

# 'Usability Comparison of a Set of Websites' Research Project Proposal (Callum Bain, 2017104)

*by* Callum William Bain

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# Usability Comparison of a Set of Websites

## Research Proposal

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## 1. Introduction

The purpose of the project is to examine and compare a selected set of websites against a series of chosen accessibility and usability criteria, including complying with various standards in place such as being effective when used in tandem with screen readers, or having options to deal with various forms of blindness. Each individual has a need for different methods of interacting with web content, for example using a keyboard instead of a computer mouse, or requiring a screen reader, [1]. It is vital that websites are expected to be usable for those with additional requirements than those without.

It is also important to assess technical requirements of websites when discussing usability, such as compatibility with various web browsers, different technologies accounting for the rising prevalence of smartphone users against personal computers, [2], and the intuitiveness of websites to ensure that ease of use is foremost in design. Achieving these conditions will be carried out through constant testing and development.

This project is worth investigating as standards and guidelines for usability & accessibility are constantly advancing, developing & evolving, [3], as well as being an area of personal interest, with building websites and the steps required to take in order to present a website to a broader audience.

## 2. Background to the Proposed Research

Usability can be defined in various ways: Juristo, Windl and Constantine state that usability reflects how easy to “learn and use” software is, how productive users can be while working with the software, and how much support users need, [4], while Lawrence and Tavakol define good usability as when a user uses “something almost or completely without noticing” that they are “using an interface” to do what is needed, and go on to pose key aspects when rating usability regardless of the item, including whether any member of a target population can use the item as intended, whether it can be used with ease, and if the usability approach contributes positively to the main purpose, [5].

An important detail of usability is accessibility, which primarily refers to designing something in a way so it is useable to those with disabilities, which can range from visual such as blindness to physical disabilities. Therefore, web accessibility refers to designing & developing websites, tools, and technology so those with disabilities can use them, specifically perceive, understand, navigate, and interact, [6]. Expanding this, universal design refers to the process of creating such products to be useable by people with the widest range of abilities and all possible situations, [7].

Guidelines for website accessibility have been defined in the past according to the World Wide Web Consortium (W3C)’s Web Content Accessibility Guidelines (WCAG) since 1999. The currently released guidelines, WCAG 2.1, includes details on perceivable information including text alternatives such as braille, larger print etc., operable components such as navigation & using a keyboard interface, and understandability such as the readability of text & data, [8].

The most important aspect of usability for any website is user interface (UI) design; a good interface is easy to use & understand whilst meeting the needs of the intended user. Specifically, good UI provides easy and natural interaction between the user and the system, allowing them to carry out whatever tasks they intend to do, [9]. UI which does not meet these criteria will naturally be difficult to use or frustrating. Therefore, it is imperative that there are a set of followed rules when considering UI design; Schneiderman proposed “Eight Golden Rules” of interface design, which are applicable to most interactive systems. Some of these rules include striving for consistency such as keeping the fonts, colours and layout of pages the same across the entire website, seeking universal accessibility including recognizing the needs

of diverse users while keeping information clear and concise, and keeping users in control of their interface, keeping it as tidy and clean as possible without unexpected pop-ups, [10].

Usability testing is achieved through performing tasks on one or more user interfaces. Dumas and Fox state that all valid usability tests follow six characteristics: The focus on usability, the intended participants are end-users and potential end-users, there is a product or system to evaluate, participants perform tasks while thinking out loud, data is recorded and analysed, and the results of the test are communicated to the appropriate audiences, [11].

The advance in technology has also increased the need for usability tests on different platforms, for example the need for mobile usability testing as a priority alongside PC testing; the percentage of website traffic on mobile devices has increased by almost 30% from 2015, [2], facilitating the need for an increased focus to this type of usability test. Zhang and Adipat highlight some challenges in mobile usability testing, including a smaller screen size, differences in display resolutions between PC and various phone models, and lower bandwidth connections affecting applications, [12].

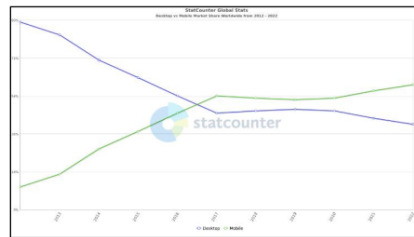


Figure 1- Worldwide Market Share of Desktop PCs vs Mobile Devices

As with most forms of tests, there are issues inherent in the process and evaluation of usability testing. Alshamari and Mayhew highlighted some of these issues including the “Evaluator Effect” in which multiple evaluators highlighting different problems rather than the same one, [13], the appropriate amount of users to test in one study, inappropriately selected tasks which can influence the final result, and the incorrect prioritization of problems, [14]. Dumas and Fox also mention the appropriate amount of test participants, whilst also mentioning inaccurate measurement criteria for tests and overall usability, the issues of out-loud thinking whilst conducting tests, and the overall reliability of tests when compared to older benchmarks, [11].

### 3. Aims & Objectives

- To investigate & evaluate a set of websites for their merit against various criteria of usability & accessibility.
  - a. Explore the various standards in place for viewing and navigating web content.
  - b. Determine the usability & accessibility criteria required to judge the website set against.
  - c. Evaluate the websites against the criteria found within the standards.
  - d. Compare the results of the evaluated set of websites against each other.

## 4. Project Design

### 4.1 Outline of Project Process

The main process for the project will be the collection of comparative data which will be created by testing the set of websites against the usability data decided by comparing various web guidelines, then choosing the tasks which appear most frequently and those with the most impact to usability.

When the criteria have been selected and tested against the websites, the results found on all sites will be compared with each other in order to determine which task had the most prevalent effect to the set overall, and which tasks could be improved by collecting more data.

### 4.2 Data Collection

The criteria to judge against the set of websites will be collected via comparing various articles detailing the guidelines in relation to website usability and accessibility.

The data recorded from performing the tasks against the set of websites will be collected first-hand and recorded appropriately. Some data will also be collected from secondary sources in relation to legacy data from past experiments for comparison.

### 4.3 Data Evaluation

In relation to data collected first-hand, it will be suited according to the thoroughness of the relevant test and will be compared to similar relevant data when the experiments have been completed. Should the data not match with what is expected, the tests will be run again in order to isolate outlier data and confirm the expected results.

Second-hand data collected from journals, articles etc. will be compared to the expected results of the undertaken tests and evaluated similarly; if the data does not match with what is expected, it will be replaced with appropriate data when necessary.

#### 4.4 Risks & Limitations

There are different risk factors which can hinder the experiment & comparison of the website set, such as sudden unavailability of a website in the set, the tools used to collect the data not operating as they should, and delays in receiving or collecting data. There is always a possibility of unavailability of resources. In the chance of these factors occurring, a contingency plan will be used in its stead, such as using a different form of testing.

There are also possible limitations to the project, including a lack of time required to complete the project and its experiments and the project having a limited scope which can result in incomplete or incorrect data. As above, a contingency plan will be put in place should any of these issues arise.

#### 4.5 Ethical Issues

Due to the nature of the experiment/project, most data will be drawn from the results of tests undertaken on websites and sourced from either first-hand experience or taken from research articles/journals. Therefore, this project carries a low ethical risk.

All collected information and data will be treated with due respect and dignity. Any data of a personal nature will be handled as strictly confidential, will be anonymised, and deleted following the finalisation of the project.

## 5. Resources & Planning

### 5.1 Resources Required

#### 5.1.1 Hardware Resources

- A personal computer connected to the internet
- A smartphone connected to the internet

#### 5.1.2 Software Resources

- Internet/Wi-Fi connection
- An internet-enabled web browser, i.e., Google Chrome
- Screen reading software, i.e., Windows Narrator, ChromeVox
- Other appropriate testing software

#### 5.1.3 Other Resources

- A library of appropriate journals and articles to support primary and secondary data

### 5.2 Planning Chart

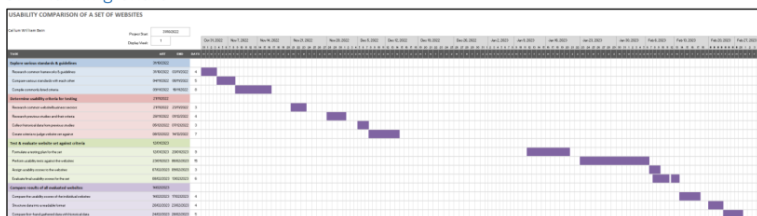
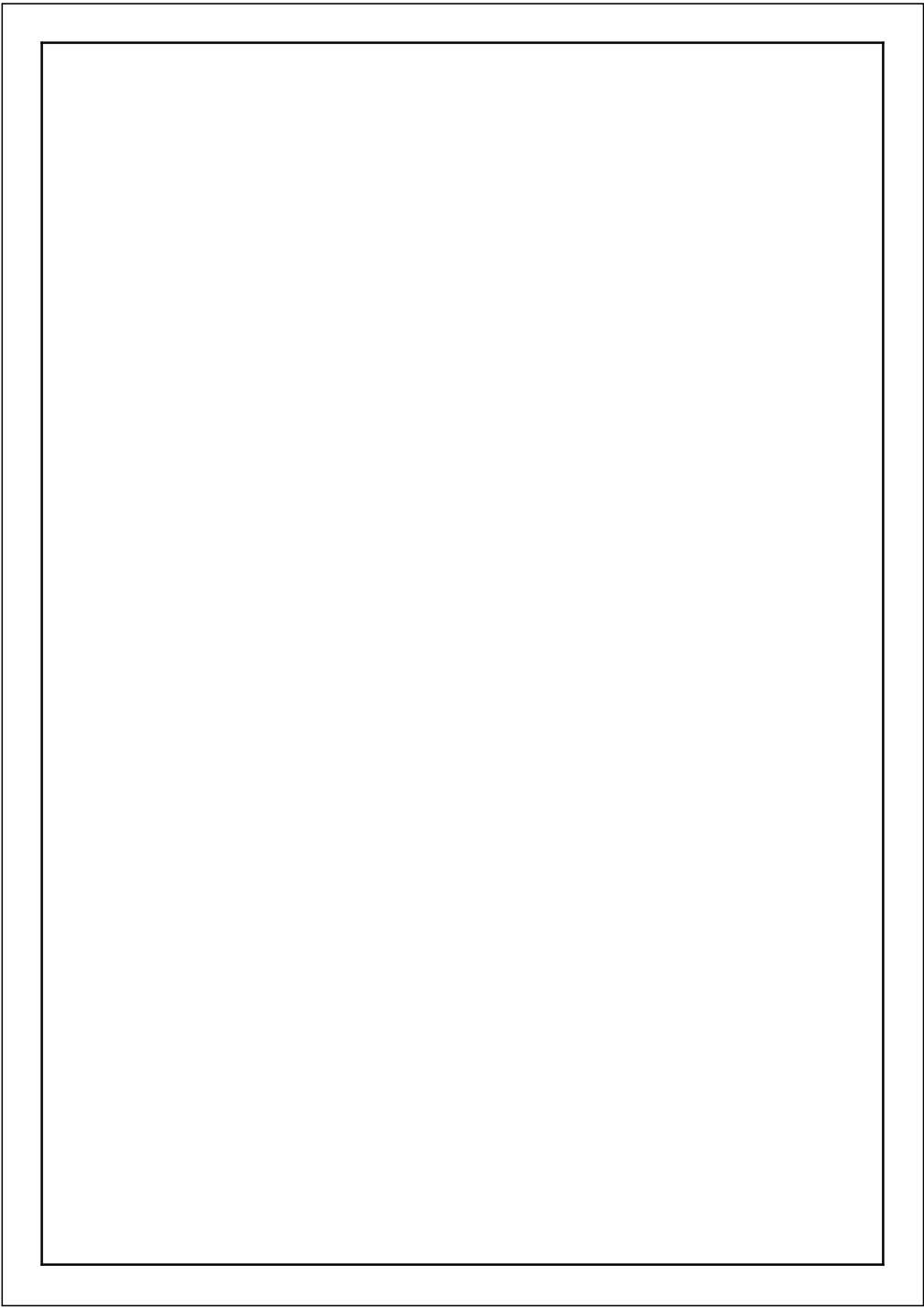


Figure 2- Preliminary Gantt Chart

## 6. Reference List

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# 'Usability Comparison of a Set of Websites' Research Project Proposal (Callum Bain, 2017104)

## GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

### Instructor

80/100

| Intro / A&O (400 words)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| <p>Project title; Identification of a specific problem to be investigated; Well-defined aims and SMART objectives; Explaining why this project is worth doing; Discussion of what the project needs to do in order to be a success; Description any deliverables that will be produced at the end of the project</p> <p>Introduction provides a good overview of the intended area of study and investigation. Note: No mention of practical implementation at this point, this will need to be considered e.g. after usability evaluation of selected websites, a website could be built that implements good practices discovered, possibly also tested with the various tools.</p> <p>A project Aim and objectives are clearly documented. Good. As mentioned above, consideration will need to be given for a practical element for the project.</p> | 20 | 14 |
| Background to the Project / Literature Review (400 words)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |    |    |
| <p>Description of how the work to be done by in the project relates to the work identified in the literature review; Discussion of any ethical issues raised by the project Identifying what has already been done within the field; Topic familiarity; Brief literature review using appropriate sources – 6-8 journal papers and book chapters rather than just websites; Selection of relevant models &amp; concepts</p> <p>Background provides a very good overview of the field of study, relevant topics are covered with supporting citations. Good. Some additional up-to-date statistics could be added and testing tools identified.</p>                                                                                                                                                                                                       | 20 | 16 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| <b>Project Design (500 words)</b>                                                                                                                                                                                                                                                                                                                                                                                                                      |    |    |
| <p>Clear statement of which development methods are to be used and why they are appropriate; Clear statement of which tools are to be used and why they are appropriate; Clear description of how data collected will be analysed</p> <p>Project design outlines the project process, data collection &amp; evaluation, risks and limitations. Good. Some additional risk contingencies could be stated. Ethical issues are also considered. Good.</p> | 30 | 23 |
| <b>Resources / Planning (200 words)</b>                                                                                                                                                                                                                                                                                                                                                                                                                |    |    |
| <p>List of any deliverables; Clear diagram showing both timing and resource use; Completed ethics form; Limited and relevant appendices</p> <p>Relevant resources are considered and documented. Planning chart is difficult to read. Perhaps a Gantt table could also be included. Relevant stages and tasks are included, very good. Some additional rows for project report evaluation and write-up could be considered and documented.</p>         | 15 | 13 |
| <b>Document Presentation</b>                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |
| <p>Correct spelling, grammar and punctuation; Flow of narrative/fluency; Coherence; Word processed ; Correct use of referencing with bibliography; Strict word limit</p> <p>Very good report presentation format and structure. Reference list included and well formatted. Good.</p>                                                                                                                                                                  | 15 | 14 |

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|              |            |    |
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