Human Centred Interface Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

A dissertation submitted in partial fulfilment of the requirements for the degree of Bachelor of Science (Honours) in Software Engineering.

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Declaration

I hereby declare that this dissertation entitled Human Centred Interface Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry is entirely my own work, and it has never been submitted nor is it currently being submitted for any other degree.

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Abstract

This project focuses on incorporating key human-centred interface design methods and guidelines into the development of web pages used regularly by call centre workers within the insurance industry. The guidelines applied to the web pages include the use of colour, consistency, layout, the grouping of items and progressive disclosure. The aim of this project is to test whether these specific design principles can improve productivity. The reason for this is due to the increased complexity of company intranets that, overall, have less consideration for the end users (i.e. the employees) and greater consideration toward the inclusion of certain features to achieve specific goals. As a result, employees are less productive due to the time taken to perform simple tasks which can ultimately lead to a drop in company profits.

This project focuses specifically on the effects of progressive disclosure by using a repeated measures experiment followed by an interview to gain user feedback. As part of the experiment, participants were asked to interact with two separate web pages whilst answering a set of insurance based questions to determine which web page lead to greater productivity. One web page made use of progressive disclosure whilst the other did not however, both web pages were otherwise identical and included key design principles. To measure productivity, participants were timed based on how quickly they could answer the questions and the times noted were then compared. Once the experiment was completed, participants took part in an interview regarding the overall design and usability of each web page.

Based on the experimental results, it was found that the web page that included progressive disclosure lead to greater productivity. Having said this, the low confidence level, small sample size and three unusual sets of data could have caused this result. This is believed to the case as results from the interview found that 68% of participants preferred the web page that did not include progressive disclosure and 16% liked both web pages equally. Further interview results found that participants reacted well to other design elements and felt that they helped them find information quickly. These elements included the use of green and red colours to represent what was covered, the layout, the consistency between the two pages and the grouping of similar information with clear headings. Whilst these design elements were successful, progressive disclosure was not.

These results are significant because they highlight the importance of user involvement and the importance of looking at each website on an individual basis as some design elements may work well for one website but the same principles cannot necessarily be applied to another.
I would like to thank my dissertation supervisor, Paul Angel who has been a huge help throughout this project and has taken the time each week to help guide me through the process.

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Chapter One – Introduction

It is important to consider human-computer interaction and design principles when looking at a company’s intranet as it can improve employee productivity (McCracken, Wolfe, and Spool, 2003). Research carried out by Nielsen Norman Group found that an employee’s average success rate when performing basic intranet tasks was set at 75% fifteen years ago. However, in 2012 the success rate was recorded as 74% showing a decline in productivity (Neilson, 2012). Comparatively, the average success rate for public websites has improved greatly in the last seventeen years and was recorded at 80% in 2012 compared with 61% in 2000 (Neilson, 2010).

Whilst the overall design of intranets has improved since 2002, the increased number of features included (to aid the increased complexity of the problems intranets are aiming to solve) means it takes longer for an employee to perform the same task they were asked to perform fifteen years ago (Neilson, 2012). Furthermore, there is less emphasis on ease of use and user involvement when introducing a new design because there is a greater reliance on the default design included in packaged software that has not been modified for its intended purpose (Neilson, 2012). Having said this, improved intranet usability design should be easily achievable as companies have full control over the environment and, the end users (i.e. the employees) are readily available to provide feedback and test the web pages (Neilson, 2012).

An intranet with good usability is particularly important within the ever-increasing call centre industry because call centre workers are required to interact with the system almost continually throughout the day. For example, the company that has agreed to take part in this study require call centre workers to rely heavily on the information displayed on certain web pages to provide complete and accurate information to customers regarding an insurance claims process. This shows that multitasking is an essential skill for call centre workers who are made to listen to the customer, interact with the computer system and verbalise their answers all within a tight timeframe (Holman, 2003). Multitasking in this way can be challenging because thinking and interacting with the system whilst verbalising answers causes the two cognitive processes to compete which can cause a delay when performing tasks (Nielsen, Clemmensen, and Yssing, 2002). To lessen this delay, a system that is simple, easy to understand and displays information clearly could help to lessen the cognitive load which, in turn, could increase both the quantity and quality of the calls taken.
As mentioned previously, call centre workers are required to handle each call within a timely manner. To enforce this, performance monitoring is carried out to record an employee’s average call time, the number of calls answered and the content of the call itself (Holman, Chissick, and Totterdell, 2002). Speed is therefore an important factor for call centre workers who are often monitored based how quickly they can deal with each enquiry. Such emphasis on speed can add a lot of pressure to the advisors and has been noted as one of the main stressors of the job role (Holman, Chissick, and Totterdell, 2002). Because of this, another important factor to consider is accuracy as the pressure of dealing which each enquiry as quickly as possible can negatively affect the accuracy of the information provided to customers.

This project will therefore focus on lessening the pressure on call centre workers and increasing employee productivity by improving an insurance company’s intranet pages to help employees locate information accurately and efficiently. It will be looking specifically at pages detailing a large amount of textual information regarding claims procedures and looking into the best methods of displaying this information to create a user-friendly system. To achieve this, the users will be involved throughout the process to provide detailed usability feedback to allow for a better understanding of the challenges faced by employees. To create the web pages, key usability design features will be included and discussed by the users to determine their effectiveness during the feedback section.
Chapter Two – Literature Review

2.1 Human centred design – Cognition

With theories and approaches surrounding human-computer interaction constantly evolving and being re-invented due to the continual and rapid growth of technology, greater consideration to the way the human mind works is necessary. It is important to consider three main parts of the cognitive process: perception, attention and memory.

**Perception**

The context in which an image is displayed can lead to a variety of interpretations depending on the person viewing the image. This established set of attitudes based on experience is known as “mind set” which can have a substantial effect on the usability of a web page as people largely notice elements they expect to see (McCracken et al. 2003, pp.17-18). Expectations and therefore perception is based on experience (the past), the current content (the present), and end goals (the future). Experience tells us to look for certain features in certain areas; therefore, it can sometimes be difficult to find something that is sitting in plain sight if it looks different or if it is not in its usual place. Similarly, the same phrase can be perceived differently depending on the sentence it is in and the same character can be perceived differently depending on its surrounding letters (Johnson, 2014, pp.4-9).

**Attention**

Attention is the process of concentrating on something using either the visual or auditory senses. Usually, the focus is on information that is relevant to what a person is doing at a specific point in time (Preece et al. 2007). It has been shown that information displayed ‘first’ based on the reading direction (the top left in many cultures) usually gets more attention (Nielsen, 1993, p.118). There are many design techniques that can be implemented to capture a user’s attention, for example, the use of animated graphics, colour, ordering of items or underlining (Preece et al. 2007).

Eye Tracking software that calculates the direction of the user’s gaze can be used to test how well these techniques work. Many studies have been conducted using heat maps and eye tracking to show the number of fixations on different areas of a web page, in order to determine which areas the user focuses on most and which areas are largely ignored. The findings show that web pages often contain too much information in the areas users are most
drawn to, that is, the home page, the main page of a section or the topmost menu. As a result, users will not see or acknowledge the content being displayed (Nielsen and Pernice, 2009).

Further to this, overuse of attention-grabbing techniques can have the opposite affect and often confuse or distract the user rather than help to focus their attention on relevant and important information that designers want them to see (Preece et al. 2007). For example, capitalisation should be used sparingly because it is 10% slower to read and blinking objects are often far too distracting and considered to be annoying (Nielsen, 1993, pp.118-119). Because of this, it is useful to include changing content and to prioritise the most important information to be displayed (Nielsen and Pernice, 2009).

**Memory**

People do not remember all the information they see. The mind recreates a picture based on the information that has meaning to that person. Because of this, only the meaningful information is remembered and the irrelevant information is filtered out (McCracken, Wolfe, and Spool, 2003, p.17). Similarly, when considering the learning process of a user, infographics (static or dynamic graphics that are representative of a section of text) are commonly used to help the human brain process, remember and re-use the textual information (Mayer, 2002). This shows that text is more meaningful to the user when accompanied by a picture and is therefore more likely to be remembered.

Understanding human memory is crucial to achieving user friendly systems and it is important to promote recognition rather than recall when designing a user interface. This is because it is easier for humans to recognise information rather than recalling it from memory. For example, it is easier to recognise a correct answer in a multiple-choice quiz than it is to recall the correct answer when asked a specific question in an exam (McCracken et al., 2003, p.17)

Using menus, icons and objects that are consistently placed in certain areas of the web page is recommended in order to reduce the “memory burden” of the user. Menus are important as they allow users to browse through the options until they recognise the option they want to select. The use of icons and objects are important because it is easier for the human brain to recall pictures rather than text. Lastly, consistency in terms of positioning and layout is important because the context in which something was remembered can affect the extent to which that information can be retrieved and applied (Preece et al. ,2007, pp.101-103).
2.2 Understanding the user

The constant emphasis on technology-driven computer development has lead designers to believe that users need to adapt to the system they have built. It is often necessary for users to rely on instruction, training and practice when faced with a new system. Thus, a user is made to interact in a manner that matches the system’s preferences and capabilities. A solution to this is to create a more intuitive system by analysing natural human behaviour and incorporating this into the design and modelling of the system (Oviatt, 2006).

Users are complicated and varied and, whilst crucial, it is also extremely difficult to understand user’s needs, desires, preferences and behaviours (Pruitt and Adlin, 2005). It is therefore extremely beneficial to involve the user throughout each stage of the design process. This is known as ‘participatory design’ and it is the best method of gaining a deep knowledge of the user’s needs through the use of brainstorming, storyboarding, workshops and pencil and paper exercises. This interactive process produces a better design and a system that will ultimately be used. (Dix, Finlay, and Abowd, 2006, pp.197-203)

Pruitt and Adlin (2005) explain that people naturally think about their own wants and needs when designing a product instead of considering the end user. This is clearly an issue as a team of predominantly male developers are not always representative of those that will be using the product. To understand usability, it is important to understand who the users are and what they are trying to do; a particular web design or layout may work well for one user whilst others may struggle. For example, some web interfaces assume the user has a certain level of technical knowledge which could be troublesome for the average user (Nielsen and Pernice, 2009).

Users are not compelled by new, innovative features; they are only concerned with achieving their end goal (Cooper, 1999). Because of this, user interfaces should be simplified as much as possible as every additional feature, section of text or information is an extra thing for the user to learn or potentially misunderstand and, it’s one more thing the user must scan through to find what they want (Nielson, 1994). When designing a system, it is therefore important not to put too much emphasis on these features that developers would be eager to include. It is always important to consider the primary goal of the end-user and to help them achieve this in the most straightforward way possible. (Cooper, 1999, pp.47-48).
2.3 Usability and User Experience

Attention must be paid to the usability of a product during the design stage to make sure the user has a positive and enjoyable experience. Without this, the user will feel frustrated and irritated and the product will not be used, recommended or re-purchased.

For simple products, it should not be necessary for a user to have to read instructions. Instead, a product should be simple to use and intuitive (Norman, 2013). Further to this, using a system or product should be self-evident, obvious and self-explanatory. The user should be able to understand how to use it without spending any effort thinking about it (Krug, 2013). Good design is achieved by questioning what actions are possible (and knowing where and how to achieve them) and, by thinking about how the product is supposed to be used (and what controls and settings are meant to do). For example, purchasing a product with a multitude of settings, buttons and controls can lead to poor usability as the consumer will likely only memorise one setting and ignore the rest. Because of this, the purpose of the design is lost as the interesting features included are unlikely to be used. (Norman, 2013)

To create an intuitive and usable product, looking at everyday objects and the way people interact with them is extremely useful. For example, the physical action of picking up and putting down an object has been mirrored in most computer file systems today by using the ‘drag and drop’ method. By focusing on people’s everyday knowledge of how the physical world works and including this in the design of a system, a more enjoyable experience for the user is achieved (Preece et al., 2007).

It is, however, important to note that it is not possible to model every product based on the real world. Nevertheless, there are a variety of different techniques that can be used to create an intuitive system. For example, the use of signifiers can provide vital clues to the user to help them understand how to use a system or product. For instance, a small circle can be placed on a screen to signify to the user that the screen can be touched. Users are constantly and subconsciously searching for these clues when interacting with an object or system to find meaningful information. By including signifiers, users will not have to rely on their past experiences to work out how to interact with a new system as the subtle clues will help them understand what actions are possible and how they should be carried out (Norman, 2013).
2.4 Text

Users do not read every section of text on a website. Instead, they scan through it in order to find words or phrases that match the task at hand or current personal interests. Similarly, users are drawn to trigger words that they are hardwired to see such as their name or the word “sale”. This is because users are usually looking to complete a specific task and therefore any unrelated words are ignored which allows the task to be completed as quickly as possible (Krug, 2013 pp. 22-23). Because of this, it is important not to include too much text on a webpage, especially if it is not necessary.

Furthermore, when textual information is displayed in a structured format, it is easier (and therefore quicker) for the user to scan and understand. This is because a human’s visual system is proficient in perceiving structure. Structuring textual information is achieved through sparing the use of words by eliminating those that contain no informational or factual value. This can be applied to UI design by using web links, for example. An alternative to a sentence being used as a link would be to use a word that represents an option instead (Johnson, 2014). To expand on this, Krug (2013 pp. 39-41) explains that formatting text to make sure it is easy to scan can be achieved by:

- Using plenty of headings to describe a section of text as the user will know which sections to read and which to skip.
- Keeping paragraphs short so the user is not daunted by a wall of text
- Using bullet points with spaces between each point for optimal readability
- Highlighting key words to make them easier to find.

This is useful when considering human information processing because it allows the user to focus on key information quickly.

Another method of achieving this is to ensure any words or names are written in the simplest way possible. Krug (2013) explains that words, names and phrases are either obvious to everyone or needlessly obscure. For example, if someone is looking for job opportunities and they see the link for “jobs”, they will immediately click on this link. Conversely, if someone sees a link for “employment opportunities” or “join our team”, it will take them more time to register whether this is the link they are looking for. Using the words that are obvious to everyone helps to lessen the cognitive workload and doesn’t distract the
user’s attention from their end goal. Although the distractions are minimal (usually milliseconds), this time can add up which can lead to a poor user experience (Krug, 2013).

2.5 Colour

There are many cultural interpretations of colour. For example, white symbolises death in Japan, India and China but it symbolises joy in Egypt (McCracken et al. 2003, pp.238-239). In the UK, red is often used to command attention and often symbolises an error or an incomplete field whereas green is used to show correctness. This maps the real world as it is taken from traffic lights that we often see multiple times every day. Although commonly used, red and green are the primary colours that people who suffer with colour-blindness often struggle to define. Roughly 8% of males are colour blind and so it is important to make sure an interface can also be used without colour. For example, to close a page, an “X” icon is present for those who are colour blind and those without colour-blindness can also see the symbol turn red when a mouse is hovering over it (Rice and Travis, 1991 cited in Nielsan, 1993, p.119). This allows for better accessibility and usability for a wider range of the target users. Because of this, it is important to understand and consult the target user of a system at the design stage to ensure the cultural norms and standards are correct.

Ergonomically, text should be distinguishable from the background by using contrasting colours to make it clear and easy to read (Sharp, Rogers, and Preece, 2007). Similarly, high contrast between the background of a webpage and an image could be the main factor that determines whether the user will look at that image (Neilsen and Pernice, 2009).

Furthermore, using similar colours for certain elements can help to group items together. For example, when using text as a clickable link, it should be immediately obvious to the user that it is clickable by ensuring that all links are the same colour (Krug, 2013). Similarly, colour consistency when designing buttons is also important as it will allow the user to quickly identify and click the button needed. For example, if a “next” button was suddenly coloured differently, the user may struggle to locate it as it is not what they would have expected (Preece et al. 2007 p.693).
2.6 Layout

It has been shown that there is no universal way of looking at web pages (Neilsen and Pernice, 2009) and that users do not always pay close attention to the finer details of a system or website as they often base their perception of the display on past use (Johnson, 2014). This shows that consistency is crucial in terms of design layout as users will have similar look patterns if they are re-visiting a page and carrying out the same task as they had done previously. (Neilsen and Pernice, 2009).

A large-scale eye tracking study found that users expect certain features to be displayed in specific sections of a web page. Because of this, their eyes are automatically drawn to these areas.

As illustrated in figure 1, the key areas and features used include:

- A navigation bar at the top of the page that is outlined with a horizontal boarder and highlighted with some graphics or contrasting colour
- An open search field at the upper right hand corner
- General commands such as “contact us” at the upper right hand corner
- A logo in the upper left corner
- A “home” button near or in the menu on the far left of all pages

By following these design conventions, most participants in the eye-tracking study found the user experience to be more enjoyable compared with websites that did not follow these design conventions (Neilsen and Pernice, 2009). This confirms that using consistent web design techniques that match the user’s experience makes features more attractive and visible to them.
Another important area to consider in terms of layout is the grouping of items. As illustrated in figure 2, items that belong together as a group or unit should be placed close together or grouped together using lines or boxes and they should look alike in terms of colour, shape or typography. This is beneficial because it will increase people’s understanding of the relationship between elements as humans will naturally perceive these items being closely linked or related (Nielson, 1993, p.117).

Grouping of items forms part of the visual hierarchy that should be included in every web page. That is that every visual cue on a page should portray the relationship between elements...
by ascertaining which items are most important, which are similar and which elements are part of other elements. As illustrated in figure 3, the more important an element is, the more prominent it should be. Similarly, things that are logically related should be visually related and, elements should be visually nested to show that they are part of other elements (Krug, 2013 pp.33-34).

2.7 Progressive Disclosure

The last method that will be discussed is known as “Progressive Disclosure”. Similarly to layout, colour and text, Progressive Disclosure focuses the user’s attention on relevant information to help them reach their end goal quickly. Complex websites that are very information-rich are most likely to benefit from progressive disclosure because it manages complex information by showing only the information that is necessary at a certain point in interaction (Babich, 2016). To explain, users are firstly shown only a few of the most important options before a larger set of specialised options are disclosed upon the user’s request (Babich, 2016). Progressive Disclosure is beneficial because it helps to focus the user’s attention on information that is most important or relevant by reducing the complexity and the clutter of the additional information that would not be useful to the user (Neilson, 2006). Babich (2016) explains, “by hiding more infrequently used features, you remove UI clutter, not features”. Furthermore, prioritizing features and information helps users to understand a system better as they spend more time interacting with the features that are most relevant or important (Neilson, 2006).

2.8 Summary

To conclude, there are many design features that can positively impact the way in which a user interacts with a system or webpage. A well-designed webpage can increase the speed at which users can complete their end goal by focusing their attention on key information and elements. The most common theme throughout this literature review is consistency as this effects the user’s perception through experience. Whilst most the literature has a strong focus on public websites and individual users wanting to reach their personal end goal quickly, it does not explain how these usability design principles can be applied to workplace systems
that require a team of employees to locate specific information within a tight time-frame. This project will therefore be focusing on how the techniques discussed in this literature review can be applied to an insurance company’s website that includes a lot of textual information regarding an insurance claims process and how this information can be displayed and interacted with to increase employee productivity.
Chapter 3 – Methodology

3.1 Introduction

This chapter will outline the methods used to test the effect of progressive disclosure on productivity within the workplace. This project will focus solely on the call centre industry as locating the correct information quickly is a key skill within an advisor’s job role. Specific usability techniques will be applied to web pages to display detailed procedures regarding an insurance claims process. These web pages will mimic those that advisors are required to interact with daily whilst handling customer queries.

3.2 Research Philosophy

Ontology contains important assumptions about the way the world is viewed whilst epistemology provides a philosophical background that helps the researcher decide what kind of knowledge is adequate (Gray, 2009 p.17). The most common ontological and epistemological approaches are known as positivism and interpretivism.

Unlike the interpretivist approach that is primarily concerned with thoughts and feelings, this project will adopt the positivist approach that focuses on the development of knowledge and the collection and analysis of facts based on ‘real’ objects (Saunders and Doherty, 2012). The facts that will be collected for this project include the number of questions answered correctly within a given timeframe and user feedback and, the ‘real’ objects will be the web pages the participants interact with.

3.3 Research Approach

Due to the positivist philosophy of this project, a deductive approach is most suitable. Unlike the inductive method that focuses on the creation of theories based on patterns, consistencies and meanings gathered from data, the deductive approach tests a hypothesis (usually through experimentation) based on known principles or the universal view of a situation (Gray, 2009, pp.14-15). For example, the universal view for this project is that a well thought out and consistent design can help users reach their end goal. This view will be tested by measuring how quickly an end goal can be reached when a single design element is manipulated.
Furthermore, the deductive approach contains important characteristics such as: the search to explain relationships between variables, the collection of mostly quantitative data (although qualitative can also be used), controls that allow the testing of hypotheses and, a structured methodology to facilitate replication (Saunders and Doherty, 2012, pp.19-20).

3.4 Research Design

Whilst this project will primarily follow a quantitative approach, it will also include some qualitative research. This is because quantitative data can be used to generate statistics and identify important themes that qualitative data can then strengthen (Gray, 2009, p.208). Because of this, it will be following a mixed methods design.

The quantitative method will be applied by using a repeated measures experiment to test the speed at which participants can accurately locate information. Once completed, the participants will be asked a series of primarily open ended questions as part of a structured interview to gain user feedback. The addition of qualitative research will be particularly useful as it explores attitudes, behaviours and experiences and provides an in-depth opinion from participants (Dawson, 2009 pp.14-15). Furthermore, the combination of both qualitative and quantitative research will help to bring added dimensions to the research (Gray, 2009, p.205) as quantitative data alone will not be sufficient to generate an understanding of the participant’s thoughts on the website’s usability.

3.5 Research Strategy

Usability Testing

An experimental design is often used to test web usability. A popular method is known as ‘A/B testing’ which allows websites to show a different version of the same page to different visitors, the outcome of which will then determine whether the change will be permanent. A/B testing is beneficial because it allows businesses to see whether a slight or major change to a web page can have a positive or negative effect on business profits and, it tests effects on users under real-world conditions. However, one major disadvantage of A/B testing is that it fails to provide behavioural insights to indicate the reasons why the changes being made are working in their favour. Because of this, designers and researchers are not
able to confidently apply the same design decisions to other pages as they do not know the reason why the change made is the best choice going forward (Nielsen, 2005).

To overcome this, it is necessary to combine the experimental approach with another method to gain user input. Popular usability testing methods include observations, interviews, questionnaires or video recordings. However, one of the most well-known is called “think-aloud” observation which involves participants thinking out loud as they perform tasks. The main benefits of think-aloud observation are that it is a simple, effective and straightforward technique that is widely used because it provides insight into the user’s intuitions, reasons and decisions when interacting with a system (Nielsen, Clemmensen, and Yssing, 2002).

Although this project will not strictly use A/B testing or think-aloud observation, it has been heavily influenced by them both. This project will be testing whether progressive disclosure can influence productivity within the call centre industry. To achieve this, participants will be required to verbally communicate whilst taking part in an experiment and they will also provide verbal feedback as part of a semi-structured interview once the experiment has been completed.

Experimental Design

Figure 4 - Website A – Progressive disclosure is used in the ‘Perils’ section. When the mouse hovers over any of the red or green buttons, further information is displayed.
Figure 5 - Website A – Progressive disclosure is used in the ‘Contractors’ section. When the mouse hovers over any of the contractor buttons, further information is displayed.

Figure 6 - Website B – Progressive disclosure is not used in the ‘Perils’ section. All other design elements are consistent with website A.
A repeated measures experimental design will be used to test whether progressive disclosure can affect the speed at which call centre workers locate information. I have chosen to test the effects of progressive disclosure because it is a method that should have the most impact in terms of usability because its purpose is to reduce clutter on information rich websites such as this. Furthermore, it is also a method that encourages users to interact with the webpage which can help to provide more in depth usability feedback.

The independent variable will be the use of hidden information behind buttons of the web pages and the dependent variable will be the time taken to answer a set of questions. This project will be looking specifically at the “Perils” and “Contractors” sections as these areas are the most information dense. As this is a repeated measures design, participants will be asked to interact both web pages. As detailed in the above figures, website A and B will be identical in terms of design layout. However, whilst the information displayed will largely be the same, some of the content will vary to ensure the answers provided are not retrieved from memory. For example, web page A notes the excess as £100 whereas it’s noted as £50 for web page B. Furthermore, if the participants provide an incorrect answer, they will be told that it is incorrect and they will be given the opportunity to find the correct information.
The main disadvantage of using a repeated measures experimental design is order effects. Order effects can result in participant performance improvement because of practice. Because both websites are very similar, it is anticipated that the time taken to answer the questions will lessen on the second webpage the participants interact with. To overcome this, a counterbalancing technique will be used. That is that half the participants will firstly interact with website A and then move onto website B whilst the other half with interact with website B and then move onto website A.

For each condition, participants will be asked the same set of insurance based questions requiring them to read through the information displayed and verbalise their answers. Closed questions will be used because the answers are factual and the participants are either correct or incorrect (Gillham, 2008). Also, timing each test condition is beneficial as it can indicate the effectiveness of the information displayed as it will provide statistical data that can be compared between each condition.

Furthermore, both websites will follow usability design principles such as the grouping of the most important and commonly referred to information in the upper left hand corner (Neilsen and Pernice, 2009), the grouping of items that are like one another (Neilson, 1993, p.117), the use of green and red colours to represent what is covered and what is not (Rice and Travis, 1991 cited in Neilson, 1993, p.119) and, displaying textual information in a structured format through the use of headings and bullet points (Krug, 2013). These design principles have been included as the overall usability of the web pages should have a direct impact on the speed at which users can reach their “end goal” (i.e. the answers to the questions being asked). Both websites will be identical in terms of the usability techniques used and feedback regarding these techniques will be provided by participants during the interview process.

It is important to test as closely to the conditions by which the system is intended to be used as this will lead to more accurate results. Verbal communication has been chosen as it will mirror a real-world call centre situation whereby the customer asks a question and the advisor answers and, is it quicker for participants to answer out-loud rather than writing their answers. Similarly, the participants will be made aware that the experiment is timed. This will also mirror a real-world call centre situation as advisors are required to answer a large

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1 The experimental questions can be found in the appendix section
volume of calls each day as this is the measure of their productivity by management (Gilmore, 2001).

**Interview Design**

To generate usability feedback, participants will be asked to provide their honest opinions regarding both websites during a structured and informal interview that will be conducted once the experiment has been completed. The interview will begin with a simple question that is easy to answer and is transparently linked to the purpose of the research to put the participants at ease (Gray, 2009, p.367). From there, more in-depth questions will be asked regarding participant’s opinions to gain knowledge about what worked well and areas to improve.

The questions that will be asked will be short and simple and the interview will not include any negative questions or double questions that could cause confusion or be misinterpreted (Dawson, 2009, p.90). One of the benefits of conducting an interview rather than providing the participants with a questionnaire is that interview questions can easily be modified or explained if they are ineffective or if they are not understood by the participants (Gray, 2009, pp. 369). Furthermore, participants are more likely to enjoy talking about their experiences rather than committing them in writing (Gray, 2009, pp. 369 - 370). Additionally, it is likely to be easier for the participants to describe and talk about their experience and show me the areas that worked well by point directly at them rather than having to explain themselves in writing which could be misinterpreted or misunderstood when analysing the results.

**3.6 Data Collection**

**Experiment**

The experimental data (i.e. the time taken to answer the set of questions) will be collected immediately after the participants have taken part in each condition.

**Interview**

Similarly to the experiment, it is important that the answers provided for each question during the interview are recorded immediately to accurately note the exact words of the participants. To achieve this, notes will be taken on a laptop during the interview as the
participant is speaking. Typing is quicker than writing notes which allows more time for interacting with the participant (by nodding and maintaining some eye contact to show they are being listened to) and will therefore be more efficient and less disruptive to the flow of the interview (Dawson, 2009, pp. 70-71).

3.7 Data Analysis

Experiment

Statistical analysis will be carried out to compare the results for each condition to determine the relationships between variables and to prove or disprove the hypothesis. This will be calculated once all the data has been collected.

Interview

The analysis of qualitative data involves interpreting the data, understanding it and being able to explain it (Gray, 2009, pp.499-500). To achieve this, Cresswell (2008, pp.191-193) has outlined the steps that will be followed for this project to effectively analyse the data. The steps are as follows:

1  **Organise and prepare the data for analysis.** This will involve transcribing the interviews with full and clear sentences immediately after the interview has been completed.

2  **Read through all the data.** This involves getting a sense of the qualitative information to create notes about the general ideas stated by the participants and the tone of those ideas. From this, a list of common topics will be noted.

3  **Begin a detailed analysis with a coding process.** Coding is the process of organising the material into common themes before bringing meaning to them.

4  **Generate a description of the categories or themes for analysis and interpret the meaning of the data.** Once the text has been coded, the themes and trends will be interpreted by organising them into categories that include major findings which are then analysed individually and explained using direct quotes.
5 Analyse the common themes found. To analyse the data further, connections can be made between the themes to see whether they confirm past information or diverge from it. Analysis can also lead to new questions being asked that were not foreseen by the researcher.

The strategy outlined above is known as content analysis and it treats the qualitative data in a quantitative manner by counting and coding the content (Dawson, 2009, p.116). Unlike most qualitative data analysis methods, content analysis can be carried out once all the data has been collected (Dawson, 2009, p.116) which means it can be analysed alongside the experiment.

3.8 Participants and Sampling

The participants for this study will be insurance advisors working within a busy call centre environment. The department that has agreed to contribute toward this research project primarily operates out-of-hours, that is, on evenings and weekends. Because of this, most (but certainly not all) employees within this department are part-time undergraduate students between the ages of 18-24. Participants also have a varying level of insurance knowledge based on their length of employment.

The sampling method that will be used for this project is known as ‘purposive sampling’. Purposive sampling allows the investigator to discover, understand and gain insight. Because of this, the sample selected must be one from which the most can be learned (Merriam and Tisdell, 2015 p.77). In this case, the most can be learned from participants that are currently working within the call centre industry. This is because they are familiar with handling calls and dealing with customer enquiries whilst interacting with a computer system. Because of this, they will be able to provide the most insight in terms of usability feedback and, as the experiment attempts to mimic tasks the advisors would ordinarily do, they should be able to more easily understand the purpose of the experiment.

A snowball sampling method is the most common form of purposive sampling and it is one that will be adopted for this project. The method first involves the participation of a few key participants who match the criteria established for participation in the study. Once these participants have taken part, they will then refer the researcher to other participants who also match this same criterion (Merriam and Tisdell, 2015 p.79).
3.9 Ethical Considerations

Informed Consent

Because this project will involve research within an organisation, it is important not only to obtain consent from the participants but also from the organisation that employs the participants. To obtain consent from the organisation, a letter has been issued that outlines the research procedure and requires a signature to confirm that consent has been granted for the use of employees as participants.\(^2\)

Overt research should be conducted so the participants fully understand what they are consenting to. The researcher must be open and honest about the process and purpose of the project which allows the participants to make an informed decision about whether to take part (Dawson, 2009, pp.150-151). Further to this, it is important to be completely candid and upfront with participants as deception must be avoided at all costs to build a positive relationship with the participants and avoid a negative reputation which can lead to a decrease in participation (Gray, 2009, p.80). Furthermore, consent not only needs to be provided before the research begins but also during the research process. Thus, participants have the right to withdraw at any point if they wish to do so (Gray, 2009, p.78).

To provide consent, participants will be given an information sheet explaining: the purpose of the study, the project risks and an explanation of how the participant’s privacy will be protected. Outlining the purpose of the study allows participants to understand the nature of the research and how this might impact them and the procedure helps the participants understand what they can reasonably expect during the research process (Cresswell, 2008, p.64). Participants are given a copy of this sheet so that they can refer to it at any point throughout the project. Once the participants have read the information sheet, they are required to sign a consent form.\(^3\)

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\(^2\) A copy of the signed letter sent to the organisation taking part in this project can be found in the appendices section.

\(^3\) Participant consent forms and information sheets can be found in the appendices section.
**Right to Withdraw**

As stated clearly in the participant consent forms, all participant’s involvement will be entirely voluntarily and they each have the right to withdraw at any point during the research process.

It is difficult for participants to anticipate how their involvement might affect them, even after the consent form has been completed. Because of this, participants have the right to withdraw without warning or explanation and they should be reassured of their right to withdraw at any point (Oliver, 2010, p.48). Should participants wish to withdraw, they should not be brought under any pressure to continue (Oliver, 2010, p.48) especially by those in a position of power or authority (Cresswell, 2008, p.64).

A general cause of participants wishing to discontinue their involvement is due to a change in circumstances of the research from that which was outlined in the consent form. Should any alterations be needed, it is important to let participants know as soon as possible and to alter and re-visit the consent forms to avoid this sudden withdrawal of participants (Oliver, 2010, p.48).

**Anonymity/Confidentiality**

In this project, there will be a section that invites participants to provide their personal opinions regarding the usability of the system. Although this project will not be gathering any sensitive information, it is important to give participants the opportunity to choose whether they will allow anonymised quotes to be included. This has been highlighted in the participant consent forms and participants can clearly indicate their acceptance of this.

Furthermore, participant’s names will not be used when analysing the data gathered and it is not necessary to gather irrelevant personal information such as the person’s age, gender, sexuality etc.

Nevertheless, all participants will be briefed on the intended use of the information gathered for this research project and, each respondent’s results for both the experiment and the usability scale questionnaire will be saved in a password protected database by assigning a code number identifier instead of their names (Gray, 2009, p.79).
Other Ethical Considerations

To avoid any issues relating to the Data Protection Act (1998), any information regarding insurance claims processes will not be specific to the company that has agreed to participate in the experiment. All claims procedures will be entirely fictional and policy cover will be based on policy documents that are readily available online from various sources. Furthermore, the current system that is currently used by the company to outline claims procedures will not be included in this project.

3.10 Hypothesis

It is anticipated that the website that includes progressive disclosure will result in greater productivity from the participants due to the reduction of “clutter” displayed. Also, due to the consistent layout, participants will become familiar with website A and apply what they have learnt to website B which will lead to a reduction in time because they will look for certain features in certain areas of the display as their perception is based on past use. Although this is not strictly being assessed in the experiment due to the repeated measures design, this should be reflected in the user feedback generated from the interview.
Chapter 4 – Statement of Results

4.1 Introduction

The aim of the interview was to gain qualitative feedback regarding the usability of the websites. The aim of the experiment was to test whether progressive disclosure could affect the speed at which participants answer a set of insurance based questions. It was anticipated that website A (that is, the website that made use of progressive disclosure) would allow participants to answer questions quicker as they could easily find the information they needed due to the reduction of “clutter”. This chapter will summarize the results from both the experiment and the interview.

4.2 Experiment

The figures below show the results from the experiment. The results noted were recorded in minutes and converted into seconds to conduct the statistical analysis.

<table>
<thead>
<tr>
<th>Minutes</th>
<th>Seconds</th>
<th>Minutes</th>
<th>Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.53</td>
<td>113</td>
<td>1.53</td>
<td>113</td>
</tr>
<tr>
<td>1.59</td>
<td>119</td>
<td>1.33</td>
<td>93</td>
</tr>
<tr>
<td>3.12</td>
<td>192</td>
<td>2.16</td>
<td>136</td>
</tr>
<tr>
<td>2.16</td>
<td>136</td>
<td>1.57</td>
<td>117</td>
</tr>
<tr>
<td>3.00</td>
<td>180</td>
<td>2.08</td>
<td>128</td>
</tr>
<tr>
<td>2.44</td>
<td>164</td>
<td>2.23</td>
<td>143</td>
</tr>
<tr>
<td>1.46</td>
<td>106</td>
<td>2.13</td>
<td>133</td>
</tr>
<tr>
<td>1.58</td>
<td>118</td>
<td>3.03</td>
<td>183</td>
</tr>
<tr>
<td>2.03</td>
<td>123</td>
<td>2.13</td>
<td>133</td>
</tr>
<tr>
<td>1.23</td>
<td>83</td>
<td>2.13</td>
<td>133</td>
</tr>
<tr>
<td>2.47</td>
<td>167</td>
<td>3.50</td>
<td>230</td>
</tr>
<tr>
<td>1.48</td>
<td>108</td>
<td>2.20</td>
<td>140</td>
</tr>
</tbody>
</table>

Table 1 - Table showing the time taken to answer the set of insurance based questions for both website A and B.
Figure 8 - Line graph showing the difference between the time taken to answer the set of insurance based questions for website A and website B.

Figure 9 - Bar chart illustrating the difference between the time taken to answer the set of insurance based questions for website A and website B.
Table 2 - Table showing statistical analysis based on the time taken (in seconds) to answer the set of insurance based questions for website A and website B.

<table>
<thead>
<tr>
<th>A</th>
<th>Result</th>
<th>B</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.413333333</td>
<td>Mean</td>
<td>1.761666667</td>
</tr>
<tr>
<td>Median</td>
<td>2.18</td>
<td>Median</td>
<td>1.575</td>
</tr>
<tr>
<td>Mode</td>
<td>2.13</td>
<td>Mode #N/A</td>
<td></td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.618948277</td>
<td>Standard Deviation</td>
<td>0.406936076</td>
</tr>
<tr>
<td>Sample Variance</td>
<td>0.38309697</td>
<td>Sample Variance</td>
<td>0.16559697</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.336289792</td>
<td>Skewness</td>
<td>0.428101912</td>
</tr>
<tr>
<td>Range</td>
<td>1.97</td>
<td>Range</td>
<td>1.24</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.53</td>
<td>Minimum</td>
<td>1.23</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.5</td>
<td>Maximum</td>
<td>2.47</td>
</tr>
<tr>
<td>Sum</td>
<td>28.96</td>
<td>Sum</td>
<td>21.14</td>
</tr>
<tr>
<td>Count</td>
<td>12</td>
<td>Count</td>
<td>12</td>
</tr>
<tr>
<td>Largest(1)</td>
<td>3.5</td>
<td>Largest(1)</td>
<td>2.47</td>
</tr>
<tr>
<td>Smallest(1)</td>
<td>1.53</td>
<td>Smallest(1)</td>
<td>1.23</td>
</tr>
<tr>
<td>Confidence Level(95.0%)</td>
<td>0.393260973</td>
<td>Confidence Level(95.0%)</td>
<td>0.258554847</td>
</tr>
</tbody>
</table>

Table 3 - Table showing the time taken to answer the set of insurance based questions per group and per condition. Highlighted data shows the outliers.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A (condition 1)</td>
<td>B (condition 2)</td>
<td>B (condition 1)</td>
<td>A (condition 2)</td>
</tr>
<tr>
<td>113</td>
<td>113</td>
<td>133</td>
<td>106</td>
</tr>
<tr>
<td>119</td>
<td>93</td>
<td>183</td>
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<td>192</td>
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<td>180</td>
<td>128</td>
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<td>167</td>
</tr>
<tr>
<td>164</td>
<td>143</td>
<td>140</td>
<td>108</td>
</tr>
<tr>
<td>Average (seconds)</td>
<td>Average (seconds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150.67</td>
<td>121.67</td>
<td>158.667</td>
<td>117.5</td>
</tr>
<tr>
<td>Average (minutes)</td>
<td>Average (minutes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.30</td>
<td>2.01</td>
<td>2.38</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>Variable 1</td>
<td>Variable 2</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.413333333</td>
<td>1.761666667</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>0.38309697</td>
<td>0.16559697</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>12</td>
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<td></td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
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<td>df</td>
<td>19</td>
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<tr>
<td>t Stat</td>
<td>3.047551465</td>
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</tr>
<tr>
<td>P(T&lt;=t) one-tail</td>
<td>0.003312446</td>
<td></td>
<td></td>
</tr>
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<td>t Critical one-tail</td>
<td>1.729132812</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P(T&lt;=t) two-tail</td>
<td>0.006624891</td>
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<td>t Critical two-tail</td>
<td>2.093024054</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 - T-test showing statistical significance

![Line graph illustrating the time taken for the participants in group 1 to complete each experimental condition.](image)

Figure 10 - Line graph illustrating the time taken for the participants in group 1 to complete each experimental condition.
4.3 Interview

**Question 1:** In your opinion, which web page do you think was easiest to use?

*Figure 11 - Line graph illustrating the time taken for the participants in group 2 to complete each experimental condition.*

*Figure 12 - Pie chart displaying the results for question 1 of the interview.*
As illustrated in figures 8 and 9 above, most the participants thought website B was easiest to use.

**Question 2: Why?**

This question required participants to elaborate and note the main reason(s) why they thought a particular website worked well.

Those that preferred website A explained that they preferred it because there was “Less information to scan through” and they “did not have to scroll up and down the page as much as less space was taken up”.

Those that preferred website B explained that they did not like that they had to hover over the “perils” and “contractors” sections to find the information they wanted. Below are some examples of what the participants had to say:

“Because the information was right in front of me and I didn’t have to hover over it. It was quicker to read and find the information.”

*Figure 14 – Interview question 2, answer 1*

“The information was easy to find because you didn’t have to hover over the buttons. I liked the design of website A though.”

*Figure 15 – Interview question 2, answer 2*

“Although the ticks and crosses are intuitive in website A, in website B the information was already in front of you without having to hover for further information. However, if there was a lot more detailed information written for each section then I think website A would have been better to manage that information.”

*Figure 16 – Interview question 2, answer 3*

“The information is readily available and easy to see up front without the need for additional user interaction e.g. hover states.”

*Figure 17 – Interview question 2, answer 4*
Those that answered “Neither” thought that website A looked more visually appealing and they liked the overall design of both websites. Their answers are shown below:

“Both sites are well laid out and easy to follow. Whilst the ‘buttons’ for the perils section did help with locating the correct information I don’t feel they made the most impact they could have because Site B was still laid out cleanly.”

Figure 18 - Interview question 2, answer 5

“I prefer the design and layout of company A but I was quicker at finding the information for company B.”

Figure 19 - Interview question 2, answer 6

**Question 3:** Are there any other elements on the web pages you thought helped you find the information quickly?

The common themes for this question include consistency, use of colour and the grouping of information.

![Bar chart illustrating the number of times each of the common themes were mentioned as a response to question 3.](image)

**Consistency**

Participants advised that they were able to easily apply what they had learnt from the first website they interacted with to the second website they interacted with due to the consistent design and layout. This allowed them to easily and quickly locate the information they needed as the location of that information on the page was retrieved from memory.

“Consistency between pages because I learnt from website A and could then use what I’d learnt for website B so I didn’t have to think about it as much because I wasn’t searching for the information.”

Figure 21 - Interview question 3, answer 1
Use of Colour

Participants liked the use of green and red colours to show what was covered and what was not because it allowed them to easily differentiate between the two. Some participants also liked that the headers were orange which again helped them locate the information quickly.

"The information that had been categorised into green/red – tick/cross groups were easy to find but also clear in that the terms of the insurance policy were clear. It reduced ambiguity and any possibility of a “grey area”.

Grouping of information

Many participants liked that similar information was grouped together with the use of headers to distinguish between each group. Having said this, the grouping of information was also mentioned in the next question, “Are there any other elements that you thought slowed you down?” as they believed that the information could have been grouped differently. Some of the more in-depth answers are shown below:

“Having each section (e.g. – Perils / Process) sectioned out make each area more distinct. The subheadings were clear which meant it was easier to disregard the sections you do not need and easily locate the information you are trying to find. The grouping also limits the area you have to read once you have found the subheading you need”

“I liked the bullet points and the grouping of company information in top right corner on its own. The bullet points and grouping of items meant the information was displayed clearly.”
**Question 4:** Are there any other elements you thought slowed you down?

There were two main themes identified for this section – scrolling and grouping. Most people didn’t like that they had to scroll down the page to find the details for the contractors as it was located at the bottom of the page and some thought the information could have been grouped further. Many others reiterated the point that they did not like that they had to hover over the buttons to find the information with one person explaining why:

“Although the text was larger for each part of the perils section in website A, it felt quicker to find the exact information needed in website B. As your eyes scan the page in website B phrases / words within the text for each peril catches your eye as well as the subheading itself. Same with the contractor section. On some I read the name of the contractor before there area of expertise but in doing that was able to find the actual information needed quicker overall.”

![Figure 27 - Interview question 4, answer 1](image)

**Figure 27 - Interview question 4, answer 1**

### Scrolling

Scrolling down the web page to locate information (particularly the contractor section) was seen to be the element that hindered the participants the most (as hovering has already been mentioned in the previous section above). However, the result could have been affected because each participant carried out the experiment on a 13” laptop. If they had carried out the experiment on a larger screen, this wouldn’t have been an issue as the content would have fit onto the screen without the need to scroll. Having said this, it is still valid because information is continually being added to the system or changed which means that it can easily take up more space. It is therefore important to consider how best to use the limited space available on a single screen to avoid the need for scrolling as much as possible.
Here is what one participant had to say:

“Contractors could be grouped under the what’s covered section so there is logical grouping and immediate information without having to scroll up and down the page”

*Figure 29 - Interview question 4, answer 2*

The above participant mentioned the issue with both the scrolling and grouping of information and offered a solution that would look to tackle both issues. They felt that the information could have been grouped differently i.e. the “Escape of Water” section could also hold the information for the plumbing contractor rather than having these separate.

**Question 5:** If you were to design the websites yourself, is there anything else that you would include to help you?

This question provided mixed results that were hard to code into specific themes. A large portion of participants answered “none” whilst some mentioned some very specific changes. The following answers could be used as solutions for the issue of scrolling to find the information at the bottom of the screen:

“I scanned down the screen to find an answer for you but sometimes the answer was more specific and lower down and I missed it. So maybe more frequently needed info higher up?”

*Figure 30 - Interview question 5, answer 1*

“There could be clickable anchors to the contractors which could scroll the user to the desired section of the page and give a visual highlight of the contractor”

*Figure 31 - Interview question 5, answer 2*

The following answer focuses on the textual information advising that perhaps it would be best to focus on the specific perils rather than the coloured buttons:

“Larger subheadings with smaller hover buttons in website A so your eyes are drawn to the words more than the colours. I found I was getting distracted by the large bright buttons.”

*Figure 32 - Interview question 5, answer 3*

However, the following participant felt that infographics would have been easier instead of text to locate the specific perils:

“Pictures to represent the perils so they’re easier to find.”

*Figure 33 - Interview question 5, answer 4*
Chapter 5 – Discussion of Results

5.1 Introduction

Overall, the experimental results proved the hypothesis as participants could answer questions quicker whilst interacting with the website that included progressive disclosure (website A). However, in terms of usability, the results showed that most participants preferred website B. This chapter will provide an in-depth analysis of the results and an explanation as to why progressive disclosure did not work well for this particular type of website.

5.2 Why progressive disclosure was unsuccessful

Experiment

Based on the mean result, the experiment showed that, on average, participants were 6 seconds slower at answering questions whilst interacting with website B (the website that did not include progressive disclosure). Additionally, the slowest time recorded for website A was 38 seconds quicker than the slowest time recorded for website B. This shows that participants were more productive when interacting with website A.

Furthermore, the second website the participants interacted with resulted in an improved time on almost every occasion which is likely due to the consistent layout of each page and improvement due to practice. However, those that firstly interacted with website B before moving onto website A (group 2) had a greater improvement rate when compared with those who interacted with website A before moving to website B (group 1). To explain, those in group 2 had an average improved time of 41 seconds (as illustrated in table 3, page 27) whereas those in group 1 had an average improved time of 29 seconds i.e. those in group 2 were 12 seconds quicker at answering the questions when interacting with the second website they were exposed to. This could be explained by labelling website B as a website that results in poor performance and website A that results in a better performance. Therefore, interacting with a poor performance website first before moving on to a website with better performance will likely result in greater performance improvement.

In addition to this, the T-test (as illustrated in table 4, page 28) shows that P < 0.5 in both the one-tailed and two-tailed T-tests. This shows that the null hypothesis (i.e. that there
is no difference between the two sets of data) should be rejected. Furthermore, the t-values are less than the critical t-values which shows there is a relationship between the results for website A and website B. More importantly, P < 0.5 shows that the results are not likely to be a result of chance and that they are therefore statistically significant.

Having said this, one participant in group 1 showed no performance improvement and achieved the same time of 1 minute 53 seconds when interacting with both websites which could have affected these results. Additionally, the spread of data is greater for website B which could also have led to more inaccurate results. To explain, there was less variation between the results for website A compared with website B based on the range result of 1 minute 49 seconds noted for website A and 2 minutes 17 seconds noted for website B. To add to this, the standard deviation (that is, how the rest of the data differs from the mean value) is greater for website B compared with website A. Moreover, the confidence level is noted as 39% for website A’s results and 26% for website B’s results (as illustrated in table 2, page 27). This shows that if the experiment were to be repeated, the chance of the same outcome is low as 95% is the typical percentage that is required to show good level of confidence and accuracy.

Overall, the results from the experiment are unexpected as website B was favoured by most participants. It is understood that a small sample size of 12 people could have caused these unexpected results. For example, there were three outliers found in the data which could be responsible for the greater variation and a lower confidence level for website B’s results (the outliers are also highlighted in table 3, page 27):

1. The participant in group 1 who showed no performance improvement
2. The participant in group 2 who held the slowest time for the first condition and was 1 minute 26 seconds slower than the average time recorded for the rest of the group
3. The participant in group 2 who was 41 seconds (i.e. considerably quicker) than the average time recorded for the rest of the group in the second condition. This participant also achieved quickest time overall for website A.

These outliers account for 25% of the total sample which can significantly affect the results. However, if the sample size were greater, the outliers would not have created as much of an impact which could have led to a greater confidence level. Because of this, the user feedback gained from the interview can be used to provide further insight.
Based on the usability feedback generated from the interview, 68% of participants preferred website B whilst 16% preferred website A and 16% said they liked both. The main reason the majority preferred website B was because they didn’t like that they had to hover over the buttons to get the information they wanted. This is likely due to the additional interaction that was needed to obtain the information which complicated the website rather than helping to simplify it. As noted by Cooper (1999), users are only concerned with achieving their end goal. In this situation, their only concern was to obtain the information that was hidden behind the buttons. Cooper (1999) also explains that interfaces should be simplified as much as possible as every additional feature or piece of textual information is an extra element that the user must scan through (or in this case, hover over) to reach their end goal. Whilst the inclusion of progressive disclosure simplified the appearance of the website by reducing “clutter” (i.e. the textual information displayed on the page), it did not simplify the interaction the user had with the interface.

Similarly, when asked if there were any other elements that slowed participants down, 33% said they didn’t like that they had to scroll down the page to find certain information. Again, this is likely due to the increased interaction that is required to find the answers to the questions being asked. Additionally, because the information was not readily available on the page (particularly with the “contractors” section), users had to spend time locating the information by scrolling up and down rather than simply scanning the page.

Furthermore, some participants agreed that website A looked more visually appealing compared with website B. However, whilst it is important for a website to be well presented, the issue with this particular website is that users would be required to interact with it continually throughout the day. Because of this, it is important to consider whether a potential time improvement would be beneficial if the users themselves do not respond well to the system they are interacting with daily. Because most participants experienced an improved time, it would perhaps be more accurate to test the website for a prolonged period until there is no further improvement from practice to truly test which website leads to greater productivity. Moreover, the main aim of this research was to maintain the quality of the calls dealt with by advisors whilst increasing the number of calls answered. If the advisors are having difficulty with the system, this could be reflected in the overall quality of the calls taken.
5.3 Successful Design Elements

Colour

When asked if there were any elements that helped participants locate the information quickly, 64% of the responses noted that the use of green and red colours was helpful. One participants felt that the colours “clearly separated all the important sections” and that the visual aid was “much faster than reading text that may have been lost in the surrounding information”. This shows that the colours were easily interpreted to represent what was covered and was not without the need for explanation and the colours helped to focus the user’s attention on either the text with the green background or the text with the red background. The participant thought it would be harder to focus their attention if there was no colour to differentiate between the sections. This supports the research conducted by Preece et al. (2007) that states that good use of colour and ordering of items can help to focus the user’s attention on relevant and important information that designers want them to see.

Consistency

As previously stated, the second website the participants interacted with resulted in an improved time. Furthermore, the participants themselves noticed that as they became more familiar with the webpage, they were able to answer the questions much more easily and confidently. This was likely due to the consistent design that was included in both websites in terms of the use of colour, text, layout and structure. This supports the research conducted by Neilsen and Pernice (2009) who explain that using design features that are in line with user’s expectations based on past use can result in a more user friendly system as users expect certain features to be displayed in specific sections. Because of this, users are automatically drawn to those areas of the webpage (Neilsen and Pernice, 2009) which explains why some participants were able to improve their time by as much as 60 seconds, with one participant achieving a 63 second improvement.
Chapter 6 – Conclusions

6.1 Summary of findings

Despite the uncertain experimental results, progressive disclosure is ultimately seen to be an unsuccessful method of displaying a large quantity of textual information primarily due to the user feedback gained. Neilsen (2012) explains that in order for a system to be considered user-friendly (or simply usable), it must be easy to learn, efficient and memorable and users must feel a sense of satisfaction when interacting with it. Without a usable intranet, users “waste time being lost” or “pondering difficult instructions” which, in the long run, costs the company money as their employees are less productive (Neilsen, 2012). This shows that disregarding user feedback can not only lead to a poor user experience, but it can also result in a financial loss as the users will be under performing. Because of this, employee feedback that generates an understanding of the overall usability and user experience is one of the most important factors to be considered when designing or re-designing a company’s intranet as the employees are the primary end users.

6.2 Strengths and Limitations

This study demonstrates the importance of following key design conventions such as consistency, good use of colour and structure to achieve good usability. However, the main strength of this research study is that it disproved the hypothesis and, in doing so, proved the importance of participatory design and the avoidance of including unnecessary features that do not contribute toward the functionality or usability of a system. As stated by Cooper (1999), users are not compelled by new, innovative features; they are only concerned with achieving their end goal. Therefore, it is crucial not to put too much emphasis on features that are appealing to the designers without considering or consulting with the end users. Also, it is important to treat each website or system separately and consider whether widely used design conventions or usability techniques are suitable for the specific system or website being created.

The primary limitations for this study were the uncertain experimental results and the time constraint. Whilst the experimental results were statistically significant, the low confidence level meant that the same results were unlikely should the experiment be repeated. Additionally, the time constrains meant that the website could not be perfected by conducting
multiple iterations of the experiment and changing certain aspects until the optimum level of productivity and positive user feedback was gained.

6.3 Future work

If further research were to be conducted, it would be beneficial to expand upon the findings of this study. The same research design (i.e. an experiment followed by an interview) will be used to discover the best method(s) of displaying a large amount of textual information in order to produce a user-friendly website that can help to increase productivity within the call centre industry.

Because the website includes a lot of important information regarding insurance claims processes, the amount of text cannot be reduced further. Therefore, rather than focusing on reducing textual information by using techniques to hide it, it would instead be useful to look further into the optimum structure of the text to help users scan through it quickly. As noted by Krug (2013, pp. 39-41), text is easier to read if: there are plenty of headings to describe a section of text, paragraphs are kept as short as possible, bullet points are used and key words are highlighted to draw attention.

Further to this, it would also be interesting to consider the use of a small amount of user interaction that could help users rather than hinder them. As suggested by a participant in this study, a further version of this website could use an anchor whereby the user clicks on a piece of text at the top of the page such as “contractors” which then directs the user to the “contractors” section at the bottom of the page rather than requiring the users to scroll. Although adding this feature will require user interaction, it could increase productivity as clicking on a piece of text to re-direct the user is likely to be quicker than scrolling through the page. Furthermore, users will have the choice of whether to scroll or to click on the anchor depending on what works best for them.
Chapter 7 - References

References


Cooper, A. (1999) The inmates are running the asylum: Why high-tech products drive us crazy and how to restore the sanity. Indianapolis, IN: Sams Publishing.


Appendix 8.1 – Ethics Form

Ethics Number: 2016D0286

DEVOLVED ETHICS APPROVAL APPLICATION SUMMARY

Student Name: Rhiannon Ayres  
Student Number: ST20048765

Module Name: BSc(Hons) Software Engineering Dissertation Project (2016-2017)

Module Number: BCO6010_YR_16

Programme Name: BSc(Hons) Software Engineering  
Supervisor Name: Paul Angel

<table>
<thead>
<tr>
<th>To be completed by student and supervisor before submission to Ethics Approval Panel</th>
<th>Student Signature;</th>
<th>Supervisor Signature;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application for ethics approval</td>
<td>[✓]</td>
<td>-</td>
</tr>
<tr>
<td>Participant information sheet</td>
<td>[✓]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Participant consent form</td>
<td>[✓]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Pilot interview/s</td>
<td>[ ]</td>
<td>[✓]</td>
</tr>
<tr>
<td>Pilot questionnaire/s</td>
<td>[✓]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Letter/s to participating organisation/s</td>
<td>[ ]</td>
<td>[✓]</td>
</tr>
<tr>
<td>Confirmation of interviewee participation</td>
<td>[✓]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

First Submission: [✓]  
Resubmission: [ ]

Date: 23/11/2016

For use by the devolved ethics approval panel:

Panel Members  
Name  
Signature

Module leader, Chair:  
________________________  
________________________

Supervisor:  
________________________  
________________________

CSM Ethics Committee Representative:  
________________________  
________________________

Date:  
Date of Reassessment:  

Outcome:  
Project Approved: [ ]  
Reference number issued:  
Chair’s Action: [ ]  
Application not Approved: [ ]
Comments for projects not fully approved:

The original to be retained by the supervisor and a copy given to the student and module leader. In the case of a resubmission being required this original form should be submitted with the resubmission not a new, blank, one.

When undertaking a research or enterprise project, Cardiff Met staff and students are obliged to complete this form in order that the ethics implications of that project may be considered.

**If the project requires ethics approval from an external agency (e.g., NHS), you will not need to seek additional ethics approval from Cardiff Met. You should however complete Part One of this form and attach a copy of your ethics letter(s) of approval in order that your School has a record of the project.**

The document *Ethics application guidance notes* will help you complete this form. It is available from the [Cardiff Met website](http://www.cardiffmet.ac.uk). The School or Unit in which you are based may also have produced some guidance documents, please consult your supervisor or School Ethics Coordinator.

Once you have completed the form, sign the declaration and forward to the appropriate person(s) in your School or Unit.

**PLEASE NOTE:**
Participant recruitment or data collection MUST NOT commence until ethics approval has been obtained.

**PART ONE**

<table>
<thead>
<tr>
<th>Name of applicant:</th>
<th>Rhiannon Ayres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor (if student project):</td>
<td>Dr Paul Angel</td>
</tr>
<tr>
<td>School / Unit:</td>
<td>School of Management</td>
</tr>
<tr>
<td>Student number (if applicable):</td>
<td>ST20048765</td>
</tr>
<tr>
<td>Programme enrolled on (if applicable):</td>
<td>BSc (Hons) Software Engineering</td>
</tr>
<tr>
<td>Project Title:</td>
<td>Human Centred Interface Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry</td>
</tr>
<tr>
<td>Expected start date of data collection:</td>
<td>01/02/2017</td>
</tr>
<tr>
<td>Approximate duration of data collection:</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Funding Body (if applicable):</td>
<td>N/A</td>
</tr>
<tr>
<td>Other researcher(s) working on the project:</td>
<td>N/A</td>
</tr>
<tr>
<td>Will the study involve NHS patients or staff?</td>
<td>No</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Will the study involve human samples and/or human cell lines?</td>
<td>No</td>
</tr>
<tr>
<td>Does your project fall entirely within one of the following categories:</td>
<td></td>
</tr>
<tr>
<td>Paper based, involving only documents in the public domain</td>
<td>No</td>
</tr>
<tr>
<td>Laboratory based, not involving human participants or human samples</td>
<td>No</td>
</tr>
<tr>
<td>Practice based not involving human participants (e.g. curatorial, practice audit)</td>
<td>No</td>
</tr>
<tr>
<td>Compulsory projects in professional practice (e.g. Initial Teacher Education)</td>
<td>No</td>
</tr>
<tr>
<td>A project for which external approval has been obtained (e.g., NHS)</td>
<td>No</td>
</tr>
</tbody>
</table>

If you have answered YES to any of these questions, expand on your answer in the non-technical summary. No further information regarding your project is required.

If you have answered NO to all of these questions, you must complete Part 2 of this form.

In no more than 150 words, give a non-technical summary of the project

I will be creating 2 separate web pages that display the same information regarding an insurance claims process. However, whilst the web pages will have a consistent layout, design and structure, one will include progressive disclosure and the other will not. This will be done to test whether interface design can have an effect on the way people find, understand and apply information. In order to achieve this, the participants will be given a task asking them to find certain information and verbalise their answers as part of a repeated measures experiment. The time taken to complete the task will be recorded for each condition and compared to determine which web page results in better productivity. Further to this, the participants will also take part in an interview in order to provide their own personal opinions regarding both web pages.

DECLARATION:

I confirm that this project conforms with the Cardiff Met Research Governance Framework.

I confirm that I will abide by the Cardiff Met requirements regarding confidentiality and anonymity when conducting this project.

STUDENTS: I confirm that I will not disclose any information about this project without the prior approval of my supervisor.

Signature of the applicant: Rhiannon Ayres  
Date: 08/11/2016

FOR STUDENT PROJECTS ONLY

Name of supervisor:  
Date:  
Signature of supervisor:  

Research Ethics Committee use only

Decision reached:  
- Project approved  
- Project approved in principle  
- Decision deferred  
- Project not approved  
- Project rejected
PART TWO

A RESEARCH DESIGN

| A1 Will you be using an approved protocol in your project? | No |
| A2 If yes, please state the name and code of the approved protocol to be used⁴ | N/A |
| A3 Describe the research design to be used in your project | - Both interfaces will be tested by the voluntary participants who will then be asked a series of questions.  
- I will be collecting qualitative and quantitative data through the use of an interview and an experiment  
- This project will adopt the positivist approach that focuses on the development of knowledge and the collection and analysis of facts based on ‘real’ objects  
- I will be using a deductive research strategy because my aim is to test existing theories based on HCI principles. The aim is to see whether these theories can help designers create more effective systems.  
- The sampling technique I will be using is the purposeful sampling method. This is because my aim is to test a specific group (insurance advisors) and so it is difficult to represent this group as part of a larger population because the exact number of insurance advisors in the larger population is not known. I will use the snowball sampling method (part of the purposeful sampling method) to choose my participants i.e. I will ask colleagues at work to participate if they wish to do so and, if they know anyone else who might be willing to participate.  
- The size of the sample population will be 10-20 participants based on the number of insurance advisors in my workplace.  
- Statistic analysis will be used in order to analyse the data collected from the experiment and a coding technique will be used for the results from the questionnaire. Thematic analysis involves familiarising myself with the data and searching for common patterns or themes in order to generate results within the final section of this assignment.  
- In order to avoid any issues regarding data protection, I will ensure all data will remain confidential and will be stored in a password protected computer system. All participants will remain anonymous and any data provided will not be traceable to specific participants. |

⁴ An Approved Protocol is one which has been approved by Cardiff Met to be used under supervision of designated members of staff; a list of approved protocols can be found on the Cardiff Met website here
A4 Will the project involve deceptive or covert research?  |  No
A5 If yes, give a rationale for the use of deceptive or covert research  |  N/A
A6 Will the project have security sensitive implications?  |  No
A7 If yes, please explain what they are and the measures that are proposed to address them  |  N/A

**B PREVIOUS EXPERIENCE**

B1 What previous experience of research involving human participants relevant to this project do you have?  |  None
B2 **Student project only**
   What previous experience of research involving human participants relevant to this project does your supervisor have?  |  Click here to enter text.

**C POTENTIAL RISKS**

C1 What potential risks do you foresee?
I am familiar with insurance claims processes because of my role as an insurance advisor who deals with claims on behalf of hundreds of different insurance companies. Because of this, I am able to see a variety of processes used by these companies as well as customer information. There could therefore be a potential data protection risk.

C2 How will you deal with the potential risks?
To avoid this risk, I will ensure any “customer information” included in my web pages will be completely fictional. Also, any processes used will be generic and not be specific to any insurance company i.e. the information regarding a claims process will be common knowledge. Further to this, because the focus of this assignment is to test how participants are able to accurately locate specific information, the information itself does not need to and will not be correct.

When submitting your application you **MUST** attach a copy of the following:
- All information sheets
- Consent/assent form(s)
PARTICIPANT INFORMATION SHEET

Human Information Processing and Interface Design

Project summary
The purpose of this research project is to establish whether interface design can have an impact on the speed at which information can be found, understood and applied to an insurance claims process. Your participation will enable the collection of data which will form part of a study being undertaken at Cardiff Metropolitan University.

Why have you been asked to participate?
You have been asked to participate because you fit the profile of the population being studied; that is, you are an insurance claims advisor who is either moderately or fully familiar with an insurance claims process and insurance policies.

Your participation is entirely voluntary and you may withdraw at any time.

Project risks
The research involves the completion of a questionnaire. We are not seeking to collect any sensitive data on you; this study is only concerned with how quickly you can find and understand relevant information depending on the user interface you are given. We will not discuss any immoderate behaviours. We do not think that there are any significant risks associated with this study. However, if you do feel that any of the questions are inappropriate then you can stop at any time. Furthermore, you can change your mind and withdraw from the study at any time – we will completely respect your decision.

How we protect your privacy
All the information you provide will be held in confidence. We have taken careful steps to make sure that you cannot be directly identified from the information given by you. Your personal details (e.g. signature on the consent form) will be kept in a secure location by the research team. When we have finished the study and analysed all the information, the documentation used to gather the raw data will be destroyed except your signed consent form which will be held securely for 5 years.

YOU WILL BE OFFERED A COPY OF THIS INFORMATION SHEET TO KEEP

If you require any further information about this project then please contact:
Rhiannon Ayres, Cardiff Metropolitan University
Cardiff Metropolitan University email: st20048765@outlook.cardiffmet.ac.uk
Dr Paul Angel, Cardiff Metropolitan University
Cardiff Metropolitan University email: paul.angel@outlook.cardiffmet.ac.uk
Appendix 8.2 – Completed participant consent forms

 CARDIFF METROPOLITAN UNIVERSITY
 APPLICATION FOR ETHICS APPROVAL
 Cardiff Metropolitan University
 Ethics Committee

 PARTICIPANT CONSENT FORM

 Cardiff Metropolitan University Ethics Reference Number: 2016D0286
 Participant name or Study ID Number: Ben Lewis

 Title of Project: Human Centred Interface Design: How Information can be Presented to Increase
 Productivity Within the Call Centre Industry.

 Name of Researcher: Rhiannon Ayres

 Participant to complete this section: Please initial each box.

 1. I confirm that I have read and understand the information sheet for the above study. I have had the
    opportunity to consider the information, ask questions and have had these answered satisfactorily.
    [✔]

 2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving
    any reason. [ ]

 3. I agree to take part in the above study. [ ]

 4. I agree to the use of anonymised quotes in publications
    Yes [ ] No [ ]

 Signature of Participant

 Name of person taking consent

 Signature of person taking consent

 Application for ethics approval v6 October 2016
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2016D0286

Participant name: Berman Williams

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

3. I agree to take part in the above study.

4. I agree to the use of anonymised quotes in publications

Yes [ ]

No [ ]

Signature of Participant

B. Williams

Date

14/03/17

Name of person taking consent

R. Ayres

Date

14/03/17

Signature of person taking consent

Application for ethics approval v6 October 2016
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2018D0286

Participant name: Charlotte Adams

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

Participant to complete this section:

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. [ ]

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. [ ]

3. I agree to take part in the above study. [ ]

4. I agree to the use of anonymised quotes in publications

   Signature of Participant ___________________________ 13/05/17

   Name of person taking consent ___________________________ 13/05/17

   Signature of person taking consent ___________________________
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2016D0286

Participant name: Elena Willicombe

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

Participant to complete this section: Please tick each box.

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. [Y]

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. [Y]

3. I agree to take part in the above study. [Y]

4. I agree to the use of anonymised quotes in publications

   [Y] Yes   [ ] No

Signature of Participant: Elena Willicombe
Date: 14/03/17

Name of person taking consent: Rhiannon Ayres
Date: 14/03/17

Signature of person taking consent

Application for ethics approval v6 October 2016
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2016D0286

Participant name: Harriet Vaughan

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

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Participant to complete this section: Please tick each box.

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3. I agree to take part in the above study.

4. I agree to the use of anonymised quotes in publications

   Yes: M  No: [ ]

   Signature of Participant: Harriet Vaughan  Date: 13.03.17

   Name of person taking consent: Rhiannon Ayres  Date: 13.03.17

   Signature of person taking consent
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2016D0288

Participant name: Jodie Griffiths

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

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Participant to complete this section: Please tick each box.

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. [ ] [ X ]

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. [ ] [ X ]

3. I agree to take part in the above study. [ ] [ X ]

4. I agree to the use of anonymised quotes in publications [ ] [ X ]

Signature of Participant

Rhiannon Ayres

Date: 15/3/17

Name of person taking consent

Signature of person taking consent

Date: 15/3/17

Application for ethics approval v6 October 2016
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 201600196

Participant name: Matthew Neil

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhianon Ayres

Participant to complete this section: Please tick each box.

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3. I agree to take part in the above study.

4. I agree to the use of anonymised quotes in publications

   [ ] Yes  [ ] No

Signature of Participant

Rhianon Ayres

Date: 15/03/2014

Name of person taking consent

Date: 15/03/2014

Signature of person taking consent

Application for ethics approval 15 October 2016

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PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2016D0286

Participant name: Michael Golding

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

Participant to complete this section: Please tick each box.

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. [ ]

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3. I agree to take part in the above study. [ ]

4. I agree to the use of anonymised quotes in publications

Yes. [ ] No. [ ]

Signature of Participant: ___________________________ Date: 13/03/2017

Name of person taking consent: ___________________________ Date: 13/03/2017

Signature of person taking consent: ___________________________
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2016D0286

Participant name: Natalie Evans

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

Participant to complete this section: Please tick each box.

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. [✓]

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. [✓]

3. I agree to take part in the above study. [✓]

4. I agree to the use of anonymised quotes in publications

[ ] Yes, [ ] No

Signature of Participant: Rhiannon Ayres
Date: 14/03/17

Name of person taking consent: 
Date: 14/03/17

Signature of person taking consent:

Application for ethics approval v6 October 2016
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2016D0286

Participant name: Sian Lloyd

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

Participant to complete this section: Please tick each box.

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

3. I agree to take part in the above study.

4. I agree to the use of anonymised quotes in publications

   [ ] Yes   [ ] No

Signature of Participant

Rhiannon Ayres

Date: 13/03/17

Name of person taking consent

Date: 13/03/17

Signature of person taking consent
CARDIFF METROPOLITAN UNIVERSITY  
APPLICATION FOR ETHICS APPROVAL  
Cardiff Metropolitan University  
Ethics Committee  

PARTICIPANT CONSENT FORM  
Cardiff Metropolitan University Ethics Reference Number: 2016D0286  
Participant name: Steve Ankin  
Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry. 
Name of Researcher: Rhiannon Ayres 

Participant to complete this section:  
1. I confirm that I have read and understand the information sheet for the above study, I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. 
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. 
3. I agree to take part in the above study. 
4. I agree to the use of anonymised quotes in publications  

Yes / No  

Signature of Participant: 
Date: 14/03/17  
Name of person taking consent: Rhiannon Ayres  
Date: 14/03/17  
Signature of person taking consent: 

Application for ethics approval v6 October 2016
PARTICIPANT CONSENT FORM

Cardiff Metropolitan University Ethics Reference Number: 2016D0286

Participant name: Victoria Golding

Title of Project: Human Centred Usability Design: How Information can be Presented to Increase Productivity Within the Call Centre Industry.

Name of Researcher: Rhiannon Ayres

Participant to complete this section: Please initial each box.

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

3. I agree to take part in the above study.

4. I agree to the use of anonymised quotes in publications [ ]

5. I would like my organisations' name to be anonymised in all publications [ ]

Signature of Participant: [Signature] Date: 15/03/17

Name of person taking consent: [Signature] Date: 15/03/17

Signature of person taking consent: [Signature]
Dear Mr Thomas Cryer

I am a final year student at Cardiff Metropolitan University. The title of my research is ‘Human Centred Interface Design: How Information Can Be Presented to Increase Productivity in the Workplace’. Its aim is to test whether interface design can have an effect on the speed at which people find, understand and apply information. As part of my research I would like to undertake research with Insurance Advisors. I am writing to you because Cunningham Lindsay fits the profile of this type of organisation and also employ a sufficient number of employees so as to provide a large enough number of potential participants. Before any primary data is collected, this project will have been approved by Cardiff Metropolitan University and all data collection will be in accordance with the university’s ethics code of practice.

My purpose in writing is to ask if you would permit me to issue a questionnaire to your employees and test the speed at which they are able to find information using web pages. Their participation would be entirely voluntary, neither they nor the company would be identified in the research and it would only take 5 to 10 minutes for each employee to complete a questionnaire and undertake the test. I would hope to gain 20-30 responses from your employees.

The areas which would be covered by the questionnaire and the test include:
• Participants opinion on the usability of the web pages
• The speed at which participants were able to locate information on the web pages

I shall be very happy to make the results of my research available to you as a participant in the research when it is complete. To indicate your acceptance of the above, please sign below.

Thank you in anticipation.

Yours sincerely

Rhiannon Ayres
Cardiff Metropolitan University
s120048765@outlook.cardiffmet.ac.uk

Dr Paul Angel
Cardiff Metropolitan University
paul.angel@outlook.cardiffmet.ac.uk

I confirm that I have read, understood and agree with the above.

Signed........................................ Date 18/02/2017..............
Appendix 8.4 – Experiment questions with answers

1. What type of insurance does this company deal with?
   A: Buildings and contents
   B: Buildings

2. What’s covered under the escape of water section?

   The resultant water damage caused by:
   - Fixed water tanks
   - Water pipes
   - Fixed central heating units
   - Domestic appliances

   Trace and Access up to £5,000

3. If I need to register an escape of water claim, which contractor would you appoint?

   A: Heating and Plumbing
   B: CET

4. How much would the excess be for escape of water?

   A: £250
   B: £150

5. What’s not covered under the storm section?

   - Gates, hedges or fences
   - Loss or damage caused by frost

6. How much is the standard excess for this policy?

   A: £100
   B: £50

7. If you were to appoint a contractor, who would have to pay for it?

   A: Customer
   B: Company B

8. Which contractor would you appoint for flood damage?
9. Once a claims form has been completed, how long will it take for the insurance company to contact the policyholder?

   A: 24-48 working hours
   B: 24 working hours

10. What is the company’s opening hours?

    A: 09:00 – 17:30
    B: 08:30 – 20:00

11. What’s not covered under the Malicious damage section?

    Loss or damage
    - Not reported to the police within 24 hours
    - That happened while the home was unfurnished or unoccupied

12. What is the telephone number for the roofing contractor?

    A: 0208 555 554
    B: 0208 555 554

13. What is the e-mail address for company A/B?

    A: CompanyA@insurance.co.uk
    B: CompanyB@insurance.co.uk

14. What’s covered under the flood section?

    Surface water flooding that causes damage to your home and/or its contents

15. What’s the telephone number for the flood contractor?

    A: 0345 555 666
    B: 0345 555 666
Appendix 8.5 – Interview questions with answers

Interview 1

1. In your opinion, which web page do you think was easiest to use?
   B

2. Why?
   The information was easy to find because you didn’t have to hover over the buttons. I liked the design of website A though.

3. Are there any other elements on the web pages you thought helped you find the information quickly?
   I liked the red and green colours and I liked that things were grouped together because my eyes were drawn to the headings that were orange.

4. Are there any elements you thought slowed you down?
   Scrolling down the page to find contractor information

1. If you were to design the web page, is there anything else that you think could be included to help you?
   Not that I can think of
**Interview 2**

2. In your opinion, which web page do you think was easiest to use?
   Neither

3. Why?
   I prefer the design and layout of company A but I was quicker at finding the information for company B.

4. Are there any other elements on the web pages you thought helped you find the information quickly?
   Consistency between the pages because I learnt from website A and could then use what I’d learnt for website B so I didn’t have to think about it as much because I wasn’t searching for the information.

5. Are there any other elements you thought slowed you down?
   Having to hover the buttons to get further information

6. If you were to design the web page, is there anything else that you think could be included to help you?
   Group the information further to avoid getting confused i.e. escape and water excess. I think maybe the excess for escape of water and the plumbing contractors could have been grouped together.
Interview 3

1. In your opinion, which web page do you think was easiest to use?
   B

2. Why?
   Because the information was right in front of me and I didn’t have to hover over it. It was quicker to read and find the information.

3. Are there any other elements on the web pages you thought helped you find the information quickly?
   I liked the bullet points and the grouping of company information in top right corner on its own. The bullet points and grouping of items meant the information was displayed clearly.

4. Are there any other elements you thought slowed you down?
   Visually the expanding boxes look good but practically, they don’t work because it’s something that gets in the way of finding the information.

7. If you were to design the web page, is there anything else that you think could be included to help you?
   Pictures to represent the perils so they’re easier to find.
Interview 4

1. In your opinion, which web page do you think was easiest to use?
   A

2. Why?
   Less information to scan through

3. Are there any other elements on the web pages you thought helped you find the information quickly?
   Green and red boxes because it helped distinguish between what was covered

4. Are there any other elements you thought slowed you down?
   None that I can think of

5. If you were to design the websites yourself, is there anything else that you would include to help you?
   Not that I can think of
Interview 5

1. In your opinion, which web page do you think was easiest to use?

Webpage A

2. Why?

I didn’t have to scroll up and down the page as much as less space was taken up.

3. Are there any other elements on the web pages you thought helped you find the information quickly?

The colour coding (green for covered, red for not covered) as well as the use of tick and cross symbols. Use of larger and bolder font for key information like insurance excess.

The information that had been categorised into green/red – tick/cross groups was easy to find but also clear in that the terms of the insurance policy were clear. It reduced ambiguity and any possibility of a “grey area”.

4. Are there any other elements you thought slowed you down?

The need to scroll the page.

5. If you were to design the websites yourself, is there anything else that you would include to help you?

Not particularly. I imagine my response rate would increase the more I used the interface.
Interview 6

1. In your opinion, which web page do you think was easiest to use?

B

2. Why?

The information was clearer to see without having to hover over each item

3. Are there any other elements on the web pages you thought helped you find the information quickly?

Yes. The web pages are quite simple with a white background that helped the text and colours stand out.

4. Are there any other elements you thought slowed you down?

Only having to hover over the icons to find the information

6. If you were to design the websites yourself, is there anything else that you would include to help you?

Not that I can think of
Interview 7

1. In your opinion, which web page do you think was easiest to use?
   Web page B

2. Why?
   The information is readily available and easy to see up front without the need for additional user interaction e.g. hover states.

3. Are there any other elements on the web pages you thought helped you find the information quickly?
   Colour coding of each of the perils is clear because the use of green and red give the immediate impression of what is good (covered) and bad (not covered)

4. Are there any other elements you thought slowed you down?
   Contractors could be grouped under the what’s covered section so there is logical grouping and immediate information without having to scroll up and down the page

7. If you were to design the websites yourself, is there anything else that you would include to help you?
   There could be clickable anchors to the contractors which could scroll the user to the desired section of the page and give a visual highlight of the contractor
Interview 8

1. In your opinion, which web page do you think was easiest to use?
   Neither

2. Why?
   Both sites are well laid out and easy to follow. Whilst the ‘buttons’ for the perils section did help with locating the correct information I don’t feel they made the most impact they could have because Site B was still laid out cleanly.

3. Are there any other elements on the web pages you thought helped you find the information quickly?
   Cleary formatted sections with bold, clear titles. Colour aids in the Perils for covered/not covered because it clearly separated all the important sections. The visual aid was a quick way to convey right/wrong – much faster than reading text that may have been lost in surrounding info.

4. Are there any other elements you thought slowed you down?
   none

8. If you were to design the websites yourself, is there anything else that you would include to help you?
   none
Interview 9

1. In your opinion, which web page do you think was easiest to use?
   B

2. Why?
   I could see everything

3. Are there any other elements on the web pages you thought helped you find the information quickly?
   Colours that represent positive and negative.

4. Are there any other elements you thought slowed you down?
   I thought it was hard to find the company info because I read from the top left corner and down so I didn’t think to look in the top right hand side.

9. If you were to design the websites yourself, is there anything else that you would include to help you?
   I scanned down the screen to find answer for you but sometimes the answer was more specific and lower down and I missed it so maybe more frequently needed info higher up?
Interview 10

1. In your opinion, which web page do you think was easiest to use?
   B

2. Why?
   Although I knew the layout more from practice in the second one, I thought it was easier to find the info in the first.

3. Are there any other elements on the web pages you thought helped you find the information quickly?
   Green and Red colours. Because I automatically knew that red was not covered and green was covered.

4. Are there any other elements you thought slowed you down?
   None

10. If you were to design the websites yourself, is there anything else that you would include to help you?
    No.
Interview 11

1. In your opinion, which web page do you think was easiest to use?
   Website B, even though I was quicker on website A.

2. Why?
   Although the ticks and crosses are intuitive in website A, in website B the information was already in front of you without having to hover for further information. However, if there was a lot more detailed information written for each section then I think website A would have been better to manage that information.

3. Are there any other elements on the web pages you thought helped you find the information quickly?
   Having each section (e.g. – Perils / Process) sectioned out make each area more distinct. The subheadings were clear which meant it was easier to disregard the sections you do not need and easily locate the information you are trying to find. The grouping also limits the area you have to read once you have found the subheading you need.

4. Are there any other elements you thought slowed you down?
   Although the text was larger for each part of the perils section in website A, it felt quicker to find the exact information needed in website B. As your eyes scan the page in website B phrases / words within the text for each peril catches your eye as well as the subheading itself. Same with the contractor section. On some I read the name of the contractor before there area of expertise but in doing that was able to find the actual information needed quicker overall.

5. If you were to design the websites yourself, is there anything else that you would include to help you?
   Larger subheadings with smaller hover buttons in website A so your eyes are drawn to the words more than the colours. I found I was getting distracted by the large bright buttons.
Interview 12

1. In your opinion, which web page do you think was easiest to use?
   B
2. Why?
   because it was all clearly stated; didn’t have to hover over it
3. Are there any other elements on the web pages you thought helped you find the information quickly?
   The use of red and green on the perils
4. Why?
   Clearly stated what was covered and what wasn’t
5. Are there any other elements you thought slowed you down?
   Not that I can think of. I just didn’t like the hovering for website A.
6. Is there anything else that you think could be included to help you?
   Nothing, once I understood the website it was easy to use