

WISA Hub in Wireframes

Student	Zhao Ning
Lecturer	Nik Whitehead
Module Name	User Experience Design
Module Code	ACCA7020
Date	04/04/2020
E-mail	1904564@student.uwtsd.ac.uk
Score	

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1 Introduction

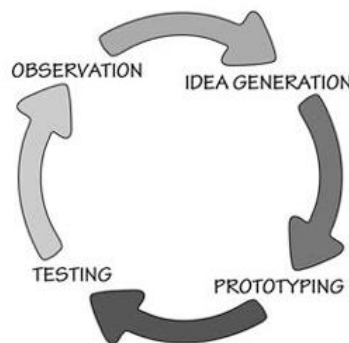
In this report, an initial design in the form of wireframes will be presented and it is created as part of a full-fledged user experience (UX) design for mobile applications. Key definitions such as the title, aim, and target users of this project are shown in [Table 1. Product Definition].

Table 1. Product Definition

Project Title	WISA Hub
Aim (Positioning)	To build a one-stop, all-around mobile application that satisfies both fundamental and personalized needs of target users.
Target Users	People who are currently enrolled as students in WISA of UWTSD.

The iterative human-centered design approach [1], which has been widely adopted in product lifecycles, contains 4 stages:

Figure 1. The Human-centered Spiral Design (Picture Taken from [1])



- 1) Observation: qualitatively identifying the real problems and gain deep insights into user requirements by observing user activities - what they want to achieve and what get in their way;
- 2) Idea generation: seeking solutions to the problems, usually by brainstorming;
- 3) Prototyping: building a model of the solutions in order to test it on users and collect feedbacks;
- 4) Testing: letting users interact with the prototype, and interpreting their emotions and actions;

This project will focus on the 1st, 2nd, 3rd step and touch on a few aspects in testing. The structure of the report is as follows: 4 user personas and requirement analysis are given in Section 2. Several key components of the information architecture are discussed in Section 3. Section 4 presents the prototype, and a few feedback collecting methods are proposed in Section 5.

2 User Personas and Requirements

It is essential that designers know well who use their apps and what their requirements are.

Of the 5 properties of mankind (胡晓, 2019): [Cross Ref] 1. Properties of Mankind

- 1) intrinsic properties (e.g., gender, age)
- 2) social properties (e.g., income, marital status, education background)
- 3) behavioral patterns (sleeping / eating / reading habits)
- 4) motivation of behaviors (e.g., goals, attitudes towards incidents)
- 5) psychological properties (e.g., way of thinking, personality, moral values, desire, religious beliefs)

4) and 5) are more relevant in building user personas. This report includes 4 personas as examples, each of which will be analyzed individually in *Section [2.1 User Personas]*.

Once the personas are assumed, designers can start investigating corresponding requirements by user research[2] (e.g., card sort, focus groups, surveys, interviews) or by competitive product analysis[3] (CPA) [4]. Preferably, designers should sit down with users and observe their activities, in the aim of gaining a deep understanding of the WHAT&WHY&HOW of their behaviors. Considering the unusual circumstances of recent lockdown, CPA is used in *Section [2.2 Collecting Requirements by Competitive Product Analysis]* for persona development.

2.1 User Personas

2.1.1 Justin

Table 2. User Profile: Justin

Demographic	Age: 17-18 Income: £4.5 per hour Home Place: Aberdeen, UK
Program	Software Engineering (Apprenticeship)
Level	L4

Description (Scenario)	- Justin is a freshman who has just moved to Swansea and found an employer who is willing to offer him apprenticeship. - He cannot wait to visit the campus, get to know his peers and travel around the city. - He is eager to find out what his timetables look like and do some preparation before the courses officially start. - He also wants to have a look at how the students' union is run and join the football team.
Expectations	A comprehensive and well-structured walk-through of all the things that: - he should know (e.g., registration, plans that the Uni has arranged during the orientation week, and locations of major facilities such as lecture halls, libraries, the financial office, cafeterias, and toilets) - he would like to know (classmates, SU societies, tourist sites around the city and etc.).
Pain	The amount of new information is kind of overwhelming.

2.1.2 Nina

Table 3. User Profile: Nina

Demographic	Age: 19-20 Income: 0 Home Place: Peking, China
Program	Dance (BA)
Level	L6
Description (Scenario)	- Nina is about to graduate in less than half a year. - As a course representative, currently she is busy with both assignments and the final project, both of which involve much groupwork. Other than emails, she doesn't have any contact information of her group members. She tells friends that she has been feeling super stressed out lately. - Soon she has to worry about applying for jobs in the UK. However, she isn't clear about the regulations regarding work permits for international students.
Expectations	A compilation of downloadable student records, including transcripts and certificates; A convenient tool to manage her library resources and research project; A notification center to receive all important notices (e.g., incoming emails, module deadlines) in real time; A portal providing career opportunities (e.g., links to job vacancies, career fairs, info sessions).
Pain	The ways in which she can reach out to 1) classmates or 2) Tier 2 sponsors are very limited and inefficient.

2.1.3 Frank

Table 4. User Profile: Frank

Demographic	Age: 18-19 Income: 0 Home Place: Swansea, UK
Program	Film and Television (BA)
Level	L5
Description (Scenario)	- Coming from a working-class background, Frank is passionate about dance and arts. When he was a child, his family visited Disney and Hollywood, which was not long before he fell in love with acting. - He dreams of enrolling on affordable exchange programs based in California. - He loves going to the theatre and any other film-related events (e.g., film festivals, auditions, movie premiers) in spare time. - His modules are taught on the Carmarthen campus, from which he travels back home twice every weekend. He prefers Uni shuttles to other modes of transportation.
Expectations	A handy Uni bus schedule which is updated regularly and can be configured for personalized notification; A visual guide to overseas programs with creative videos, real pictures and informative text;
Pain	There are financial uncertainties as to whether he's entitled to scholarships and bursaries for overseas programs.

2.1.4 Miranda

Table 5. User Profile: Miranda

Demographic	Age: 27-29 Income: £22k Home Place: Swansea, UK
Program	Automotive Engineering (MSc - Part-time)
Level	L7

Description (Scenario)	Miranda is a single mother of 2. The difficulties she has experienced over the years make her feel empathetic. Whenever possible, she likes to take part in social work and support other young parents. Although steadily employed, she craves for a better-paid job to cover household expenses and save up for her children. When she has a lecture, the kids are often left with their father. But occasionally she needs to take them with her to the Uni.
Expectations	A booking service for child-care facilities on campus; A section dedicated to fund-raising or voluntary work for people in need, where students can make donations or apply to volunteer. Weather forecast to help her prepare warm clothes for her kids and decide whether to bring outdoor recreational gadgets;
Pain	Public awareness of societal issues (e.g., child neglect, domestic violence, discrimination) is far from enough.

2.2 Collecting Requirements by Competitive Product Analysis

2.2.1 MIT Mobile

Strengths	○ A simple and clear design; ○ Adjustable font size; ○ “Top of page” buttons; ● Customizable navigation (Users can add items to their favorites and reshuffle them. Their favorite items always appear at the top of the home menu.)
Weaknesses	No “Return” buttons;

2.2.2 Stanford Mobile

Strengths	○ Same as 2.2.1 ● 2 Personas (Everyone / GSE STEP) for customized experience; ● Rich map features (real-time traffic; virtual visitor tour; visual guides to page operations)
Weaknesses	Unpredictable bugs (no actions after button clicks except for screen refresh);

2.2.3 Berkeley

Strengths	○ Same as 2.2.1 • Useful information for diverse facilities (hours of operation, FAQs); • A special Social Media section showing Facebook & Twitter posts natively;
Weaknesses	Messy pop-up navigational lists;

2.2.4 Sydney Uni

Strengths	• Categorized map legends panel in which each legend button takes user to relevant locations to that specific legend on the map (much less confusing compared to all legends placed together); • Welcome week planners (checklist, contacts, maps and locations) • Plenty useful and special-purpose applications included;
Weaknesses	Partially loaded pages followed by screen refresh;

2.3 Prioritization of Requirements

The MVPs among user requirements should be [4]:

1. in line with the strategic positioning of a product;
2. achievable within the constraints of time, human resources, and technology.

At the same time, the MVPs that are important and urgent should have the top priority. This project will identify these MVPs and prioritize them, as is shown in Table 6. Requirement Analysis, according to the **MoSCow** criteria:

Table 6. Requirement Analysis

MUST-HAVES	• Fast access to Moodle, e-mails and the Office365 suite; • Fast access to personal student records (e.g., balances, grades, book loans, ID card status) • Maps of different campuses; location pins of facilities (e.g., car parks, gyms, libraries, resting lounges, cafeterias, smoking areas and etc.), directions and availability; • Library resources; • Sign-in and Sign-out functions; • Catalogue of SU societies and their detail pages; • Visa information for international students; • Latest news and important notices; • Contact information of staff and departments (e.g., academic institutes, finance, student support, accessibility, emergency, maintenance and etc.); • Bursaries & scholarships and career services;
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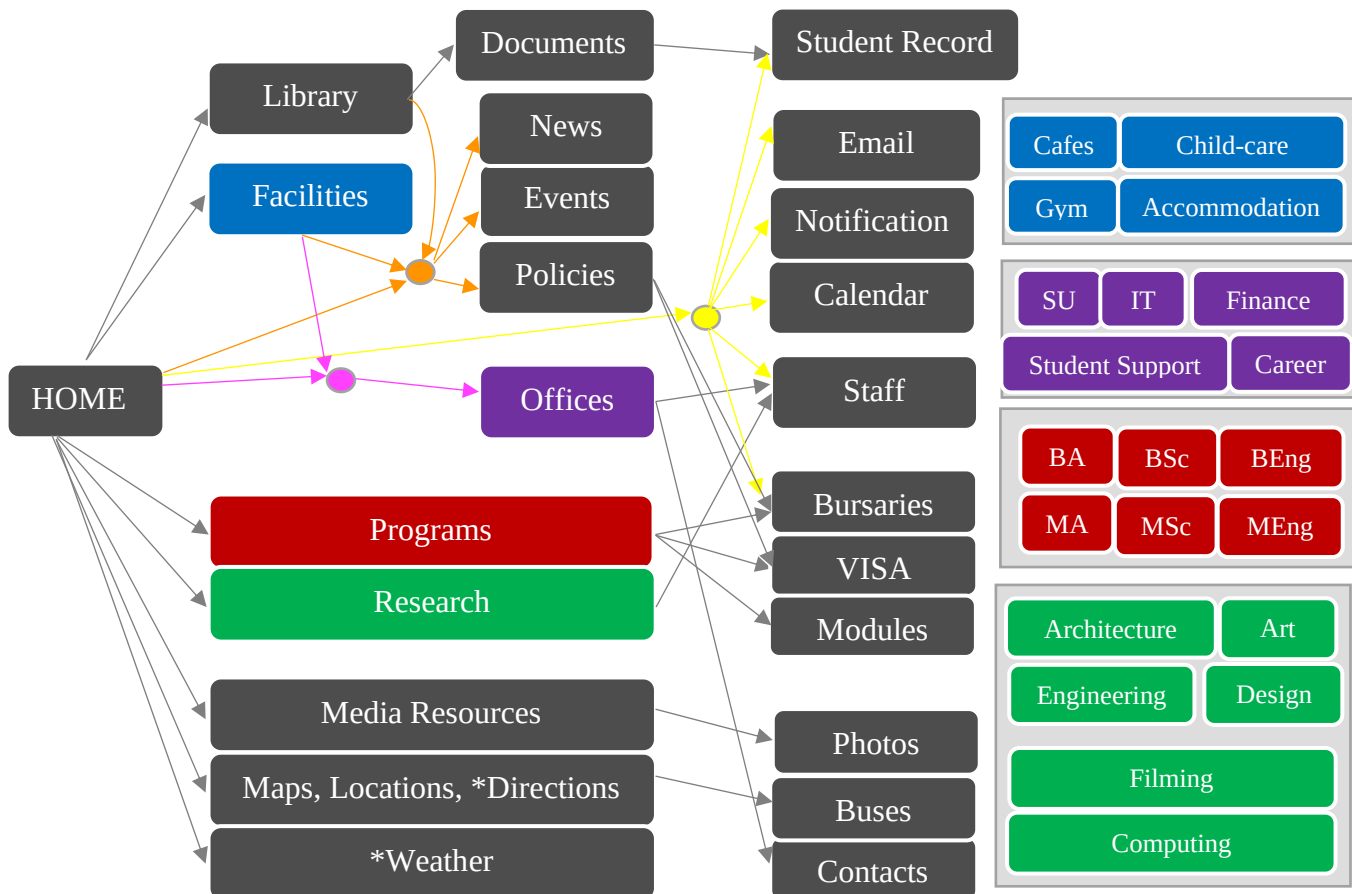
SHOULD-HAVEs	• Orientation-week guides and a customizable Calendar; • Photo galleries of life on campus; • Events categorized by disciplines (e.g., art exhibitions, car exhibitions, handicraft workshops, hacking competition, visits to music / filming studios and etc.); • A customizable navigation panel (which shows a maximum of 8 sections and the rest of which are hidden under “See All”); • “Report a problem” and “File a complaint”; • Per-page functions such as select-languages (English / Welsh), page-sharing, add-to-favorites(bookmarks), leave-comments(feedbacks), returning-to-previous-pages, page-refreshing, and page-rating (design / content / performance); • Overseas programs; (application, fees, admission)
COULD-HAVEs	• A private Contacts center to send / process requests and manage contacts; • A private Notification center for receiving messages from contacts and email inbox; • An introduction to the Uni: its history, development, highlights, awards, alumni, student stories, media coverage, official Facebook/Twitter/Instagram account and etc. • Weather forecast and clothes suggestions;
WILL-NOT-HAVEs	• 3-D Virtual visitor tours; • Tools for distance learners (similar to the MIT Open Courseware); • Food take-away ordering and tracking services (which is linked to verified bank accounts and phone numbers); • Package delivery tracking services (which is linked to email or a verified phone number); • Chat-rooms; • Fast top-up to ID cards / printing balances; • Records of personal transactions; • Location-based landmark tagging: people can share their photos taken onsite and leave comments;

3 Information Architecture

Product requirements that are formed earlier can now be integrated into the design of overall information architecture (shown below in Figure 2. The Information Architecture). Here the two basic structural elements of an information system[5]: content components, and connections between them are portrayed as rectangles(nodes) and arrows respectively. The components are grouped together during the construction process, based on which of the following categories they fall into [5]:

1. organization systems (in the form of groups)
2. labeling systems (representation of groups)
3. navigation systems (clicking through the hierarchy from the top down)
4. searching systems (executing search queries from the bottom up)

Figure 2. The Information Architecture



- * - Location-sensitive data are marked by asterisks.

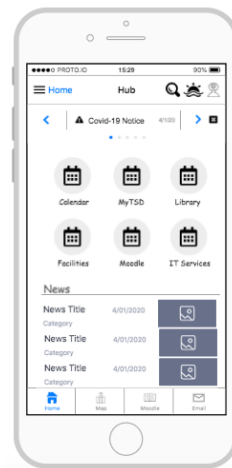
For the sake of clarity, the sub-components of several components are abstracted out by color-coding. Reusable components are preceded by solid circles (virtual nodes) to which their parent components are connected.

The hierarchical structure has a maximum width of 17 nodes. Starting from the root node, all the way to leaf nodes, a path spans 1 to 5 layers, the topmost of which is the Home page. The layer closest to the top layer covers the most important features requested by users (library, facilities, news, events, policies, student records, email, notifications, calendar, staff profiles, scholarships and bursaries and etc.).

4 Prototyping

The design thinking of the Home Page will be presented in this section (shown in Figure 3. Home Page).

Figure 3. Home Page



To make the home page look simple and clear, the 16 top/first layer nodes in the information architecture are placed in 4 different places (the most frequently used features can appear more than once):

- The tab bar (Home, Map, Moodle, Email);
- The menu in the upright corner (MyTSD, bookmarks, Calendar, Contacts, Messages, Settings);
- The navigation menu (My favorites, facilities, library, news, events, and hidden nodes);
- Grid View in the main body.

Right under the navigation bar is the Important Notices section in the form of a carousel. It can be closed through the cross button. Among all the pages of the same type (List Views | Detail Views | Web Views | Map Views | Weather View | Home Page), we will choose one page of each type for prototyping. See more details of the wireframes created in Proto.io¹ in Appendix 7 Appendix: The Wireframes Design.

¹ <https://proto.io/>

5 Testing

5.1 A/B Testing

Before testing the prototypes, only necessary context information such as use scenarios should be communicated to target users. They have to explore the functions and value proposition themselves[6]. A/B testing is a popular data-driven method[7] used for prototype testing. In the example of WISA Hub, one of the hypotheses is:

- Swim lanes are better suited for paragraph division than foldable accordions

Here the independent variables are:

1. The choice between 2 UI elements: swim lanes or foldable accordions;
2. The type of page content: pure text or with multimedia.

Objects of our experiment can be divided into 4 groups, each of which will be assigned different combinations of variable values:

1. Pure text pages in which paragraphs are separated by swim lanes;
2. Pages with photos and videos in which paragraphs are separated by swim lanes;
3. Pure text pages in which paragraphs are separated by foldable accordions;
4. Pages with photos and videos in which paragraphs are separated by foldable accordions;

5.2 The Feedback System Design

The same as feedback systems of applications that are already in market, prototype feedback systems should take into account the following aspects(马彦威, 2019):

1. a logical structure: the granularity of feedback systems should increase with the complexity of prototypes. There should be several categories of problems that users can choose from, e.g., issues in the layout, unnatural page transitions, confusing labels and controls, lack of instructions, lack of features and etc.
2. multiple channels of communication: The incorporation of such features as per-page rating and comments can be more useful, insightful and efficient than conventional universal-page feedback systems.

5.3 User Sampling

User sampling usually involves randomly choosing objects of experiments among target users. In our case, it is preferable that more than 10 students are chosen from each school: art & design, film, computing, and engineering. Surveys, interviews can be arranged, the content of which should be in accordance with the discussions we had in Section 5.1 A/B Testing, and Section 5.2 The Feedback System Design.

5.4 Quantitative Data Analysis

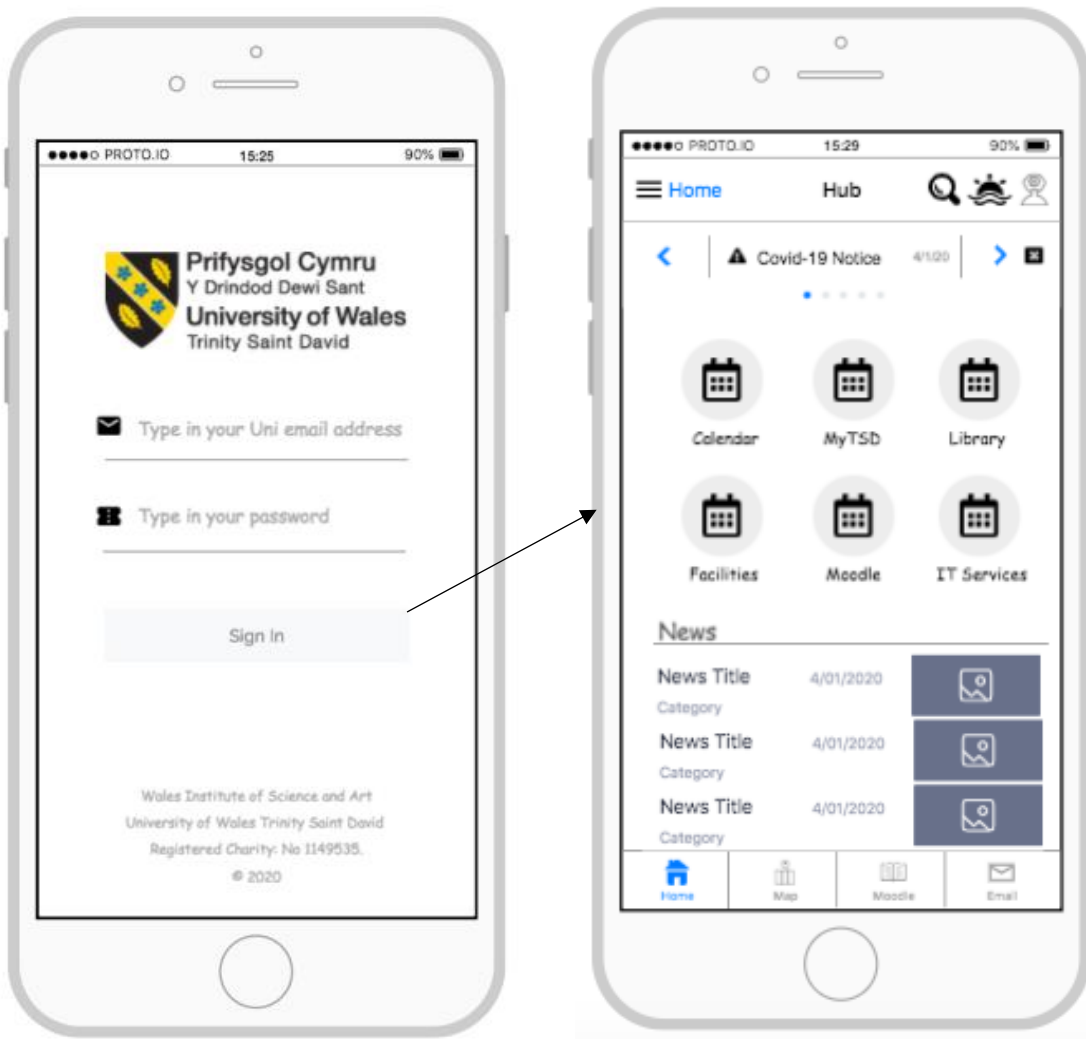
Typically, in the testing phase, user feedbacks and app usage statistics are collected on a large scale. This is when new requirements will emerge and existing ones might become extraneous. To build more precise user profiles (more relevant to 1), 2) and 3) in [Cross Ref] 1. Properties of Mankind), quantitative research and analysis can be conducted, which in turn aid in refining user personas and requirements.

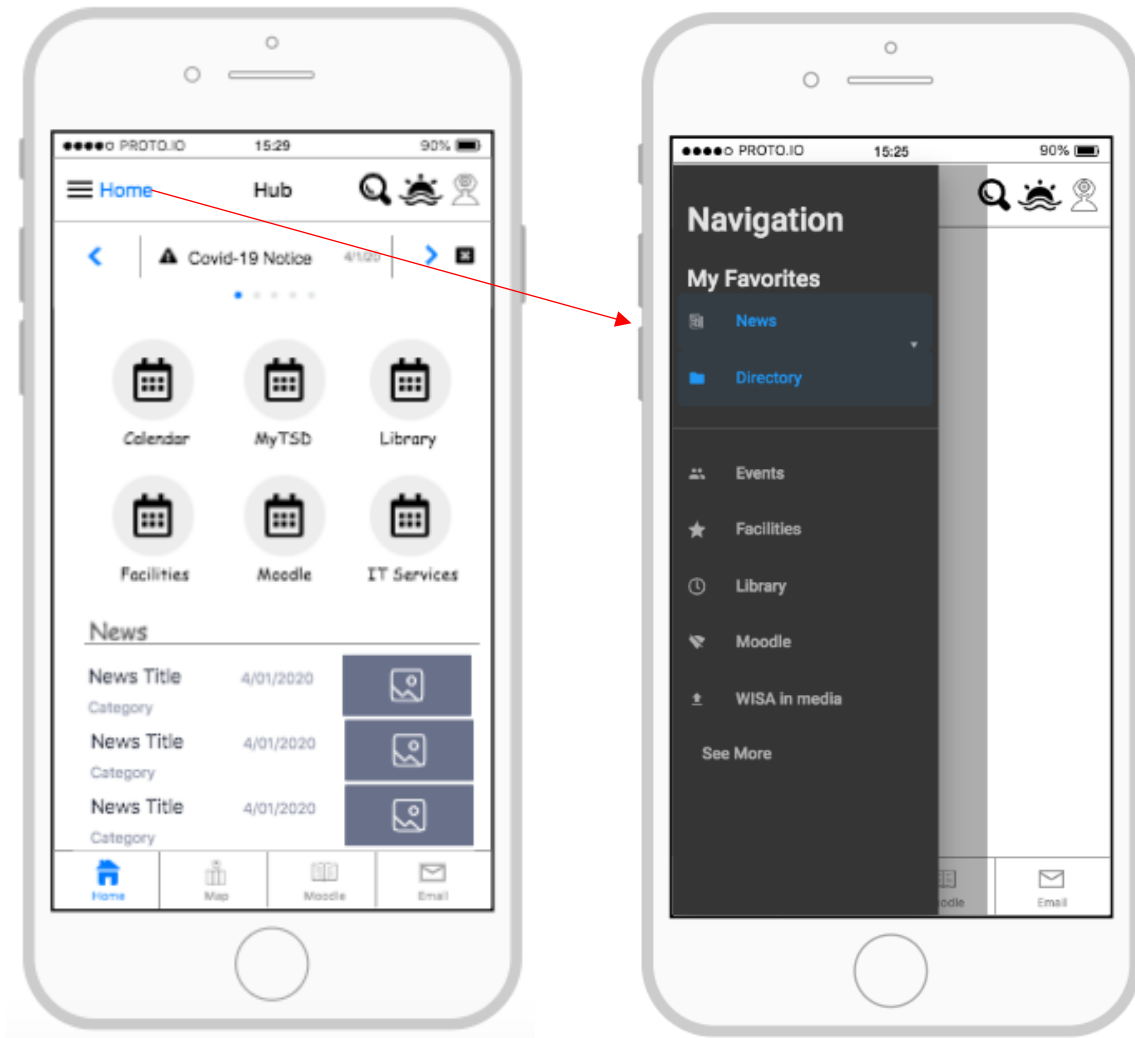
Commonly used metrics include page views, IP/cookie-based unique visitors, session visits, bounce rate of landing pages, and daily active users. These metrics can be automatically calculated through programming interfaces.

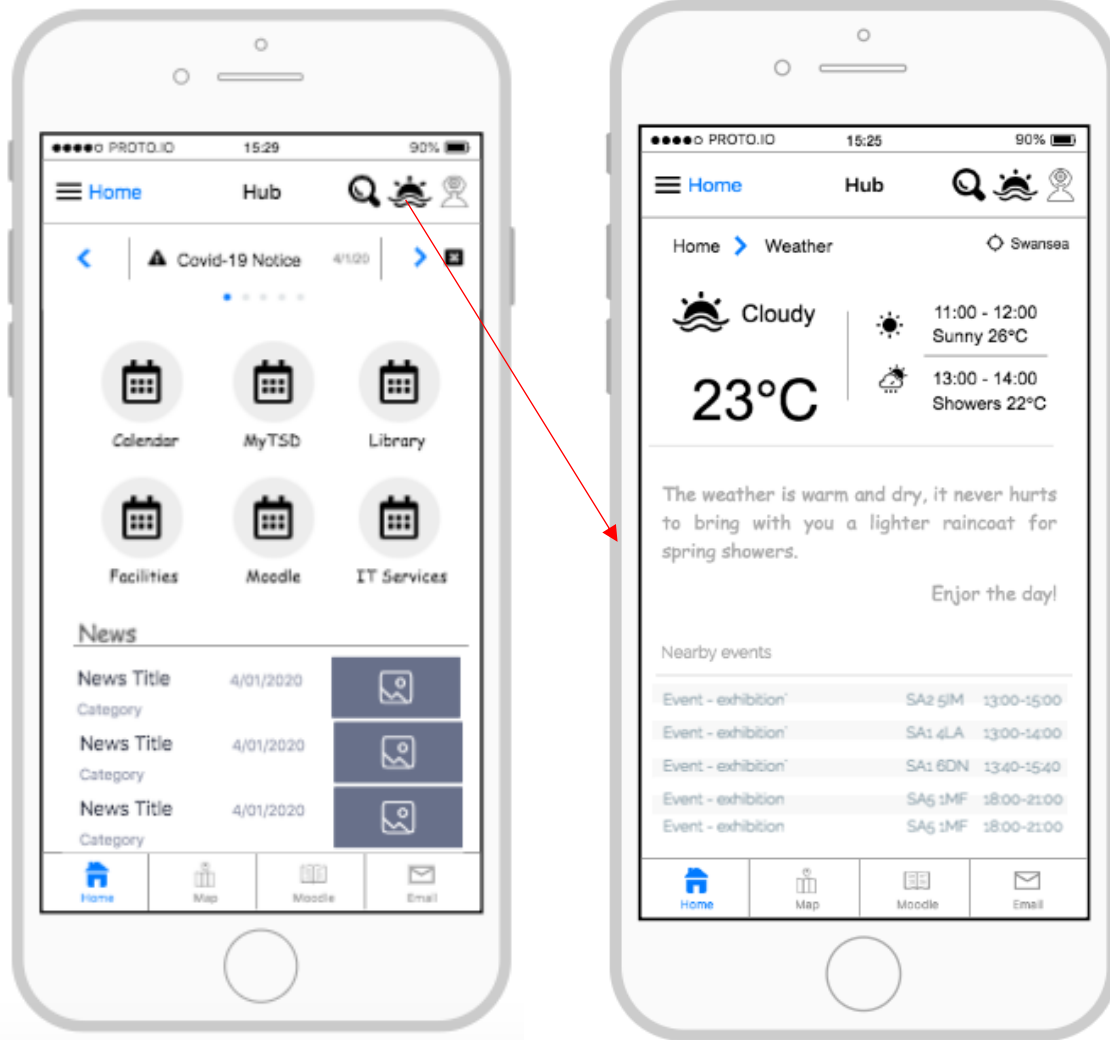
6 Summary

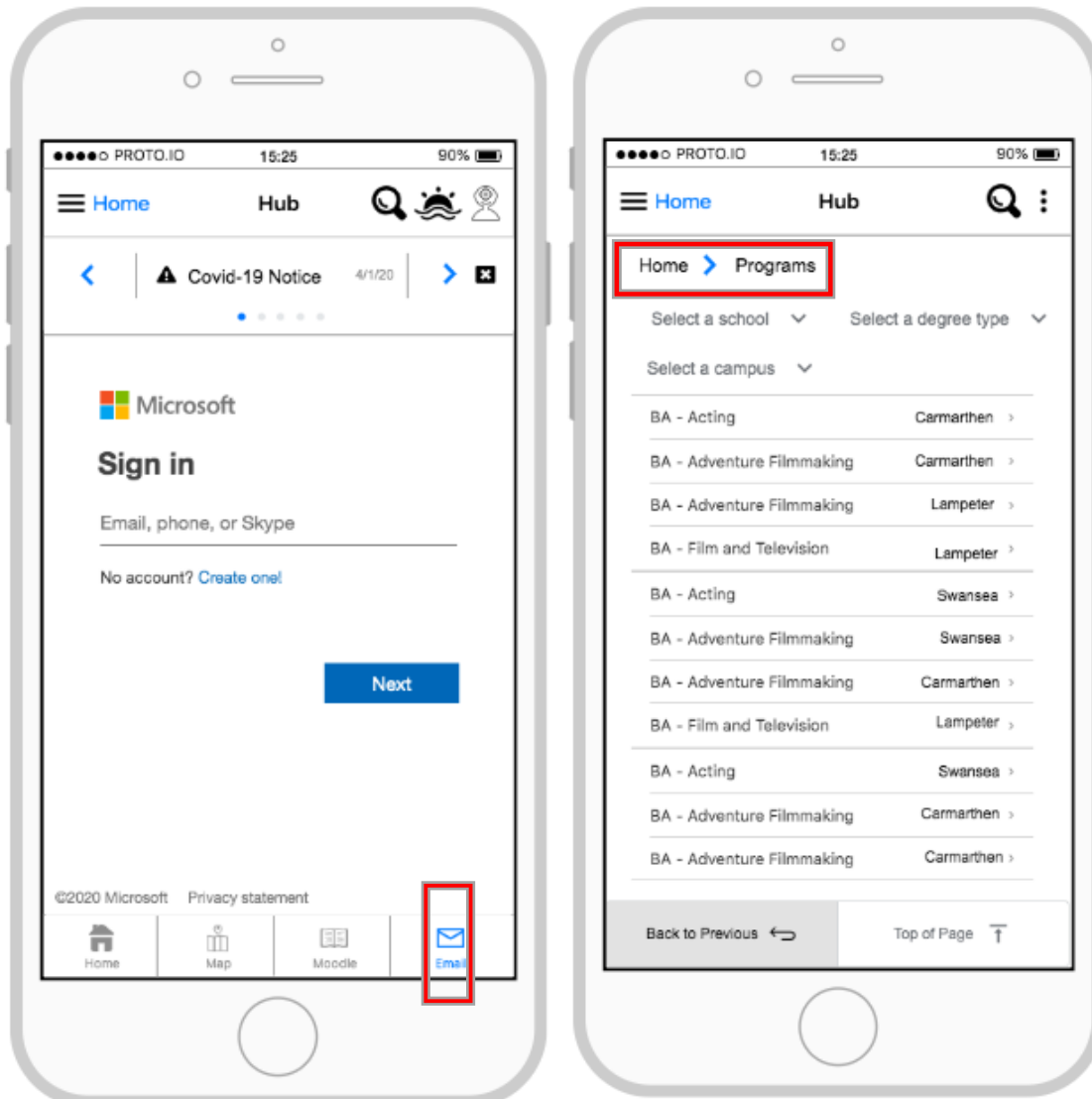
In this report, a comprehensive research of user experience design is performed. The result of this study is a wireframe-based prototype for the WISA Hub mobile application. We have covered several key concepts and topics such as user personas, requirements analysis, prototyping and testing.

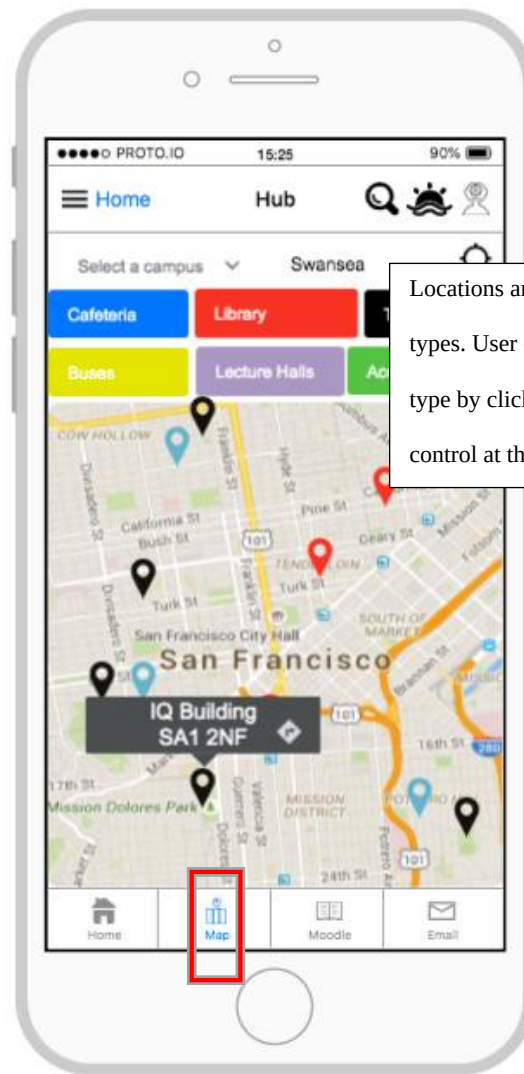
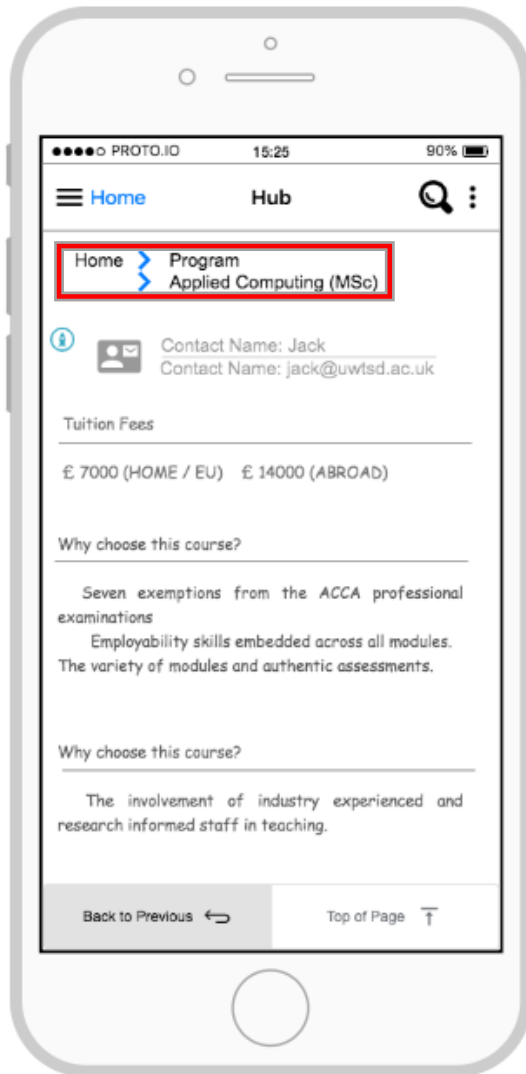
7 Appendix: The Wireframes Design











Locations are color-coded by their types. User can choose a specific type by clicking the corresponding control at the top.

8 References

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