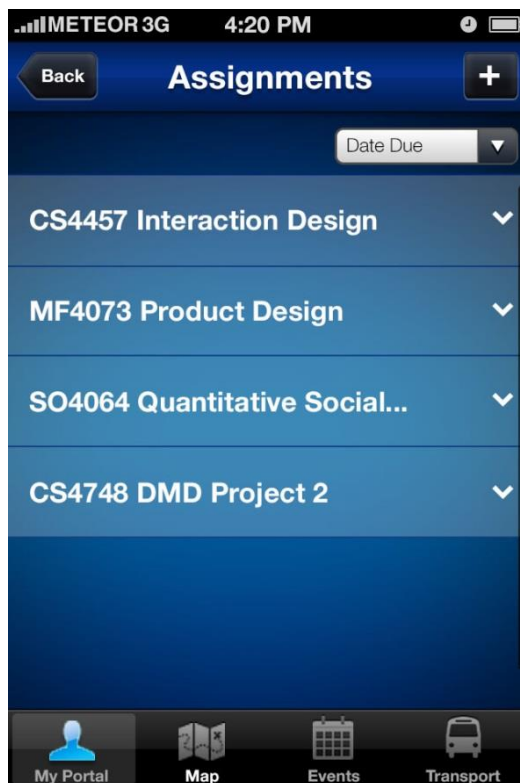
5.3 High-Fidelity Prototype Development – Axure

At this stage of the project, initial user requirements had been gathered and a number of design concepts had been sketched, one of which was developed, prototyped and tested. Using the feedback collected from the focus group, the next stage was to develop the first design and build on it to include elements that had not been considered for the first design. This included a section which would include some useful information for students such as Admissions Office details and Fees Office details and the Medical Centre to name a few. With this in mind, new rough sketches were drawn up to explore new design concepts incorporating the data found in the focus group. These sketches were further developed by the creation of Adobe Photoshop mock-ups. These mock-ups displayed a more visual design and provided a real representation of the user interface. This experimentation of visual design took place alongside the creation of a high-fidelity prototype.



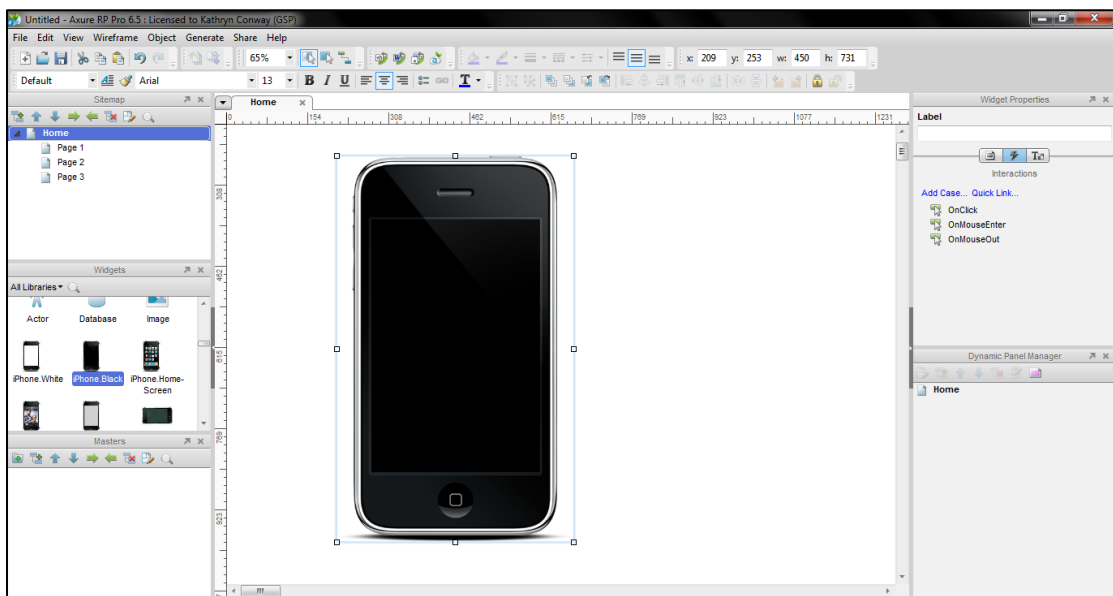
Photoshop mock-ups of first design

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Photoshop mock-ups of first design

High-fidelity prototypes are much more functional and interactive and as a result require more time and effort to develop. They are designed to “represent the interface to be implemented in the product” and provide a “better basis for thorough evaluation by end users” (Rudd et al., 1996). Furthermore, they are used as a means of representing “a combination of the way the design looks, feels, behaves, and works” (Moggridge, 2006) and offers a more appropriate representation of the user experience similar to an Experience Prototype. An experience prototype is difficult to define but can be seen as a “representation, in any medium, that is designed to understand, explore or communicate what it might be like to engage with the product, space or system we are designing” (Buchenau and Suri, 2000) which effectively communicates the design and the context in which it may be used in.



Axure RP working space

Because of the increased functionality, target end users can operate the prototype in a manner that is close to the final product and gain a clear understanding of the design. For this project, I created a high-fidelity prototype using the prototyping tool Axure. Axure is becoming a standard for creating interactive wireframes and prototypes for websites and mobile applications amongst others. It allows for rapid prototype creation and collaboration among users through ease of use with drag and drop widgets and user interface libraries to tailor your prototype. These prototypes are then

generated, displayed and functional on a web browser and can also be uploaded to a server for shared access (Axure, 2013).

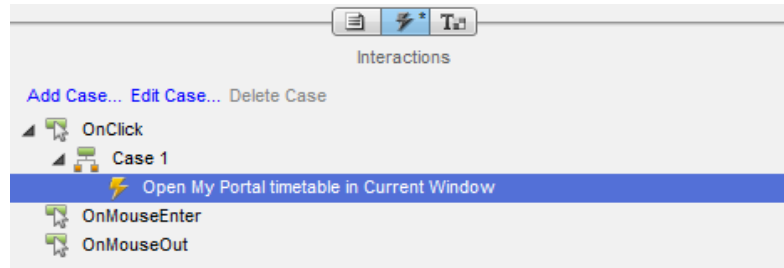
The software was acquired through the “Good Student Program” offered from Axure RP. During the early stages of getting to know the software, a rough version of the prototype was created using the widget libraries provided by Axure. This practice run, so to speak, provided a deeper understanding of the navigation and layout that had been designed in the early design stages and brought to life the overall usability. The screen views created in the rough prototype offered functionality but did not provide any visual or graphic indicators as to the style of the application. This did come about in creating the high-fidelity prototype that would be used in cooperative evaluation.



Practice prototypes created using Axure RP.

Having developed an understanding of the operations of Axure, a high-fidelity prototype was created. This prototype combined a certain amount of functionality and interactivity and the visual elements designed in the Photoshop mock-ups. This process involved an exercise called “slicing”. This is to slice up the Photoshop image

files and separate individual elements such as buttons and icons so functionality can be added to them. These images are then brought into the Axure workspace, each of which can have a “case” added to them. For example: Case 1 – On Click - Action is to “open *My Portal* in *current window*”. In layman’s terms, on clicking the designated button, the students portal screen view will open in that web browser window.`



Adding an interaction case in Axure



High-Fidelity Axure prototype for cooperative evaluation

5.4 Cooperative Evaluation

Cooperative Evaluation is a method of evaluation often used by designers who may not have specialised knowledge in the field of human computer interaction. Monk et al., (1993) define Cooperative Evaluation as a “procedure for obtaining data about problems experienced when working with a software product, so that changes can be made to improve the product.” It is beneficial to designers in both evaluating prototypes and for improving existing products. A high fidelity prototype is created for target end users. These users are given a set of tasks ranging from simple straight forward tasks, incrementing in difficulty to more complex tasks that demand more attention from the user. By asking users to employ the think aloud technique, the evaluator can easily gather information on the end users thoughts and feelings regarding the prototype as each task is being carried out. Often the evaluator may have to prompt the end user to provoke thought and expression with questions such as “how do you find this task?” or “what do you think of this navigation?” From this, evaluators receive invaluable feedback regarding design, usability issues and any other issues that may arise in the evaluation process and utilise these findings to reiterate and refine the next design.

A sample of ten students attending the University of Limerick was recruited. Those recruited included fellow students of the Digital Media Design course, students of courses of a different nature such as Sports Science and Physical Education whom I know personally and acquaintances approached in the Computer Science building who were more than willing to participate. Participants were all met individually at a time and place that was of most convenience to them and that offered a quiet and relaxed environment. The procedure for this evaluation was the same for all participants, each with similar settings. A laptop was placed open in front of them and the prototype ready for use with the task list at hand. Pen and paper was used to collect participants’ comments and thoughts as well as noting their actions and behaviour in using the prototype.

As before, participants were briefed on the goals of this project, the current aims of this cooperative evaluation, informed on their rights as participants and supplied a consent form before commencing the tasks. It was important to emphasise to participants that this was not a test on their ability but a test of the applications

usability to ensure they were at ease and did not feel self-aware as they carried out the tasks. Recording tools such as audio and video were not utilised during this cooperative evaluation as often it can be intimidating and off-putting for participants.

The tasks were as follows:

1. Log in to the application and ensure you stay signed in.
2. View your timetable.
3. Get the telephone number for Castletroy Cabs.
4. View information regarding the Admissions Office.
5. Go to your Portal and view your transcript.
6. Turn off Notifications and save settings.
7. Mark MF4073 Product Design project as done.
8. Add Careers Fair to your calendar.
9. Check the opening hours of the Robert Schumann building.
10. Log out of application.

5.5 Cooperative Evaluation Results

The cooperative evaluation was carried out on a total of 10 target end users. Snowball sampling occurred during the recruitment of participants. Early participants displayed great interest and shared the experience with peers who in turn, volunteered to participate. The cooperative evaluation was successful and proved beneficial to the design process. Both positive and constructive feedback was received during the exercise and taken into consideration for final amendments to the final product of this project.

1. Log in to the application and ensure you stay signed in.

Almost all users found this a straightforward process and understood what was required to complete a successful login. Some users however, missed the checkbox option to ‘stay signed in’ and simply did not see it. This could be due to the fact of initial uncertainty and only becoming newly familiar with the prototype.

2. *View your timetable.*

As the option to view ones' timetable was the default view that met the user after logging in, all users simply clicked the 'timetable' icon and successfully arrived to viewing it. Fitting the timetable in a clear and legible way was a thing of concern throughout the design stage. For the purpose of this prototype, simple text represented a sample timetable. One user suggested separating the timetable into two lines in that Monday to Wednesday could be displayed on the top half of the screen with Thursday and Friday below it but was aware of having to allow for up to nine hour slots for one day. Another suggested that the standard means of zooming in and out of a table would be legible and sufficient for use.

3. *Get the telephone number for Castletroy Cabs.*

All users had no issues in completing task by using the applications tab bar, clicking the 'transport' option followed by the 'local taxi numbers' option.

4. *View information regarding the Admissions Office.*

All users completed this task although for some, it was not without its difficulties. The information was to be found under the tab 'Resources'. Some users' initially assumed that this information would be found in the 'My Portal' tab and because of this responses included "*I don't really know where to go*" and "*I'm just assuming it's here*". Moments later, these users spotted the 'resources' tab and completed the task and stated that it made sense in hindsight but suggested renaming this to information or something similar.

5. *Go to your Portal and view your transcript.*

Most users were able to successfully complete this task without issues and enjoyed the navigation of scrolling through 'My Portal'. This success may have resulted from becoming familiar with the application – "*I know this because I saw it a minute ago*" - or a logical train of thought. One user suggested that this option of scrolling through

the ‘My Portal’ options (which on a touch device would involve a swipe gesture), should be continuous on either side similar to a carousel; meaning that there would be no end but a user could cycle through each option repetitively. Another user mentioned that the scroll through navigation could be made more obvious which will be taken into consideration for the final design. The rest of the users all felt that this was easy to complete and it was “*well directed*”. The option of actually viewing ones’ transcript pleased the users as they all felt this would be a preferred option to the current method of logging into yet another portal on a desktop computer and inputting several means of identity verification. The logistics regarding security of such an option are something which would require much consideration although it was perceived that this is not an issue for most students.

6. *Turn off Notifications and save settings.*

As the settings icon was placed in the top right hand navigation bar of the ‘My Portal’, most users had seen it from previous tasks and recalled that it was there. As a result most users had no problems in completing this task. However, some acted with hesitation as regards to where to look first. One user mentioned that they “*did not notice the settings icon at first because I was focusing on the tab bar on the bottom*” while another was surprised that they found it so quickly stating that they “*thought I’d have to search more*”. Another point made by another user, who had no problem completing the task said that “*it would be ideal to have the settings accessible at all times but this may not be practical*”. It was clear to see that the task itself was simple to complete but getting to the point of doing it brought the most issues.

7. *Mark MF4073 Product Design project as done.*

This task created some confusion amongst most of the participants. While most completed the task by navigating through ‘My Portal’ to the ‘Assignments’ icon, having come across it in previous tasks others immediately clicked on ‘Events’ in the tab bar. This ‘events’ displays a list of upcoming events that take place on campus. Having realised that this task could not be completed via ‘events’, some clicked the

‘resources’ tab as a means of uncertainty before navigating to ‘My Portal’ and completing the task.

8. Add Careers Fair to your calendar.

Due to usability issues raised in the previous task, some users were already aware of the ‘Events’ tab and the functionality that could be carried out from there. Almost all users had no issues in completing this task but some suggested that after adding the event to your calendar, a user should be able to “*access your own calendar from the events*”. One interesting usability issue was raised during this task whereby one user had remembered personal calendar option in ‘My Portal’ and clicked on it and proceeded to add the Careers Fair manually similar to a personal reminder situation. Having completed this alternative task, they then noticed the ‘Events’ button in the tab bar and followed up with “*oh, that’s what I really wanted to do*”.

9. Check the opening hours of the Robert Schumann building.

This had a variety of issues of which, seemed to be linked to how the task was phrased. While some users had no issue completing the task, some interpreted this as solely information and referred to the ‘Resources’ tab for the answer, which as facilitator was understandable. Following that, some decided to look in ‘My Portal’ for a solution but to no avail. The users then sought about rectifying the situation and clicked ‘Map’ in the tab bar, the only item they had not previously visited. They then completed the task by expanding the necessary item. Users who had trouble with this task mentioned that a more informative name for this tab may be better whereby a user can immediately know what information is available in that option.

10. Log out of application.

This task was completed efficiently without issues by all users by navigating to the settings icon they had come across in a previous task and clicking ‘Log Out’.

With the cooperative evaluation completed, a short de-brief interview was carried out with each participant. This was without structure and more a means of gathering thoughts and opinions that may have formulated having used the prototype. All participants seemed pleased with the prototype and its functionality. Regarding usability, some mentioned that overall it was *“really ease to use”* and that it would be *“a great thing for students to have”* as well as being *“appropriate and relevant”*.

One student suggested a usability solution in that instead of accessing settings in ‘My Portal’ that the last tab of the tab bar could be a ‘More’ button rather than just resources. With this, a clearer usability could be achieved in the final product as settings will then always be accessible as requested by another user.

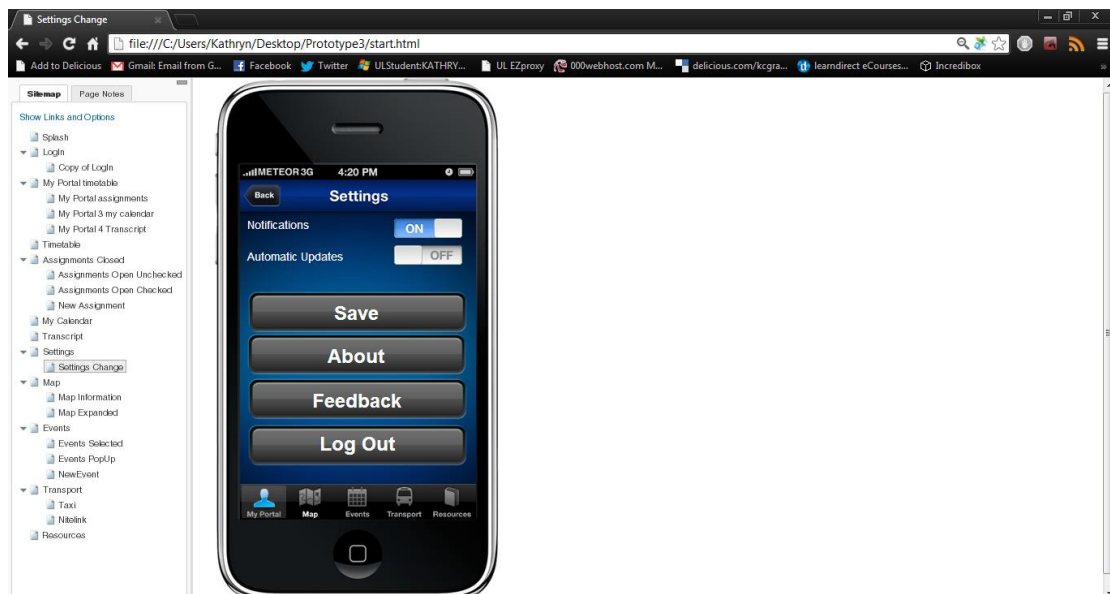
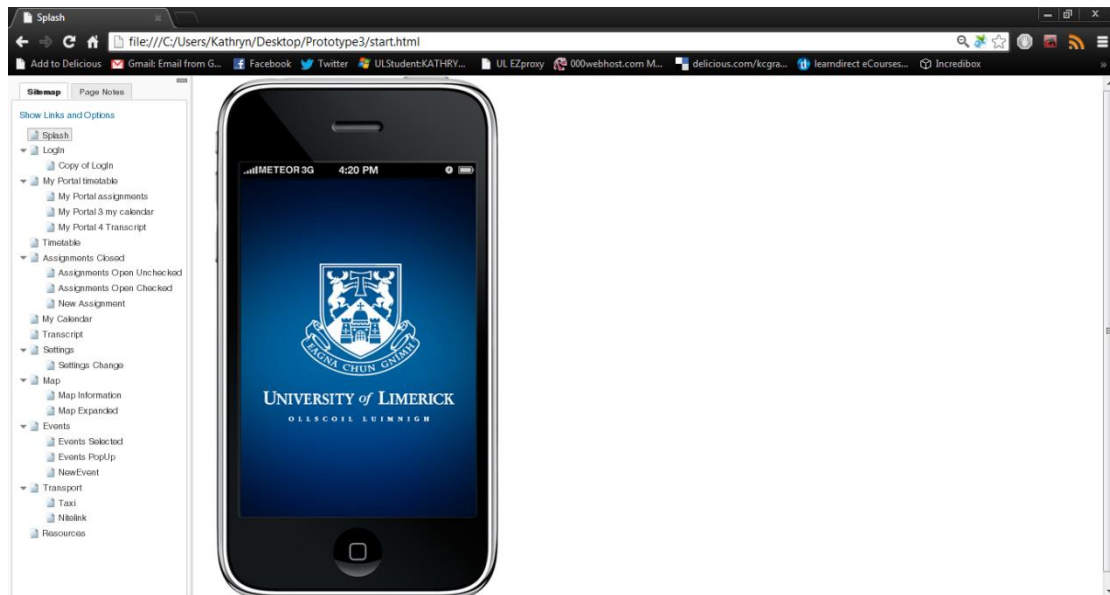
The option of viewing assignments is one that raised questions as a designer as to how would this work. From my own view, it would work best if users were to input this information themselves but this meant they relied upon their own attitude towards carrying out said assignments. This was something raised in the de-briefing discussion. Most users felt that it should be up to the students themselves to fill in the data regarding what is due, the date and any other information. One user said that if this information was automatically loaded into the application that they *“wouldn’t look at it if it was already there”* whereas the option to edit this information yourself was more of an incentive to look at it. Contrast to this, another user said that if such information was not automatically provided that *“so many people wouldn’t bother”*.

Another comment made by a participant was regarding the map feature in which a user can not only see where a building is but also view opening hours, general room code and if there is a café in the building – *“I like that you can find out about the café, and providing a photo of the building is very helpful because you can recognise it rather than just going off the name”*.

Towards the end of the de-brief, one participant informed me that they were looking for a mobile application similar to this in which you can *“manage it yourself”* and keep track of your timetable and own assignments to suit your needs.

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Cooperative Evaluation screenshot

5.6 Final Product

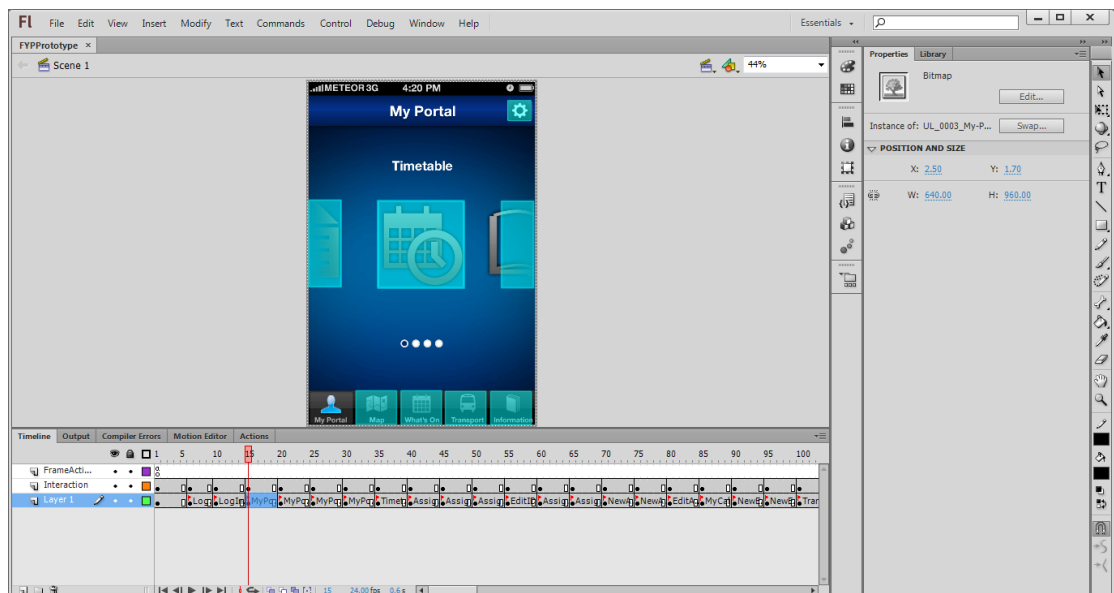
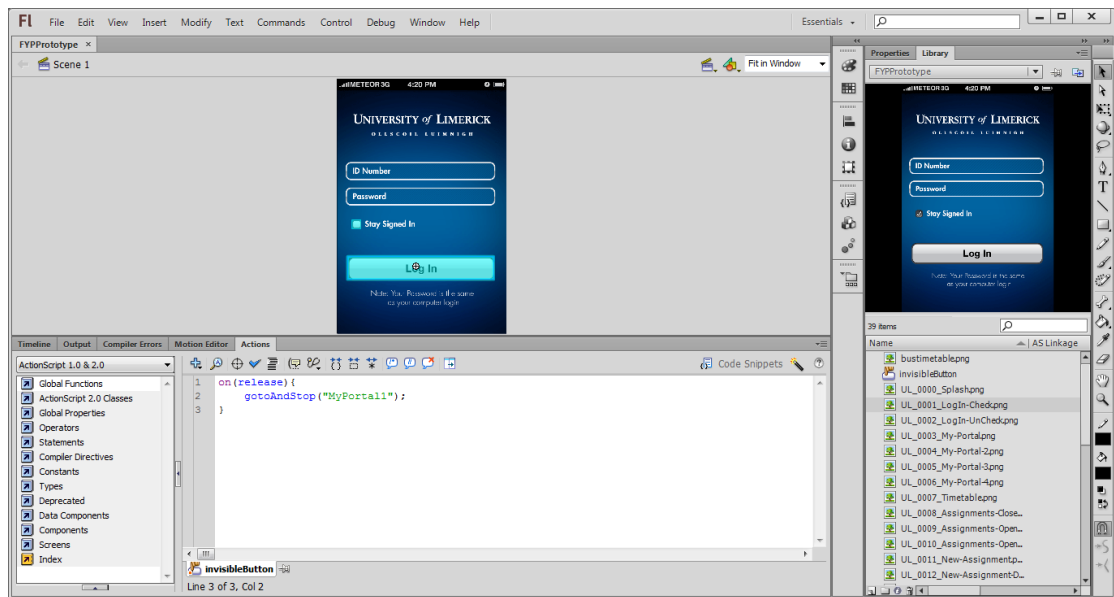
As set out at the beginning of this project, it was decided that a high-fidelity prototype would be created as a means of demonstrating the look and feel, navigation and interaction. Having carried out a successful cooperative evaluation and become aware of the main design and usability issues incurred, the findings contributed to the final design that would be used in creating this final prototype.

Up until this point, the main focus was on the navigational issues and iterating the prototypes efficiently for testing purposes. As a result, some smaller details of the design were ignored but corrected for the final design for the sake of full completion. One such element was the map feature. Throughout the process of testing and design, the campus map offered from UL was used as a placeholder before the decision to use Google Maps was reached. This was due to Google Maps providing a more adequate representation of the campus and the added option for a developer to customise the code depending on requirements.

As the user interface was created using Adobe Photoshop, the .psd file allowed for the creation of layer comps, more simply put, an image of each screen view. These images were then imported to the Flash file library and placed in sequence on the stage. A button object was added to each image where interaction could be demonstrated and a simple 'gotoAndStop' function allowed each view to be clickable and lead the user to the corresponding screen view. Upon completion of this process, the published shockwave file was exported to a mobile device for demonstration. The final design in full can be seen in Appendix 10.5. A user flow chart is available in Appendix 10.6 and can be used to map the typical navigation.

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Adobe Flash workspace used to create final product prototype

6. Project Evaluation and Future Development

6.1 Evaluation

The aim of this project was to employ methods of User Centred Design through user research, prototyping and user testing to design a mobile application that is personal and tailored to the needs of the students of the University of Limerick.

The initial survey carried out at the beginning of this project proved to be beneficial in unearthing the most common nuisances faced by students of the University of Limerick, their habits and current practices when sourcing information. However, a higher number of respondents to provide a more information rich basis would have been ideal but a general concept was acquired none the less.

This initial user research was useful in determining early design concepts, developing ideas and pin pointing what functionalities would be of most use in such an application.

Applying the User Centred Design approach involved iterations of prototyping and user testing. This was achieved throughout the project using both low and high fidelity prototypes. This methodology was favoured as target end users were easily recruited for user testing and resulted in first hand feedback.

The wish to further investigate all elements of information architecture fell short in areas. The timetable for example was one such area that further research was required but was not essential to the project at this moment in time, but for the future development of the application.

In an ideal world, a further iteration of design would have been carried out to make changes to the design that became apparent in the late stages of this project. This would include some edits to current screen views and the addition extra screen views to the application such as the ability to access your calendar after adding a ‘What’s On’ event to it.

6.2 Recommendations for Information Technology Department UL

Based on the research carried out in this project, there are a number of recommendations that can be made to the Information Technology Department in UL.

These recommendations would provide both staff and students information that is generally an uncertainty and provide a better student experience. In turn these recommendations will provide the useful content deemed necessary for the application designed in this project.

Buildings, restaurants and cafés are all facilities in which the open hours vary and most users are often uncertain of the definite times. A solution to this would be the creation of a database in which managers of café, restaurant or those in charge of buildings could access and input the respective opening and closing hours. This database would then be made available online for visitors to refer to. Furthermore, the option to change these times should be included as quite often these times vary from weekday to weekend and off season times such as summer when the campus is less populated. This would provide visitors with real-time updates and remove any uncertainty.

Many of the online services offered by ITD, such as timetable and student portal were projects that were outsourced and now are dated and lacking efficiency. The current timetable, developed using Active Server Pages and Microsoft FrontPage, is something accessed by staff and students on a regular basis. However, a user must have internet access should they wish to view their own timetable. My recommendation is for the development of a new timetable utilising new, more efficient methods and the creation of a timetable that a user can download and synchronise with their mobile device and personal calendar. Such an option would allow students to check their timetables in any location and provide a means of offline access.

6.3 Future Development

As this project was focused on the design of a mobile application, the obvious future work involves the actual development of the application using the design and information found in this project. As with most projects, there is generally room for improvement and the same applies to this project. Improvement can be made in terms of usability and functionality through more user testing and determining what can and cannot be done in the development stage. As evident, the user interface has been

designed following the recognisable iPhone interface elements. Therefore, an android friendly version of the Photoshop file will have to be created to allow for use cross platform and remain sleek and professional.

Certain functionality that was mentioned by target end users in testing may be considered such as Clubs and Society information. However, as much of the functionality mentioned was not suitable for this application, separate content specific applications could be designed to meet the extra needs of students.

The development of this application could be simplified depending on the information and tools already available such as an updated student timetable as recommended above.

7. Conclusions

This project demonstrates the application of the User Centred Design approach for the design of a mobile application to be used by UL students. This approach employed user research and developing an understanding of user needs in an effort to design a suitable application. Both research and design elements were central to the success of this project. Sketches, wireframes and Photoshop mock-ups were created throughout the project and were built on towards making the final design. As a result, the main objective of designing a personalised campus guide for UL students was met. An early paper prototype was developed based on the survey findings and tested in a focus group setting which provoked useful thought and suggestions to be used in the next iteration of design. The UCD approach continued with the creation of a high fidelity prototype which was tested using cooperative evaluation. This more formal method of testing, informed me, as a designer of the application's usability and as it involved target end users, its perceived reception should such an application be developed. Feedback received from this second round of user testing was taken into consideration for the final design as demonstrated. While the final product created was satisfactory, it is worth noting that there still may be flaws regarding the design. This may be regarding to how a functionality would be built in the development stage or areas of usability of which can be revisited should the need come.

Furthermore, both personal and academic objectives were completed as this project allowed for personal growth in my skills set and provided an ideal opportunity to utilise new methodologies and apply such methodologies in creating a real world solution. Having had some experience in user interface design from my time on cooperative education, this project allowed me to take the lead role of the designer of a complete project and develop my knowledge of user interface design and understand further, the needs of the end user in any given situation.

In conclusion, the high fidelity prototype created using Adobe Flash, provides a suitable representation of the intended design and will be a useful tool to the developer. Through user testing and informal conversation with fellow students, such an application will be well received upon delivery and meets the immediate academic needs of UL students.

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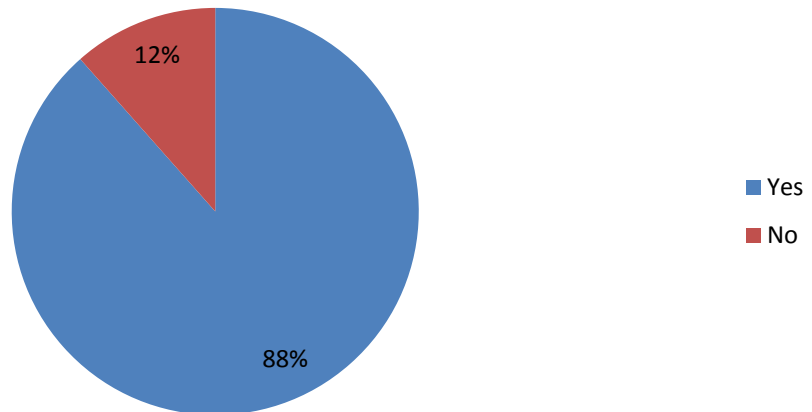
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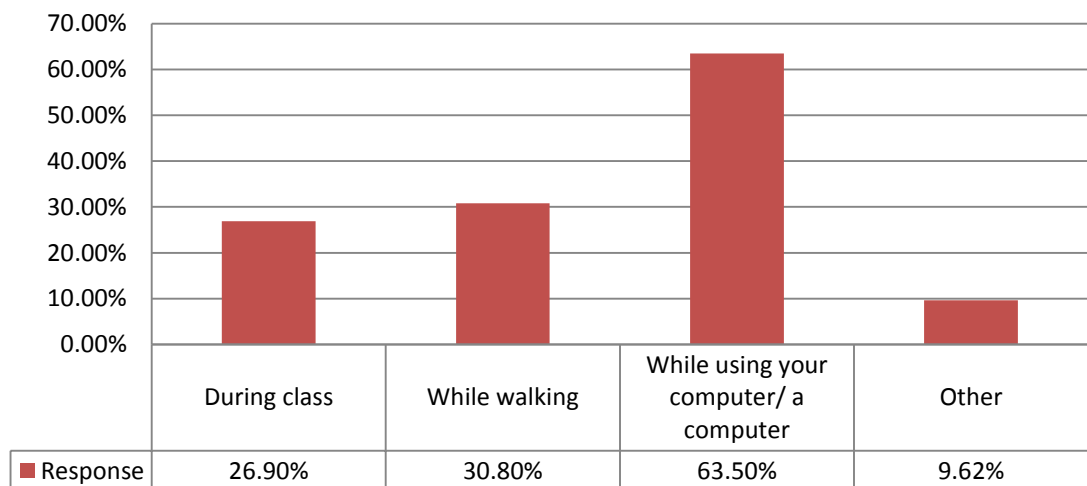
10. Appendices

10.1 Initial Survey

Q.1 Do you own a mobile device with internet access? Can be a phone, laptop or tablet.



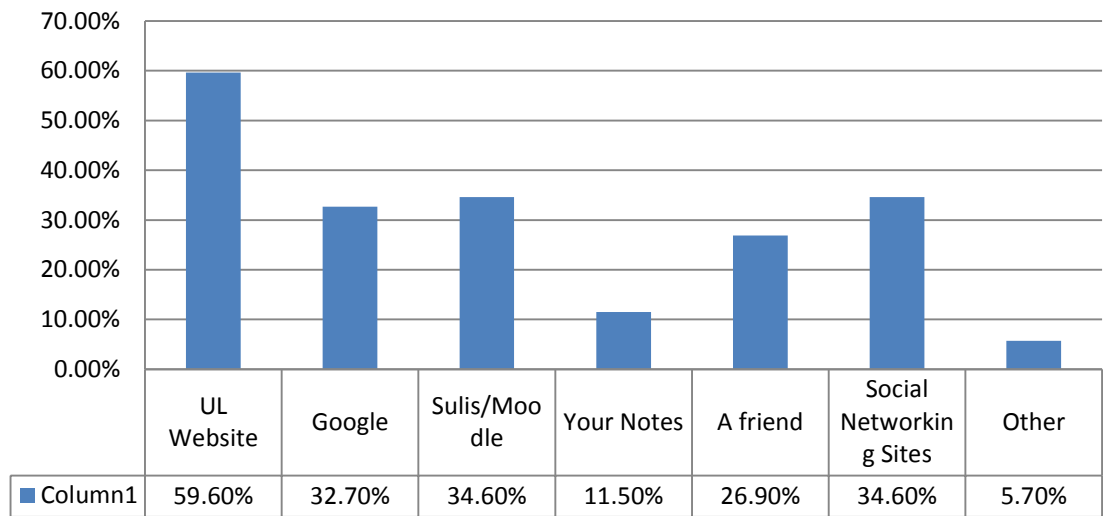
Q.2 When do you most often come across the need to look online for information regarding UL, your course or the campus?



Other Responses:

- While working on an assignment.
- at home
- usually looking for a room or checking my timetable
- While at home
- Anywhere and anytime, there is no telling when true inspiration will strike me

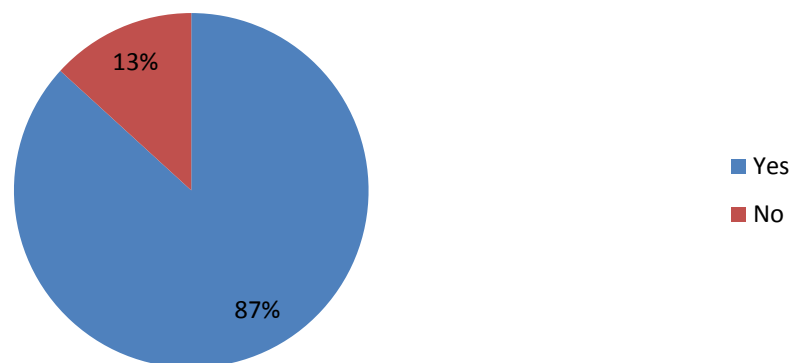
Q.3 Where do you source/ go to find out this information mostly?



Other Responses:

- <http://tt.daniel.ie/>
- Jstor
- Databases

Q.4 Does information sourcing impact you in anyway or prevent you from completing a task?

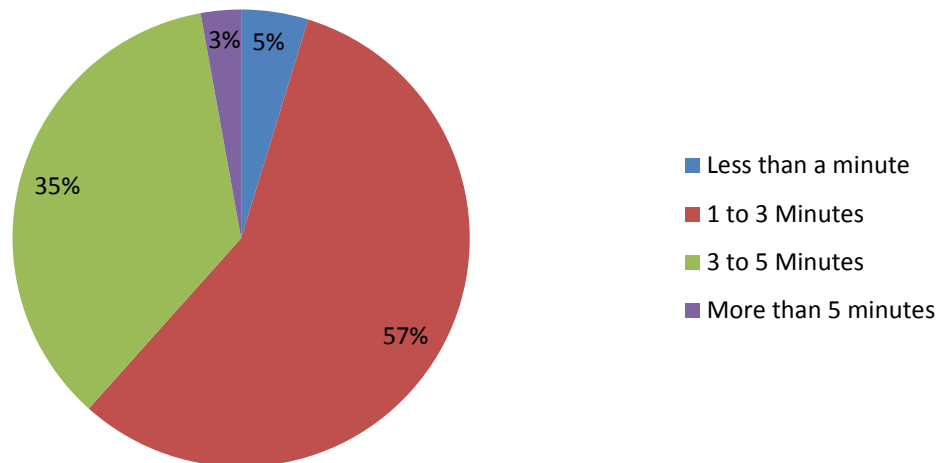


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If YES, how? responses:

- If I don't have access to say a brief for an assignment. I wouldn't know where to start.
- Well if sourcing the information is not easy then the task by extension is not easy either.
- Yes it impacts me slightly. for essay you have to be aware of the origins of all our information.
- makes everything quicker and hassle free
- UL's site was designed by donkeys. Information all over the place.
- Can't find way around main building or find rooms etc.
- Sections of UL website are difficult to navigate - several different menus required to access generic documents
- It leads to longer times in getting the task done
- Yes, sourcing information does have an impact on the way I complete a task. I find the citations of sources to be a slightly demanding task due to the structured way one could quote a source in his or her works.
- you need to specify the q
- I cannot multitask on any level, so if I'm looking for information, I can't think about anything else.
- delays things unnecessarily
- Loss of concentration in class.
- procrastination
- Referencing is a bitch
- I don't understand the question
- If I can't find it I don't get to where the lecture is on
- Takes up more time than it should.

Q.5 How long does this process usually take?



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Final Report

Q.6 Tell me about your own ways to make information portable. For example, a picture of your timetable on your phone.

- I download a ical version from <http://tt.daniel.ie/> and link to my Google calendar which is synced with my iPhone
- Timetable in phone
- I have a timetable app on my phone which I think it is dead handy as you don't have to keep pulling out the timetable that is awkwardly lost in the bag, I have a picture of the bus timetable on my phone this too is very handy as it allows me to see exactly what times it runs
- Google Calendar on my smartphone with deadlines.
- Timetable synched with my calendar on my phone.
- Transfer of calendar to iPad. Transfer of files I need on the go to my dropbox, which can then be viewed on the go using a mobile app.
- Picture of my timetable on my phone. That's basically it.
- Timetable on iTouch
- timetable, sulis and the csis website to opened up with ease on touch screen user interface
- Transferred lecture times into my personal calendar
- Print outs, Pictures, Memory stick.
- map of ul and buildings
- I'm good at remembering stuff
- Easier access to timetables, room numbers, etc.
- Write them down in a copy.
- icons on my phone home screen to bring me directly to what I want e.g. Sulis.... with just ONE click.
- Writing on hand or paper.
- Saved pdfs on phone regarding timetables etc.
- Putting my timetable as reminders in my phone and dropbox important things
- Virtual guide around the campus almost like a sat nav with information stores in certain stops on the route
- Synchronize calendar with phone
- student mail synched to my phone
- Timetables are printed off or stored in a pdf on my phone. Most other stuff is saved on memory stick.
- I have a picture of my timetable on my desktop screen. i used to carry around a map and building name leaflet but i know most of the buildings we use.
- timetable picture, module codes with actual names saved as a text
- Take a screenshot on my iPod Touch of my timetable, or quickly check Facebook
- College project to-do list on my phone - Picture of timetable - Events calendar of college events
- I make notes on my phone and have an alarm set to them so I know if I have a class, project etc. due a certain time
- I use my mobile phone to check my emails, and I use my laptop for sustain other types of information (my phone has no Wi-Fi connectivity)
- mendely is useful... Can sync info to my phone and computer on the go...
- Photographs of things I need to remember
- yes, I take photos of things, I stick paper to notebooks, I make notes in the notebook on my iPhone
- I download my timetable from <http://tt.daniel.ie/> as an ical and add it my Google calendar
- I have a PDF viewer that works well. Otherwise, I depend on the site being fluid.
- picture of my timetable on my phone, although takes a bit of searching
- Picture of timetable on phone. Inputting timetable to Google calendar to get free text reminders about class/deadlines. Porting my UL email to my phone. Saving my assignments

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in to Google docs or saving them as an attachment in a draft in Gmail so I can have them on any device.

- Have a folder, print off and keep all relevant information. Have timetable on the phone
- Bus routes and times around campus
- write on paper or hand
- Downloading helpful apps for either android or apple products is normally helpful
- timetable on phone Homescreen, links to find UL sites in book marks
- Put timetable into own table on excel/word and printout
- I have a screenshot of my timetable on my phone.
- Have picture of timetable on phone, make notes in draft messages of phone.
- I have a picture of my timetable on my phone. Some things have changed though and it's a lot of hassle to upload the picture again.

Skipped answers: 7

Q.7 What types of information are you looking for most frequently?

- Timetable, Deadlines
- Timetable
- Sometimes to find out what certain words may be, to learn how to research something properly, or how to reference something or ever how to write something. These are usually the most common.
- Notes and briefs.
- Opening hours of SAA etc. Emails from lecturers.
- Timetables, QCA Calculators, Resources on Sulis
- Buildings, Rooms, Times. Tests. Assignments.
- Timetable, academic calendar
- student email, timetable and sulis/csis notes
- Assignment information
- College information, Random trivia, news
- Timetable, notes, lecture slides, e-mails.
- Timetables
- Emails about classes
- Timetables, lecturers
- Timetable; course documents
- Research, project due dates , anything that's relevant at the time. So it's really broad.
- Timetable, room locations, exam locations.
- Phone numbers, Student records, Timetables.
- Timetables.
- Timetable, lecture notes
- Core portal rooms lecturers
- Email
- module outlines and resources
- lecture times etc.
- Lecture notes.
- library info (book availability, times open, especially near exams), online lecture documents, sulis (to check if grant is ever coming in or cv etc.)
- deadlines of projects
- E-mails, way around college
- Cheap places for lunch
- Timetable - College project due dates

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- Timetable
- Information regarding digital technology, politics and the entertainment industry.
- images
- Room Location, exam timetables,
- where is the post box, what time is something on, where it is located, depends.
- Timetable, possible map
- Usually stuff I already knew, but I'm not sure anymore, like room numbers, or assignment due dates.
- timetable, room numbers, email
- Clubs and Socs info, class timetable, assignment info.
- Timetable, lecture rooms
- Course notes, exam papers, course outlines and QCA calculation
- Opening hours of offices, timetable changes,
- classes
- timetable and anything that will help my thesis
- timetable, emails
- course info, contact details
- lecture notes/exam information
- Academic calendar
- Where rooms are, what rooms are free and when, what deadlines I have, contact details for lecturers
- Information on modules/future modules and assessment points within modules. Room numbers.
- Probably deadlines for assignments. Or maybe room numbers during the first week.

Q.8 Can you describe a frustrating experience when sourcing information?

- Lecture Notes and previous exams
- No
- n/a
- CSIS website and its licence agreement for downloading files.
- Using sulis
- Sulis' constantly logs out when I am using it automatically. Often information that I seek cannot be easily sourced on the careers website, but will require me to go into my email and find the email and click the link.
- When it's not specific enough.
- when loads of useless links pop up in relation to the topic I'm trying to research instead of the academic links which help me
- Sulis!!!
- It can be hard to find information for example while I was trying to research Cuchulain of Muirthemne by Lady Gregory there seemed to be little to no internet sources for this.
- sulis timing out.
- Lack of wifi in the paddocks
- Have had difficulty finding lecturers' rooms.
- Computer crashing; links to information not obvious on website
- I think the ultimate aid in sourcing is not how you find what you want but that you find it all in the same place and it all has the same lay out. A Wikipedia Scholar would be good.
- Looking up printing information and the UL site providing a load of dead links.
- Sponsored adds take over what I'm searching. Relevant information
- Slow internet
- Could not find the print room

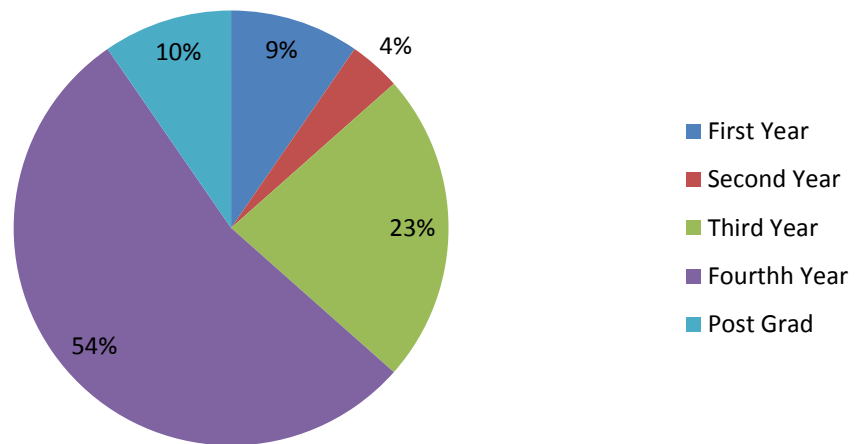
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- Wifi coverage very patchy in foundation building
- No comment
- finding campus maps that have clear instructions
- loading times, hard to find links
- Sulis. Enough said.
- Trying to find out when college fees were due
- Pretty easy due to the user friendly layout of the website
- I was once unsure of how to insert a hyperlink of a website into a Microsoft Document. Furthermore, I was in a rush to have the document completed for the next morning.
- advertising
- going to a site that has an information page that is dead or info emails that don't reply
- Hassle to long
- That the page doesn't go where you reasonably expected it to. I often come out of a site, and use Google to find the direct link to the info I need from that site.
- not being able to find it easily, have to go through so many steps at times
- The UL website in general. The UI of Sulis.
- Trying to figure out how to calculate QCA but more so how each year affects your QCA/ what each module counts for. UL have just one page outlining it on the portal and its explained terribly. A lot of people posting on boards about it
- can't find what you're looking for
- none
- UL's incredible sh*t WiFi, makes me want to kill myself and also makes me regret choosing UL as a university to study in. Also I hope you have a lovely day
- unable to successfully navigate to certain pages, buried deep in the UL site-easier to ask someone to send a direct link than look for it
- when lecture notes are not up on sulis (e.g. most modules are on sulis but some are on the UL portal)
- Trying to find a vacant room in which to conduct an interview for a project, the timetable had all of the rooms blanket booked with no details or available, neither was completely correct.
- Information not being updated from previous years.
- Having to go between sulis, a wiki, emails, csis website. Too many different sources

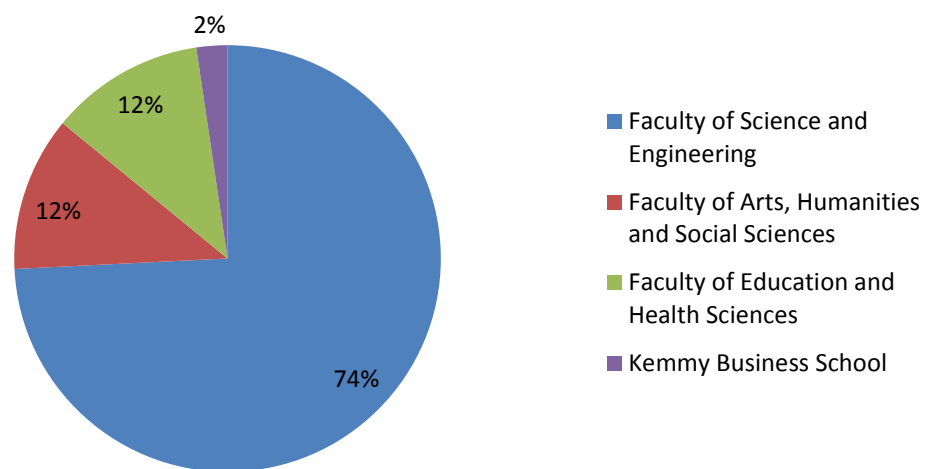
Skipped answers: 10

Demographics

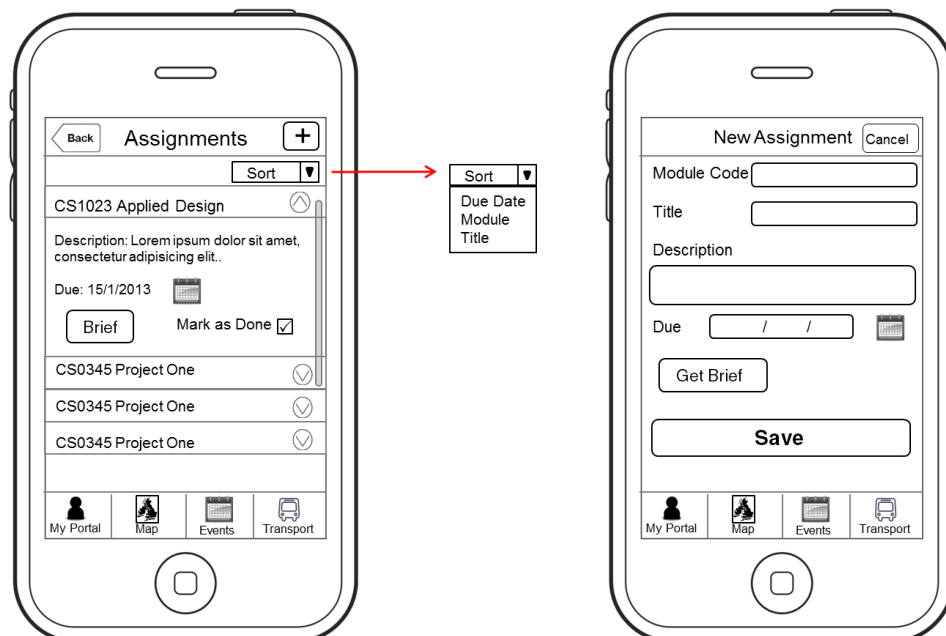
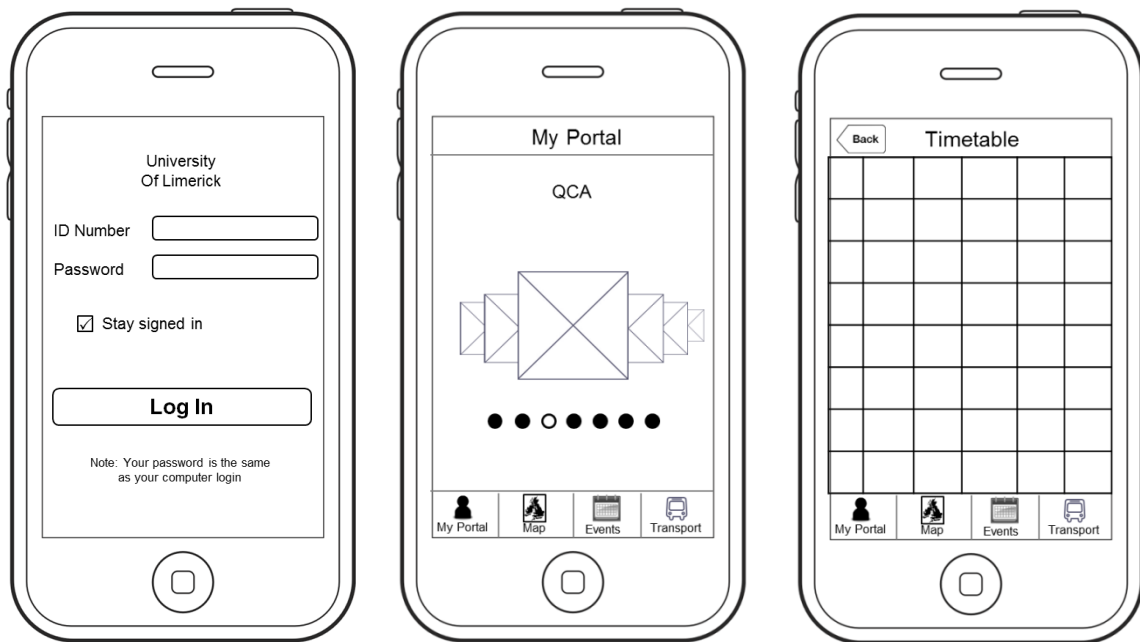
Q.9 What year of study are you in?



Q.10 What faculty does your course belong to?

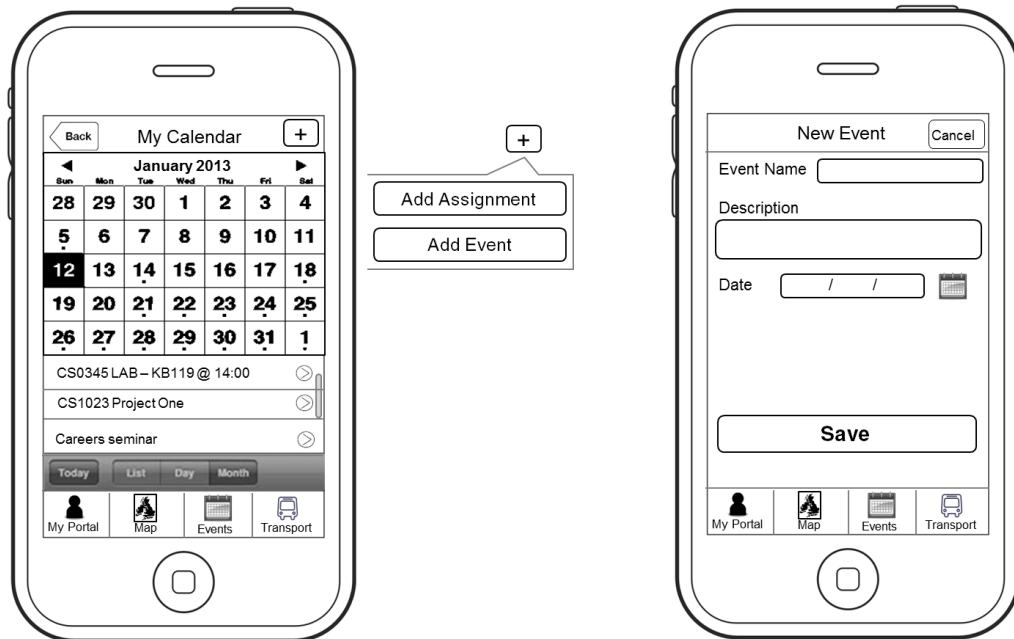


10.2 Wireframes

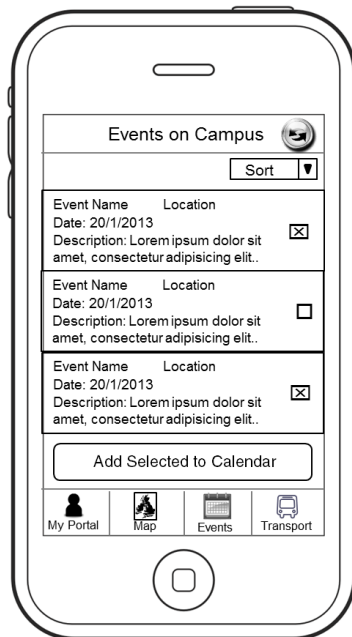


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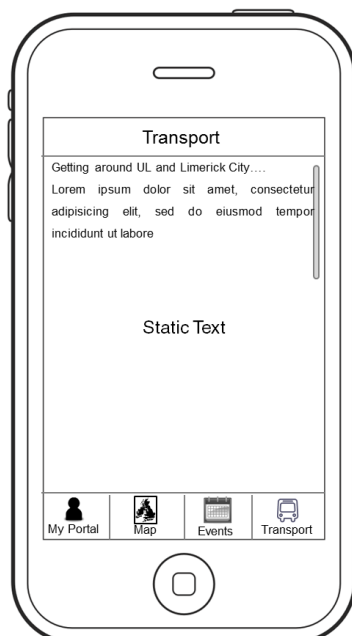
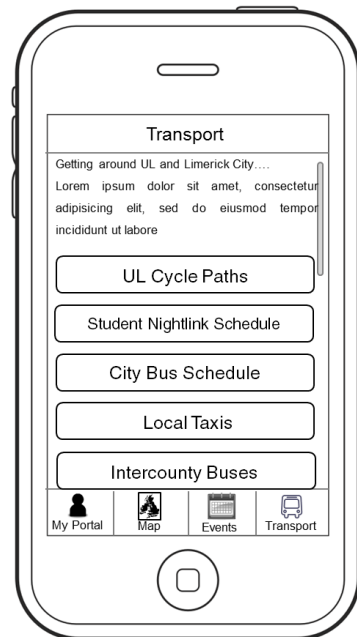
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| Sort |
|------|
| Name |
| Date |



10.3 Information Sheet



UNIVERSITY of LIMERICK

Information Sheet

My name is Kathryn Conway, I am a fourth year student in Digital Design in the University of Limerick. This project is part of a mandatory element of my final year.

Project Title

Personalised Campus Guide for UL Students

Topic Explanation

The aim of this project is to research, prototype and design a mobile application that meets the needs of students within UL. Based on my research I will identify and prioritise what elements should be included in this application. My research will come from an online survey and following that focus groups to evaluate prototypes and get valuable feedback on possible User Interface designs.

Confidentiality and data protection

All gathered information will be kept confidential. The data will be kept and stored in the Interaction Design Centre, University of Limerick, using password protected computers. Only I, and Dr. Gabriela Avram will have access to this information. The data will be stored for 7 years, and after that time will be destroyed.

Participants Rights

As a participant, you have the right to anonymity and data will be collected and stored with the utmost confidentiality. You have the right to decline to answer or discuss any questions or topics at any time during their involvement in this study. You may withdraw at any time.

Contact Information

Researcher: Kathryn Conway, 09006094@studentmail.ul.ie

Supervisor: Gabriela Avram, gabriela.avram@ul.ie

10.4 Declaration of Informed Consent



UNIVERSITY of LIMERICK

Declaration of Informed Consent

I, the undersigned, declare that I am willing to take part in research for the project entitled “Personalised Campus Guide for UL Students”.

- I declare that I have been fully briefed on the nature of this study and my role in it and have been given the opportunity to ask questions before agreeing to participate.
- The nature of my participation has been explained to me and I have full knowledge of how the information collected will be used.
- I am also aware that my participation in this study may be recorded (video/audio) and I agree to this. However, should I feel uncomfortable at any time I can request that the recording equipment be switched off. I am entitled to copies of all recordings made and am fully informed as to what will happen to these recordings once the study is completed.
- I fully understand that there is no obligation on me to participate in this study I fully understand that I am free to withdraw my participation at any time without having to explain or give a reason.
- I am also entitled to full confidentiality in terms of my participation and personal details.

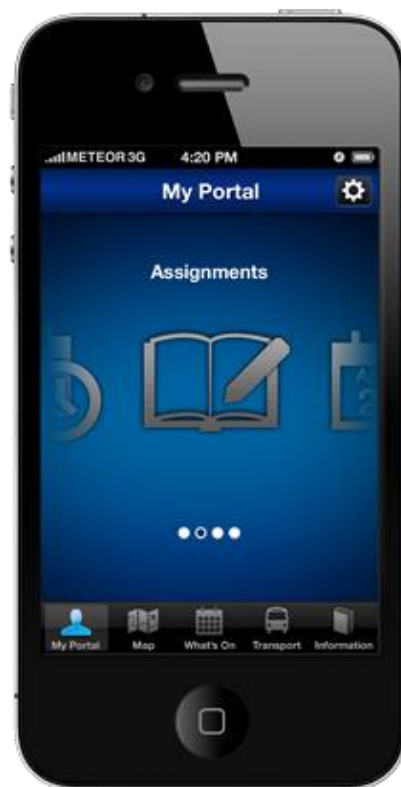
Signature of participant

Date

Contact Information

Researcher: Kathryn Conway, 09006094@studentmail.ul.ie
Supervisor: Gabriela Avram, gabriela.avram@ul.ie

10.5 Final Design



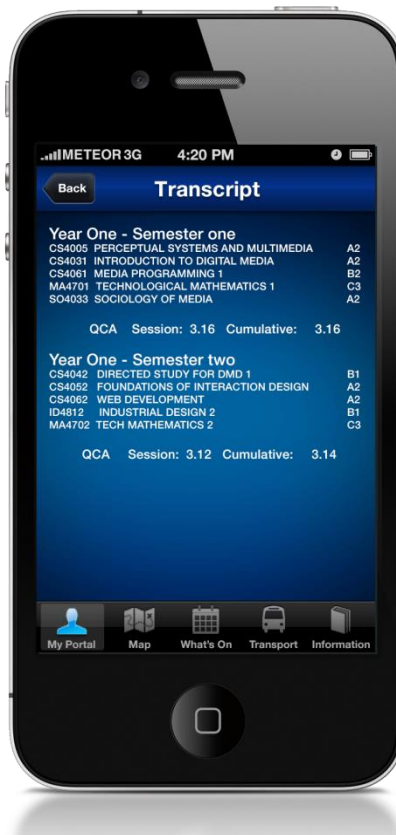
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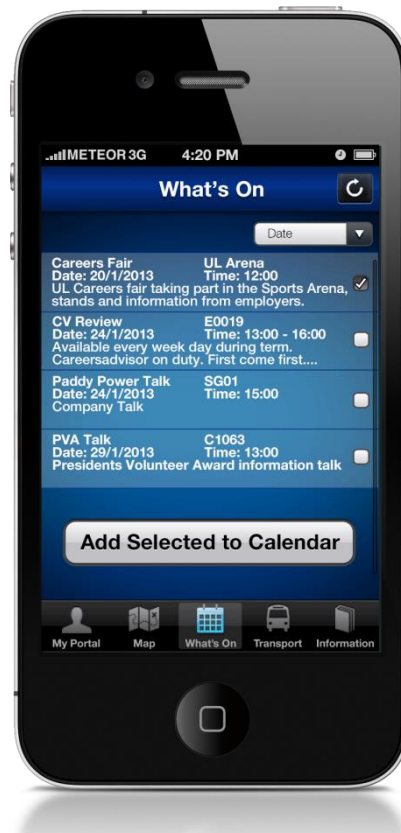
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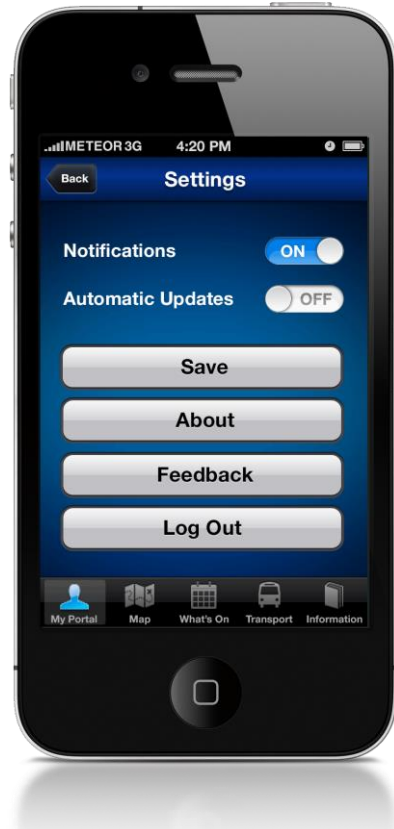
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10.6 User Flow Chart

