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Keele Institute for Sustainable Futures

User Interaction Design

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Introduction

Background

The Keele Institute of Sustainable Futures (ISF) was launched on 3rd October 2018 to contribute to research, education and training that has a positive impact on long-term sustainability, environments and ecosystems on both local and global scales. The work conducted by the ISF is co-ordinated around 6 challenges, chosen to highlight existing research and frame it around applied sustainability challenges faces by society and the environment. These challenges are mapped against the 17 United Nation (UN) Sustainability Development Goals, which highlight the vast range of challenges faced in working collectively towards a more sustainable future. Aligning the research around these goals emphasizes contributions to the major international agenda as well as ensuring a maintenance of focus on areas recognised as making a positive difference to a more sustainable future.

ISF Website Redesign

The ISF website redesign brings with it a set of aims and requirements that the website needs to meet to be considered successful.

1. The main objective for the redesign is to increase the visibility of Keele Institute for Sustainable Futures and promote awareness and engagement across campus and beyond.
2. The target audience includes students, staff, the local community, business partners and research partners.
3. There may also be other types of users with needs and interests that should be identified.
4. Content that already exists may be used as a basis for the new site, but pages/sections can be updated, removed or created as required.
5. The University Brand Identity (https://www.keele.ac.uk/brand/) must be adhered to but may be adapted if appropriate reasoning and evidence is supplied.
6. The Keele University website “header” elements must remain available.
7. Relevant academic/social media links should be considered for integration.
8. The university is interested in identifying and implementing any novel interactive features that may interest the target audience.

Heuristics and Guidelines

When redesigning the website, it is important to consider various heuristics and guidelines to ensure that the website is accessible to all user groups considered. The main guidelines that will be considered will be those by NNGroup. Specifically, Nielsen’s 10 Usability Heuristics for User Interface Design (1995). With reference to the landing page of the ISF website, Nielsen’s Top 10 Guidelines for Homepage Usability (2002) will be the focus.

The evaluation against these heuristics will only apply to the content of the ISF website and not to the Keele University styling as the corporate identity of Keele needs to be included and so heuristically evaluating this portion of the website is irrelevant.

Other references in terms of website usability and design will be considered, including ‘Research-based Web Design & Usability Guidelines (Leavitt & Shneiderman, 2007). Heuristically, the aim of the website redesign is to make it more accessible to all user groups.

User Profiles

The ISF website is aimed at a range of user groups, all of which have different reasons for visiting the website. User profiles are based on interviews conducted with potential users. The characteristics of each user have been included to represent possible accessibility issue that will need to be addressed to ensure that the website is usable for all intended user groups.

The benefit of using user profiles (a.k.a personas), is that they give a much more concrete picture of typical users (Gulliksen, et al., 2003), meaning that website content can be structured around a user-centred design approach. The data from user interviews can be distilled into multiple fictitious characters that can be presented as examples of potential user groups. Each character can be developed in realistic detail, explaining how the character will interact with the website, describing task-based scenarios (Long, 2009).

However, personas are not always the best way to judge user activity. NNGroup describes different reasons why persons fail, for example when personas are created based on little information (Flaherty, 2018). In the case of the personas created for the ISF, this is a possible issue as the interviews conducted were unstructured, and so there is no consistency in the information gained from each one, meaning there will be a lot of areas where assumptions will need to be made.

SEND Researcher

Firstly, researchers such as David Fredericks (SEND PHD Researcher), see the website as an opportunity to find collaborators for research projects as well as news about current research being done by the institute. He also said that he would visit the website to find out about any upcoming events that the ISF is involved in.

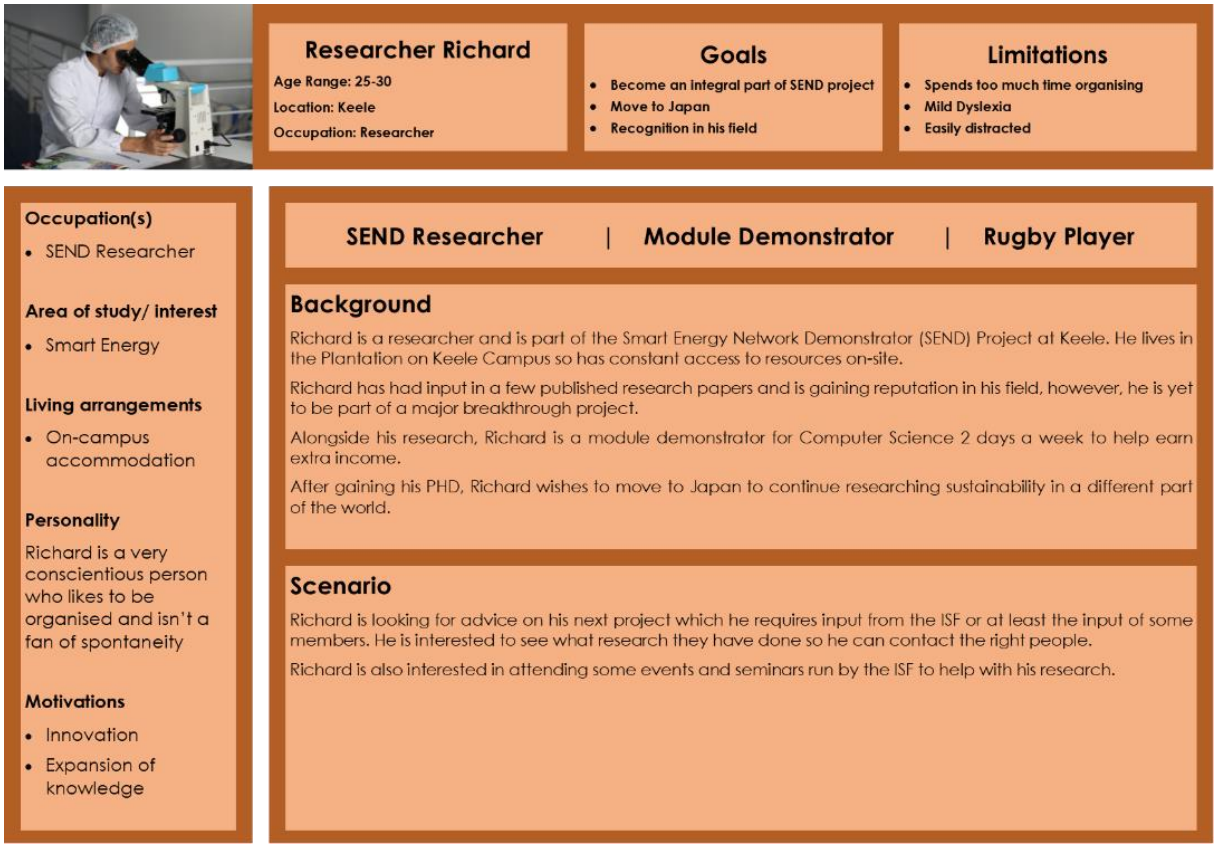

Figure 1: Researcher Persona

University Lecturer

Secondly, educators at Keele would be visiting the website for resources to use in lecturers, as well as case studies which could be used as a base for coursework assignments. Also, in a more pastoral role, opportunities for projects that students could participate in might be presented, especially in disciplines closely linked to sustainability.

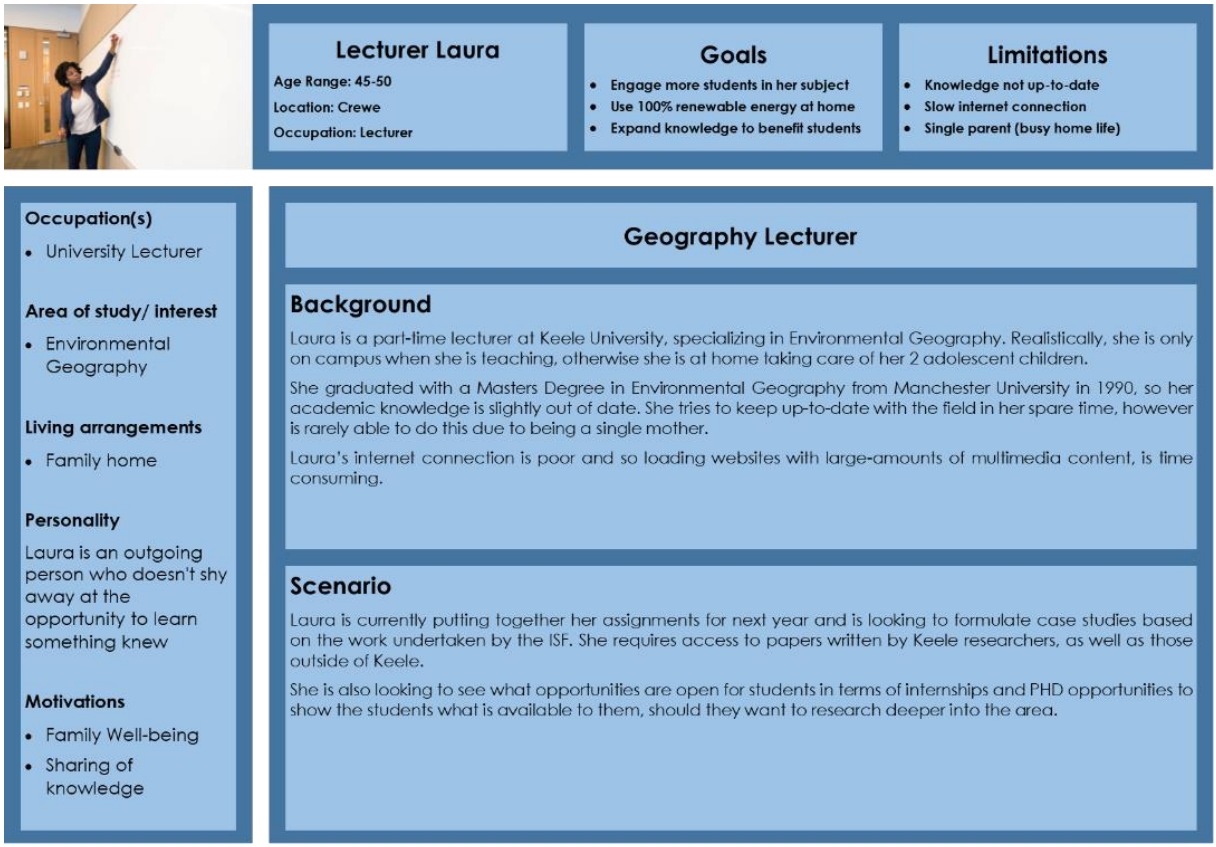

Figure 2: Educator Persona

University Student

Next, students at Keele would be visiting the website for information on the sustainability challenges, as well as accessing opportunities for projects outside of formal teaching. With focus on 3rd year students, those who are doing dissertations based around sustainability, might visit the website for research papers and further information.

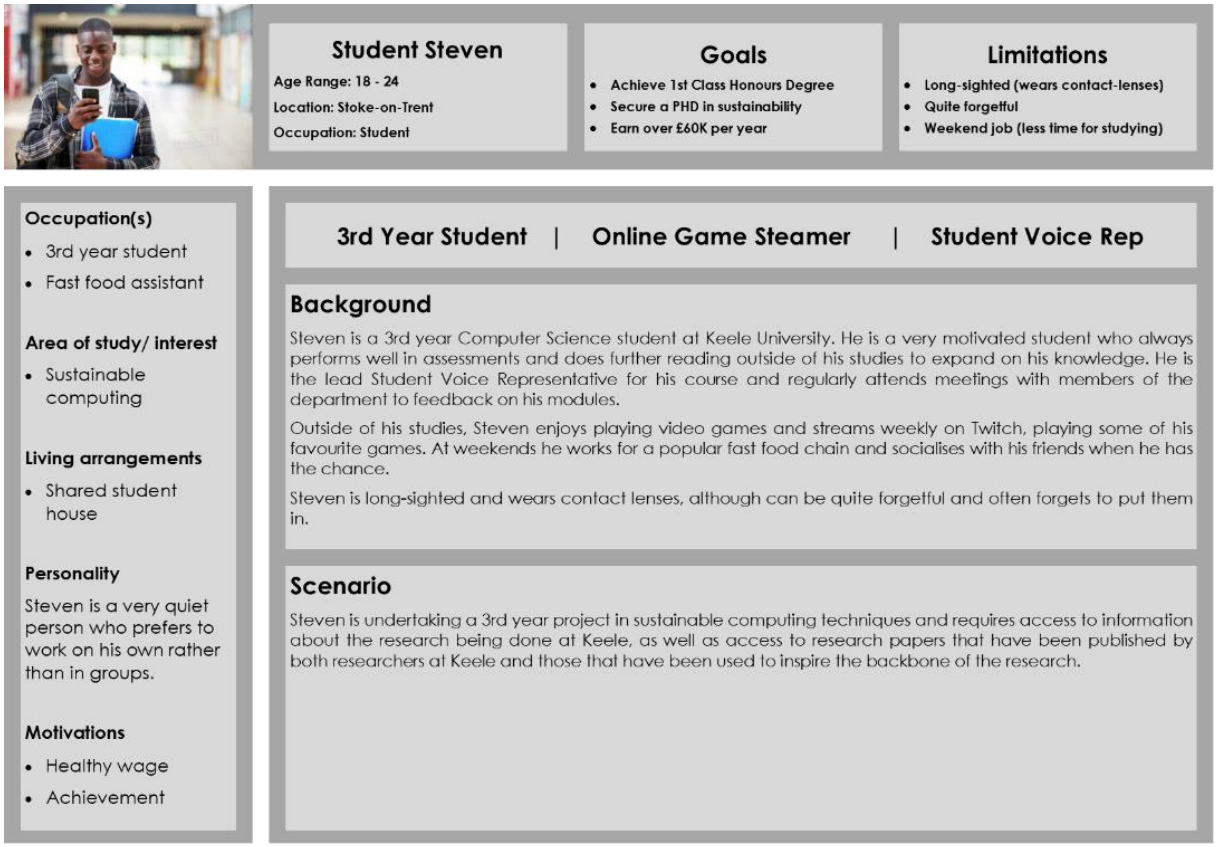

Figure 3: Student Persona

ISF Member

The members of the ISF such as Dr Sharon George, would visit the website to find other members to contact, as well as looking at potential grants and marketing. She would look to communicate with other members of the ISF through the website and see potential PHD opportunities to promote to other people.

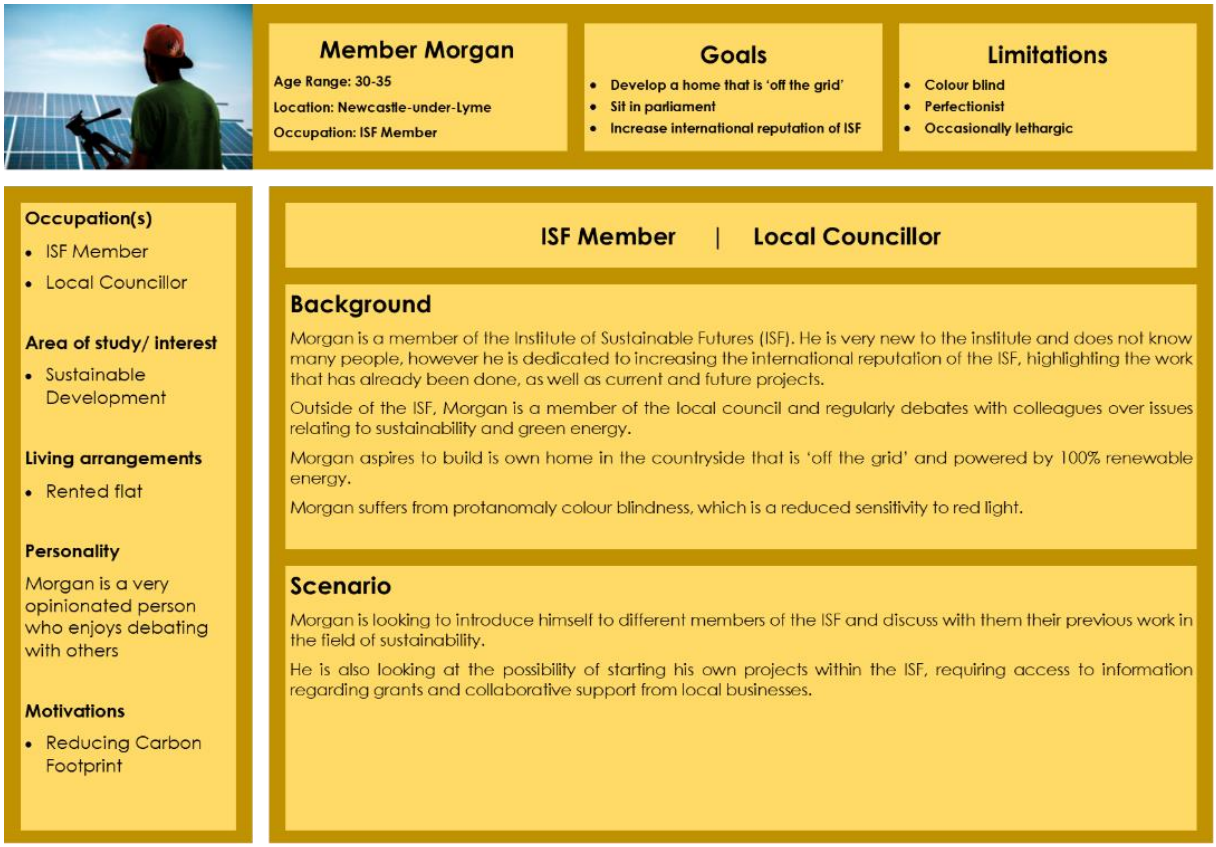

Figure 4: ISF Member Persona

Sustainability Officer

Non-teaching staff such as Sarah Briggs (Sustainability Officer), see the website as an advertisement for the work carried out by the ISF. She feels it is important for the main sustainability goals to be prominent with multimedia assets to promote these goals. The website should also explain the wider impact that the ISF has on sustainability.

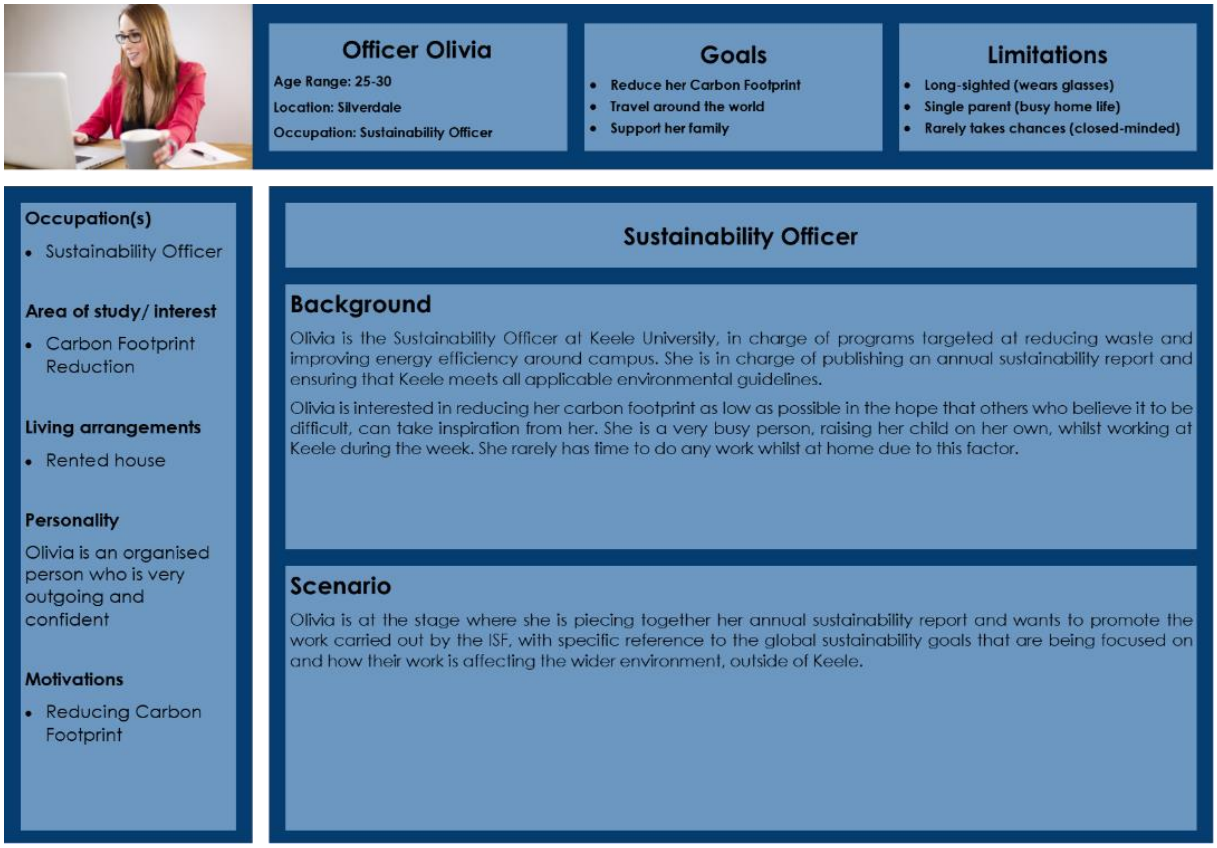

Figure 5: Sustainability Officer Persona

Secondary School Teacher

Externally from Keele teachers such as Jon Carter (Physics Teacher), would visit the website to get a short summary of what the ISF is about and the research they do. He would look for potential lesson activities. There is also the possibility for an interest in educational visits that might be available.

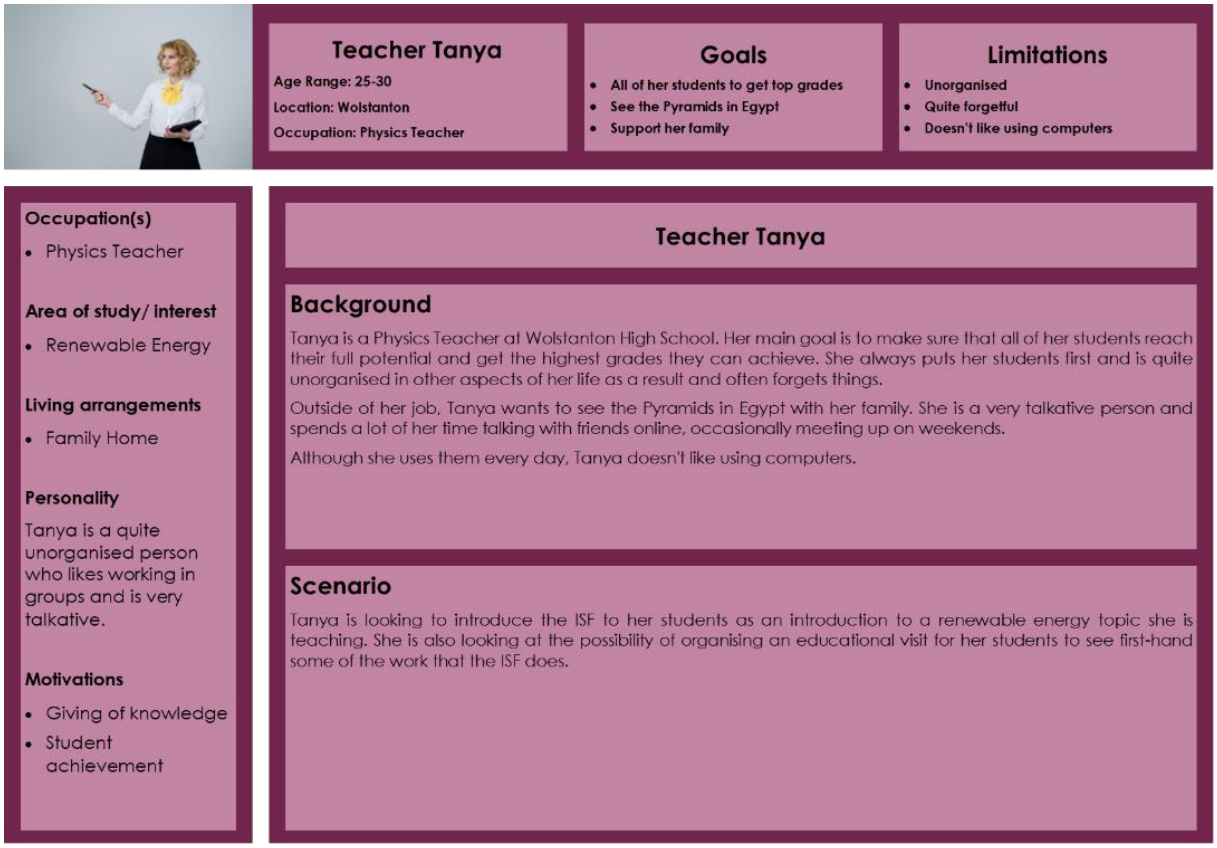

Figure 6: Physics Teacher Persona

Local Resident

Finally, residents such as James Borg (Parish Councillor), sees the website as an opportunity to inform the local community about the work done by the ISF and how it affects the local area. He believes that the information should be written at a level that is possible for a member of the public to understand.

Local Larry

Age Range: 60-65
Location: Keele
Occupation: Retired

Goals

- Stay healthy
- Stay active
- Keep the village safe

Limitations

- Suffers from technophobia
- Mild Parkinson's
- Slightly deaf

Occupation(s)

- Retired
- Parish Councillor

Area of study/ interest

- Gardening

Living arrangements

- Family Cottage

Personality

Tanya is a quite unorganised person who likes working in groups and is very talkative.

Motivations

- Family well-being
- Personal well-being

Retired | Parish Councillor

Background

Larry is a retired landscaper who has lived in Keele all his life. He has tried to stay fit and healthy all his life although this is getting more difficult due to developing Parkinson's disease. Despite this, he still tries to get out as often as he can.

Larry also does a lot of reading and has some interest in sustainability. He rarely uses a computer as he has technophobia and tries to stay away from new technology if he can. He has become more open to some technologies recently as he has realised the benefit of using them

Larry sits in weekly meetings of the Parish Council, discussing issues regarding the local area. His interest in sustainability has stemmed from hearing about work that Keele University is doing to try and be more green.

Scenario

Larry is looking to spend as little time on the website as possible but wants to see in more detail the work that Keele University is doing to be more sustainable. He only wants a brief overview as he will ask for more information in the weekly Parish meetings, as some of the council members are academics as the university.

Figure 7: Local Resident Persona

User-Task Matrix

A user-task matrix helps to understand the frequency and importance of tasks that are performed by different user groups and is critical for many different design decisions. A user-task matrix can be used to summarise data related to frequency and importance of tasks and determine whether some tasks are used by few or many user groups, helping to determine their visibility on the website. Also, the matrix allows for the determination of whether some user groups can be combined if they will be performing similar tasks (Wilson, 2011).

The benefits of using a user-task matrix include that it displays critical information for design teams who are considering what aspect of usability they should focus on during the design process. However, if you have many tasks, it can be difficult to understand the data produced. This can be combated by creating a hierarchical version of the matrix (Wilson, 2011).

ISF Website User-Task Matrix

The tasks the website should support can be determined by the types of users that will access the website. As previously states, unstructured interviews were conducted with members of potential user groups to try and understand the types of tasks that the website will need to support. Some tasks suggested are either already supported or no applicable to the ISF website or already existing on other areas of the Keele website, and so have been omitted.

	Tasks	Educator	Local Resident	ISF Member	Sustainability Officer	SEND Researcher	Student	Physics Teacher
1	I want to get a brief overview of what the ISF is	Rarely	Often	Never	Rarely	Sometimes	Often	Often
2	I want to find contact information for an ISF member	Very Often	Never	Very Often	Often	Often	Rarely	Never
3	I want to see information on current research being done	Very Often	Rarely	Rarely	Often	Often	Often	Sometimes
4	I want to find information on upcoming events	Often	Never	Very Often	Often	Very Often	Often	Never
5	I want to find information on previous research done by ISF	Very Often	Rarely	Sometimes	Often	Very Often	Very Often	Sometimes
6	I want to find information on how to get involved in projects	Sometimes	Never	Never	Never	Very Often	Sometimes	Never
7	I want to find information on potential PHD opportunities	Often	Never	Never	Never	Rarely	Often	Never
8	I want to get information on targeted sustainability goals	Often	Sometimes	Very Often	Very Often	Often	Often	Sometimes
9	I want to find publications by ISF members	Often	Never	Rarely	Rarely	Very Often	Very Often	Rarely
10	I want to get information on grants & funding	Never	Never	Very Often	Very Often	Often	Rarely	Never
11	I want to find information on wider impact of ISF research	Often	Sometimes	Rarely	Very Often	Often	Very Often	Sometimes
12	I want to find information on possible educational vists	Never	Never	Rarely	Never	Rarely	Never	Often
13	I want to find practical examples of complete research	Often	Rarely	Sometimes	Often	Often	Often	Sometimes
14	I want to locate external links for more information	Often	Sometimes	Rarely	Never	Very Often	Very Often	Sometimes
15	I want to find information on the seminar series	Often	Never	Very Often	Rarely	Very Often	Often	Never
16	I want to make a general enquiry to the ISF	Often	Often	Never	Sometimes	Sometimes	Often	Often

Figure 8: User-Task Matrix

Some tasks are specific to a certain type of user, whereas some are applicable to multiple user groups. These tasks are the ones that should be the most prominent and easy to complete as they are the ones that are most likely to be needed.

The figure above shows a list of tasks which the website should represent, as well as the user profiles that will be accessing the website. Analysis shows a separation between general and specific tasks in that most user groups will complete the general tasks, whereas as little as one user group may require another task.

Further analysis shows that the most common task that will be completed is task 5 which specifies that the user will want to find information on previous research done by the ISF. This is to be expected given the user profiles included as most of the user groups will be looking at previous research for referencing or assignments. The least common task is task 12 which specifies that a user will want to find information on educational visits. This is also typical of what was expected as the only user group that will be needing this information is the 'Physics Teacher'.

Finally, the most common user group is the SEND Researcher. This is based on the number of tasks that this user is likely to want to perform and does not necessarily reflect on the frequency that a user group will visit the website. If this was considered, the most frequent user group would be a student due to their likely familiarity with the ISF, and the size of this user group being the greatest inside Keele.

Content Inventory

A content inventory is a list of all the content on a site. To gain a meaningful insight from the inventory, it is necessary to access each piece of content to help understand what is on the site, where it is located and whether it is up-to-date (Usability.gov, 2018).

The benefits of using a content inventory to evaluate website content include being able to determine problems in content and possible content gaps. This can lead to the ability to improve the information structure and better search engine optimization, which will ultimately improve the visibility of the website (Bigby, 2018).

ISF Content Inventory

Page ID	Page Name	Source	Notes	Current ISF Page?
0.0	Institute for Sustainable Futures home	https://www.keele.ac.uk/sustainable-futures/	This is the Institute for Sustainable Futures landing page	Y
0.1	ISF Promotion		This could appear on 0.0, however would be short to minimise scrolling	N
0.2	ISF Wider Impact		This would include information present on 0.0, however would be collapsed and hidden	N
1.0	Launch Event	https://www.keele.ac.uk/sustainable-futures/launchevent/	This is the ISF Launch Event page	Y
1.1	ISF Events Calendar		This would display a list of all upcoming events that the ISF is involved in	N
2.0	Our Network	https://www.keele.ac.uk/sustainable-futures/ournetwork/	This is the ISF Network page showing all the members of the ISF	Y
2.1	ISF Internal Portal		This would be a secure intranet, to allow members, partners, etc. to access more information	N
2.1.1	ISF Communication Network		This would allow ISF members, partners, etc. to contact eachother	N
2.1.2	ISF File Sharing		This would be a Google Drive link which would allow people to share files (all files would default to read-only unless downloaded)	N
3.0	Our Challenge 'Themes'	https://www.keele.ac.uk/sustainable-futures/ourchallengethemes/	This explains the set of global challenge goals that the ISF focuses on	Y
3.1	Providing Clean Energy & Reducing Carbon Emissons	https://www.keele.ac.uk/sustainable-futures/ourchallengethemes/providingcleanenergyreducingcarbonemissions/	Overview of area with list of goals addressed and examples of published work	Y
3.2	Protecting air, land, water and ecosystems	https://www.keele.ac.uk/sustainable-futures/ourchallengethemes/protectingairlandwaterandecosystems/	Overview of area with list of goals addressed and examples of published work	Y
3.3	Providing food security	https://www.keele.ac.uk/sustainable-futures/ourchallengethemes/providingfoodsecurity/	Overview of area with list of goals addressed and examples of published work	Y
3.4	Creating responsible, sustainable communities and governance	https://www.keele.ac.uk/sustainable-futures/ourchallengethemes/creatingresponsiblesustainablecommunitiesandgovernance/	Overview of area with list of goals addressed and examples of published work	Y
3.5	Creating healthy societies	https://www.keele.ac.uk/sustainable-futures/ourchallengethemes/creatinghealthysocieties/	Overview of area with list of goals addressed and examples of published work	Y
3.6	Communicating sustainability	https://www.keele.ac.uk/sustainable-futures/ourchallengethemes/communicatingsustainability/	Overview of area with list of goals addressed and examples of published work	Y
4.0	Seminar Series	https://www.keele.ac.uk/sustainable-futures/seminarseries/	This shows an overview of the seminar series with a link to a .pdf file with the dates of different seminars	Y
4.1	ISF Seminar Series Autumn 2018	https://www.keele.ac.uk/media/keeleuniversity/microsites/greenkeele/kusrn/ISF%20Seminar%20Timetable%20Autumn%202018.pdf	This is a timetable of seminars coming up, however could be included on 4.0 as an event calendar similar to 1.1	Y
5.0	News	https://www.keele.ac.uk/sustainable-futures/news/	This shows the latest news for the ISF	Y
5.1	ISF Twitter Feed		This would show a snippet of the ISF Twitter feed	N

6.0	Contact Us	https://www.keele.ac.uk/sustainable-futures/contactus/	This is the contact page for the ISF	Y
6.1	Social Media Contacts		This would be included on 6.0 and would provide links to the various social media accounts	N
7.0	Get Involved		This would be a landing page explaining how people can get involved in the ISF	N
7.1	ISF PHD Opportunities		This would provide information on how to enquire about PHD opportunities	N
7.2	Grants & Funding		This would provide information to existing and potential partners about how to enquire about funding research	N
7.3	Secondary Education		This would provide information for secondary schools on possible educational visits to the ISF	N
8.0	External Links		This would provide information on other websites that the user can visit to get more information	N
8.1	University-wide Links		This would be included on 8.0 and would provide links to other areas of the Keele website (e.g. SEND Project)	N
8.2	Global Links		This would be included on 8.0 and would provide links to external websites (e.g. UN website)	N

Figure 9: ISF Content Inventory

The content inventory above shows current website content with proposed new website content, marked by the last column 'current ISF page?'. Overall, most of content added will be included on existing pages. Additional pages include 7.0 Get Involved, and 8.0 External Links. This is from analysis of the User Task Matrix which specifies that users would want to know about opportunities to get involved with the ISF, as well as be able to easily access external links, either within Keele or wider, to find out more information about either a specific topic or a more general area.

Navigation Structure

After the content inventory had been analysed, a card sort was conducted with the included content to evaluate a possible structure to the website. A card sort is a method used to help design or evaluate the information architecture of a website. Participants organise topics into categories that make sense to them, with possible help in labelling each group (Usability.gov, 2018). The type of card sorting selected is open card sorting. This is the most common form of card sorting and provides the participants with the ability to assign whatever names they want to the groups (Sherwin, 2018).

The benefits of card sorting include that it is simple and easy to conduct, resulting in fast results. Card sorting allows the design process to adhere to a user-centred design approach as it relies on potential users to determine the categories. However, the drawbacks to using a card sort is that it doesn't consider the tasks that will be completed on the website. Card sorting is also variable, so it is very possible that different user groups will yield very different results. Also, although conducting a card sort is very quick, the analysis can take time and most often, does not go deep enough into the actual structure and content of the website as the user is only presented with short phrases as appose to actual content (Interaction Design Foundation, 2016). There is more of a reliance on the user being able to understand the terminology used.

ISF Website Structure (Sitemap)

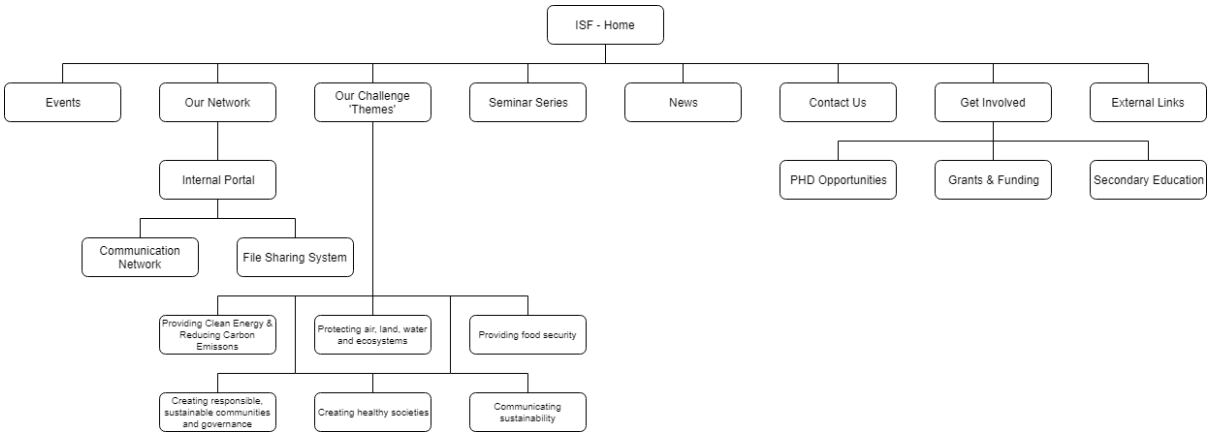

Figure 10: ISF Website Navigation Structure

Mock-up Designs

The pages chosen for redesign are the homepage and the news page. Both pages include new elements from the content inventory, therefore will display more information that the current pages.

Homepage

Current Homepage

Figure 11: Current Homepage

The current homepage displays an introduction into what the ISF is about, as well as collapsed sections explaining what the ISF does for different user groups. There is no clear indication on the top priority tasks which breaks Nielsen's 5th heuristic for homepage usability, 'emphasize the site's top high-priority tasks' (2002).

Also, the links on the left-hand side do not always start with the keyword, for example 'our network'. It is likely that a user is going to be looking for 'network' when scanning down the page so using keywords will make it easier for the user to notice it. This breaks Nielsen's 7th homepage usability heuristic, 'Begin link names with the most important keyword'.

Mock-up Homepage

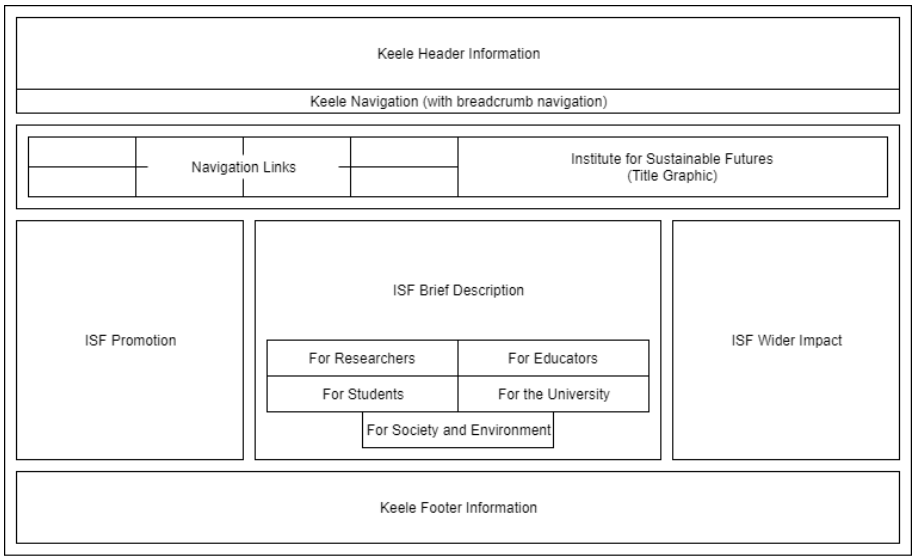

Figure 12: Homepage (Wireframe)

The figure above shows a low fidelity wireframe for the desktop version of the homepage. Analysis of the user interviews suggests that there should be emphasis on promoting the ISF to potential business partners. Therefore, a section has been included on the left-hand side which is solely responsible for explaining to the user why the ISF is a good initiative to get behind. This adheres to the F-shape pattern of reading as states by Pernice who states that eye tracking research has shown that people scan webpages using various patterns, one of which is an F-shape (2017). Analysis from the user-task matrix shows that the second most-common task is finding out the wider impact of the ISF research. This can be summarised in a brief overview; therefore, the decision was made to include this on the homepage.

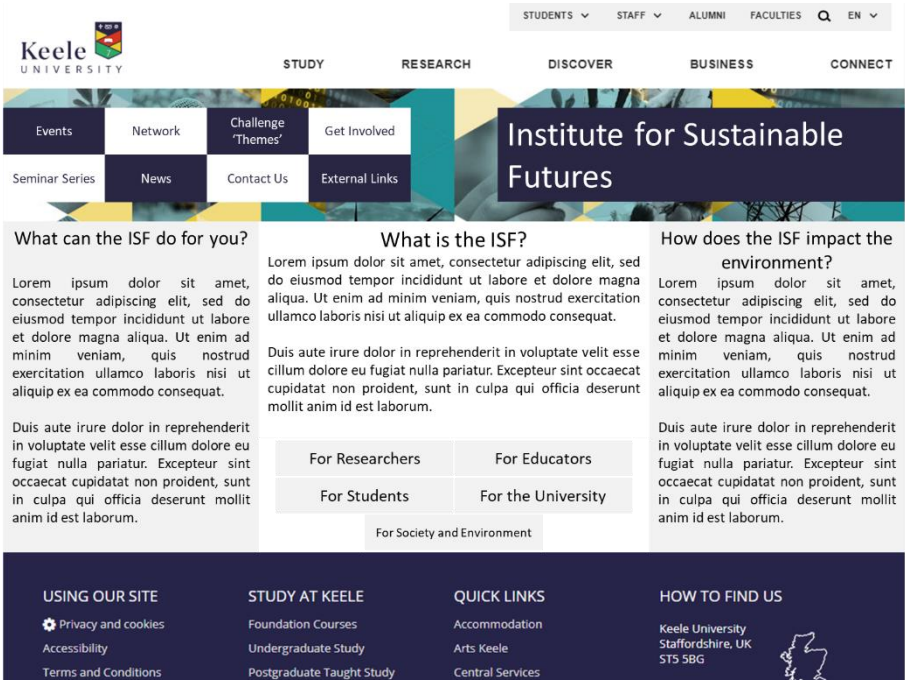

Figure 13: Homepage (PowerPoint)

The figure above shows a PowerPoint representation of the proposed homepage. The website has been structured using a mobile-first approach, warranting modular design. The benefits of adopting a mobile-first approach assures that the website will be responsive to any platform that a user may use to access it. It also allows for compression and simplification of information into more manageable chunks (IOCEA, 2018).

In terms of Nielsen's 7th heuristic on homepage usability (2002), as stated previously, the links at the top of the page use keywords to make it easier for the user to find the link they want to visit. In terms of the placing of the links, the decision was made to place them in the same banner as the title to maximise the space available on the page for information, allowing for more information to be displayed to the user, without cluttering the page, making it hard to read and understand. The issue of banner-blindness (Nielsen, 2007), does not apply here as the main banner on the page is a corporate banner which does not apply to the design of the ISF website, due to its necessary inclusion.

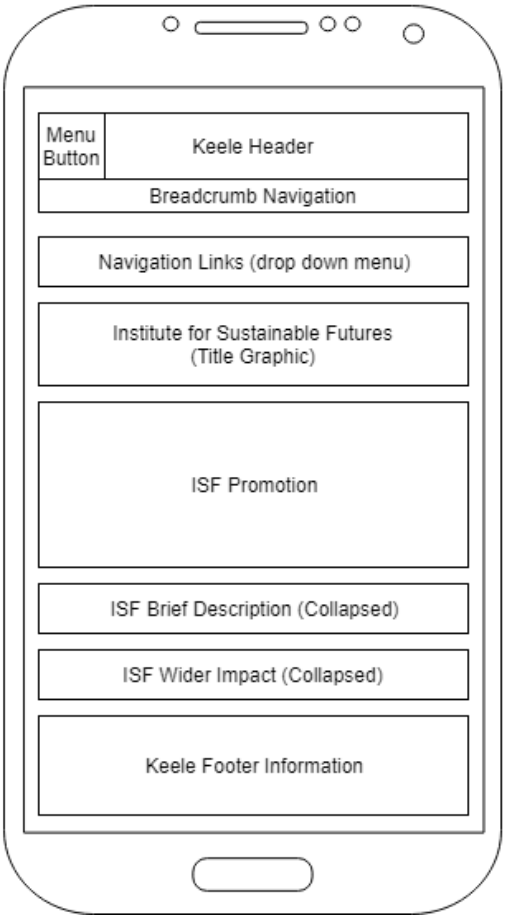

Figure 14: Homepage (Wireframe) Mobile

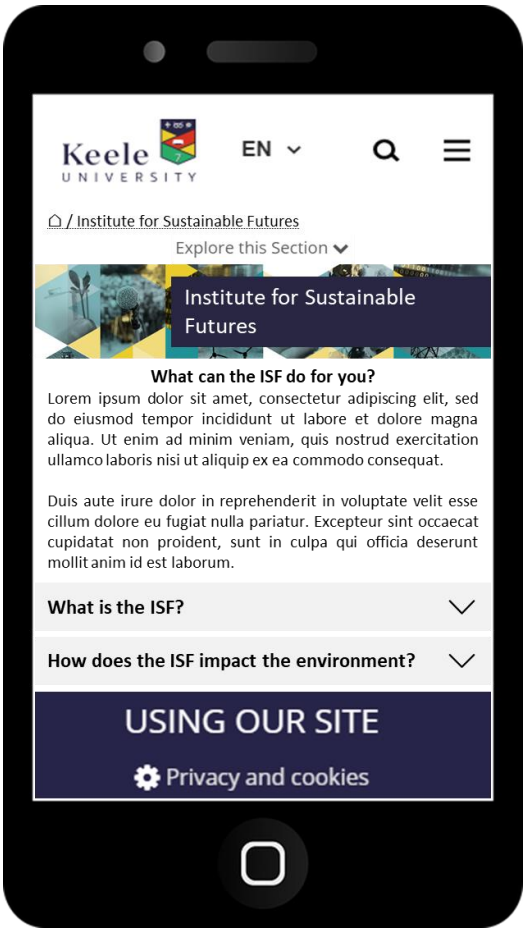

Figure 15: Homepage (PowerPoint) Mobile

Current News page

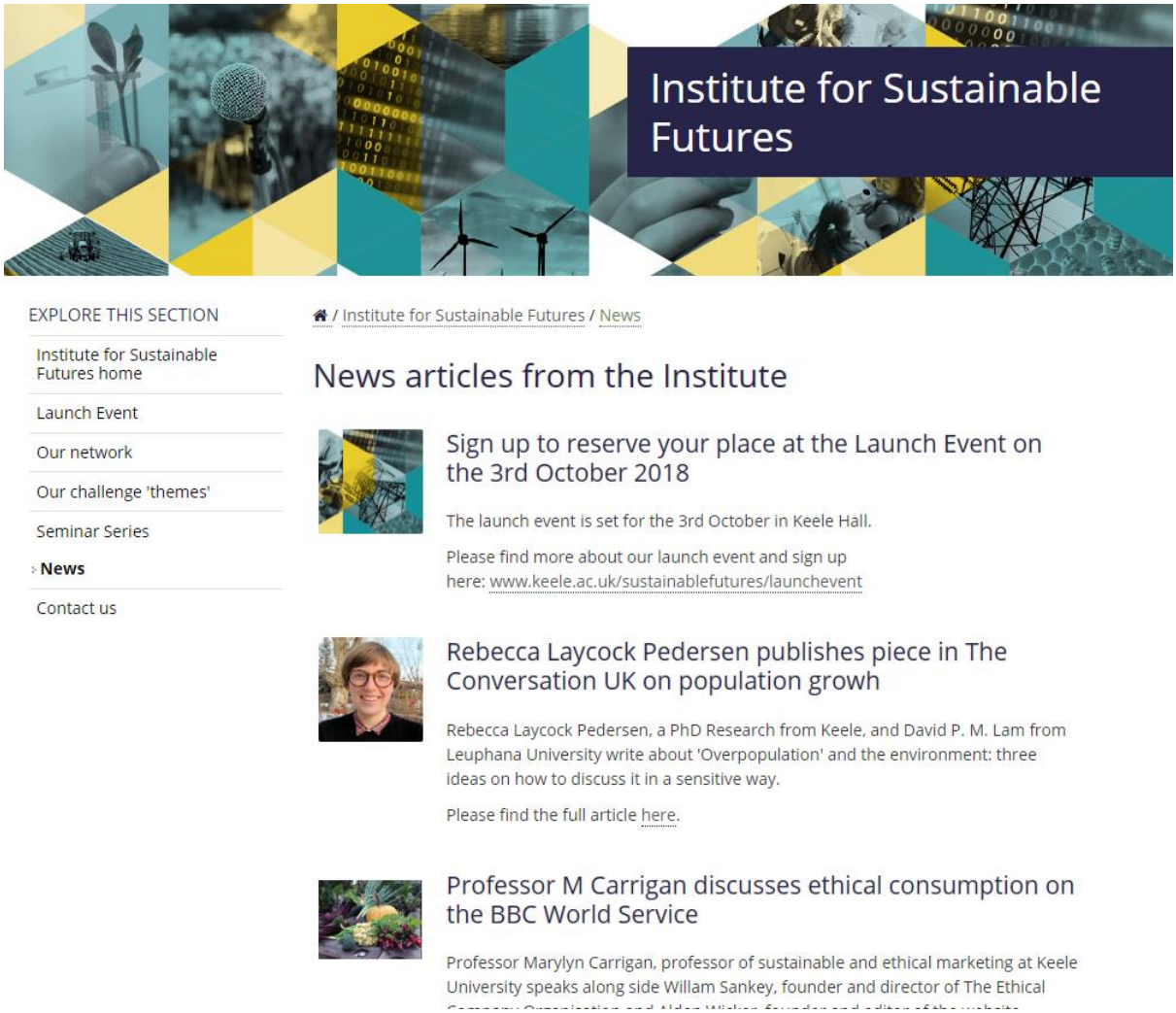

Figure 16: Current News Page.

The current news page does not clearly show the user which page they are on. Whilst most of the time this would not be an issue, for the case of the news page, the page title is different to the title of the link the user would have used to access the page. This breaks Nielsen's 1st heuristic for user interface design, 'visibility of system status', which states that the user should always be kept informed about what is going on (Nielsen, 1995). There is also a slight breach of Nielsen's 5th heuristic, 'error prevention', as is it likely that if the user is unclear whether they are on the news page, they may choose to return to the previous page, increasing the time taken to access the information they want.

Mock-up News page

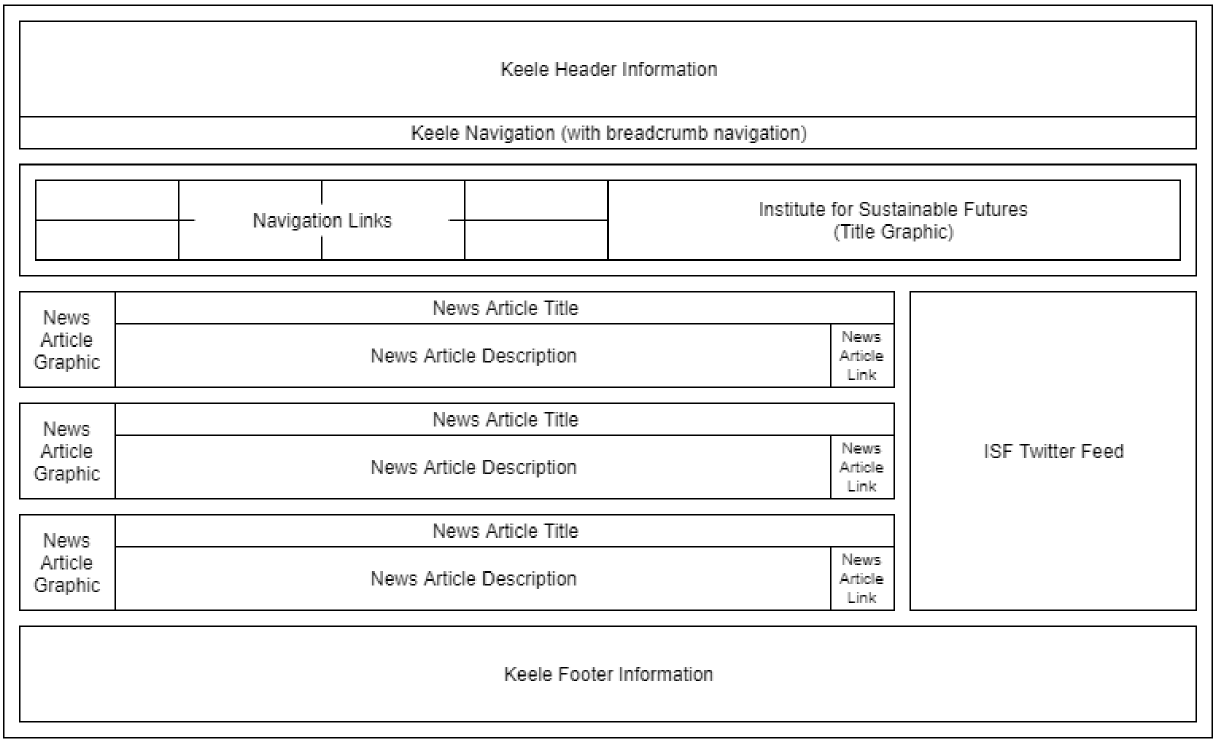

Figure 17: News Page (Wireframe)

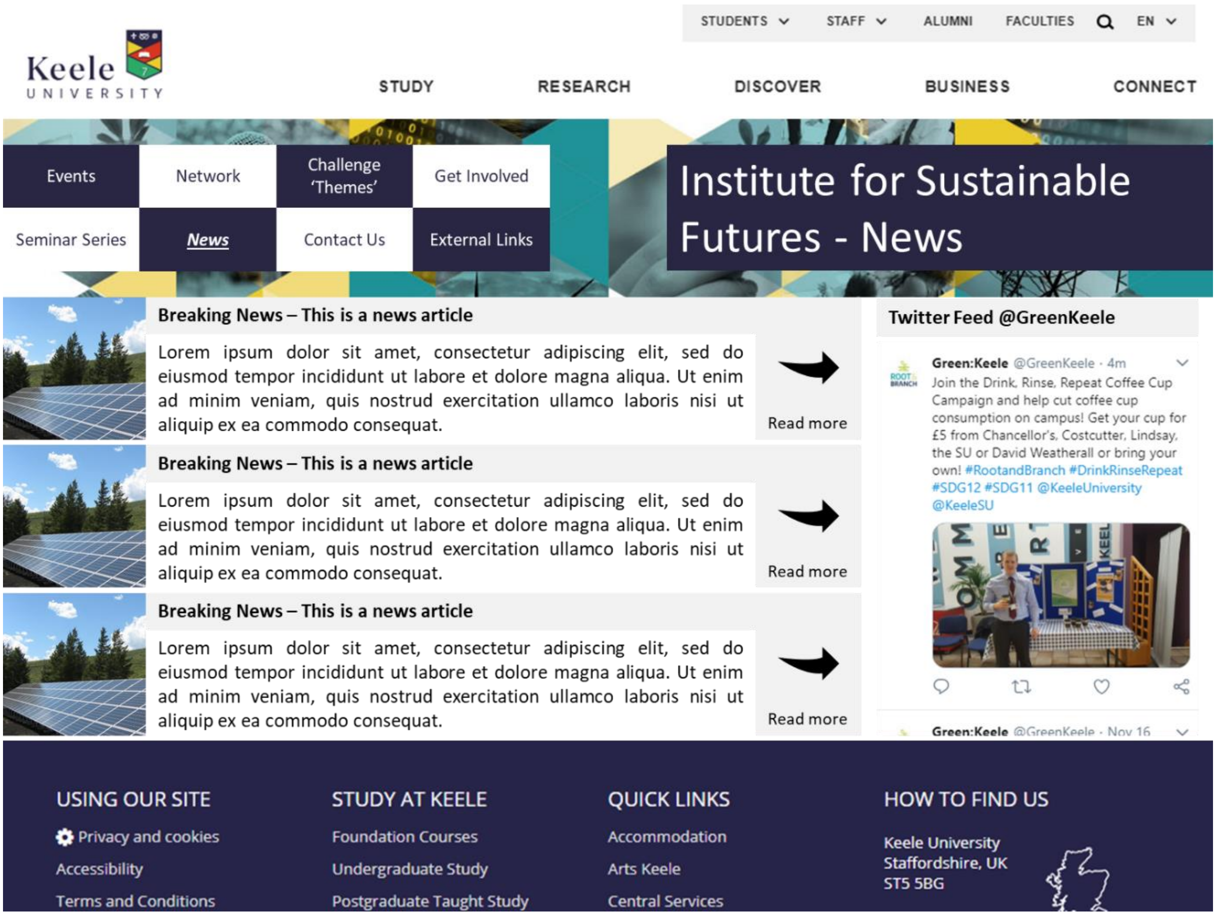

Figure 18: News Page (PowerPoint)

The proposed news page, as shown above, fixes the issue regarding system status as the page header includes the name of the individual page, using the same keyword as the link the user would have used to access the page. Like the homepage, the structure follows a modular, mobile-first design meaning that there is a seamless transition between desktop and mobile site.

The inclusion of a Twitter feed follows the request that the website include social media links. Twitter is an ideal medium to post quick updates on research or other news, therefore the decision was made to include it in the news page of the website. Like the current page, the news articles are structured in a similar way with an image, news title and brief description. The only change to the design is the use of an icon to direct the user to the full article, which is not present in the current design.

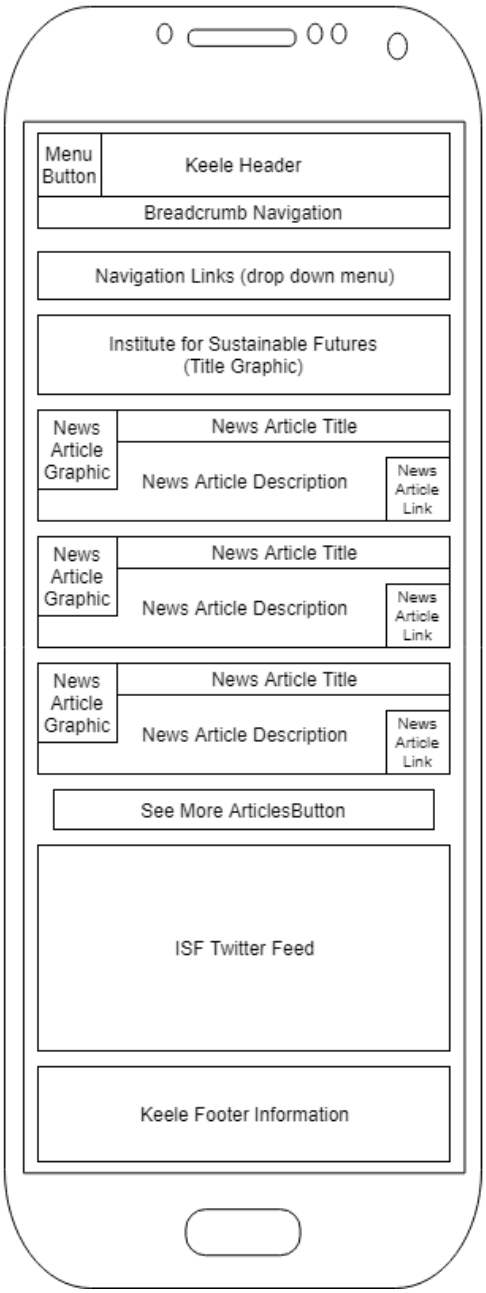

Figure 20: News Page (Wireframe) Mobile

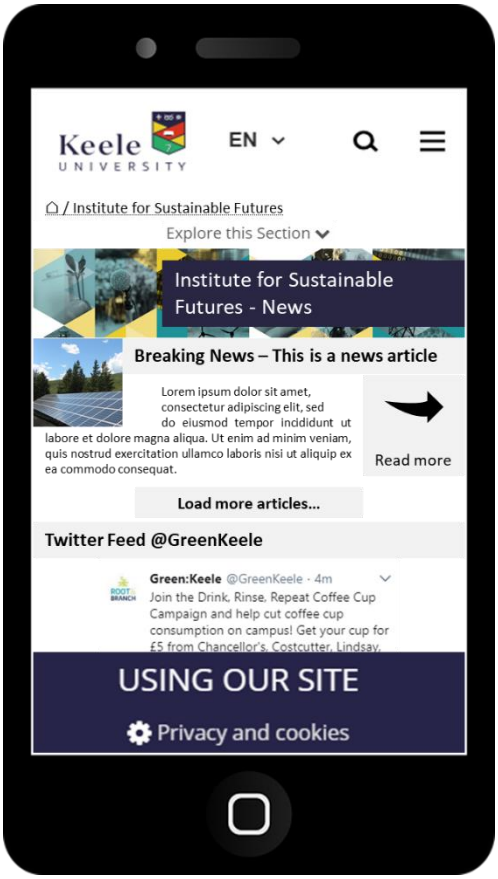

Figure 19: News Page (PowerPoint) Mobile

Conclusion

Overall, the redesign of the Keele Institute for Sustainable Futures website, hopes to meet the aims and requirements set out at the beginning of the project.

1. *The main objective for the redesign is to increase the visibility of Keele Institute for Sustainable Futures and promote awareness and engagement across campus and beyond.*

   The way that the mock-up designs have been completed, following a user-centred design process, hopes to increase the visibility of the ISF as more people will want to visit the website. The content of the website has been considered using user groups outside of Keele meaning the appeal should be wider than just on campus. Also, despite constraints with Keele corporate identity, the identity of the ISF has been included.

2. *The target audience includes students, staff, the local community, business partners and research partners.*
3. *There may also be other types of users with needs and interests that should be identified.*

   User profiles spanning wider than Keele have been considered, meaning that the user-centred design approach used is inclusive of a wider audience.

4. *Content that already exists may be used as a basis for the new site, but pages/sections can be updated, removed or created as required.*

   The content of the current site was used as a base for the user-task matrix and content inventory. Further analysis of user profiles and interviews with potential user groups, uncovered further tasks such as a 'get involved' section, giving users information in PHD opportunities and funding. A page for 'external links' was also created, allowing users to easy access more information about a specific topic or the general area. The only page that was changed was the 'launch event' page, which was renamed to 'events' to include events that will happen in the future.

5. *The University Brand Identity must be adhered to but may be adapted if appropriate reasoning and evidence is supplied.*
6. *The Keele University website "header" elements must remain available.*

   The University corporate identity has been maintained using the Keele website framework. This allowed more time to be spent redesigning the crucial areas of the website, without worrying about including Keele corporate identity in the new design.

7. *Relevant academic/social media links should be considered for integration.*

   The 'contact us' page would include links to social media such as YouTube and LinkedIn. The 'news' page also includes the Twitter feed of 'GreenKeele'

8. *The university is interested in identifying and implementing any novel interactive features that may interest the target audience.*

   This aim was not met in mock-up designs however, other pages would include interactive, multimedia content.

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