Usability Evaluation Portfolio

HUMAN COMPUTER INTERACTION

C3432363

## CONTENTS

Context

The aim of this report will be to reflect on a usability evaluation portfolio conducted using two websites. Human Computer Interaction (HCI) techniques and approaches will be used during the creation of the portfolio. Rubin & Chisnell (2008) define usability as when "the user can do what he or she wants to do the way he or she expects to be able to do it, without hindrance, hesitation, or questions".

To test usability, both websites will be tested against a carefully chosen criteria that has been curated using highly regarded and recognised HCI principles and heuristics including Schneiderman's (2004, p. 74) Eight Golden Rules of Interface Design, as well as Nielsen's (1995) 10 Usability Heuristics for User Interface Design.

The two websites that have been chosen for the usability evaluation portfolio are sportswear retail juggernauts www.nike.com and www.adidas.com. It was important that the genre of the two chosen websites were the same, as the type of information found on both websites will be similar, and therefore it will allow a single, fixed and fair criteria to be created and used against the two websites.
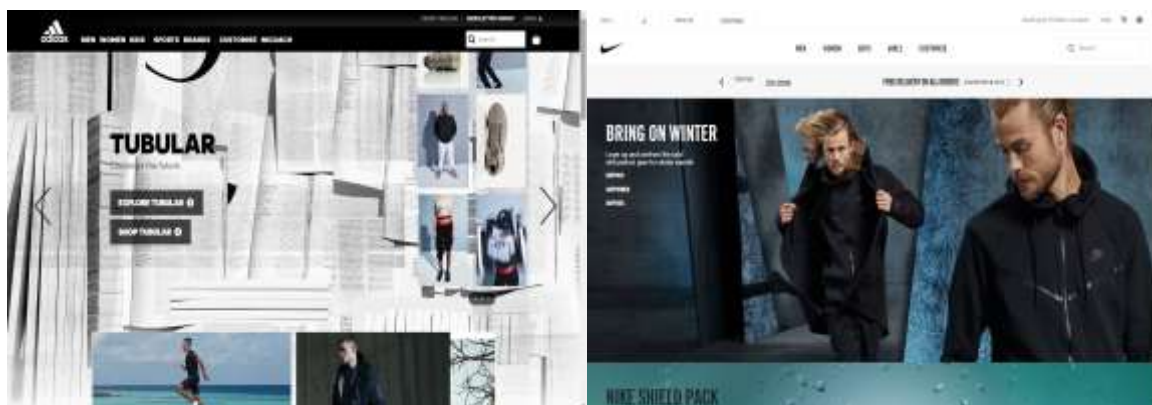
Outlines of the evaluation techniques and plans have been included as well as justification for each technique used. The findings have also been described and visualised. Critical analysis of all findings have been included and discussed extensively while remaining grounded in relevant HCI principles, with improvements also being recommended. Finally, an overall reflection as well as further work and references have been included.

Evaluation of the web sites

Table 1 shows the criteria that has been chosen to test against while conducting the evaluation, as well as the justification for why each criterion has been chosen, linking to relevant human computer interaction principles and references.

Table 1.

Criteria chosen to evaluate against and justification for each criterion

Criteria	Justification
Navigation	Navigation is an integral factor that either elicits a satisfying or negative user experience and also determines how quickly users can achieve their goals (Farrell, 2015).
Informative feedback	Informative feedback responding to user actions is important in attaining a positive user experience (Renaud et al, 2000). Schneiderman (2004, p.74) also lists informative feedback as one of his eight golden rules of interface design.
Accessibility	Websites are expected to cater to all types of people, including those with visual, physical and other disabilities (Vora, 2009). It is important that the web provides equal access and opportunity to people with disabilities in order for them to be more actively participant in society (W3, 2005).
Use of space	Websites which bombard vast amounts of information on the screen can be a displeasing sight for a lot of people as they may be confused about where to start (George, 2005). Alternatively, websites which don't display enough

	information can be seen as useless and hard to use. Keywords and data chunking leads to improvement in user experience (George, 2005).
Consistency	A consistent website is considered to improve the user experience in regards to HCI principles. Consistency throughout the website also decreases the learning curve (George, 2005). Therefore having a consistent website is paramount in reaching a good level of user experience.

Evaluation Techniques

Three evaluation techniques have been chosen so that more usability areas can be tested. Although one technique is better than none, it is recommended that as many evaluation techniques be used when testing usability (Rubin & Chisnell, 2008).

Observation

Observation techniques allow users to complete tasks in their usual environments, allowing for valid results that reflect real-life use of systems (Bernard, 2009). Direct and non-direct observations can be used to observe human behaviour (Bernard, 2009).

Direct observation involves observing a participant complete a set of tasks while an observer makes notes of behaviours displayed during the observation (Lazar et al, 2010). Direct observation can result in both quantitative and qualitative data, especially if the observation is timed alongside written notes (Lazar et al, 2010).

The Think Aloud method may be utilized in conjunction to the observation method. In the think aloud method, participants are encouraged to speak their mind as they are completing tasks (Fonteyn et al, 1993). This method is easy to conduct and expands the breadth of qualitative data gathered. Alternatively, the results given by participants may be selective and subjective, which would reduce the validity of the results (Dix et al. 2003).

Heuristic Evaluation

A heuristic is a widely recognized and accepted guideline used when designing or critiquing an interface (Dix et al, 2003). A heuristic evaluation involves experts evaluating a user interface to see how well it fits with popular and recognized usability principles (Rinder, 2012). The evaluators will note if at any point the interface violates any heuristics and the severity of the violations. This type of evaluation is cost effective and intuitive to conduct (Nielsen & Molich, 1990).

A disadvantage is that although a heuristic evaluation may identify usability problems within a system, it will not provide direct suggestions for improvement (Nielsen & Molich, 1990). Another disadvantage is that it is difficult to find every usability issue

in a website with only one evaluator, therefore it is beneficial to have multiple evaluators (Nielsen, 1994).

Interview

In user-centered designs, interviews are often conducted to determine how an average user feels when using a user interface (Wilson, 2013). The three main types of interviews are structured, semi-structured and unstructured interviews (Bernard, 2006).

Semi-structured interviews have been chosen for the usability evaluation. Semi-structured interviews are used to gather opinions on issues that have been pre-identified by the interviewer, but leave room for the user to give alternative and additional opinions through open-ended questions (Wilson, 2013). Strengths of semi-structured interviews include the ability to uncover previously unknown issues, as well as the ability to probe participants further (Bernard, 2006).

 Potential weaknesses include issues in consistency, where flexibility among interviewers may affect results (Bernard, 2006). The mixture of quantitative and qualitative data makes the analysis time-consuming (Wilson, 2013). To combat this, only one interviewer will conduct interviews.

Evaluation Plans

Evaluation plans for each technique has been described below. By creating a plan, it enables others to understand and visualise what will happen during evaluation day, as well as allowing other testers to conduct another test in a similar manner (Rubin & Chisnell, 2008).

Observation

The observation method will be the first method used during the evaluation. 5 participants will be observed individually. The participants will be given a set of tasks that they must attempt to complete while an observer times them, as well as extra note-taker recording any facial expressions the participant may display or any vocal messages. This observation will be direct, and reactive as the participant will know that they are being observed (Bernard, 2009).

The observation will allow quantitative results to be produced based on the timings of each participant for each task. These times can then be compared and analysed to identify potential shortcomings of each website, based on the type of criteria the task relates to. Qualitative data will also be produced from recording the facial expressions of each participant as well as any comments made vocally and will be an important part of producing a descriptive and extensive report.

Table 2 shows the task guideline, criterion and justification for each task.

Table 2.

Task guideline, with relevant criterion and justification

Task Number/Criteria	Task	Justification
1 **Navigation** **Informative feedback**	Find and add a specific product to cart	Both websites are e-commerce, therefore finding a product and adding to cart is the most important aspect of the websites.
2 **Navigation** **Use of space**	Find out about Click and Collect	Many people will want to find out more about these kind of services, therefore it is important that they are able to find the correct information easily and quickly (Nielsen, 2008).
3 **Informative feedback** **Navigation**	Try and make an account with provided invalid information	Generally, before or during a purchase, an account will be created. The satisfaction of the process for doing so will impact the chances of a sale (Renaud et al, 2000).
4 **Navigation** **Use of space**	Find the site map	Every website should have a site map as it will show all of the information found within the website. This allows people to find exactly what they want with ease (Nielsen, 2008).

| 5

Accessibility
Use of space | Enlarge the screen 300% and then find the help page | The reason for enlarging the screen is to evaluate how the website caters to people with difficulty with reading small sized text (W3, 2014). People with disabilities may go to the help page to find out more about what accessibility is offered within the site, or to seek help if they are struggling with a certain task (W3, 2005). This task will also evaluate how responsive the website is. |

Heuristic Evaluation

A combination of heuristics will be derived from Nielsen's (1995) 10 Usability Heuristics for User Interface Design, as well as Schneiderman's (2004, p. 74) Eight Golden Rules of Interface Design. These two heuristics are the most regarded, recognised and used in HCI.

The heuristics chosen for this evaluation have been adapted to suit the tested systems, and have been shown below:

1. Pages have a consistent look and feel
2. Errors in forms are prevented beforehand & promote valid responses
3. Webpages are minimal and aesthetically pleasing
4. Forms help users recognize, diagnose and recover form errors
5. Forms offer Informative feedback
6. Annotations are provided on forms
7. Current location highlighted – Users should know where they are at all times
8. Familiar language used throughout website

The heuristic evaluation form is available in Appendix B.

Interview

Immediately after a participant has completed the tasks set in the observation method they will be interviewed to ensure accurate answers. A semi-structured, also known as an in-depth interview has been chosen as it will utilise an interview guide containing a list of questions based on the evaluation criteria (Bernard, 1999).

The interviewer will ask questions and engage in any discussions while a note-taker will jot the answers given by the participant. Without a note-taker, the quality of notes will be poor as it will be difficult to both conduct the interview of this structure and make notes at the same time (Cohen & Cabtree, 2006).

The interview guide will contain the same questions as the heuristic evaluation. If only one evaluator would be conducting the heuristic evaluation it wouldn't identify all usability issues, therefore multiple evaluators must be used (Nielsen, 2009).

Participants

Five participants will be chosen to conduct the evaluation. The participants sample will broadly range in age from 20 – 69, and also range computer literacy so that they reflect the larger population, therefore the results can also be generalised to the larger population. A Participant profile form can be found in appendix C.
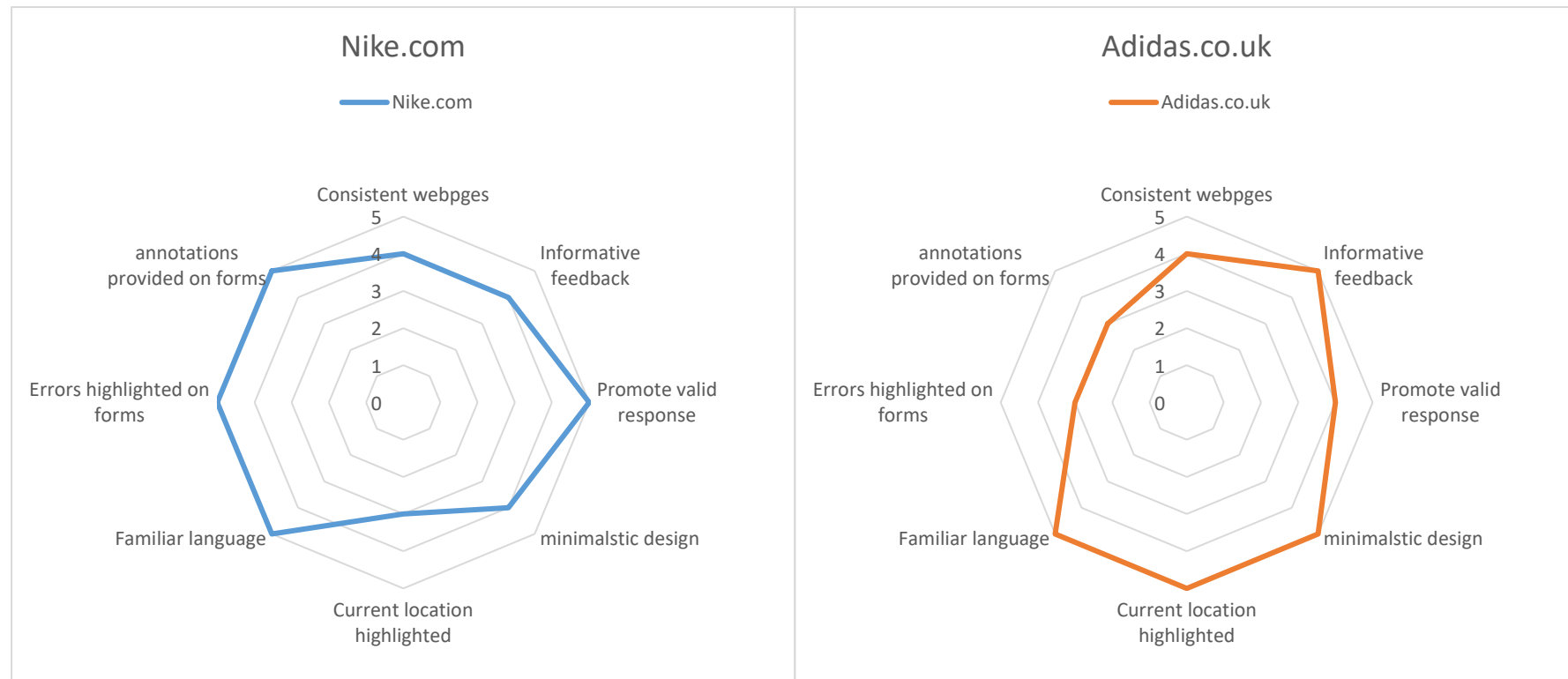
Heuristic Evaluation

The results of the heuristics evaluation have been displayed in figure 1. The heuristics were judged while conducting each of the five tasks. The results were divided by five to get the average result. To make the results easier to understand, results have been reduced to the nearest whole integer.

Figure 1.

Heuristic evaluation results for both websites   *Key: 1 = Severe usability issue, 5 = No usability issues*
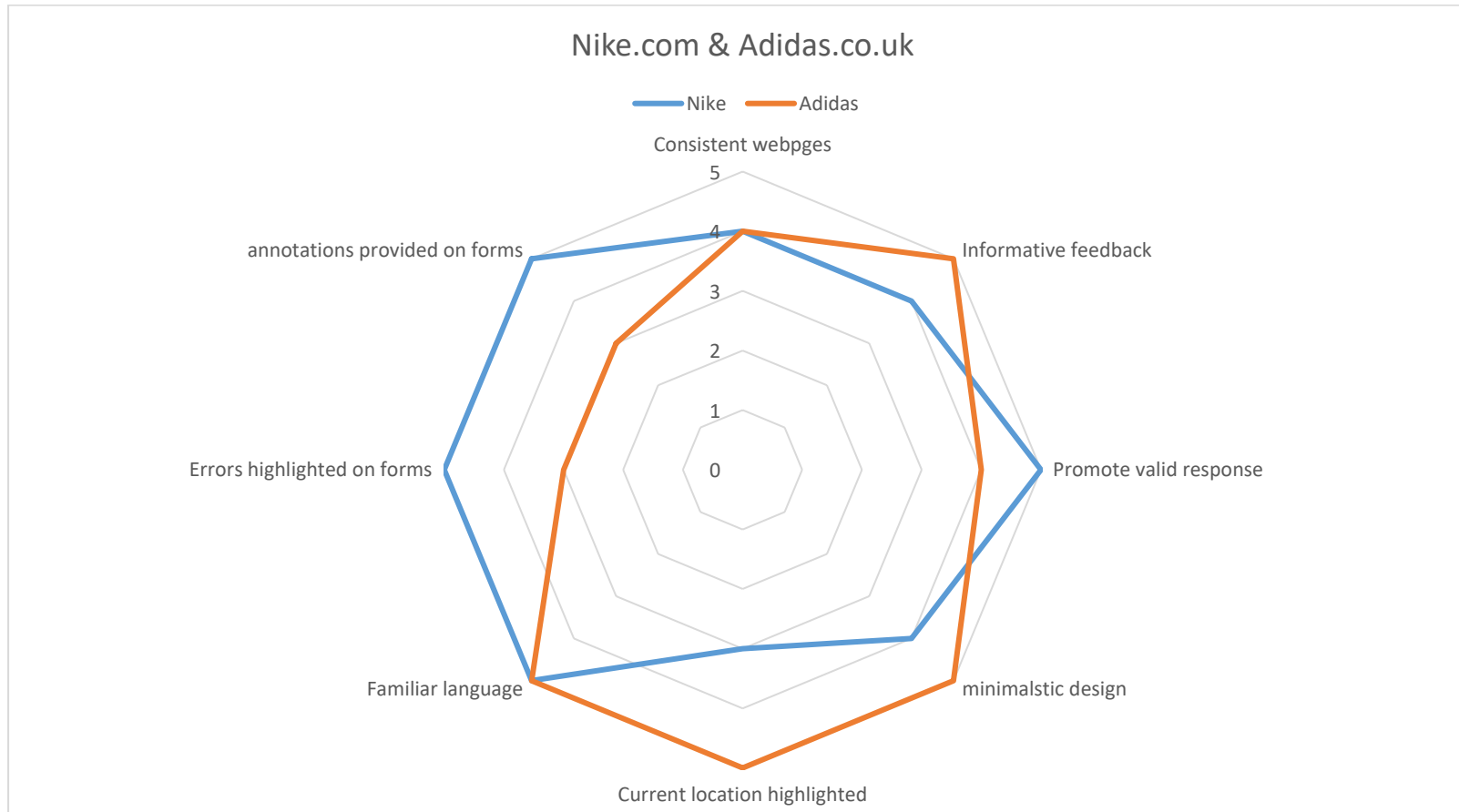
Heuristic Evaluation

the combined heuristic evaluation results can be seen for both websites in Figure 2.

Figure 2.

Combined Heuristic evaluation results   *Key: 1 = Severe usability issue, 5 = No usability issues*
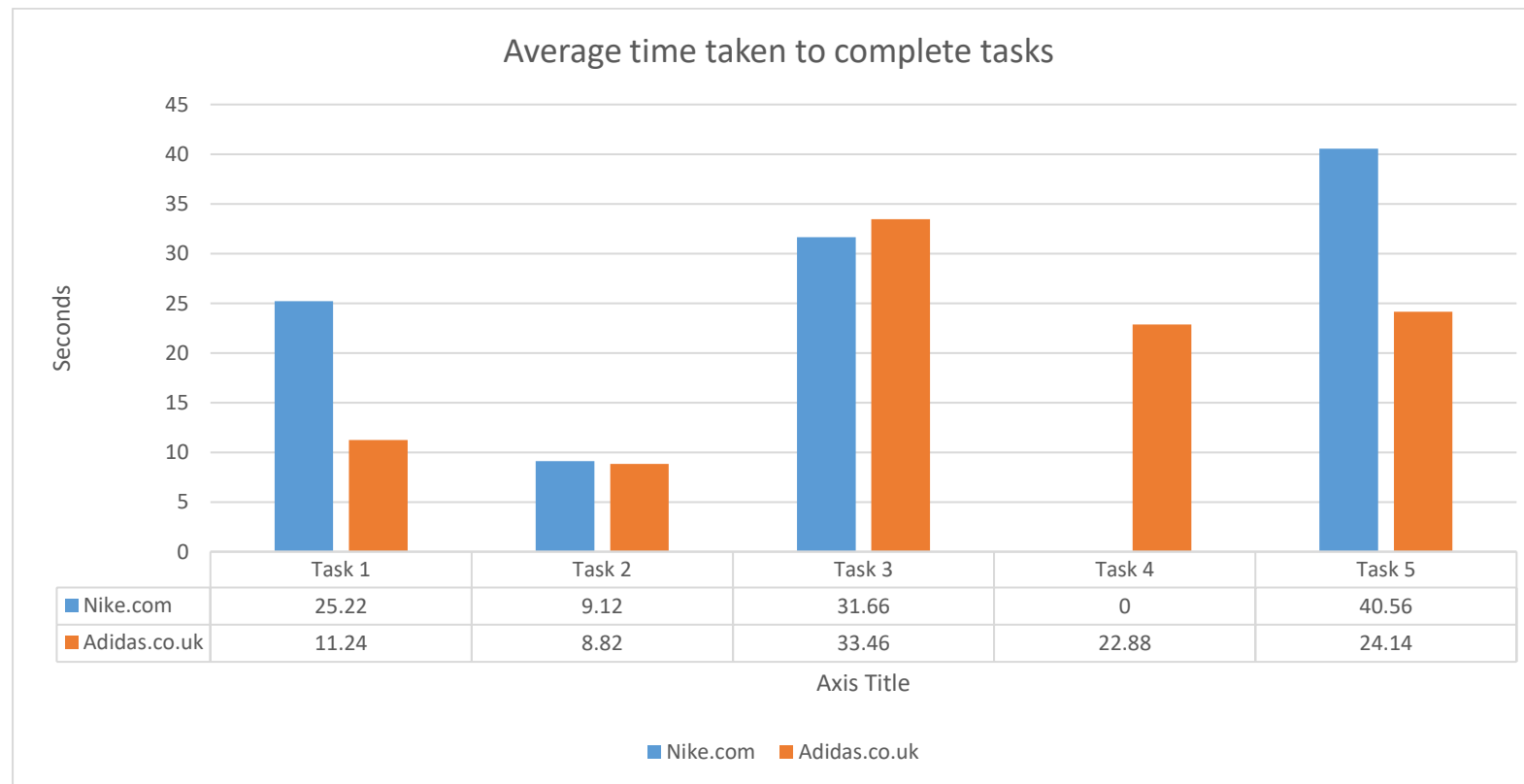
Observation Method

During observation, the time taken to complete tasks was recorded and averaged, shown in figure 3, in order to compare websites and not between participants.

Figure 3.

Average time taken to complete tasks on both websites

Average time taken to complete tasks

|	Task 1	Task 2	Task 3	Task 4	Task 5
Nike.com	25.22	9.12	31.66	0	40.56
Adidas.co.uk	11.24	8.82	33.46	22.88	24.14

Axis Title

Interview

The results of the interviews are displayed in figure 3. The interview was conducted immediately after the participant completed the five tasks. The results of the interview were divided by five to get the average result. To make the results easier to understand, results have been reduced to the nearest whole integer.
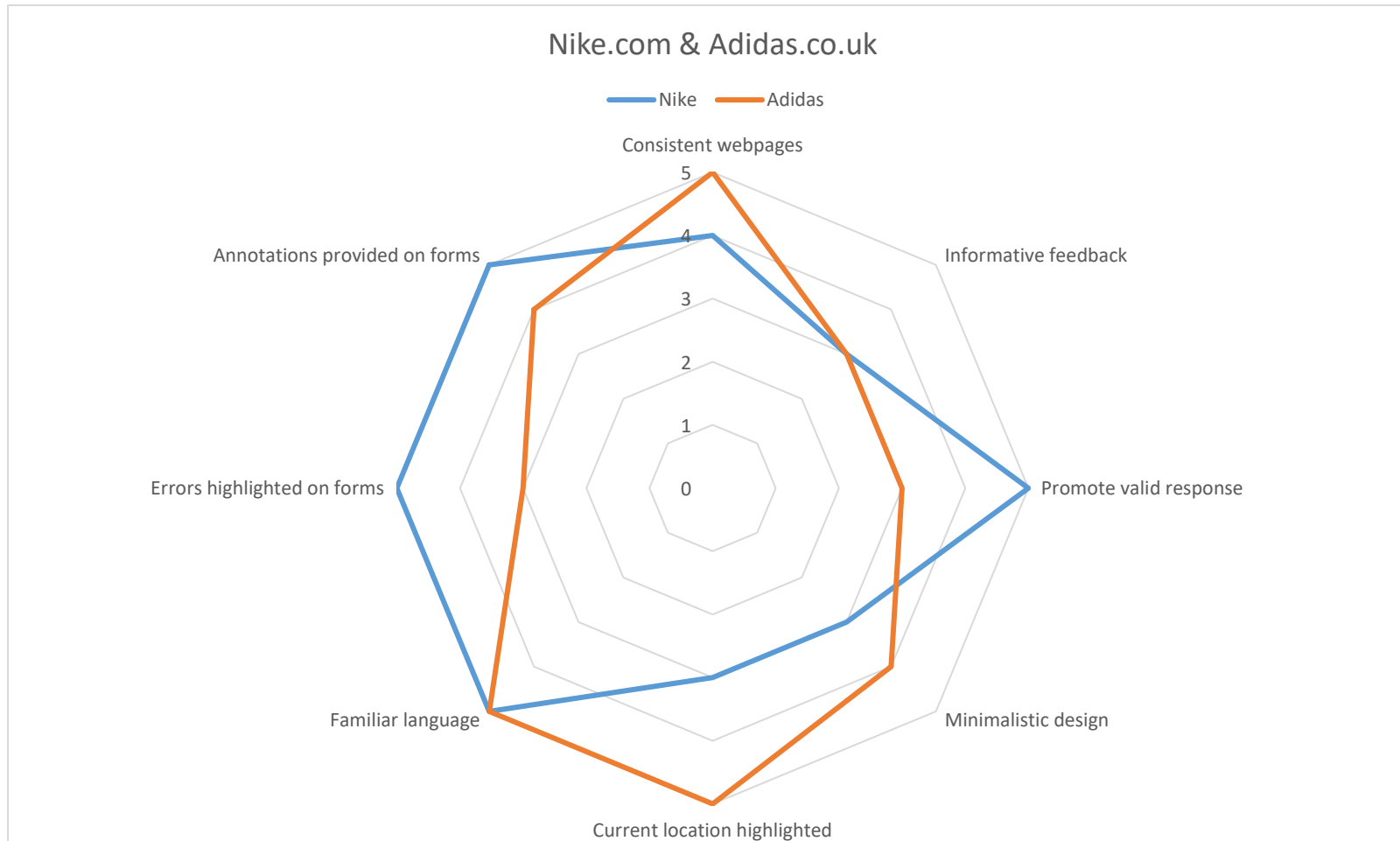
Figure 4.

User interview results for both websites
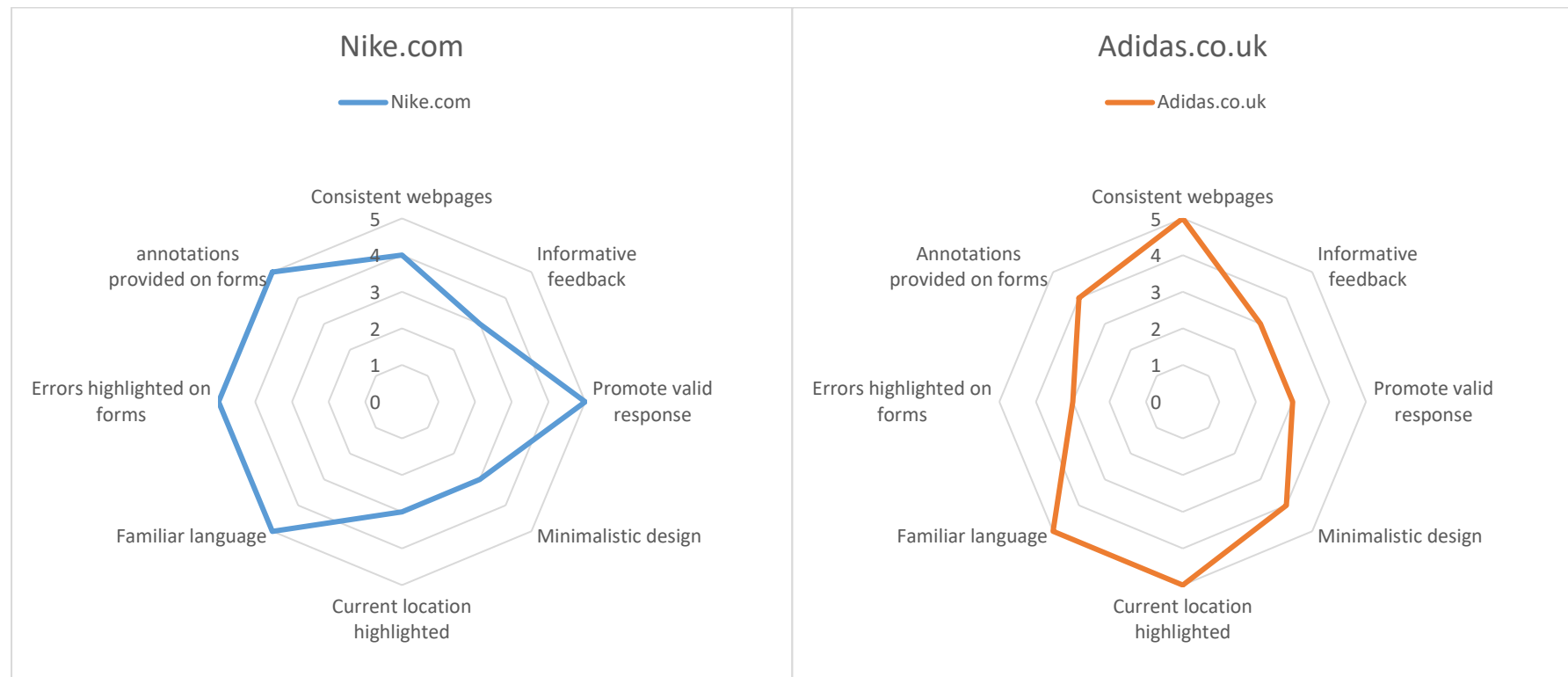
The combined interview for both websites are shown in figure 5.

Figure 5.

Combined interview results

Critical Analysis

Looking broadly over the results found from all three evaluation techniques it is clear to see that both websites perform very well. This is expected, considering the stature of both companies, with Nike and Adidas generating a massive $3.74 billion and $877.6 million respectively (Kell, 2016).

A substantial amount of that revenue is directly dependant on the websites of both companies, with Nike reporting a 51% increase in online sales this year (Nike, 2016), and Adidas also reporting a rapid expansion in their e-commerce channels (Adidas Group, 2016). As a result, one of the top concerns for both companies is their website user experience.

Navigation

During the observation when thinking out aloud and also during interviews participants found the navigation for both websites were very similar. The type of navigation was found to be identical (drop-down menus), and participants were very familiar with navigating both websites. Thomas et al (2005) found through evaluating navigation methods that drop-down menus were most effective with participants. Other benefits of this type of navigation include: less screen space being used and not having the need for vertical scrolling to see the entire menu.

The way links were structured was also noted, as both are displayed in a hierarchical fashion. Kralish et al (2005) suggested that website designs should be monochromic, where information is placed in a linear order and links emphasize a hierarchical structure to improve usability in website navigation. Nielsen (2009) praised Mega Menus like the ones present in both evaluated websites, which have everything visible at once with structured navigation links.

Similarity of Mega Menus on both sites

Alternatively, Nielsen's (2009) findings show that regular drop-down menus, especially during checkout can annoy the user as they are prone to choosing the wrong option. These annoyances increase depending on the users age, or if the user has any disabilities. However, Nielsen (2009) does also point out that while they can be irritating, they are still perceived to be bearable and it is unlikely that any sales are lost due to this. This was seen first-hand during the observational evaluation, as an elderly participant had difficulty controlling the mouse when the menu dropped down to choose the shoe size. It took a couple of attempts to click the right option, resulting in more time taken to complete the task.

A primary factor of navigation is letting the user know where they are within the website structure. It makes it easier for them to then navigate further around the website. (Farrell, 2015). During both heuristic and user evaluations, both websites fail in some ways about letting the user know their location.

Adidas.co.uk uses location-based breadcrumbs under the header of each page, which is regarded as an excellent technique at a usability standpoint. Breadcrumbs show the user the context of the page, as well as allowing the user to access a higher level of the site (Nielsen, 2009). Hull (2004) found that users who had access to breadcrumbs completed tasks faster than those that didn't. Breadcrumbs also reduce user anxiety in certain situations such as when filling out a form, since users can see how many steps they have left until they complete the form (Suresh, 2015). Nike.com however did not use breadcrumbs, violating the heuristic. Participants performed slightly faster on Adidas.co.uk rather than Nike.com during the navigational tasks. Therefore, as a suggestion for improvement, Nike.com could implement a simple location-based breadcrumb to improve usability.


Breadcrumbs on Adidas.co.uk

A user's orientation can also be found through navigational change. Generally, this means that when the user is on a webpage, the navigation button representing that page should undergo a visual change such as a colour change or a design change like being underlined (Farrell, 2015). Disappointingly the navigation bars in both websites do not undergo any visual change to indicate user location. To improve usability, both websites could change the colour of a menu bar option when the user is on the relevant webpage.

The 4th task of finding the site map resulted in unexpected findings on both websites. While evaluating Adidas.co.uk, one participant tried to search for the site map in the search bar. The participant did this because they had low computer literacy and did not know what a sitemap was, or where to find one. They had previously searched for "click and collect" and had successfully found it using the search bar, therefore they expected to be able to find the site map using the same steps. Instead, they were taken to a product page for a "team travel trolley". After looking around the website, they were eventually able to find it. Adidas.co.uk should consider fixing this search result so it shows the correct page.

Furthermore, no one was able to find a site map on the Nike.com website. As Nielsen (2008) describes, one of the oldest usability principles is to offer a visual representation of the information space. Site maps dump all of the site information on to one page making it easy for users to find exactly what they want. Nielsen (2008) found that while site maps are rarely used, they still serve a useful purpose as a secondary navigation method. Therefore, Nike.com should consider constructing a site map to increase the number of navigation options, in turn increasing usability, albeit for a relatively small number of people.

Consistency

One of Ben Schneiderman's (2004, p. 74) eight golden rules of interface design, as well as one of Nielsen's (1995) 10 usability heuristics is consistency. During the heuristic evaluation, the evaluator noticed that the navigational layout is different on the men's page compared to every other page. As Schneiderman (2004, p.74) includes consistency of layout in his list, this is considered a direct violation of the heuristic. The navigation on the men's page in on the left hand side in a box whereas on other pages it is on the top of the page as people would expect. Consistency helps users get familiar with the website which leads to goals being achieved more easily (Wong, 2016). Therefore, Nike.com should consider having consistent navigation layouts for each page to increase usability and decrease the user learning curve (Nielsen, 1995).
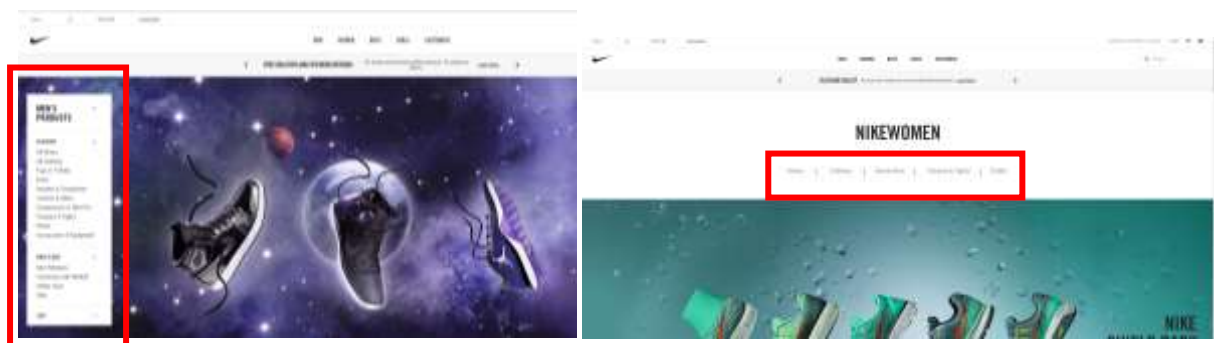
Change in navigation layout on Nike.com

Use of space

A problem interactive applications have is presenting information on a single screen, in a clear and concise manner (Dix et al, 2003). Visual complexity is an important factor to consider when designing as it can change a user's emotional response, learning curve and overall application usability (Tuch, 2009). During the second observation task participants needed to find more about the click and collect service provided by both brands. On Adidas.co.uk, participants had to find the click and collect service by navigating to the support page via the footer or search bar. However, Nike.com features a carousel on the top of the homepage that displays delivery and click and collect information. While for most participants this was a useful feature, participants who were not as computer literate completely missed the carousel and decided to scroll down the page or search for it, with the latter not producing any results.


Nike.com Carousel

This is a clear case of where the screen space can be better utilised as there is more than enough space to have both sets of information on the screen. If Nike.com implemented a responsive design using a fluid grid they could display both sets of information on bigger screens and revert back to the carousel for smaller screens (Marcotte, 2010).

Feedback

Another one of Schneiderman's (2004, p.74) eight golden rules is giving the user informative feedback. While a lot of feedback is given on forms, it can also be given in other situations where the user takes an action, such as typing into a search bar (Renaud et al, 2000).

Helping people choose something is part of persuasive design, especially on an e-commerce website where people are looking for things to buy (Laja, 2012). Participants were impressed with Adidas' predictive search bar during the first task. When a product name is typed into the bar, a range of products matching the name drop down from the bar showing price and an image. The task was completed faster on Adidas.co.uk than Nike.com because of this feature. Comments and facial expressions during participant observation indicated that the feature was appreciated. Nike.com however, had a simplified predictive search bar, only showing key words and no specific products. Improvements should be made to the search bar to make it more descriptive to improve customer persuasion and provide more informative feedback.
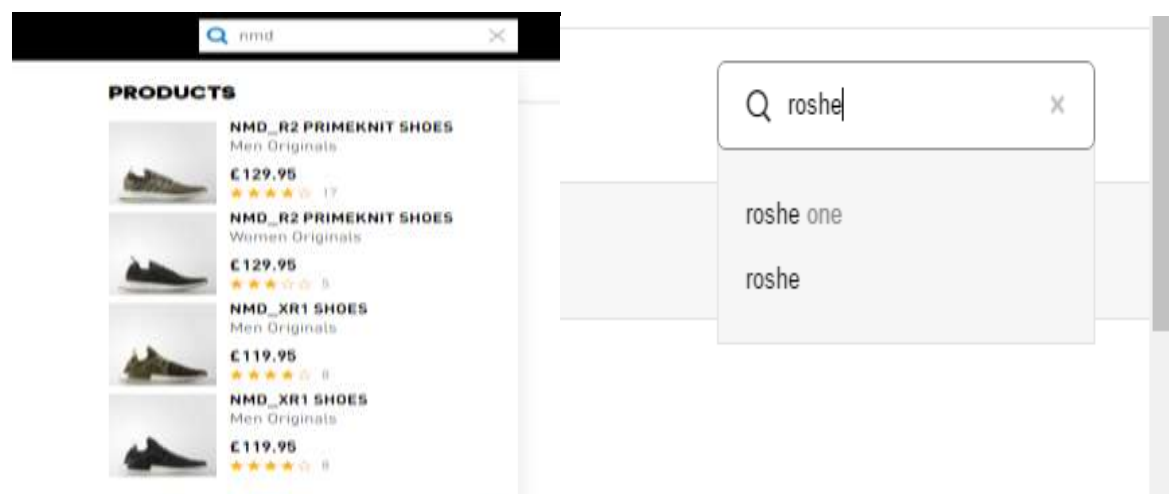
Predictive Search on Adidas.co.uk (left) and Nike.com (right)

During the third task users had to complete the registration form using incomplete information on both sites. Renaud et al (2000) lists immediate feedback as a desirable feedback feature, and this was echoed by participants while completing the task. Nike.com offers immediate validation feedback on the registration form, with form field colours changing to red if invalid information has been entered. The password field features parts of a list of requirements changing from normal to bold when each requirement has been fulfilled. This type of instant feedback made filling in the form easier for all participants, and from facial expressions they were never confused about what is expected in each field.

Participants displayed greater confusion on the Adidas' website. The registration form did not offer instant feedback and instead relied on validation upon submission. This created a sense of confusion for the participants who vocally described the disadvantage of this technique as they had to submit before receiving informative feedback (Jovanovic, 2009). Moreover, if the form was fully filled with invalid information but the terms and conditions hadn't been checked, the only feedback after submission would be to agree to terms and conditions, with no mention of the invalid data entered.

In contrast, Nike.com did not have a terms conditions box, but made the process more streamlined by stating that the user would automatically agree if an account was made, a design Adidas.co.uk should replicate. Adidas.co.uk should also consider implementing a JavaScript based validation technique into their forms that gives the user informative feedback in real time (Edwards, 2013).

Accessibility

Accessibility relates to having an inclusive design where everybody can use an application effectively, including people with disabilities (W3, 2005). The fifth task had participants zooming into the page 300%, commonly done by people with reading difficulties or disabilities. What they found was that both websites were not responsive, with text overlapping and not clear to see, a problem also described by Web Accessibility Initiative (W3, 2014).

The task set was to find the help page, which would be the first destination for many people with disabilities who want to find out about accessibility features. On Nike.com, participants could see the help button in the header when on normal zoom, but once zoomed-in the button could not be found, which they vocalised as being a very strange design decision. As with both websites, they had to revert to scrolling to the footer and having to find the help link, which was described by participants as being very hard to do because of the overlapping text.
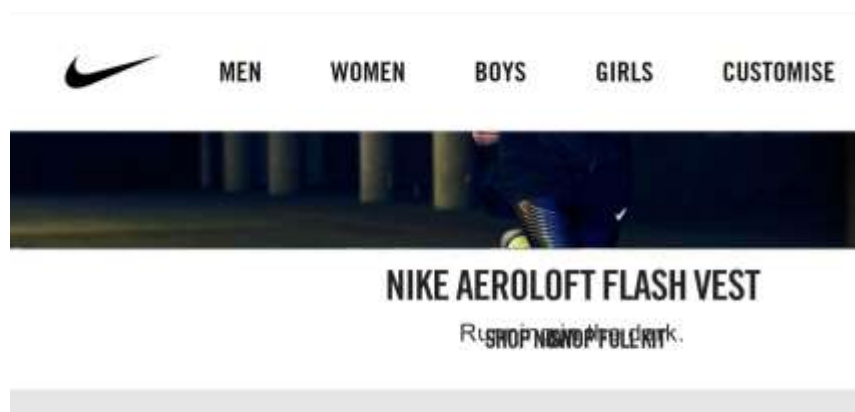
Example of text overlapping on Nike.com

Reflection

The evaluations for both websites showed that both followed and implemented HCI principles into their designs, and especially persuasive design techniques that will encourage customers to purchase their products.

Improvements that could have been made to the evaluation process include gathering more participants, as the sample size was small and therefore it is harder to generalise the results to the wider population. During observations, video recording could also be used to capture expressions missed by the note-taker.

Further techniques could have also been used, including expert walkthroughs that would find many design-based problems that would be rarely found when using regular participants (Petrie & Bevan, 2009).

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Appendices

Appendix A

Participant Profile

Thank you for accepting to be involved in this study. We will now ask you a few things about yourself in order to complete a participant profile. Please answer in the boxes.

Age	
Occupation	
Rate your computer literacy out of 10	
Have you ever been on Adidas.co.uk or Nike.com?	
Do you have any disabilities?	

Thank you. We will now continue with the evaluation.

Appendix B

Heuristic Evaluation

Website:

Heuristic	Score	Comments
1. Pages have a consistent look and feel		
2. Errors in forms are prevented beforehand & promote valid responses		
3. Webpages are minimal and aesthetically pleasing		
4. Forms help users recognize, diagnose and recover form errors		
5. Forms offer Informative feedback		
6. Annotations are provided on forms		
7. Current location highlighted – Users should know where they are at all times		
8. Familiar language used throughout website		

Appendix C

Usability Interview

Thank you for completing the tasks. Now, we would like to ask you a few questions to get an idea of how you feel about each website.

Firstly, we will be talking about nike.com. Please give a core between 1 and 5, where 5 is the best, for each question, as well as any additional comments you want to provide.

Pages have a consistent look and feel	
Errors in forms are prevented beforehand & promote valid responses	
Webpages are minimal and aesthetically pleasing	
Forms help users recognize, diagnose and recover form errors	
Forms offer Informative feedback	
Annotations are provided on forms	
Current location highlighted – Users should know where they are at all times	
Familiar language used throughout website	

Now we will discuss Adidas.co.uk using the same questions

Appendix D

Explanatory Statement

EXPLANATORY STATEMENT

Usability and User Experience evaluation for Leeds Beckett University Level 6 Human Computer Interaction Assignment

Principal Investigator: Shivam Joshi

THE PURPOSE OF THE STUDY

This usability study aims to evaluate the targeted websites. Thank you for volunteering to participate in the exercise, by doing so you are helping the University to better meet the needs of the students and its employees. This exercise is an important element in a programme of research into the usability of the web.

THE STUDY

Firstly, I would like you to complete a:

1. **An Informed Consent form**
2. **User Profile Questionnaire**
3. **Task-based experiment:** to explore the website looking for certain information required to complete the task.
4. **Usability Questionnaire:** After the tasks have been completed you will be asked to complete a questionnaire asking for feedback on aspects of the site and the conduct of the test.

Any Questions?

I believe that there is effectively no risk involved in the participation in the proposed research. All participation in the research is entirely voluntary, and can be stopped at any time. At the end of each session participants will have the opportunity to comment on the way the research was conducted. Data will be held for research analysis by Leeds Beckett University. All personal data will be treated confidentially, and no one will be identified in published material.

Consent Form

INFORMED CONSENT FORM

I agree that by signing the attendance schedule I am agreeing to take part in the above Leeds Beckett University evaluation project. I have read the **Explanatory Statement**. To take part means that I am willing to:

- **To be observed during my interactions with 2 websites**
- **To be observed and timed**
- **Complete questionnaires asking me about my experience**
- **To complete a user profile questionnaire**

Data Protection

I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published.

Withdrawal from being a participant in the study

I understand that my involvement as a participant is voluntary, that I can choose to withdraw my consent to be a participant in the evaluation part of the assignment without being penalised or disadvantaged in any way.

Date	Time	Full name	Signature
27/11/2016	13:00	Theo Bradley	Theo Bradley
27.11.16	13.00	Ben Cowton	
26/11/16	15:00	Sushma Joshi	S. Joshi
26/11/16	15:00	SUNIL JOSHI	S.JOSHI
26/11/16	15:00	Biwsen Joshi	Bbshi