

**Experimental results, evaluation and analysis:
User Testing of WAM Relevance**

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1 Executive Summary

This document (D4.3.1) reports on the experimental results, evaluation and analysis of user testing carried out with end-users to verify the relevance of the ROBACC Web Accessibility Metrics (WAMS), which were identified in WP3 for inclusion in the Observatory. The aims of user testing of WAM relevance are to:

- Compare barriers identified by users with those detected by WAMs.
- Differentiate barriers by disability.

In this first iteration of user testing the above aims have, to a large extent, been achieved. From the analysis of the results, the following observations and recommendations can be made:

1.1 Summary analysis of checkpoints tested:

1.1.1 Checkpoint 1.1: Application of the ALT tag

The pilot test tasks tested a page that did not conform to the checkpoint tested and a page that did conform. The testing proper task tested a page that part-conformed to the checkpoint tested (the ALT tag had been applied but in one case did not give helpful information relating to the image).

Although it is not possible to analyse the pilot testing results in more depth, findings relating to task completion suggest the non-conformance of the ALT tag is an accessibility barrier to blind and visually impaired people using screen readers if the information it conveys is of importance to the contents of the web page and is not conveyed anywhere else apart from the image.

For the user testing proper, blind and visually impaired participants were the group of users who experienced most problems with the task relating to this checkpoint, in particular those using screen readers. However, this was not the case for all participants in this category. Other problems experienced by participants related to colour and contrast, to navigation and page layout rather than to the failure or part-failure of the checkpoint. The majority of participants felt they were able to complete the task – this included blind participants using screen readers, one specifically commenting that although the description for one of the images was not very helpful, the participant didn't think this was very important. This suggests that when identifying images, some users do not always view a poor ALT tag description as a

major problem and they do not necessarily feel it impedes their ability to complete a task. It may also suggest that many images used on pages do not display significant content and can therefore be largely ignored. A future challenge for automated testing will be to recognise whether the lack of an ALT tag is significant within the context of the whole page.

1.1.2 Checkpoint 3.4: Use of relative font sizes

The task tested a page that did not conform to the checkpoint.

Testing this checkpoint revealed that those who experienced problems with the task relating to this checkpoint were using screen magnification or on-screen adjustments. This confirms there is an accessibility problem for these users if the checkpoint fails. Other participants mentioned accessibility issues unrelated to the checkpoint, such as a lack of headings and cluttered layout. Despite this, the majority of participants were satisfied that they could complete the task.

1.1.3 Checkpoint 3.5: Use of header elements to convey document structure

The task tested a page that did not conform to the checkpoint.

Blind participants using screen readers experienced problems with the task relating to this checkpoint. Comments show that the problems could be directly related to the failure of the checkpoint. Other participants mention accessibility issues relating to the design and layout of the page, not necessarily related to the lack of header elements – although correct mark-up may have helped the situation.

1.1.4 Checkpoint 5.5: Provision of summaries for tables

The task tested a page that did conform to the checkpoint and one that did not conform.

Participants had no real problems with the tasks relating to this checkpoint, whether a table summary had been provided or not. This suggests that when tables are presented in a way that can be read and navigated, a helpful summary might enhance the accessibility of the table but would not necessarily be a vital element for the accessibility of the table.

It should be noted that participants were not specifically asked to identify the table summary. This was because only participants using screen readers or Braille output would have been able to identify this from the web page, and also because people unused to HTML may have been confused by this instruction and failed the task due to a lack of HTML knowledge.

1.1.5 Checkpoint 13.1: Identifying the target of each link

The task tested a page that did not conform to the checkpoint.

The problems identified with the task relating to this checkpoint were mainly unrelated to the hypertext link descriptions. However, two participants did notice that two of the links in the task were given the same description and this meant they had to try both of them to find the information required. Other accessibility issues identified related to colours and the layout of information. The majority of participants felt they were able to complete the task, suggesting the failure of the checkpoint may not be a complete barrier to task completion but will simply make it more time consuming. However, accessibility problems relating to this checkpoint were identified in tasks undertaken to test other checkpoints.

1.1.6 Checkpoint 5.6: Provision of abbreviations for header labels

The task tested a page that did not conform to the checkpoint.

Responses suggest that despite the lack of the abbr attribute on the TH element for the web page tested, failure of the checkpoint does not necessarily impede the completion of the task. However, comments from visually impaired participants using screen readers suggest the abbr attribute may have helped improve accessibility of the page. The participant who experienced the most problems was not using screen readers or Braille output but found the visual display to be confusing. This suggests more of a usability problem which may be difficult to evaluate against a checkpoint.

1.1.7 Checkpoint 9.4: Creating a logical order through links

The task tested a page that did not conform to this checkpoint.

Screen reader (and Braille output) users found the task very easy because the tab key did move logically (for them) through the page and they were able to find the information required despite no order being specified in the HTML. Further testing of other pages which have no order specified would be needed to verify whether this is always the case. Problems experienced by the other user groups were attributed to the fact that they would not normally use this as a method for navigation, and to other accessibility problems such as poor link descriptions and page layout.

1.1.8 Checkpoint 12.1: Provision of a title for each frame

The task tested a page that did not conform to this checkpoint.

The blind, visually impaired and dyslexic participants were the most affected by the failure of this checkpoint, confirming that this could be an accessibility problem and that there is a need to ensure frames are provided with meaningful titles. Participants

from all user groups also experienced other problems with this task and identified accessibility issues not necessarily related to the checkpoint failure.

1.1.9 Checkpoint 12.4: Association of form labels with their controls

The task tested a page that did conform to this checkpoint.

Most participants were able to complete the form and task without any major accessibility problems. This suggests the correct application of form fields for this page did enhance the accessibility of the form. Those accessibility problems that were identified, were not related to the checkpoint tested, but related to colour, contrast and general language used.

1.2 General observations

- Clearly it is important to ensure the correct and consistent application of accessibility features. However, responses show that some checkpoints may be less important for disabled users. The ALT tag is a good example: unless images are used to display information that is not provided elsewhere on the page, blind and visually impaired participants seem unconcerned about the the ALT tag.
- Problems can be identified with the non-compliance of certain checkpoints, in particular non-compliance to the following: use of headings (3.5), labelling of frames (12.1), description of hypertext links (13.1), and use of fixed font sizes (3.4).
- Barriers can be differentiated by disability. User testing identified the disabilities most affected by non-compliance to the following checkpoints: 1.1: blind participants who use screen readers; 3.5: mainly blind participants using screen readers; 3.4: visually impaired participants using screen magnification or making on-screen adjustments to enlarge text; 12.1: blind, visually impaired and dyslexic participants, the the former using screen readers, the latter finding the layout of frames confusing.
- Failure of a checkpoint was not always a complete accessibility barrier; some of the disabled participants were able to work around them and still complete the task. For example, tables that did not include a summary or abbreviations were not necessarily a complete accessibility barrier. However it may have been a more time consuming process to complete the task.
- Accessibility barriers experienced by participants but not necessarily relating to the checkpoint being tested show that while some potential barriers can be

overcome, others remain problematic. In particular headings (3.5), description of links (13.1), layout of the page and the language used. The last two are more related to usability issues and may be difficult to test against a checkpoint.

- Colour and contrast remain an accessibility barrier experienced, predominantly by visually impaired participants, but not exclusively, which reinforces the need for a design for all approach. Automated testing of colour and contrast being developed by the BenToWeb project is therefore an important checkpoint that should be included for testing by the Observatory (EIAO release 1 will include the BenToWeb tool to test checkpoints 2.2, 13.4, 14.1).
- The control group of non-disabled participants revealed instances when they experienced accessibility barriers normally associated with disabled people. Again, this reinforces the 'design for all' approach to web design.
- Tests using the Observatory should be carried out with the same web pages that were tested with the participants so that the results can be compared. This will help establish whether the Observatory findings are in line with those of the end-users.

1.3 Recommendations for the next iteration of user testing

- The responses received from this first iteration have shown that the process of remote user testing can provide useful results and should be used to improve the user testing framework for the next iteration of user testing. In particular, further discussion is needed on how best to translate the results into barrier probabilities (F_cui values).
- The selection of websites for the next iteration could be undertaken using the Observatory first, to identify websites which display the checkpoints for testing. As well as providing data on the Observatory findings for comparison with the user findings; tasks and questions for user testing can be developed from this selection.
- Apart from the control group, all of the participants who took part said they would be willing to take part in future user testing for the project. Further recruitment would also be needed to ensure a more even spread of disabilities is involved.

2 Introduction

This document (D4.3.1) reports on the experimental results, evaluation and analysis of user testing carried out with end-users to verify the relevance of the ROBACC Web Accessibility Metrics (WAMS), which were identified in WP3 for inclusion in the Observatory.

This document should be read in conjunction with D4.1.1: specification and implementation of the experimental environment, which goes into greater depth regarding justification and description of the methods selected, selection of participants and implementation of the user testing. Reference should also be made to D3.1.1 which describes the selection of WAMS (A, B and C) for inclusion in the observatory, and to the UWEM v.0.5, which describes the user testing protocols which have been used to develop the framework for testing and evaluation described in this document.

2.1 *Brief project description*

The goal of the European Internet Accessibility Observatory project is to contribute to better e-accessibility for all citizens and to increase the use of standards for online resources.

The project will establish the technical basis for a possible European Internet Accessibility Observatory (EIAO) consisting of:

- A set of web accessibility metrics.
- An Internet robot for automatically and frequent collecting data on web accessibility and deviations from web standards (the WAI guidelines).
- A data warehouse providing online access to collected accessibility data.

The collection of web accessibility metrics and the tools for automated data collection and dissemination will be continuously improved by feedback from end users and user testing to sharpen the relevance of the automatically collected data.

The EIAO project is being carried out as part of the Web Accessibility Benchmarking cluster together with two other EC funded projects: Support-EAM and BenToWeb,¹

¹ Details of the Cluster projects are available at: www.wabcluster.org/

and in co-ordination with the World Wide Web Consortium Web Accessibility Initiative (W3C/WAI) to develop a Unified Web Evaluation Methodology (UWEM)¹.

2.2 Scope of WP4

Four main areas of user testing for the EIAO project have been identified:

1. User testing of the UWEM methods.
2. User testing of WAM relevance.
3. Usability testing of the Data warehouse.
4. User testing of the Observatory content (this comes under WP2).

WP4 comprises the following tasks:

- Implementation of the experimental environment
- Run experiments, evaluate and analyse the outcomes of:
 - Validation of UWEM Web Accessibility Metrics
 - Evaluation of the UWEM methodology.
 - Testing of the data warehouse user interface.

The work is divided into three deliverables:

- D4.1.1: Specification of the experimental environment.
- D4.3.1 Experimental results, evaluation and analysis (two iterations).
- D4.3.2 Final report on the findings and scientific results (co-ordinated or merged with D4.3.1).

Work is conducted by MMU, TUW, AUC, NK, FTB, FBL, AAU.

The user testing experiments are conducted by MMU and TUW. The work for the iteration described in this deliverable covers user testing of WAM relevance undertaken by MMU. The work undertaken by TUW on user testing of UWEM Methodology was not completed following the UWEM review recommendation to remove user testing protocols from the UWEM version 1.0. This situation may be reviewed later in the project. Data collected by TUW may be used to inform the next iteration of D4.1.1.

¹ <http://www.wabcluster.org/uwem05/>

2.3 Scope of D4.3.1

Deliverable D4.3.1 will describe the results and analysis of user testing to help verify the relevance of the Web Accessibility Metrics (WAMs). The deliverable will inform Task 4.3: Run the experiments, evaluate and analyse the outcomes.

A framework for user testing of WAM relevance was developed and described in D4.1.1 (Specification and Implementation of the Experimental Environment), sections 4 and 5. The framework took into consideration the work of BenToWeb, along with the UWEM and other related documents which were identified by the project. With this in mind, the user testing of WAM relevance includes the following steps:

- Clarify purpose of the testing, what needs to be measured etc.
- Development of scenarios, tasks and questions.
- Enlisting of participants.
- Pilot testing of the experimental environment.
- Run user testing.
- Data analysis and report writing.

2.4 Purpose of the user testing

The purpose of the user testing of WAM relevance is as follows:

- User testing to compare barriers identified by users (i.e. ranked by each user group as input to barrier probability estimates) with those detected by WAMs (this will not be run simultaneously with the user testing).
- Differentiation of barriers by disability. It should be possible to assess failure modes relating to the barrier and the disability. This could also be used to assess the user centric barrier probability model (see UWEM 0.5 Section 6.4.3) although further development of this model would be required before effective assessment could take place.

Potential participants for this iteration of user testing were involved in the user requirements data gathering. As a result of the end-user follow-up interviews, many people agreed to take part in the user testing of WAM relevance. Of these, 20 participants from the following disability groups were selected to take part in the first iteration of user testing:

- Blind.
- Visually impaired.
- Physically impaired.
- Dyslexic.

A control group of 5 non-disabled people were included to help verify whether accessibility barriers identified are specifically related to people with disabilities.

Participants were selected to provide an even spread of disabilities and assistive technologies used. All those selected had some experience using computers and the Internet (2 years or more) in order to avoid IT literacy issues influencing the testing rather than accessibility issues relating to web design and the checkpoints tested. The number selected also aimed to be in line with the UWEM recommendations to include at least 3 people from each target user group.

For this iteration of testing, people who are deaf or hard of hearing have not been included unless they had one or more of the disabilities described above. This is because the checkpoints tested for this iteration were of more relevance in terms of accessibility testing to those users with visual, learning or physical disabilities.

2.5 The Test Site

The following WAMs were selected for this first iteration of user testing:

- 1.1: missing image element.
- 3.4: absolute font sizes used.
- 5.5: summaries for tables missing or inappropriate.
- 5.6: inappropriate abbreviations for header labels.
- 12.1: titles for frames missing or inappropriate.
- 12.4: poor use of labels for form fields.
- 13.1: links for different targets given the same name or description.

Web pages were then selected using the purposive sample identified in D4.1.1 (see also Appendices One and Two of this document) and tasks were developed for each checkpoint/web page (see D4.1.1 Section 5.2 and Appendix Two). Pilot tests (using a

shorter version of the Test Sites described below) highlighted any accessibility problems with the Test Site and indicated how long each task was likely to take. Adjustments were then be made before participants were asked to undertake the testing proper. All participants took part in the pilot test to ensure they would be able to use the final Test Site properly.

To test the checkpoints required for this iteration, the complete Test Site contains 10 websites and 10 tasks. Pilot testing identified the appropriate number of tasks per disabled participant to be up to 5 tasks per user and the test site has therefore been divided into two sections as follows:

- Test Site One (10 users, 5 sites each): Sites and tasks relating to missing ALT text (checkpoint 1.1), Headings (3.4; 3.5), Links (13.1) and Tables (5.5).
- Test Site Two (10 users, 5 sites each): Sites and tasks relating to Tables and labels (5.5; 5.6), Navigation (9.4) Frames (12.1) and Forms (12.4).

The control group of non-disabled users will undertake both Test Sites One and Two.

The User Test Sites were provided online with a URL for participants to access remotely. Participants were asked to log in to the site, this enabled identification of the type of assistive technology used (if any) and of specific disabilities which were identified in the user requirements survey and verified by email prior to the testing. The Test Sites provided online instructions asking participants to look at 5 archived websites, undertake up to 2 tasks for each, and provide feedback using an online form specifically designed for the purpose. Participants completed and submitted this process remotely. The Test Site was kept in on a private server that can only be accessed by those involved in the project and has been coded so that web crawlers are unable to index the site.

Of the 25 participants who agreed to take part in the user testing (and who undertook the Pilot Testing), 23 undertook the tasks and evaluation. The results of these are described in Sections 4 and 5.

2.6 How this work relates to EIAO and the Cluster

This document is related to the following documents:

- D-WAB2 Unified Web Evaluation Methodology (UWEM 0.5).
- D2.1.4 Report on primary user requirements.
- D3.1.1 First Version of ROBACC WAMS.
- D4.3.1 Experimental results, evaluation and analysis (other iterations).

The work of WP4 will be in co-operation with WP3 to verify the models in WP3 and the user testing protocol methods of the UWEM. Results from WP2 were used to inform the selection of checkpoints for testing and for the enlisting of participants. Results from D4.3.1 can be used by the Cluster to inform Section 7: User Testing Protocol of the UWEM and to some extent inform Section 6.4: the UWEM user centric accessibility barrier model of the UWEM.

3 Pilot Test

Pilot testing was undertaken prior to the final implementation of the experimental environment. The pilot testing revealed important issues such as how long (on average) it took users to complete the tasks and allowed adjustments to be made where necessary to the framework.

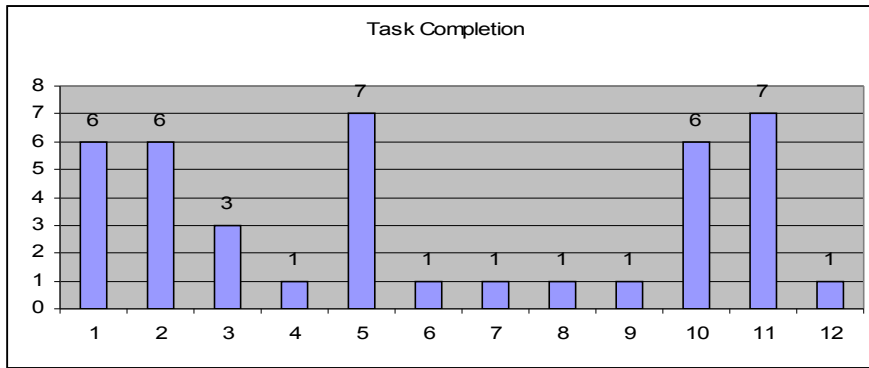
Although the pilot test was undertaken to test the user testing process, the following analysis of results on task completion are interesting for comparison alongside responses in Test Site One Task One, because they are testing the WCAG checkpoint 1.1. Because of problems experienced displaying the results which were identified in the pilot (and corrected for the user testing proper), the only question that can be analysed reliably is satisfaction with task completion.

3.1 Tasks One and Two testing checkpoint 1.1

Task One of the Pilot Test used a web page which did not conform to WCAG recommendation of providing a text equivalent for every non-text element, including images, graphical representations of text, image maps, animations, applets, scripts, decorative images (bullets for example), spacers, graphical buttons, audio and video files.

Twelve participants (from user groups who were blind, visually impaired, physically impaired and dyslexic) were asked to look at a home page of an online pizza ordering company and see if they could find out the ingredients for a 'meat lover's pizza'. The web page displayed many images, some of which had ALT text applied. The meat lover's pizza image included information on the ingredients of the pizza as part of the image, but did not have alternative text.

3.1.1 Task completion



Of the 12 participants, only 5 were satisfied or very satisfied they had completed the task. The other participants all ranked satisfaction as not very or lower. Negative comments related to the checkpoint being tested were all from blind participants using screen readers:

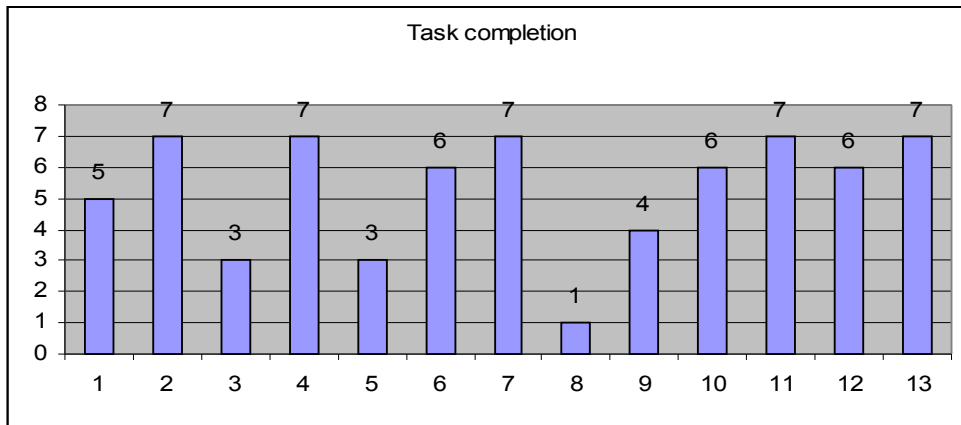
“You could at least find out what type of Pizza they sell, though not what was in it” (blind participant using a screen reader).

“If it had not been for the task outline I would not have been aware an image of the toppings should have appeared. While I may have been able to order one of these Pizzas I would not have known what was on it and so I would probably have taken my business elsewhere” (blind participant using a screen reader).

“On reading down the page, from the top, I saw the list of the pizzas, and very quickly found the meat lover's pizza, and then clicked on this, which was where I expected details on the pizza would have appeared, though this did not appear to be the case” (blind participant using a screen reader).

Task Two of the Pilot Test did conform to WCAG recommendation of providing a text equivalent for every non-text element, including images, graphical representations of text, image maps, animations, applets, scripts, decorative images (bullets for example), spacers, graphical buttons, audio and video files.

Thirteen participants (from user groups who were blind, visually impaired, physically impaired and dyslexic) were asked to look at a home page of a university research centre and identify what the image on the page was displaying. The web page showed a picture of a building with ALT text telling the visitor what the building's name is. Responses below are on task completion only:



Of the 13 participants, 8 were satisfied or very satisfied that they had completed the task. Only 3 were not very satisfied or lower that they had completed the task. Negative responses were from participants from the visually impaired and dyslexic user groups and did not really relate to the checkpoint being tested:

“I think a picture of a corner of a building with a spire or mast, lacked definition and contrast, from my point of view” (visually impaired participant using on-screen adjustments).

“Modern building of the type Prince Charles would hate! Hi Tech” (dyslexic participant not using assistive technology).

3.1.2 Summary

Although it is not possible to analyse the pilot testing results in more depth, findings relating to task completion suggest the non-conformance of the ALT attribute will be an accessibility barrier to blind and visually impaired people using screen readers if the information it conveys is of importance to the contents of the web page.

4 Tasks Undertaken for Test Site One

Fifteen participants were asked to undertake the tasks and evaluations for Test Site One. These included:

- Four blind participants, all using screen readers, one using a screen reader and voice output.
- Two visually impaired participants, both using screen magnification and on-screen adjustments.
- Three physically impaired participants, one using voice output, two not using assistive technology.
- One dyslexic participant, not using assistive technology.
- Five control group participants, none using assistive technology.

All participants had experience using the Web (2 years or more) and were comfortable using their particular assistive technology.

Of the 15 who started the Test Site, 14 actually completed all 5 tasks and evaluations. One participant (physically impaired not using assistive technology) only managed to complete the first task and evaluation.

4.1 Task One: WCAG Checkpoint 1.1

The purpose of this task is to test the accessibility of graphics through alternative text descriptions.

The WCAG recommend providing a text equivalent for every non-text element, including images, graphical representations of text, image maps, animations, applets, scripts, decorative images (bullets for example), spacers, graphical buttons, audio and video files. The web page tested only conformed in part to this recommendation.

Participants were asked to look at a university Home Page and see if they could find out how many images were displayed (see Appendix One, Task One). The web page which was tested displays a number of graphics or images on the home page, all of which have ALT text applied, but do not always explain what each image is. For example, a large image of a nurse is described in the ALT text as 'right image'. Problems with this could be experienced by someone using screen reading

technology or Braille output because although they should be able to establish that an image was displayed, it may not be described in way that is meaningful to them.

Following the task, participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

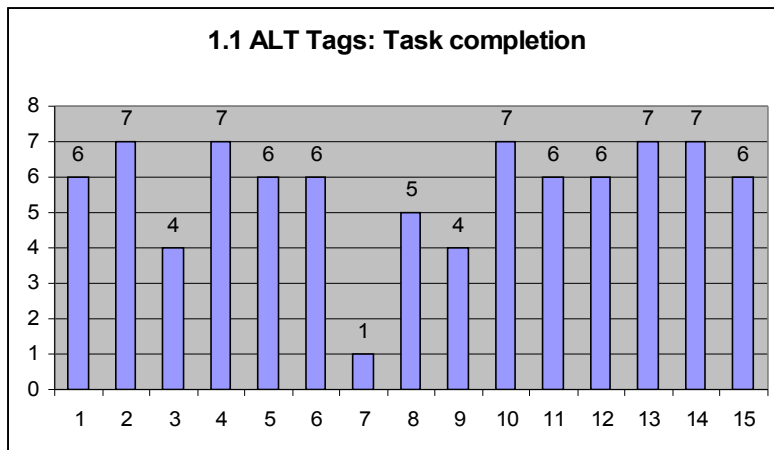
The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

4.1.1 Task completion

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

- 1= not at all satisfied
- 2= not satisfied
- 3= not very satisfied
- 4= neither dissatisfied or satisfied
- 5= quite satisfied
- 6= satisfied
- 7= very satisfied.

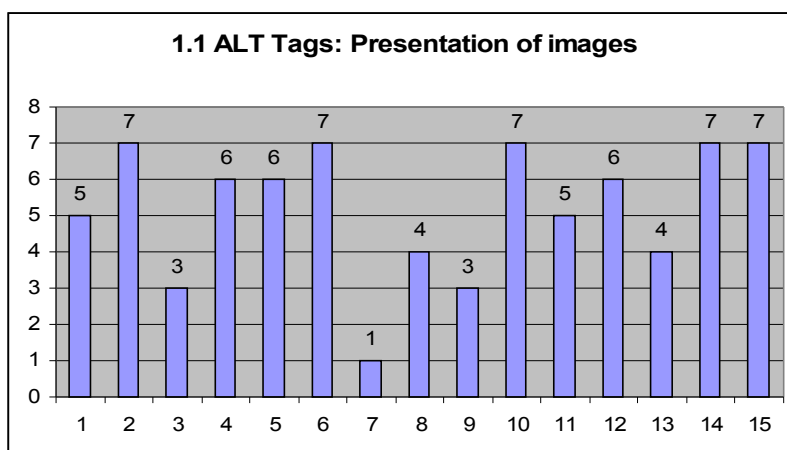
They were then asked to comment on this, firstly by providing an answer to the question (in order to verify their completion response), and then to describe how they undertook the task.



The majority of participants felt that they were able to complete this task, ranking satisfaction as quite satisfied (5), satisfied (6) or very satisfied (7).

The lower ranks were given by participants who were blind or visually impaired. One participant (visually impaired, using screen magnification and on-screen adjustments) ranked satisfaction as neither dissatisfied or satisfied but was able to identify the images on the Home Page. One participant (blind, using a screen reader and voice output) was also neither dissatisfied or satisfied and commented that "One was the ... logo, but many other graphics are of no importance such as those reading Right image ...". Another participant (blind, using a screen reader) was not at all satisfied that the task was completed, commenting: "by going up and down the links it told me what the link was but no mention of images".

4.1.2 Presentation of the images.



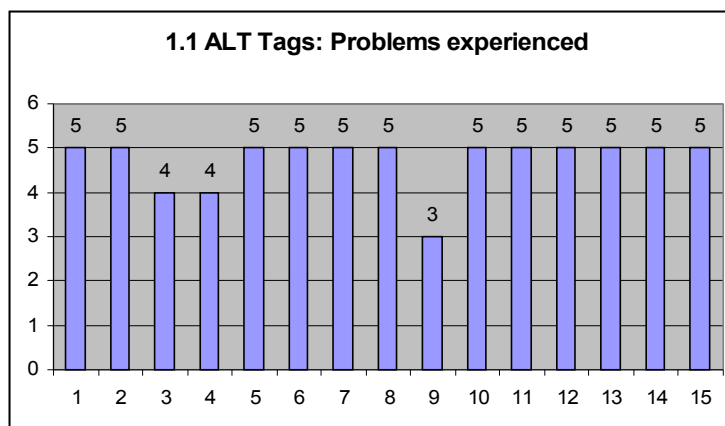
A more mixed response was given to the presentation of images, but still with only 5 ranking satisfaction as neither dissatisfied or satisfied or lower. Participants who ranked satisfaction as not very satisfied or not at all satisfied were from the blind and visually impaired user groups.

4.1.3 Problems experienced

Using the following description, participants were asked to rank any problems experienced:

- 1= catastrophe
- 2= major problem
- 3= minor problem
- 4= cosmetic problem only
- 5= not a problem

To help identify the level of problems experienced and to assess whether any other problems unrelated to the ALT tag were experienced, participants were asked to comment further.

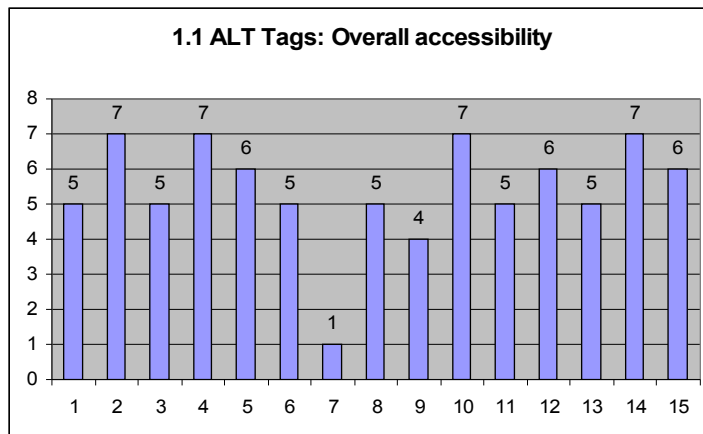


Most participants did not experience problems with the presentation of the images. One of the participants who gave a rank of "minor problem" provided further comments which revealed that problems were related more to colour and contrast rather than the failure of the checkpoint: " Colours on my computer looked washed out - I could not see what woman was doing. Not sure why picture was there in the

first place. Printer image seemed superfluous" (visually impaired participant using screen magnification and on-screen adjustments).

4.1.4 Overall accessibility of the page.

Participants were asked to rank the overall accessibility of the page and then comment further on their experience.

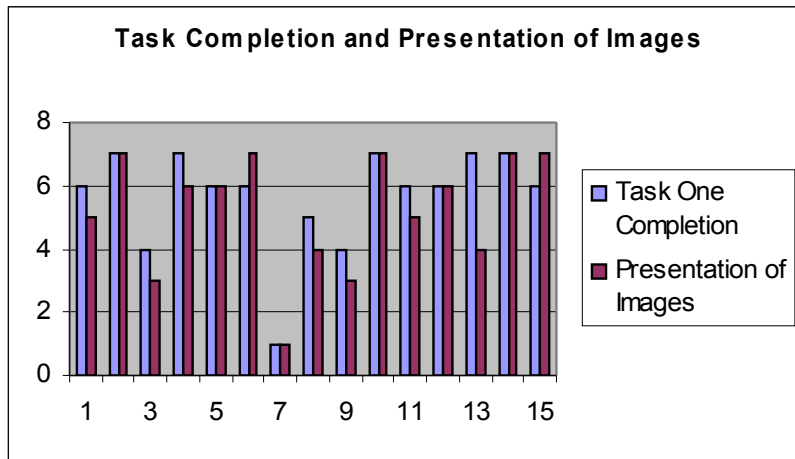


Most ranked the overall accessibility as quite satisfied and above. One participant who ranked overall accessibility as "quite satisfied" commented that: " I wish it had a skip to content link. Also I think the use of headings to distinguish between the navigation and the contents would help". The lower ranking (less than 5) of satisfaction was from participants who were blind or visually impaired. One commented: "there seemed to be too much on the page". This comment did not relate specifically to the ALT tag, but to the overall layout of the page.

4.1.5 Further analysis of Task One

The following analysis compares responses to different questions. In particular, those ranked lower than 5 (neither dissatisfied or satisfied, not satisfied or not at all satisfied) or in the case of problems lower than 4 (minor problem, major problem or catastrophe).

Task completion and presentation of images:

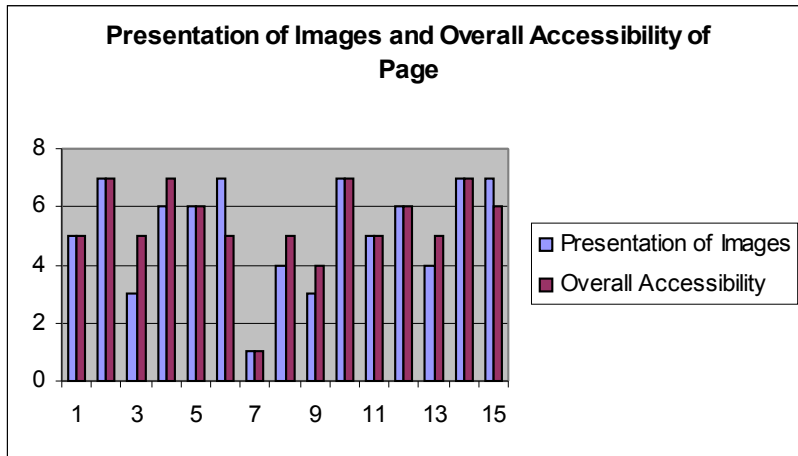


There are very few differences between whether participants felt they could complete the task and how accessible they found the presentation of images to be. Overall the responses show that if a participant ranked task completion as high, this also corresponded with their opinion of the presentation of images. Similarly, if they were less than satisfied that they completed the task, they also ranked the presentation of images as low.

Task completion and problems experienced

Participants who were not satisfied they had completed the task did not necessarily rank any specific problems apart from the comments relating to colour contrast (from a visually impaired participant) and the overall accessibility comments relating to skipping navigation and use of headings (from a blind participant). These comments were from participants who both used assistive technologies.

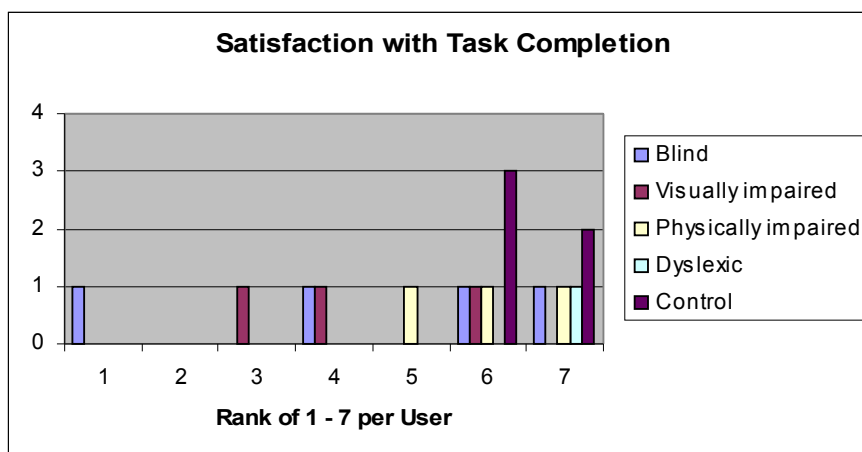
Presentation of images and overall accessibility of the page

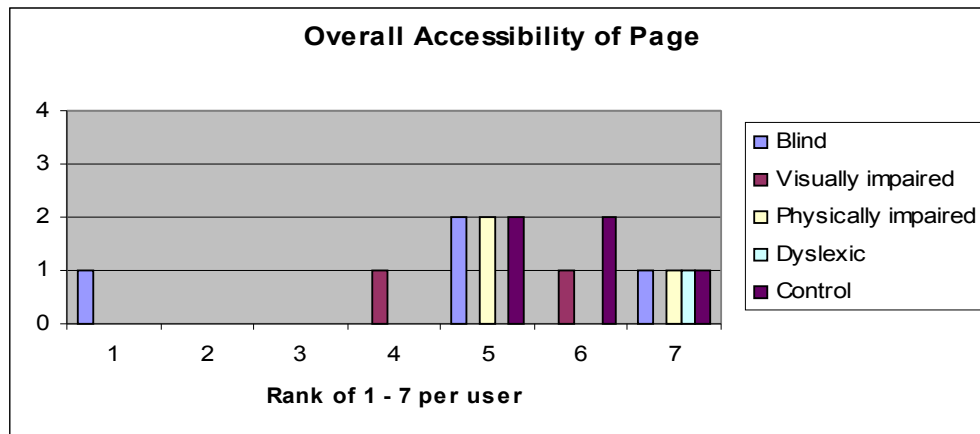
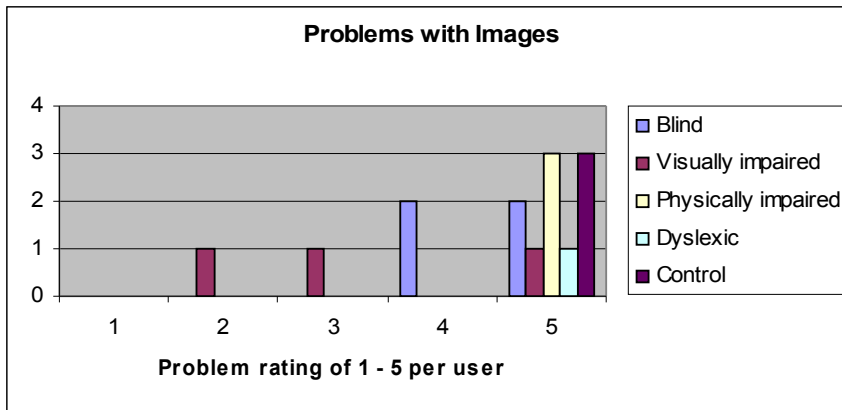


This shows again that there are few differences between how satisfied participants were with the presentation of images and the overall accessibility of the page (i.e. more than 5 for one and less than five for the other).

4.1.6 Comparisons across the user groups

Comparisons of response rates across disability and the control groups reveal that, apart from the question relating to the presentation of images, blind and visually impaired participants were the only group to rank satisfaction as neither dissatisfied or satisfied or less.





4.1.7 Summary

Blind and visually impaired participants were the group of users who experienced most problems with this task, in particular those using screen readers. However, this was not the case for all participants in this category. Other problems experienced by participants related to colour and contrast rather than to the failure or part-failure of the checkpoint. Overall accessibility of the page was ranked quite high. Issues with accessibility related to navigation and page layout. Apart from two participants, the majority of participants felt they were able to complete the task – this included blind participants using screen readers, one specifically commenting that although the description for one of the images was not very helpful, the participant didn't think this was very important. This suggests that when identifying images, some users do not

view a poor ALT tag description as a major problem and they do not necessarily feel it impedes their ability to complete a task. It may also suggest that many images used on pages do not display significant content and can therefore be largely ignored.¹

1. For example, out of 483 images on a random sample of 100 web pages, only 5 (1%) contained information which was not also contained in text on the same pages or linked to from those pages (i.e. the image held significant information content which you couldn't get anywhere else).

4.2 Task Two: WCAG Checkpoint 3.4

The purpose of this task is to test the accessibility of text presented on a page.

The WCAG recommends the use of relative rather than absolute units in mark-up language attribute values and style sheet property values. The web page which was tested did not conform to this recommendation.

Participants were asked to look at a specific section on the Home Page of a travel website and identify what stories were included in this section (see Appendix One, Task Two). The web page which was tested uses absolute values for table height and width, and the CSS uses absolute values for font attributes. Problems with this could be for people who need to use screen magnification or make screen adjustments to enlarge the text size. If a fixed (or absolute) font size is applied to the HTML the text will not always enlarge in an accessible way, often displaying pixelated text in a way that is difficult or impossible to read. Fixed font sizes also do not allow resizing, even when user tries to enlarge them.

Following the task, participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

- 1= not at all satisfied
- 2= not satisfied
- 3= not very satisfied
- 4= neither dissatisfied or satisfied

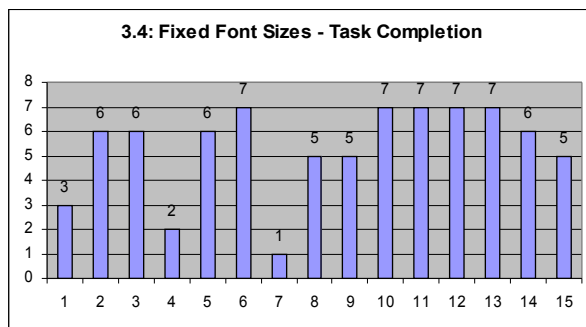
5= quite satisfied

6= satisfied

7= very satisfied.

They were then asked to comment on this, firstly by providing an answer to the question (in order to verify their completion response), and then to describe how they undertook the task.

4.2.1 Task Completion



This shows that the majority of participants were satisfied they were able to complete the task, even if their assistive technology did not work properly: "The information was on the home page, voice recognition did not function on this page but the information was there" (physically impaired participant, using voice output).

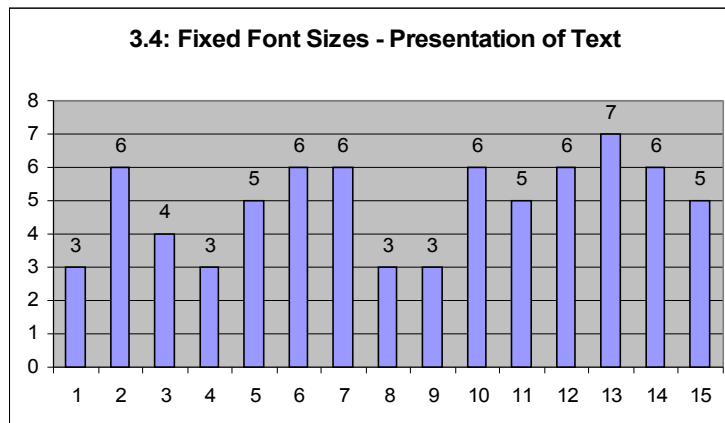
Other participants described how they used their assistive technologies to help find the information: "I used the g key which in jaws moves the virtual cursor to the next graphic on an html page" (blind participant using a screen reader and voice output).

"After quickly realising that if you clicked on an area on the map a description appeared on the right hand side of the page" (visually impaired participant using screen magnification and screen adjustments).

Participants who were less than satisfied they had completed the task were blind, visually impaired and physically impaired. Their comments were:

"Assume you refer to five famous chocolate shops but left-hand column also called world guide refers to something totally different - confusing" (physically impaired participant using no assistive technology).

4.2.2 Presentation of the text:



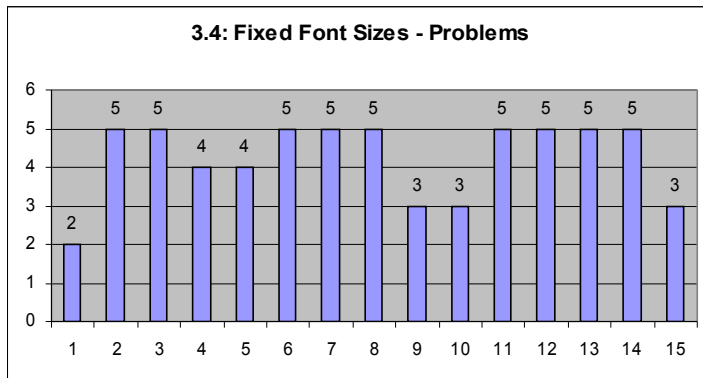
Although the majority of participants ranked their satisfaction with the presentation of text on the page as quite satisfied or higher, 5 participants gave a ranking of neither dissatisfied or satisfied or lower. These participants were two blind participants (using screen readers and one also using voice output) and two physically impaired participants (not using any assistive technologies).

4.2.3 Problems experienced

Using the following description, participants were asked to rank any problems experienced as follows:

- 1= catastrophe
- 2= major problem
- 3= minor problem
- 4= cosmetic problem only
- 5= not a problem

To help identify the level of problems experienced and to assess whether any other problems unrelated to the checkpoint were experienced, participants were asked to comment further.



The majority of participants ranked this task as being no problem to them. Responses were from participants who ranked problems as a minor, major problem or catastrophe included:

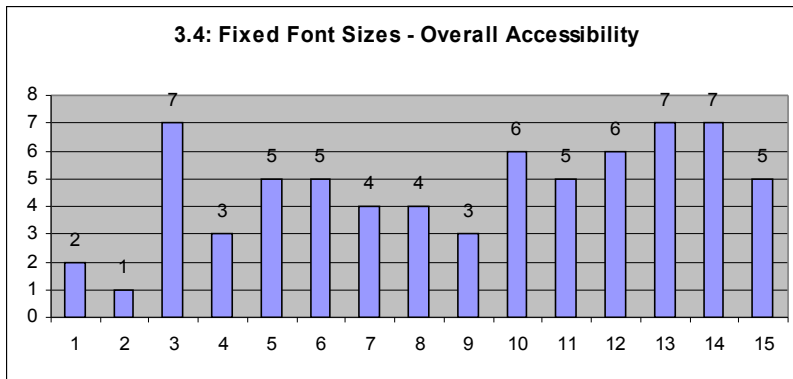
"Found that the writing was rather small and had to use magnification software, which in itself caused a problem, especially when viewing Europe as it was then difficult to read the information" (visually impaired participant using screen magnification and on-screen adjustments).

"Too much information - text has to be small" (visually impaired participant using screen magnification and on-screen adjustments).

The above comments suggest visually impaired participants did experience problems relating to the checkpoint failure. Another comment made shows an unrelated problems was also experienced: "the only issue I had was that the world guide in the main body of the page lead to a different page than the world guide on the side bar so it was a bit unclear as to which we were meant to be looking at " (control group participant).

4.2.4 Overall Accessibility

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page and then to comment further.



Six of the participants ranked their overall satisfaction with the accessibility of the page as neither dissatisfied or satisfied or lower. However, as with the problems identified, comments relating to the overall accessibility of the page were not necessarily related to the failure of the checkpoint:

"I could have achieved the task quicker and easier if the page had contained headings" (blind participant using a screen reader).

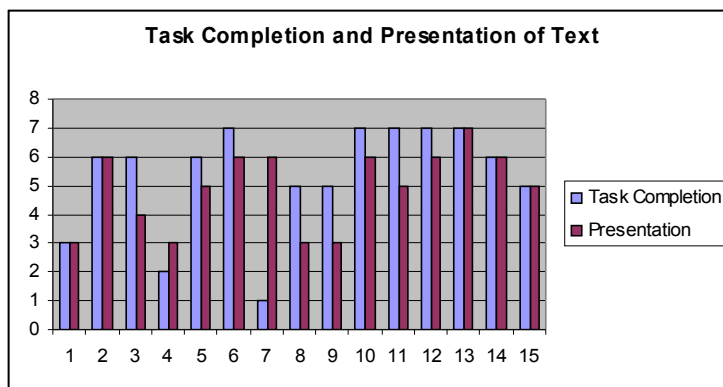
"This homepage contains too much info for one intro page. It is too messy, and not very easy on the eyes" (physically impaired participant not using any assistive technology).

"I was not satisfied because voice recognition did not work on the site" (physically impaired participant using voice output).

4.2.5 Further analysis of Task

The following analysis compares responses to different questions. In particular, those ranked lower than 5 (neither dissatisfied or satisfied, not satisfied or not at all satisfied) or in the case of Problems lower than 4 (minor problem, major problem or catastrophe).

Task completion and presentation of text

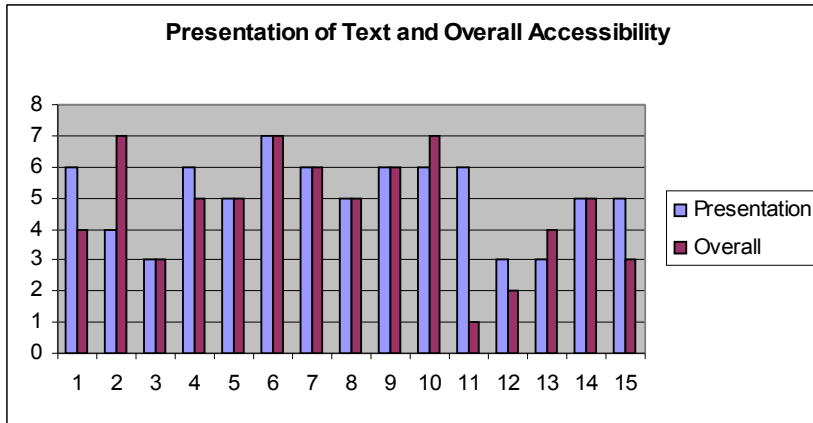


Comparison with satisfaction of completing the task and the accessibility of the text presented on the page show that participants generally ranked these in similar ways. The few differences that are demonstrated show a ranking of not at all satisfied that the task was completed, but satisfaction with the presentation of text (blind participant using a screen reader); satisfied that the task was completed but neither dissatisfied or satisfied with the presentation of the text (blind participant using a screen reader and voice output); and quite satisfied the task was completed, but not very satisfied with the presentation of the text (a visually impaired participant using screen magnification and on-screen adjustments and a physically impaired participant not using any assistive technology).

Task completion and problems

Two participants from the control group ranked problems experienced as a minor problem, but were satisfied or very satisfied that they completed the task. Strangely one blind participant using a screen reader was not at all satisfied the task had been completed, but experienced no problems. No comments were made that could help clarify this difference in ranking.

Presentation of text and overall accessibility



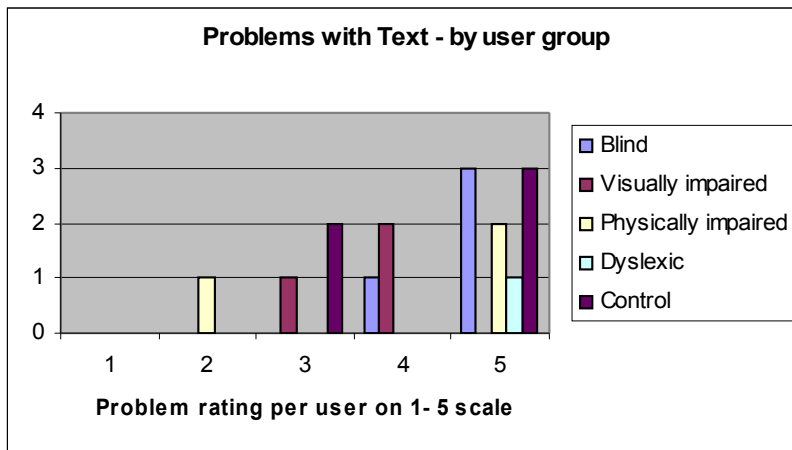
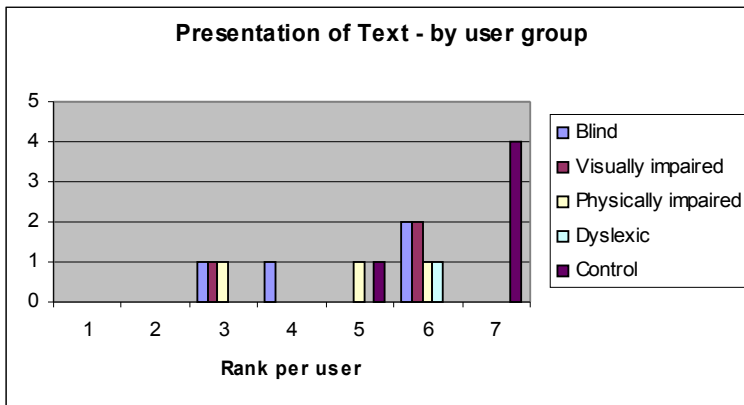
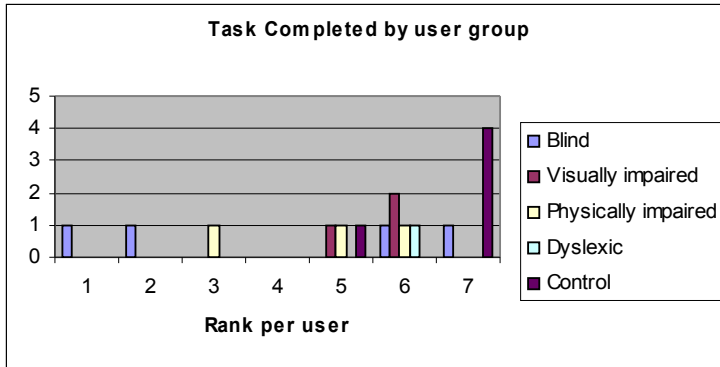
No major differences were noted between participants' satisfaction with the presentation of the text and the overall accessibility of the site. Those who did rank differently were a blind participant using a screen reader, and a blind participant using a screen reader and voice output - in both cases the text would read out to the participant rather than having to access it visually, therefore any accessibility issues would probably not be related to the checkpoint.

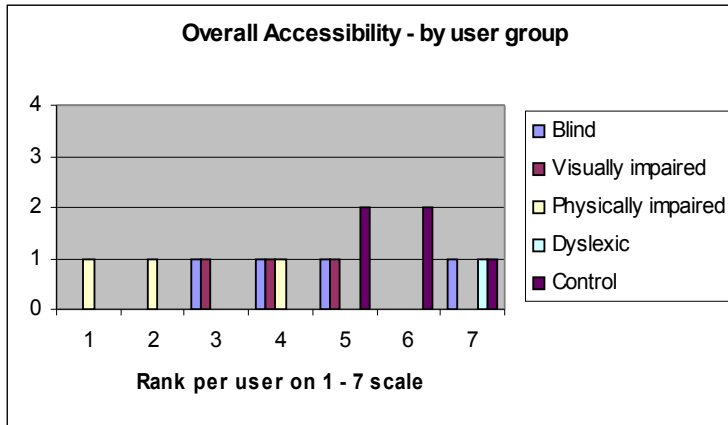
Problems with text and overall accessibility

Some differences are shown between problems experienced and overall accessibility of the page, but this was not necessarily due to a failure of the checkpoint. Two participants from the control group ranked problems with the text as minor but were either quite satisfied or satisfied with the overall accessibility of the page. A physically impaired participant responded as having no problems with the presentation of the text but was unable to use voice output on the page and so was not at all satisfied with the overall accessibility of the page. It is unclear why voice output failed to work.

4.2.6 Comparisons across user groups

Comparisons of response rates across disability and the control groups reveal that blind and visually impaired participants were most likely to rank satisfaction as neither dissatisfied or satisfied or less, although two physically impaired participants were also less satisfied with the overall accessibility of the page.





4.2.7 Summary

Testing this checkpoint reveals that those who experienced problems were using screen magnification or on-screen adjustments. This confirms there is an accessibility problem for these users if the checkpoint fails. Other participants mention accessibility issues unrelated to the checkpoint, such as a lack of headings and cluttered layout. Despite this, the majority of participants were satisfied that they could complete the task.

4.3 Task Three: WCAG Checkpoint 3.5

The purpose of this task is to test whether section headings improve the accessibility of a page.

The WCAG recommend using header elements to convey document structure. The web page which was tested did not conform to this recommendation.

Participants were asked to identify the main sections displayed on the Home Page of an online book and map shop (see Appendix One, Task three). The web page displays the Home Page with a series of section headings and sub-heading that could be visually identified in larger text, but does not use any header elements in the HTML mark-up. Potential problems could be that someone using a screen reader would be unable to identify the main headings through speech and would have to spend more time establishing the different sections of the page.

Following the task, participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

4.3.1 Task completion

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

1= not at all satisfied

2= not satisfied

3= not very satisfied

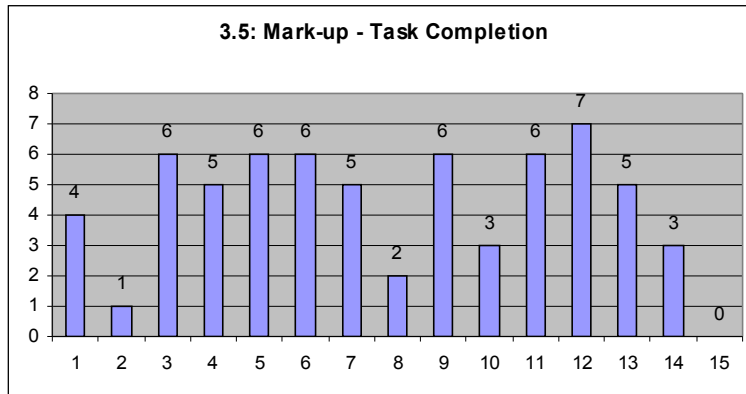
4= neither dissatisfied or satisfied

5= quite satisfied

6= satisfied

7= very satisfied.

They were then asked to comment on this, firstly by providing an answer to the question (in order to verify their completion response), and then to describe how they undertook the task.



Participants were generally very satisfied, satisfied or quite satisfied that they had completed the task. Five participants responded as being neither dissatisfied or satisfied or less. Two reported problems with assistive technology accessing the information which could be directly related to the failure of the checkpoint:

" I tried by pressing the h key which moves the virtual cursor to the next section, and by listing sections with insert+f6, but it could find no sections" (blind participant using a screen reader and voice output).

"Don't know (if task was completed). Set Jaws to look for headings then had a manual looked through the home page" (blind participant using a screen reader).

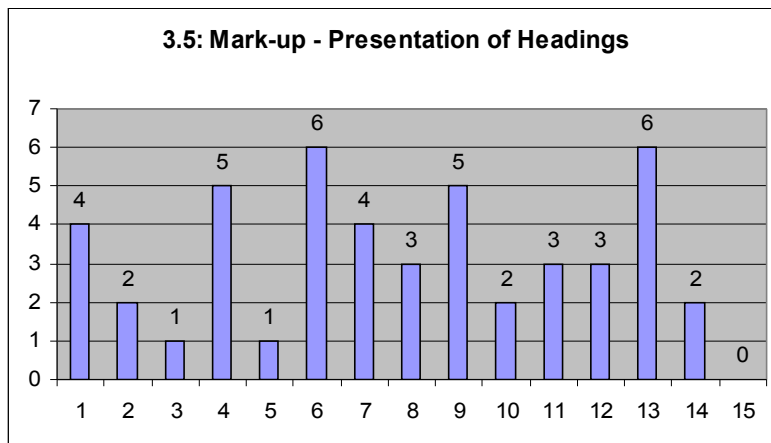
Other comments included:

"Scrolled through, lots of big gaps at the beginning, and then the next 4 headings where close together. If you know what you are looking for it works, also if you are familiar with this site than you can work quite quickly" (physically impaired participant not using any assistive technology).

"I had difficulties with the continents, as the list appeared underneath the countries heading, I did not notice this until later on in the exercise. The pull-down lists for the other sections were good and the sub-list off these were easy to follow. Would have been helpful to have a back tab to go back to the home page" (visually impaired participant using screen magnification and on-screen adjustments).

4.3.2 Presentation of headings (mark-up)

Participants were asked to rank their satisfaction with the presentation of sections on the Home Page:



This shows that generally the participants were less than satisfied with the presentation of the headings with only 4 participants ranking their satisfaction as quite satisfied or above. This is almost certainly due to the failure of the checkpoint - particularly for those using screen reading technologies.

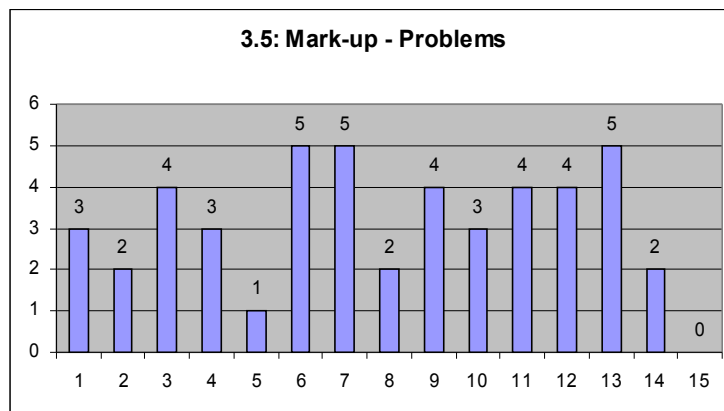
4.3.3 Problems experienced

Participants were asked to rank any problems experienced using the following descriptions:

- 1= catastrophe
- 2= major problem
- 3= minor problem

4= cosmetic problem only

5= not a problem



A mixed response was given to problems experienced. Six participants felt they experienced either minor, major problems, one experienced a catastrophe. To help identify the level of problems experienced and to assess whether problems were related to the checkpoint, participants were asked to comment further. The following could be related to a lack of section headings in the mark-up:

"If there were any headings they did not have a html heading tag which meant Jaws had no way of finding them so they were as much help as a... " (blind participant using a screen reader).

"Had to try a few times before I realised that there were further subheadings from the initial drop down heading" (control group).

"It was difficult to work out the different sections, the page was quite muddled, with things not clearly labelled" (control group).

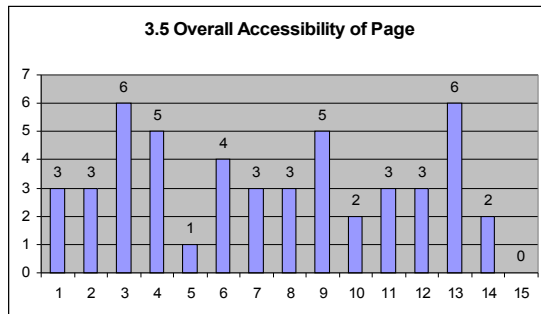
Other problems experienced which may not be related to the failure of the checkpoint were:

"The only issue I had was that the world guide in the main body of the page lead to a different page than the world guide on the side bar so it was a bit unclear as to which we were meant to be looking at" (control group).

"There is too much information on this page" (control group).

4.3.4 Overall accessibility of the page

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page:



Participants were generally less satisfied about the overall accessibility of the page with only four giving a rank of quite satisfied or above. Comments again suggest the checkpoint failure had affected the overall accessibility of the page, even for participants who were not always relying on mark-up to identify the headings and sub-headings:

"Very frustrating, looking for headings that are not there or at least not marked up in an html tag" (blind participant using a screen reader).

"Messy site so hard to direct your search without trying the main headings a few times" (control group).

Also that the general layout of the page made it less accessible to use:

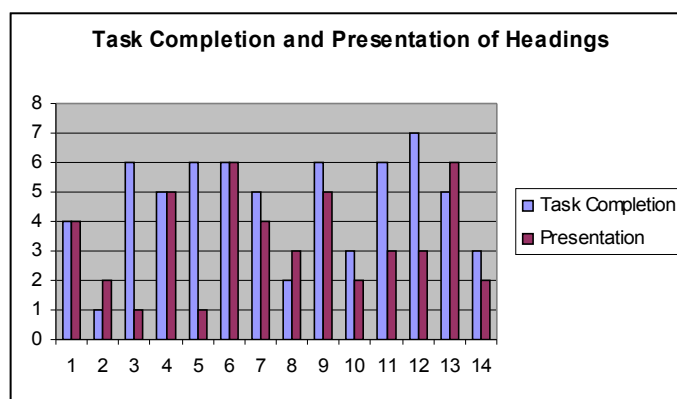
"This homepage contains too much info for one intro page. It is too messy, and not very easy on the eyes" (physically impaired participant not using assistive technology).

"I did not find this page easy to navigate, and I am not visually impaired! Very poor design, too many different text sizes, the information is poorly arranged, it is out of date. The colour is very dull and dark" (control group).

4.3.5 Further analysis of Task

The following analysis compares responses to different questions. In particular, those ranked lower than 5 (neither dissatisfied or satisfied, not satisfied or not at all satisfied) or in the case of problems lower than 4 (minor problem, major problem or catastrophe).

Task completion and presentation of headings

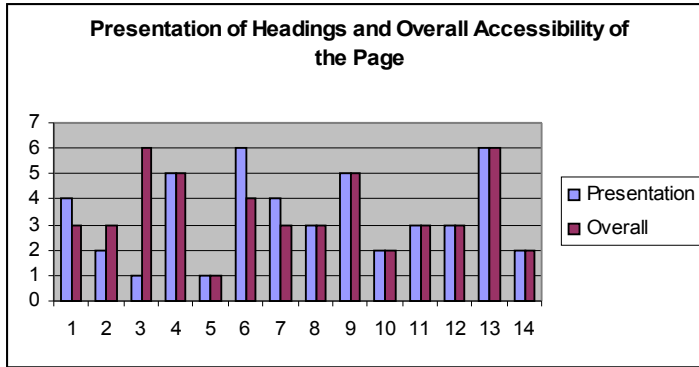


The majority of participants who were quite satisfied or above that they were able to complete the task were also satisfied with the presentation of headings. Four participants whose responses differed between task completion and presentation of headings suggest poor mark-up does not necessarily impede the completion of a task.

Task completion and problems experienced with headings

Task completion and problems experienced were ranked differently by most participants. Two responded as being quite satisfied they completed the task, but experienced minor problems, major problems or in one case a catastrophe. Again this suggests participants are able to complete tasks despite experiencing accessibility problems.

Presentation of headings and overall accessibility of the page



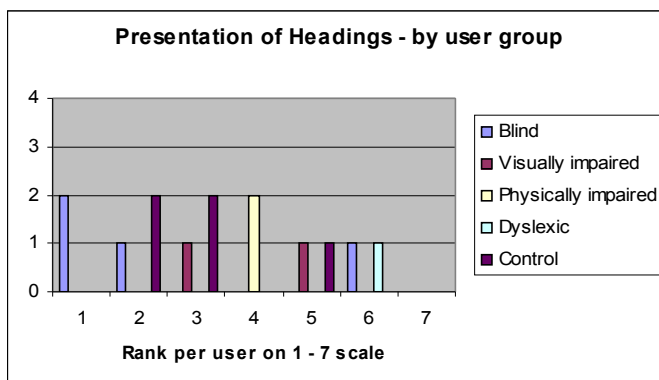
Only two participants responded differently to the presentation of headings and the overall accessibility of the page, both were blind and used screen readers. One found presentation of headings to be not at all satisfactory but overall accessibility to be satisfactory, while the other found presentation of headings to be satisfactory but overall accessibility to be neither dissatisfied or satisfied.

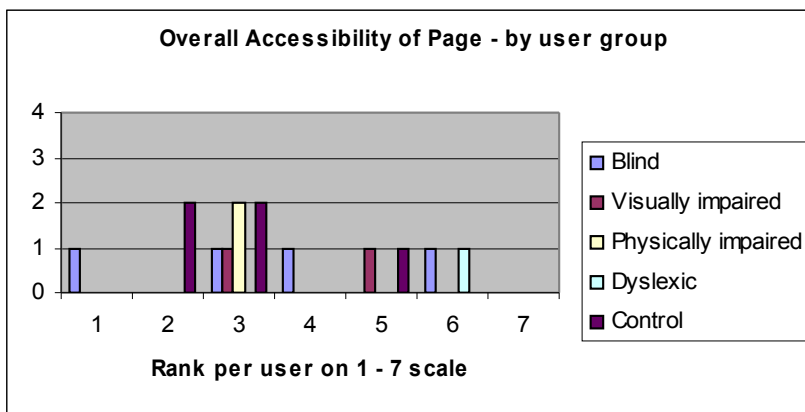
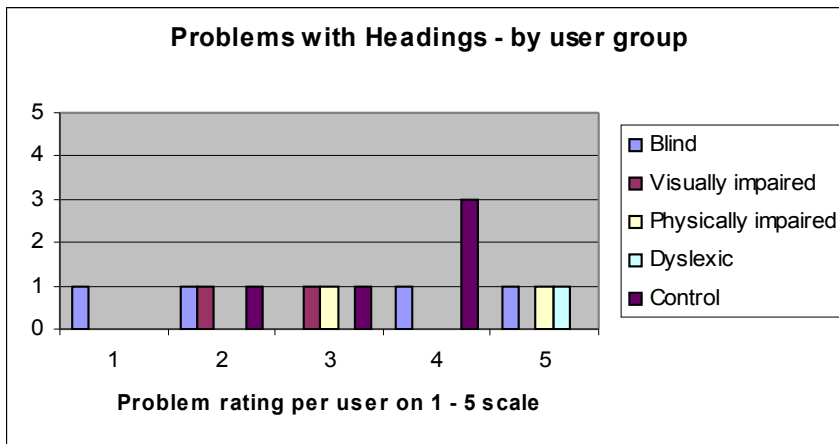
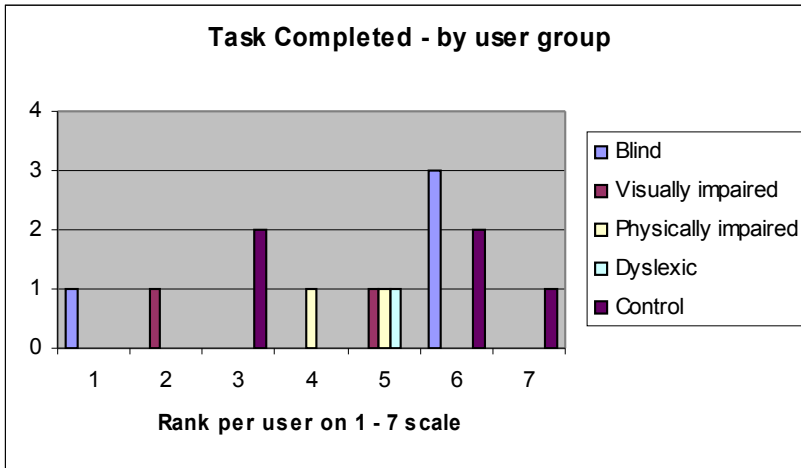
Problems with headings and overall accessibility of the page

Minor differences can be seen between problems experienced with the use of headings and with the overall accessibility of the page, but only two show a slightly greater difference. One blind participant using a screen reader, the other visually impaired and using screen magnification and on-screen adjustments.

4.3.6 Comparisons across user groups

Comparisons across the user groups show that apart from the participant with dyslexia, participants from all user groups ranked satisfaction levels and problems experienced fairly evenly. This suggests that accessibility problems are of a more individual nature rather than applying to a specific user group and that the page tested had other accessibility problems as well as the checkpoint being tested.





4.3.7 Summary

Blind participants using screen readers experienced problems with this task, their comments show that this could directly related to the failure of the checkpoint. Other participants mention accessibility issues relating to the design and layout of the page, not necessarily related to the lack of header elements – although correct mark-up may have helped the situation. Satisfaction with task completion was less than for task one and two and more problems were identified. Overall accessibility of the page again related to layout and design.

4.4 Task Four: WCAG Checkpoint 5.5

The purpose of this task is to test the accessibility of navigating around tables.

The WCAG recommend tables have a SUMMARY attribute, regardless of whether the table is for layout or a data table. The web page which was tested does conform to this recommendation.

Participants were asked to look at a table (see Appendix One, Task Four) and to try and find some specific pricing information that was displayed in the table. The web page which was tested displays a series of licence costs in a table and contains the following summary in the HTML: "This table is a price list for commercial licenses".

Following the task, participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

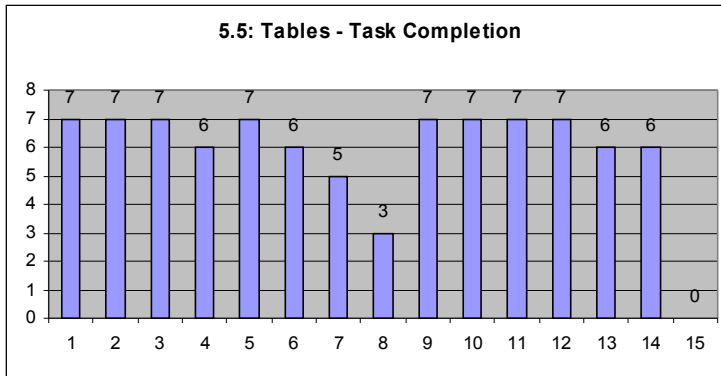
4.4.1 Task completion

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

- 1= not at all satisfied
- 2= not satisfied
- 3= not very satisfied
- 4= neither dissatisfied or satisfied
- 5= quite satisfied
- 6= satisfied

7= very satisfied.

They were then asked to comment on this, firstly by providing an answer to the question (in order to verify their completion response), and then to describe how they undertook the task.



Apart from one participant, all were quite satisfied or above that they had completed the task, with 8 of the 14 very satisfied. The participant who ranked satisfaction as not very satisfied commented: "I think the information was clearly displayed but too much to remember" (visually impaired participant using screen magnification and on-screen adjustments).

Other comments on how they completed the task included:

"I press t to go to the table, alt+control+right to move to the column cost, and alt+control+down to move down a row where the cost for a single website was shown" (blind participant using a screen reader and voice output).

"Starting again from the top of the webpage I read down the page line by line, and then discovered the table, which had a very good graphical description of the table, saying that it was showing the prices for commercial licences. From then on I moved down till I found the start of the table, where the table row titles were read out, and then straight on to the table itself where the information was quickly apparent as to the cost of a licence for a single web site" (blind participant using a screen reader).

"Opening the page and then scrolling down to the relevant table" (visually impaired participant using screen magnification and on-screen adjustments).

"First went to the commercial heading read to the table, found licences, using Jaws table keys read down the column to single website & then along the row. I also checked the Non-commercial licenses table in the same way" (blind participant using a screen reader).

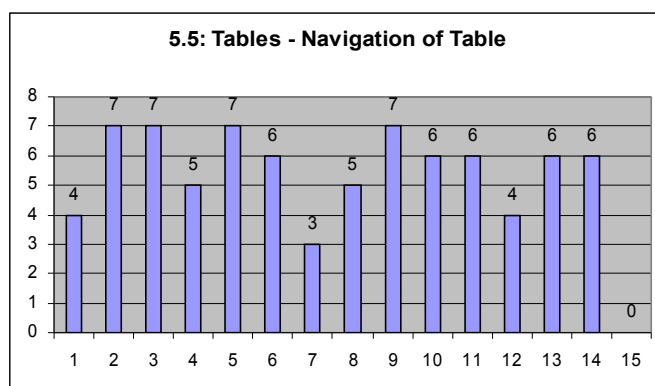
"Once again by using the tabs and arrows" (blind participant using a screen reader).

"scrolled down, but the colours used makes it quite difficult to read, although the download is in a different colour. If that is the web site that they will produce for you, no thank you" (physically impaired participant not using assistive technology).

"Looked at the table" (control group).

4.4.2 Table navigation

Participants were asked to rank their satisfaction with the ability to navigate through the table:



Only 3 participants ranked satisfaction as neither dissatisfied or satisfied or less. These were two physically impaired participants, one using voice output and one not using assistive technology, and one of the control group.

4.4.3 Problems with tables

Using the following description, participants were asked to rank any problems experienced:

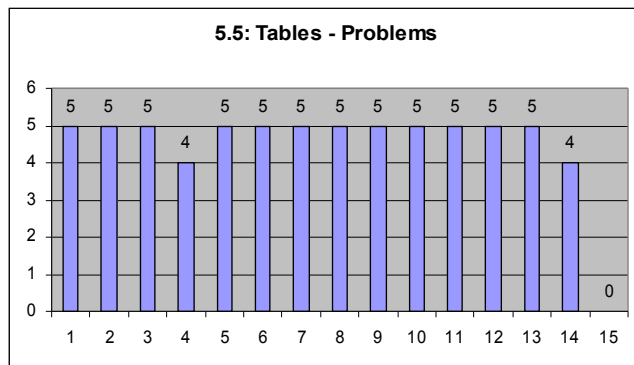
1= catastrophe

2= major problem

3= minor problem

4= cosmetic problem only

5= not a problem



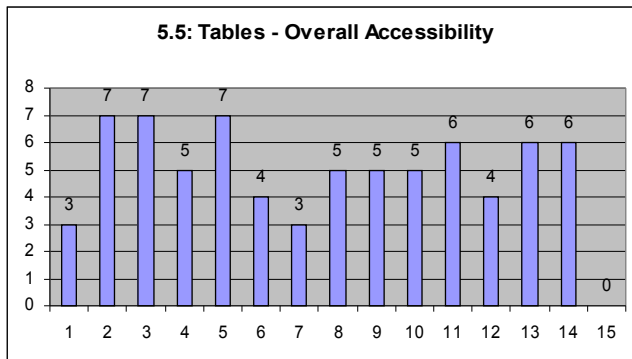
Almost all the participants ranked their experience as having no problems. Only 2 said they experienced a cosmetic problem only. To help identify the level of problems experienced and to assess whether any other problems unrelated to the checkpoint were experienced, participants were asked to comment further. Most commented that there were no problems, for example: "There were not any problems experienced during this task" (blind participant using a screen reader). Only one problem was revealed by one participant:

"At the top the page, there was a list of items on the left-hand side, which obscured some of the text and links" (visually impaired participant using screen magnification and on-screen adjustments).

This suggests a problem with layout in general rather than the ability to navigate through tables.

4.4.4 Overall accessibility of the page

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page:



Again, most commented favourably on the overall accessibility of the page, with satisfaction levels at quite satisfied and above. Comments included:

"I found this task one of the easiest to perform as the web page contains html headings allowing me to navigate the page quickly and with ease" (blind participant using a screen reader).

"I liked layout of this site. Colour contrast good. Text clear, not too many columns" (visually impaired participant using screen magnification and on-screen adjustments).

Some were less satisfied however. Their comments revealed more general accessibility problems rather than problems directly associated with the checkpoint:

"The site was very hit and miss with accessibility by voice recognition. " (physically impaired participant using voice output).

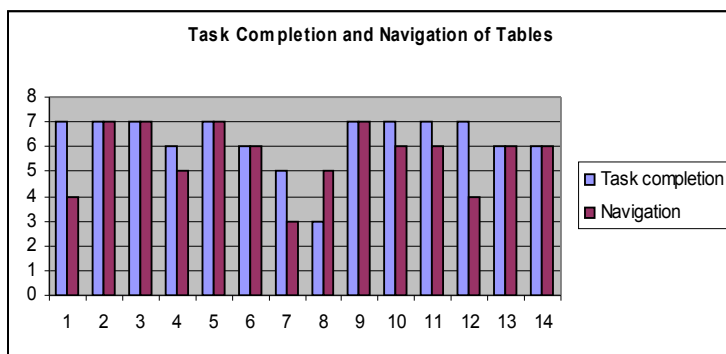
"Their product could be quite good, but the web site itself is very dull and moreover as I have said before not easy to read because of the colours used, and also quite boring" (physically impaired participant not using assistive technology).

"The web site didn't look good and there seemed to be an error with the way the side bar was displayed" (control group).

4.4.5 Further analysis of Task

The following analysis compares responses to different questions. In particular, those ranked lower than 5 (neither dissatisfied or satisfied, not satisfied or not at all satisfied) or in the case of Problems lower than 4 (minor problem, major problem or catastrophe).

Task completion and navigation of tables

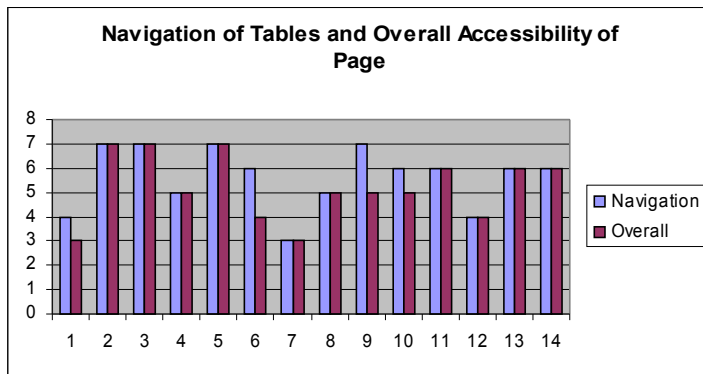


This shows that, in general, task completion and the ability to navigate the table were ranked at the same level of satisfaction. The differences were from 4 participants who were either quite or very satisfied that they had completed the task, but were less satisfied about the ability to navigate the table. These were two physically impaired participants (one using voice output) and one of the control group.

Task completion and problems

Only one participant ranked satisfaction with task completion and problems experienced differently. This participant ranked satisfaction with task completion as not very satisfied but experienced no problems navigating the table for the task.

Navigation of tables and overall accessibility of the page



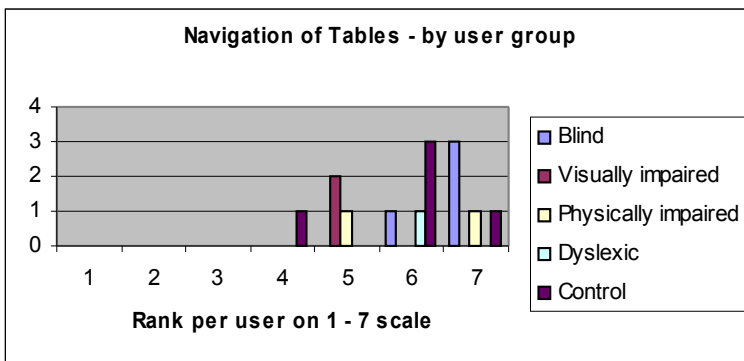
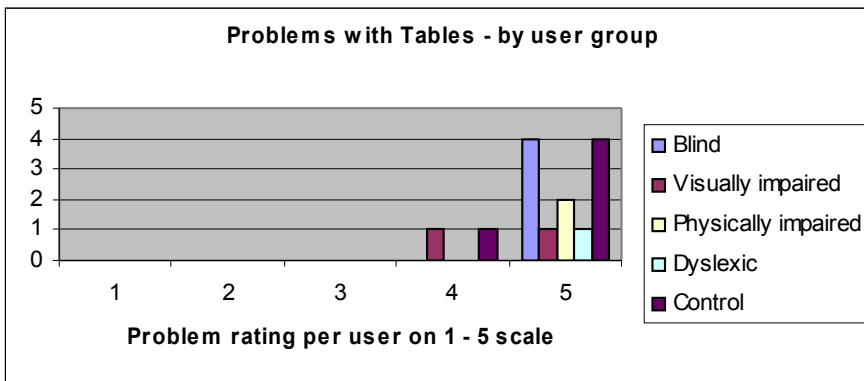
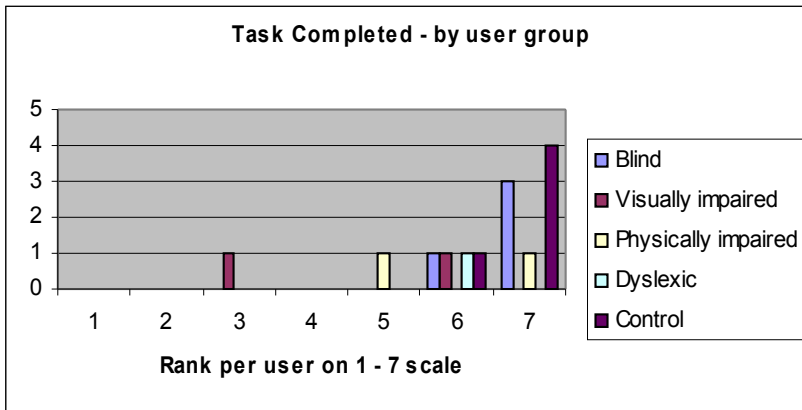
Two participants ranked navigation of tables and overall accessibility of the page differently. One participant was blind and used a screen reader, the other was one of the control group.

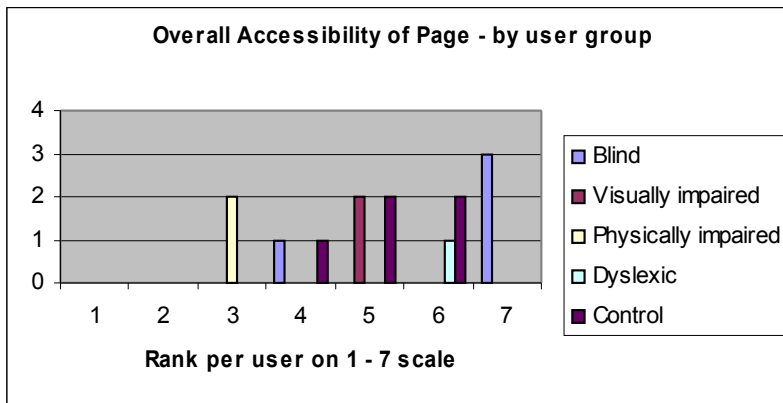
Problems with table and overall accessibility of the page

No major differences between any problems experiences with the table and the overall accessibility of the page.

4.4.6 Comparisons across user groups

Comparisons across the user groups show that apart from the overall accessibility of the page, participants from all user groups ranked satisfaction levels as quite satisfied and higher, with few problems experienced. The overall accessibility of the page was ranked a little lower, in particular by the physically impaired participants. Comments from one participant suggest this was linked to a problem with voice output, which could be related to the design of the table. Another comment related to the overall appearance of the page. One visually impaired participant was not very satisfied that they completed the task, but comments suggest this was because there was too much information to remember rather than being related to the design of the table.





4.4.7 Summary

This task posed no real problems to the participants, suggesting the table was presented in a way that could be read and navigated, and in the case of screen reader users, possibly using the summary provided. It should be noted that participants were not specifically asked to identify the table summary. This was because only participants using screen readers or Braille output would have been able to identify this from the web page, and also because people unused to HTML language may have been confused by this instruction and failed the task due to a lack of HTML knowledge.

A visually impaired participant and one of the control group experienced a 'cosmetic problem' with the page, all other participants did not experience any problems. Some accessibility issues were identified, these related to the page layout in general rather than specifically about the table. One participant had problems getting voice output to work with this page. All but one of the participants felt they were able to complete the task.

4.5 Task Five: WCAG Checkpoint 13.1

The purpose of this task is to test the accessibility of hypertext link descriptions.

The WCAG recommend that hypertext link text should be meaningful enough to make sense when read out of context, either on its own or as part of a sequence of links. The web page which was tested does not fully conform to this recommendation.

Participants were asked to look at a web page with a selection of downloads (see Appendix One, Task Five) and to follow a specific link description and then answer a simple question related to a separate page. The web page displays a number of links to further information and to download software. Some of the links have been given the same descriptive text, but when clicked on lead the user to different pages. A potential problem with this is that searching for information can be more time consuming because it is not clear which description will take the user to the information they want.

Following the task, participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

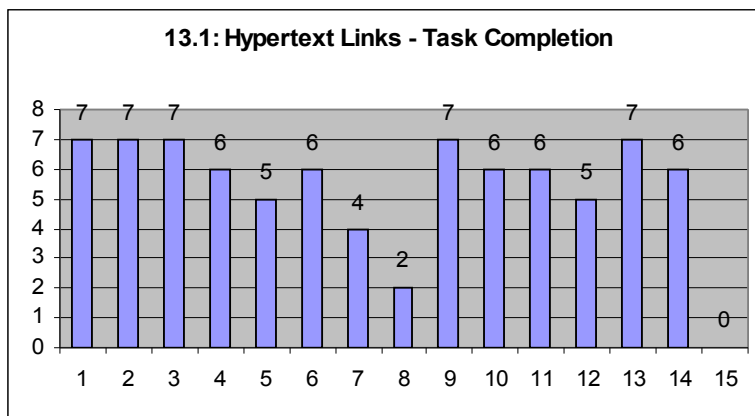
4.5.1 Task completion

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

1= not at all satisfied

- 2= not satisfied
- 3= not very satisfied
- 4= neither dissatisfied or satisfied
- 5= quite satisfied
- 6= satisfied
- 7= very satisfied.

They were then asked to comment on this, firstly by providing an answer to the question (in order to verify their completion response), and then to describe how they undertook the task.



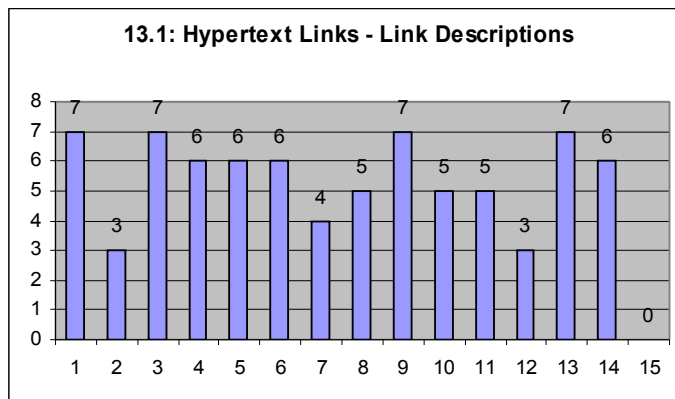
The majority of participants were either quite satisfied, satisfied or very satisfied that they completed the task. Those who were less satisfied commented further:

"The information was on the homepage, but also voice recognition did work on this site" (physically impaired participant using voice output).

"Once the web page was presented, I started looking down the list on the left hand side. I had great difficulty with this as the colours were confusing to my eyes. I then decided to look at the rest of the page and once I had scrolled down found the relevant link" (visually impaired participant using screen magnification and on-screen adjustments).

4.5.2 Descriptions for hypertext links

Participants were asked to rank their satisfaction with the descriptions given for the hypertext links:

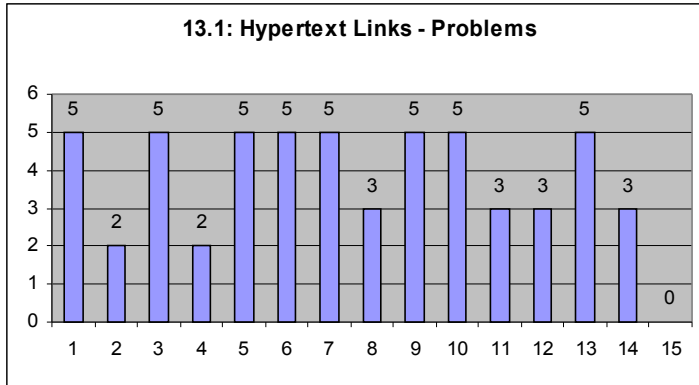


Most were quite satisfied or above with the descriptions given to the hypertext links on the page. Those who ranked satisfaction as neither dissatisfied or satisfied or less were from blind, physically impaired participants and a participant from the control group.

4.5.3 Problems with hypertext link descriptions

Using the following description, participants were asked to rank any problems experienced:

- 1= catastrophe
- 2= major problem
- 3= minor problem
- 4= cosmetic problem only
- 5= not a problem



Four participants ranked problems with the link descriptions as a minor problem and two as a major problem. To help identify the level of problems experienced and to assess whether any other problems unrelated to the checkpoint were experienced, participants were asked to comment further. Responses were:

"problems with left hand side of page" (visually impaired participant using screen magnification and on-screen adjustments).

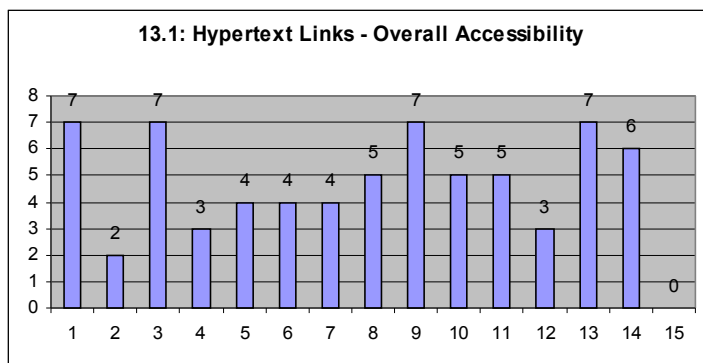
"Although main text easy to read - good contrast - parts of the pages used colours which were irritating and had less contrast. I had to read through quite a bit of text to be sure I had found the right information" (visually impaired participant using screen magnification and on-screen adjustments).

"You have to search through the page to find the link that you need, as there is a lot of information on the page, though the page itself is clearly set out" (control group).

"Clicked on the wrong heading. Initially clicked on the download link and not the link for information" (control group).

4.5.4 Overall accessibility of the page

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page:



This shows a mix of responses to the overall experience, with 3 participants being very satisfied, one satisfied and three quite satisfied. Four were neither dissatisfied or satisfied, two not satisfied and one not very satisfied.

Comments from participants who were less satisfied with the overall accessibility of the page included:

"Their product could be quite good, but the web site itself is very dull and moreover as I have said before not easy to read because of the colours used, and also quite boring" (physically impaired participant not using assistive technology).

" I felt that the item was quite a way down the page and could have been easily missed. There seemed to be too much on the page" (visually impaired participant using screen magnification and on-screen adjustments).

Comments also suggest a negative overall experience was related to the failure of the checkpoint:

"I had to go to more one area to find the correct info which is very time consuming" (blind participant using a screen reader - NB: but ranked the task has having no problems).

"Had to go back and start again as two links for the same product on the sidebar" (control group).

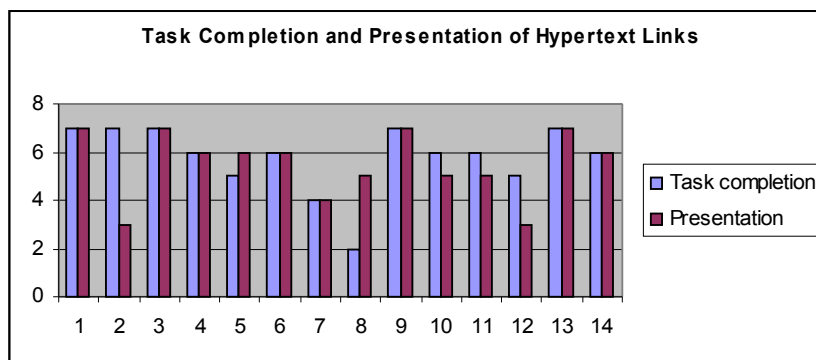
Another comment from a blind participant who was very satisfied with the overall accessibility of the page suggests the failure of the checkpoint could be a problem:

"I already knew before looking at the web site what sort of files are created by Winzip as I have used this software, but* I do think* I still would have been able to have found out this information from the descriptions given in the hypertext on the page had I not already known this " (blind participant using a screen reader).

4.5.5 Further analysis of task

The following analysis compares responses to different questions. In particular, those ranked lower than 5 (neither dissatisfied or satisfied, not satisfied or not at all satisfied) or in the case of problems lower than 4 (minor problem, major problem or catastrophe).

Task completion and presentation of hypertext links.



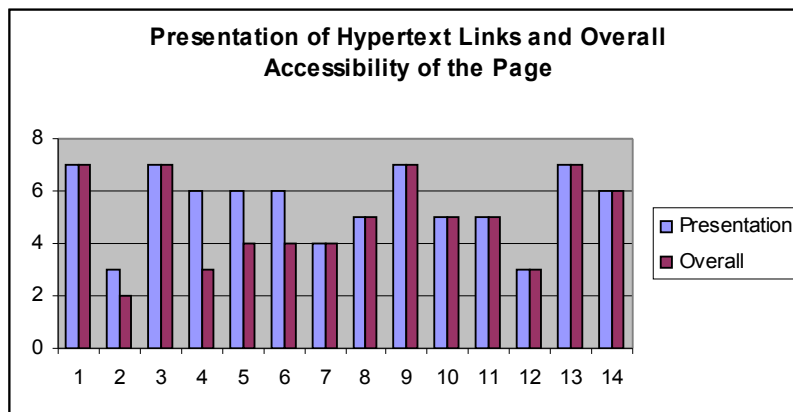
Apart from two participants, no major differences can be seen between task completion and the presentation of hypertext links. One blind participant using a screen reader and voice output was very satisfied with task completion but not very satisfied with the presentation of hypertext links. One visually impaired participant using screen magnification and on-screen adjustments was not satisfied with task completion but quite satisfied with presentation of links.

Task completion and problems with hypertext link descriptions

Some minor differences can be seen between satisfaction with task completion and problems with hypertext link descriptions. One blind participant using a screen reader and voice output was very satisfied with task completion but experienced a major

problem with the presentation of hypertext links. One visually impaired participant using screen magnification and on-screen adjustments was satisfied with task completion but experienced a major problem with the presentation of hypertext links. The control group also experienced major problems with the presentation of links, but were satisfied or very satisfied they were able to complete the task.

Presentation of hypertext links and overall accessibility of the page



No major differences between satisfaction with the presentation of links and the overall accessibility of the page. Where differences did occur these were reported by blind and visually impaired participants.

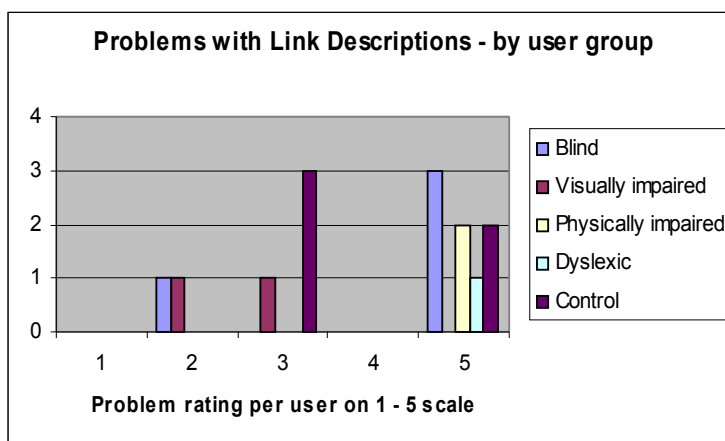
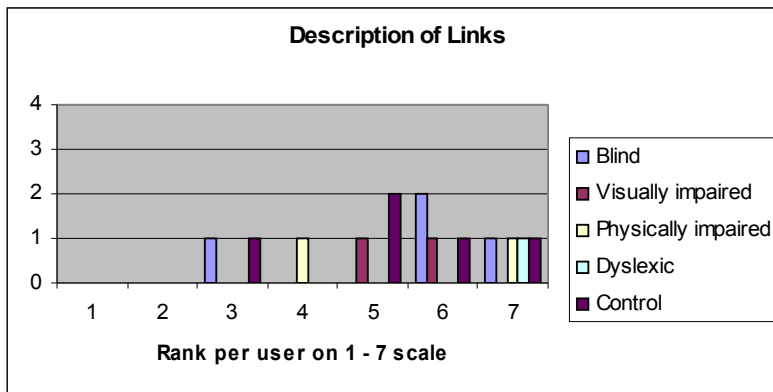
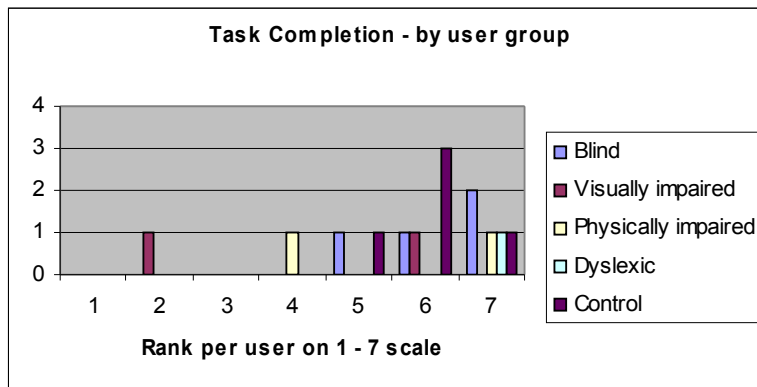
Problems with hypertext link descriptions and overall accessibility of the page

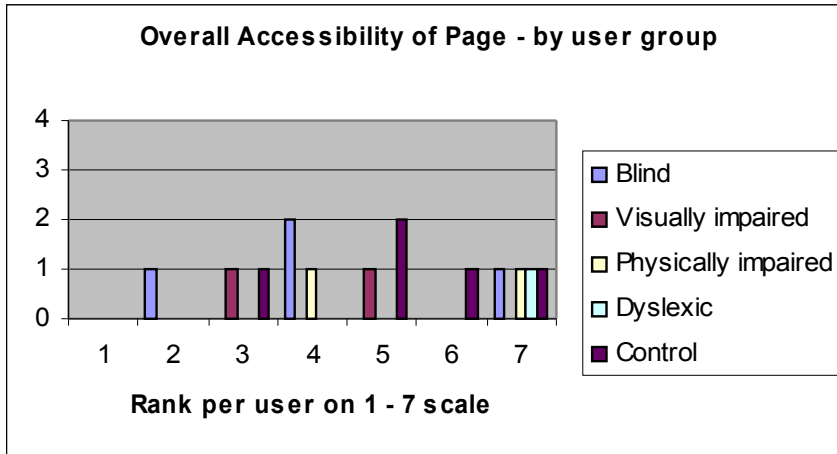
Some minor differences between problems experienced with hypertext links and the overall accessibility of the page. Three participants experienced minor problems with the links but were quite satisfied and satisfied with the overall accessibility of the page. The participants were from the control group and a visually impaired participant using a screen reader and on-screen adjustments.

4.5.6 Comparisons across user groups

Comparison across the different user groups shows that in general they were satisfied that they completed the task and were satisfied with the descriptions given to the hypertext links. The visually impaired participants experienced more problems

than any other group, but satisfaction with the overall accessibility of the page was evenly spread across all groups.





4.5.7 Summary

The problems identified with this page were mainly unrelated to the hypertext link descriptions. However, two participants did notice that two of the links in the task were given the same description and this meant they had to try both of them to find the information required. Other accessibility issues identified related to colours and the layout of information. The majority of participants felt they were able to complete the task, suggesting the failure of the checkpoint may not be a complete barrier to task completion but will simply make it more time consuming.

5 Tasks undertaken for Test Site Two

Fourteen participants were asked to undertake the tasks and evaluations for Test Site Two. These included:

- Two blind participants, one using a screen reader, one using a screen reader and Braille output.
- Four visually impaired participants, one using screen magnification and a screen reader, one using screen magnification and two using on-screen adjustments.
- One visually impaired and dyslexic participant, using a screen reader.
- Two dyslexic participants, neither using assistive technologies.
- Five control group participants, none using assistive technology.

All participants had experience using the Web (2 years or more) and were comfortable using their particular assistive technology.

All 14 completed the 5 tasks and evaluations.

5.1 Task One: WCAG Checkpoint 5.5

The purpose of this task is to test the accessibility of navigating through tables.

The WCAG recommend tables have a SUMMARY attribute, regardless of whether the table is for layout or a data table. The web page which was tested does not conform to this recommendation.

Participants were asked to look at a page of news items (see Appendix Two, Task One) and to find out the date of a specific press release. The web page displays a list press items on its News Page. These are displayed using a table, with the date of the press release in one cell and the description of the press release in another. No summary has been provided for this table.

Following the task, participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

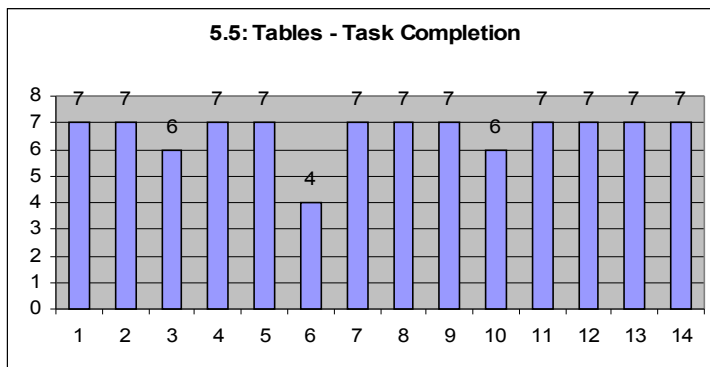
The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

5.1.1 Task completion

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

- 1= not at all satisfied
- 2= not satisfied
- 3= not very satisfied
- 4= neither dissatisfied or satisfied
- 5= quite satisfied
- 6= satisfied
- 7= very satisfied.

Participants were also asked to comment on this by providing an answer to the question (in order to verify whether the task had been completed correctly or not).



Almost all the participants were satisfied they had completed the task. Only one participant, from the dyslexic user group, was neither dissatisfied or satisfied, commenting:

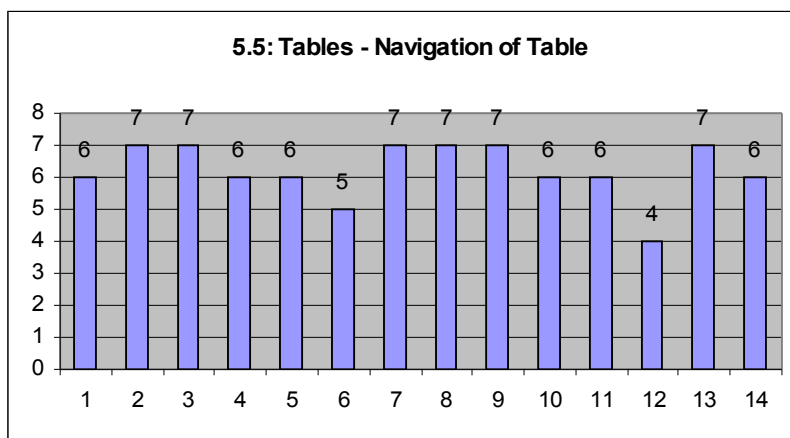
"I clicked on the right hand side and then looked all the way down the article ! No date, so I back paged and then noticed that the left hand column was the published date. Logically I should have looked left right, but did not. Was it because the top of the 2 columns was a single block ?" (dyslexic user, not using assistive technology).

A participant from the blind user group was satisfied with task completion, but commented:

" Used Jaws key to move to table and moved down row by row. Found entry looking for and moved back to date. Would have been easier with JFW V7 table navigation (blind participant using a screen reader).

5.1.2 Table navigation

Participants were asked to rank their satisfaction with the ability to navigate through the table.

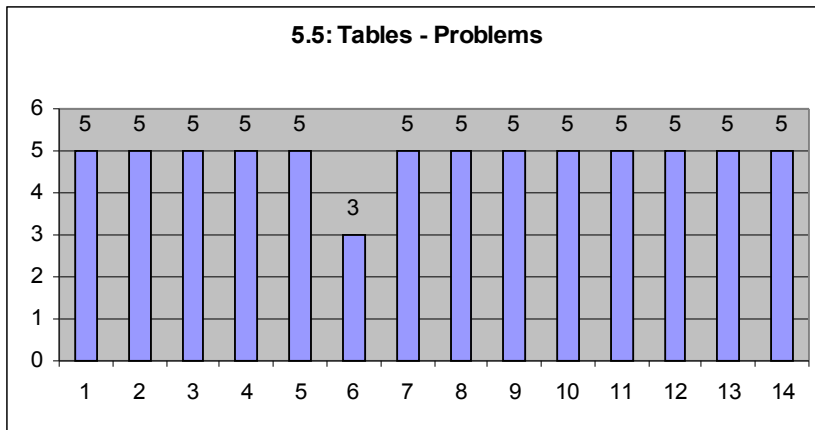


Most were satisfied with the ability to navigate through the table to find the information required, although one participant from the control group was neither dissatisfied or satisfied.

5.1.3 Problems with tables

Using the following description, participants were asked to rank any problems experienced:

- 1= catastrophe
- 2= major problem
- 3= minor problem
- 4= cosmetic problem only
- 5= not a problem



All but one of the participants experienced no problems with this task. To help identify the level of problems experienced and to assess whether any other problems unrelated to the checkpoint were experienced, participants were asked to comment further. One participant from the dyslexic user group experienced a minor problem completing the task:

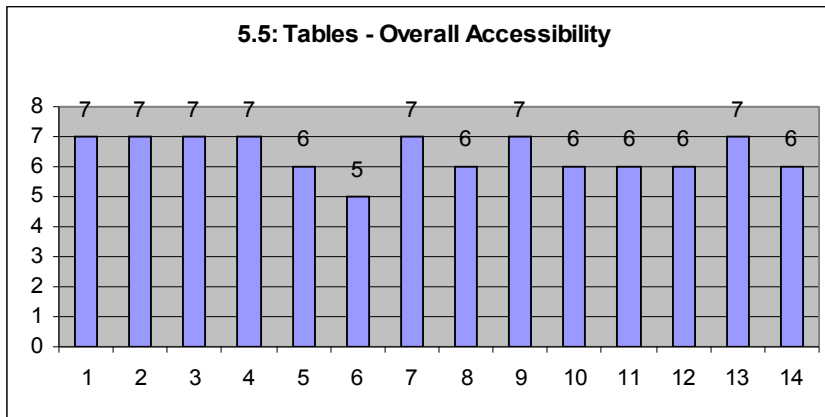
"Missing the date and looking took quite a while. So was a tad frustrating, but my own fault. After thinking about it, could be that an English brain is looking for 21 May 2003 not May 21" (dyslexic participant not using assistive technology).

A participant from the visually impaired user group commented on a possible problem, but ranked the task as having no problems:

"Only had to read through the navigation links at the beginning of the page before I arrived at the table" (visually impaired participant using screen magnification and a screen reader).

5.1.4 Overall accessibility of the page

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page:



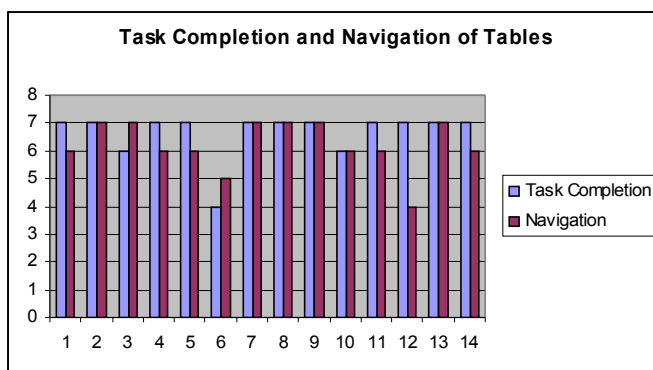
Participants were either very satisfied or satisfied with the overall accessibility of the page. Although satisfied with overall accessibility, some participants commented:

"New table navigation in Jaws V7 would have made an easy task even easier" (blind participant using a screen reader).

"The table is a little small, but not actually difficult to follow" (control group participant).

5.1.5 Further analysis of Task

Task completion and navigation of tables

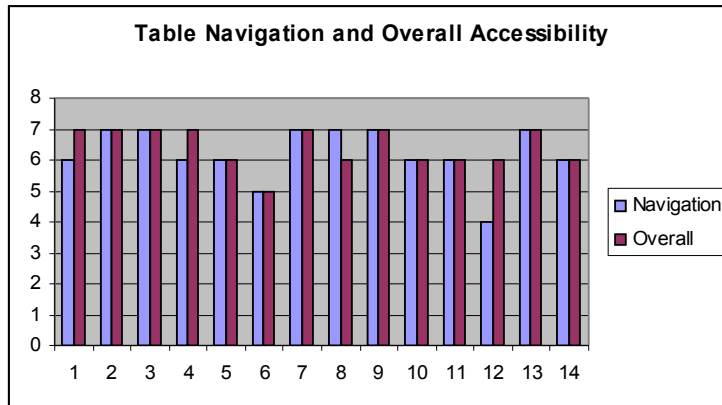


No major differences between these two variables apart from one of the control group participants who was satisfied with task completion but neither dissatisfied or satisfied with the navigation of the table.

Task completion and problems experienced

There were no major differences between these two variables.

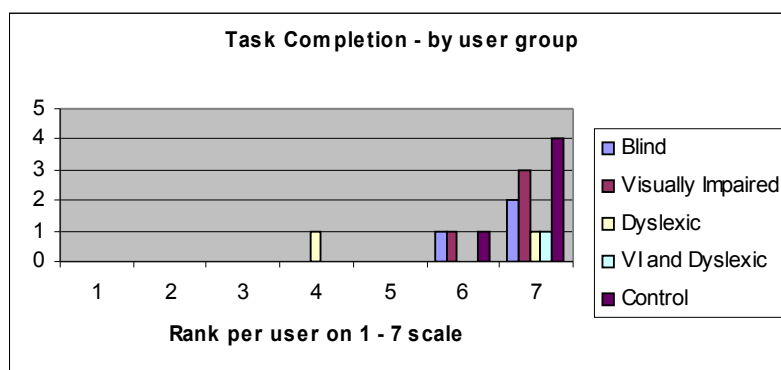
Table navigation and overall accessibility

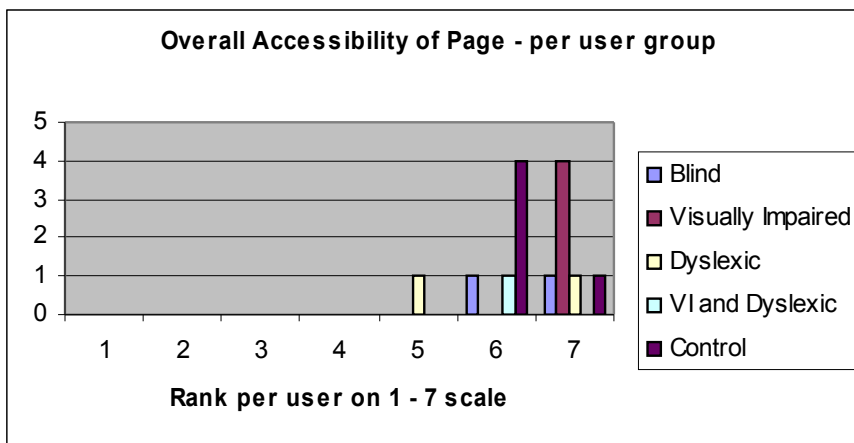
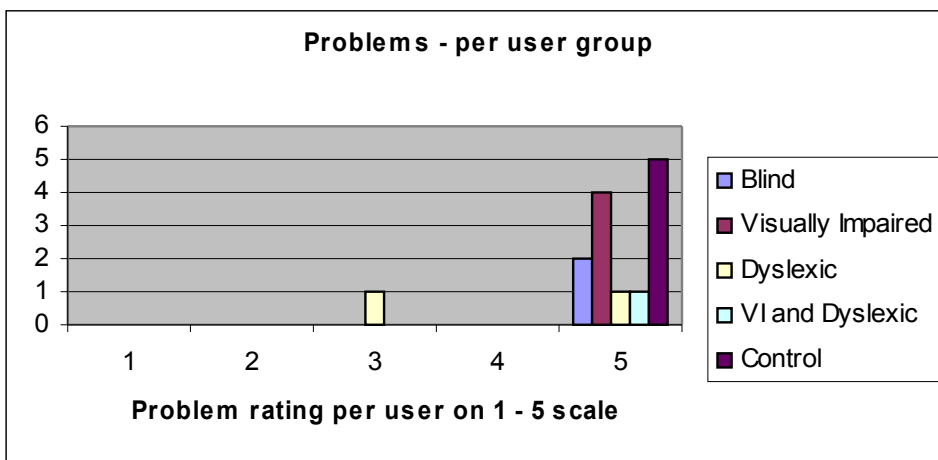
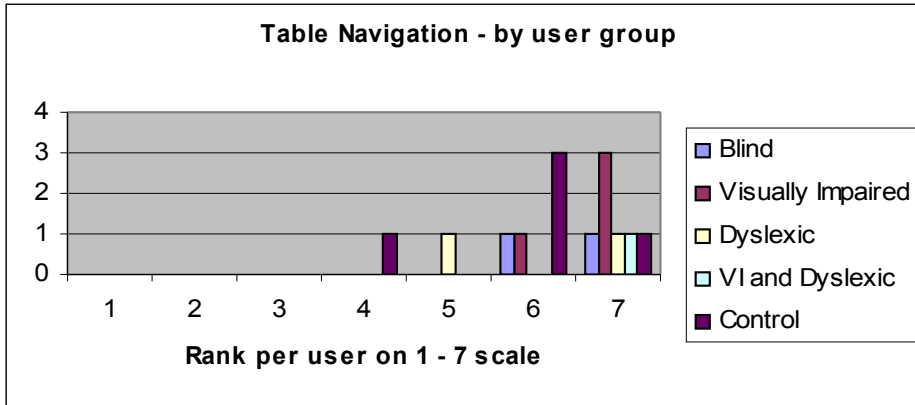


No major differences between these two variables apart from a participant from the control group who was neither dissatisfied or satisfied with the ability to navigate the table and the overall accessibility of the page.

5.1.6 Comparisons across user groups

Most participants ranked the ability to undertake this task with a high level of satisfaction and with no problems. The only participants to be less satisfied and to experience some problems were from the dyslexic user group and the control group.





5.1.7 Summary

No major accessibility issues were identified with this task or with the web page overall. This suggests that when tables have been properly labelled but have not been provided with a summary they are still generally accessible. It should be noted that participants were not specifically asked to identify the table summary. This was because only participants using screen readers or Braille output would have been able to identify this from the web page, and also because people unused to HTML language may have been confused by this instruction and failed the task due to a lack of HTML knowledge.

5.2 Task Two: WCAG Checkpoint 5.6

The purpose of this task is to test the accessibility of descriptions used in tables.

The WCAG recommend providing abbreviations for header labels, for example in HTML use the “abbr” attribute on the TH element. The web page which was tested does not conform to this recommendation.

Participants were asked to look at a table of data (see Appendix Two, Task Two) and find some specific data relating to one of the columns. The web page displays tabular data relating to reports of influenza by week, age range, total reports, total patients, and percentages. Each of the nine columns and rows had been labelled, but no abbreviations have been applied.

Participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

5.2.1 Task completion

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

1= not at all satisfied

2= not satisfied

3= not very satisfied

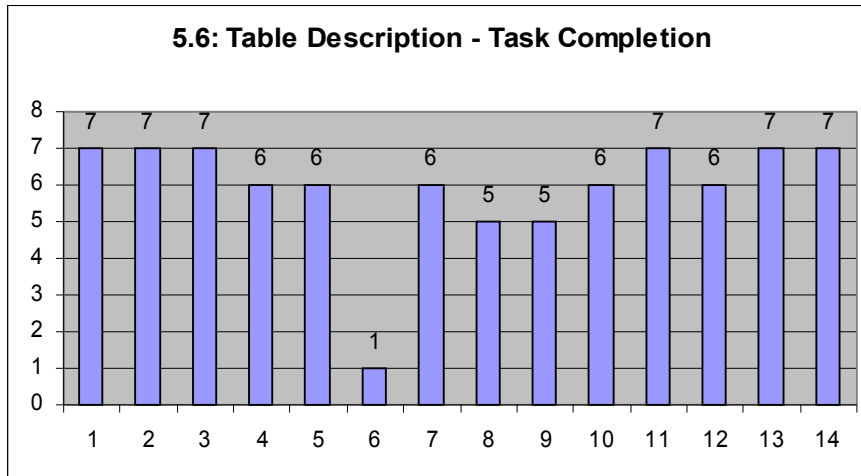
4= neither dissatisfied or satisfied

5= quite satisfied

6= satisfied

7= very satisfied.

Participants were also asked to comment on this by providing an answer to the question (in order to verify whether the task had been completed correctly or not).



The majority of participants were very satisfied, satisfied or quite satisfied they had completed the task. Only one participant from the dyslexic user group was not at all satisfied and commented:

"Well I looked down the left hand column and found 45. Then following this line I looked along the top line for the wording "Patient Visits" I spotted Total Patients and 281564. But my subconscious brain had already scanned the first few columns and I was sure it was far too high a number. (If the answer looks or feels wrong it most likely is wrong) ... So I got out the calculator and Total ILI = 5126 is/was the correct answer..... Nothing in the wording leads you in this direction" (dyslexic participant not using assistive technology).

Despite a lack of the abbreviation attribute for the TH element, blind and visually impaired participants using screen readers and Braille output were able to identify the information required using the table:

"Used down arrow on my screen reader to read through the column headings. Used magnification to position my reading cursor on the row for week 45 and then used the down arrow to read through the column values for that row" (visually impaired participant using screen magnification and a screen reader).

"Located the only table on the page as in task 1, then ran down the left-hand column until I came to the relevant week. Then navigated across the row until I came across the total field on the right. I have JAWS set to read both row and column titles so it read the headings as I navigated along the row" (blind participant using a screen reader and Braille output).

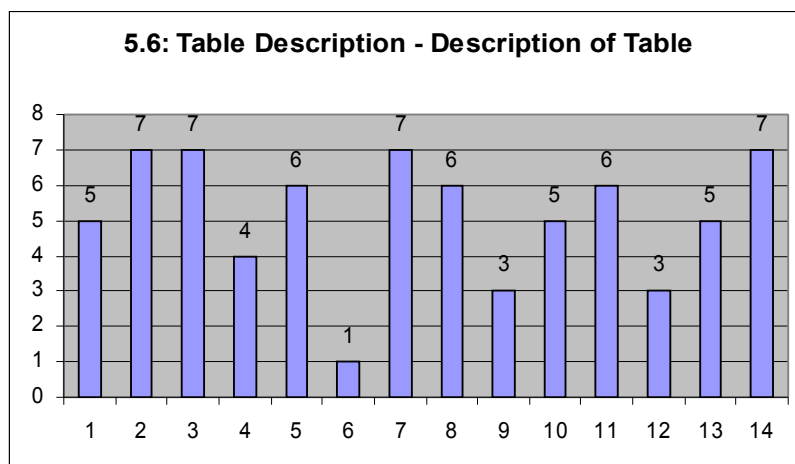
"I had loaded JFW version 7. Found start of table and read column descriptions. Moved down table to week 45 then read off value in Total column" (blind participant using a screen reader).

One participant who was quite satisfied with task completed commented on the following:

"I found this quite difficult, but my speech programme told me there was 9 rows and I gradually worked it out from then, trying to remember which column had the correct heading I was looking for" (visually impaired and dyslexic participant using a screen reader).

In this case, an abbreviation for header labels may have helped this participant further.

5.2.2 Table header descriptions

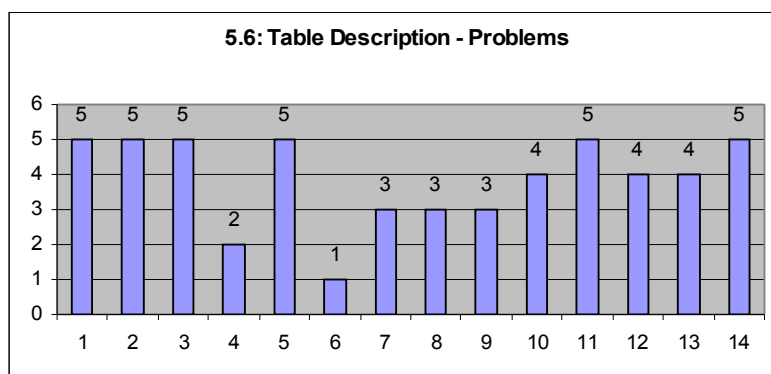


A mixed response was given to the descriptions given to tables with 4 participants ranking satisfaction levels as not very or less. Those who ranked satisfaction low were from the dyslexic, visually impaired and control user groups.

5.2.3 Problems with table descriptions

Using the following description, participants were asked to rank any problems experienced:

- 1= catastrophe
- 2= major problem
- 3= minor problem
- 4= cosmetic problem only
- 5= not a problem



Another mixed response was given to problems experienced with 5 participants experiencing minor problems (control group and visually impaired user group), major problems (visually impaired user group) and one catastrophe (dyslexic user group). To help identify the level of problems experienced and to assess whether any other problems unrelated to the checkpoint were experienced, participants were asked to comment further. Comments revealed problems identifying the columns even when column headings were applied:

"No indication of what column I was on when the values were being read out, I had to remember roughly what the column headings were and then use magnification to attempt to verify my memory. I wonder what you mean by table descriptions since the

only ones I saw (or heard!) were the column headings at the top of each column and those were only read out when I moved through them, not when I moved through the actual column values" (visually impaired participant using a screen reader and screen magnification).

"It just took a few minutes to work out the visual layout and listen a bit more and slightly longer to my speech programme" (visually impaired and dyslexic participant using a screen reader).

This suggests additional abbreviations may have been useful.

Other problems related to the design of the table rather than the mark-up:

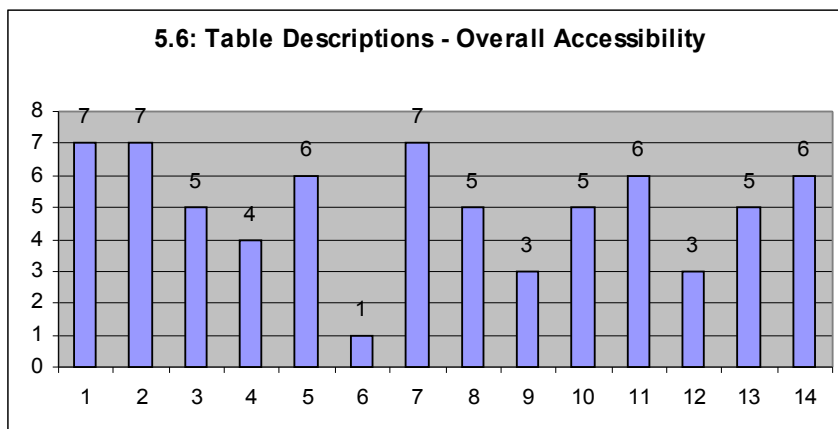
"It was difficult to read the headings. Some of them were too squashed up and abbreviated. While I wouldn't say it was difficult, the way the table was laid out meant you had to really concentrate to follow the information across" (control group).

"layout and headings of the table was not very clear or easy to read" (control group).

"The table was not as clear as it could be, some colour shading would help" (dyslexic participant not using assistive technology).

5.2.4 Overall accessibility of the page

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page and to comment on their overall experience:



Four participants ranked overall accessibility of the page as being neither dissatisfied or satisfied or less.

In general, any accessibility issues were not necessarily related to failure of the checkpoint. However, one visually impaired participant commented:

"In a larger table or looking at rows which were way down the table I would have had major problems lining up the values that were being read with the column headings" (visually impaired participant using screen magnification and a screen reader).

One participant from the dyslexic user group found the use of the abbreviation in the table itself (not the mark-up) to be an accessibility barrier:

"When people use abbreviations I go red. They should always add at the end what they mean. ILI !! MEANS VISITS, BUT NONE FROM THIS WORLD WOULD EVER KNOW" (dyslexic participant not using assistive technology).

Control group participants were also less satisfied with the overall accessibility of the page, again this related to table design and presentation rather than the checkpoint being tested:

"The table could be presented in a slightly more use friendly way, i.e. some colour to distinguish the different sections" (control group).

"Did not like the table layout or the fact that the text was not wrapped so some of the headings were not complete. Some acronyms were not clear as to what they stood for in the table headings" (control group).

Other accessibility issues identified by participants related to poor use of colour rather than to the use of the abbr attribute:

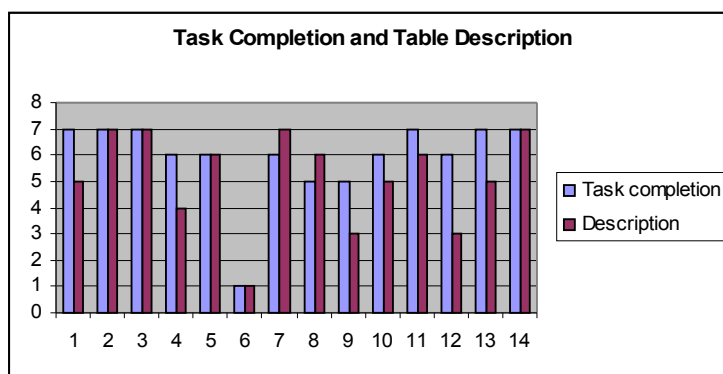
"The gridlines were a bit fussy and the digits may have been more visible in bold or a different bright colour such as red or orange" (visually impaired participant using screen magnification).

Not all participants experienced problems however:

"I loaded version 7 for Jaws and enabled sc document layout mode- table rows read as single row. Very simple to find required value" (blind participant using a screen reader).

5.2.5 Further analysis of Task

Task completion and table description

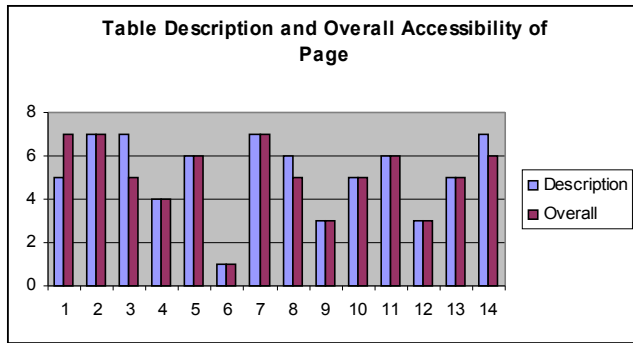


Some minor differences between the two variables. This suggests that even when participants were less satisfied with the descriptions given to the table they were still able to complete the task.

Task completion and problems experienced

Some minor differences between these two variables. Apart from one participant who experienced a catastrophe and was not at all satisfied with task completion, other participants who experienced problems were still satisfied with task completion.

Table description and overall accessibility of page



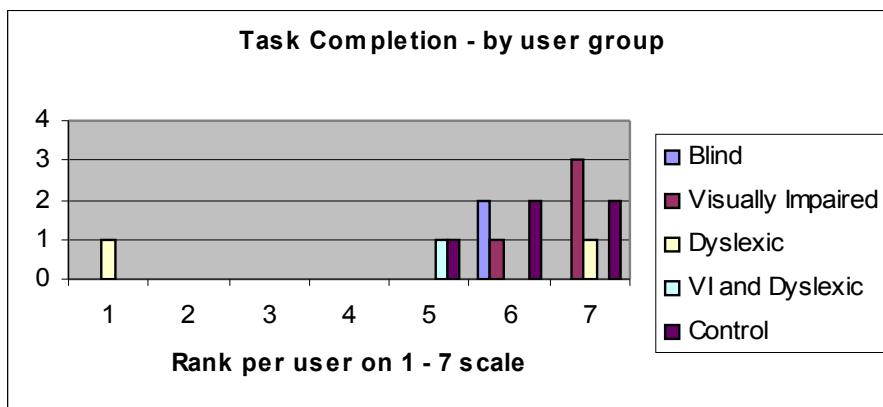
No major differences between these two variables, apart from 2 participants where minor differences occurred. Both participants were from the visually impaired user group.

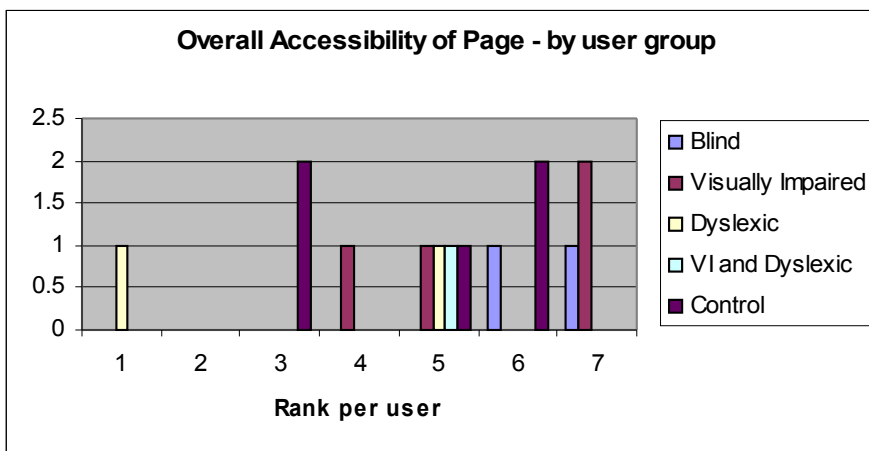
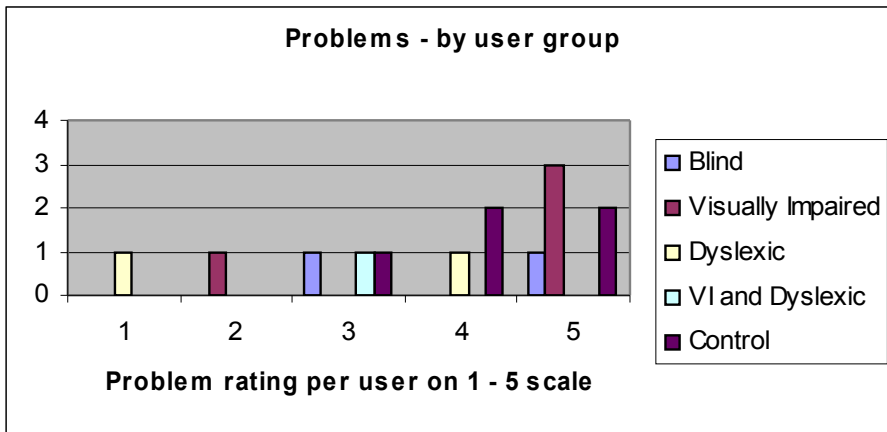
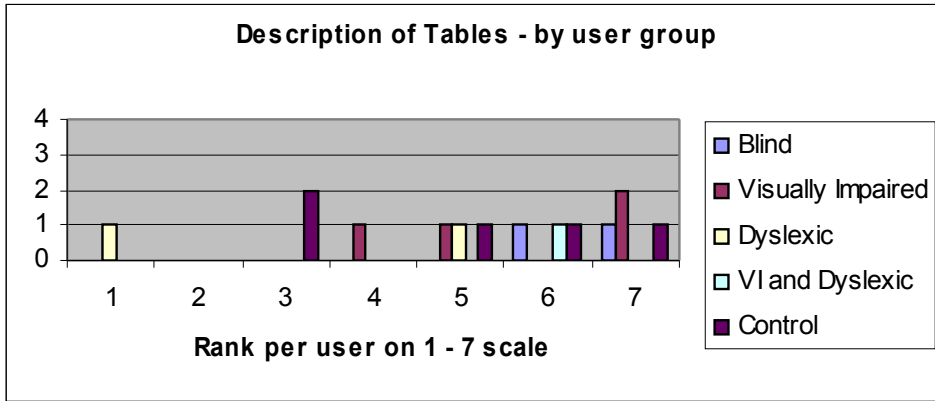
Problems and overall accessibility of the page

Some minor differences between these two variables where participants who ranked problems as minor or major but were satisfied with the overall accessibility of the page.

5.2.6 Comparisons across user groups

Participants from the dyslexic user group and the control group identified the most problems with this task. The accessibility issues and problems identified did not, however, necessarily relate to the checkpoint tested but to other issues.





5.2.7 Summary

Responses suggest the lack of the abbr attribute on the TH element does not necessarily impede the completion of the task. However, comments from visually impaired participants using screen readers suggest the abbr attribute may have helped improve accessibility of the page. The participant who experienced the most problems was not using screen readers or Braille output. This suggests more of a usability problem which may be difficult to evaluate against a checkpoint.

5.3 Task Three : WCAG Checkpoint 9.4

The purpose of this task is to test the accessibility of navigating using the tab key only.

The WCAG recommends creating a logical tab order through links, form controls, and objects. The web page which was tested does not conform to this recommendation.

Participants were asked to look at a contact page (see Appendix Two, Task Three) and find the contact email of a specific organisation. All participants were asked to do this using the tab key and then assess their experience and observations. The web page provides information for visitors to the website, including contact addresses, emails, how to register, useful links etc. No order has been specified in the HTML but the tab key does appear to move logically through the page.

Participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

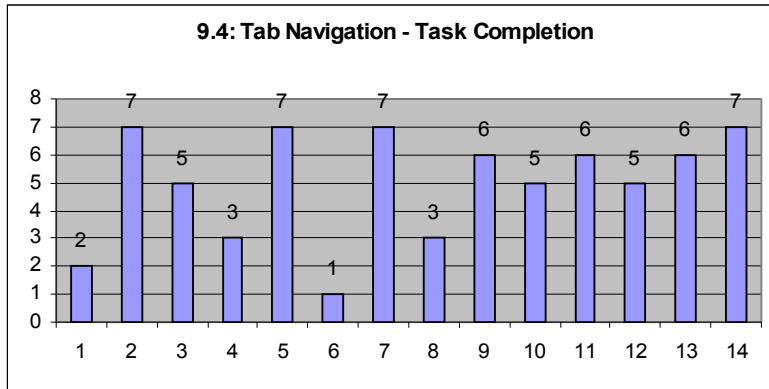
5.3.1 Task completion

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

- 1= not at all satisfied
- 2= not satisfied
- 3= not very satisfied
- 4= neither dissatisfied or satisfied
- 5= quite satisfied
- 6= satisfied

7= very satisfied.

Participants were also asked to comment on this by providing an answer to the question (in order to verify whether the task had been completed correctly or not).



Most participants were quite satisfied, satisfied or very satisfied with task completion. Four were less satisfied ranking completion as not very or not satisfied:

"Yes but only the text of the link was read out. Pressed the Tab key repeatedly, listening to the link provided. I heard something that might have been an email address but it did not say what it was or who it was for" (visually impaired participant using screen magnification and a screen reader).

"Using the tab key only I went through the page 3 times but did not find anything I was comfortable with. For this exercise I switched on my screen reader but it did not help" (visually impaired participant using on-screen adjustments and a screen reader).

"slow" (visually impaired and dyslexic participant using a screen reader).

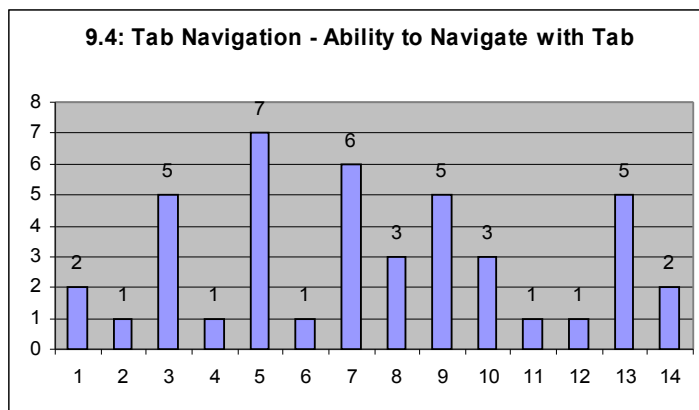
Participants from the blind user group and using screen readers were very satisfied with task completion, finding the tab order to be logical to them despite no order being specified in the HTML:

"Extremely easy. Pressed Tab key and came to link to pass navigation. Pressed space bar to move to main page. Pressed Tab once more and I was on the send mail

link. (If I had not pressed space bar I would have got same result but with a few more Tab presses.)" (blind participant using a screen reader).

"Tabbed around until I came to the sendmail link. I was tempted to click on the "Contact us" link, but found the sendmail link following another couple of tabs" (blind participant using a screen reader and Braille output).

5.3.2 Tab only navigation



A low satisfaction response was given to the ability to navigate using the tab key only. It should be noted that this could be due to the fact that some participants would not usually use the tab to navigate in this way and this is reflected in the analysis of responses from participants using screen reading and Braille technologies where satisfaction was generally higher. However, comments made about the tab order are still useful as a method of testing this checkpoint.

5.3.3 Problems experienced with tab only navigation

Using the following description, participants were asked to rank any problems experienced:

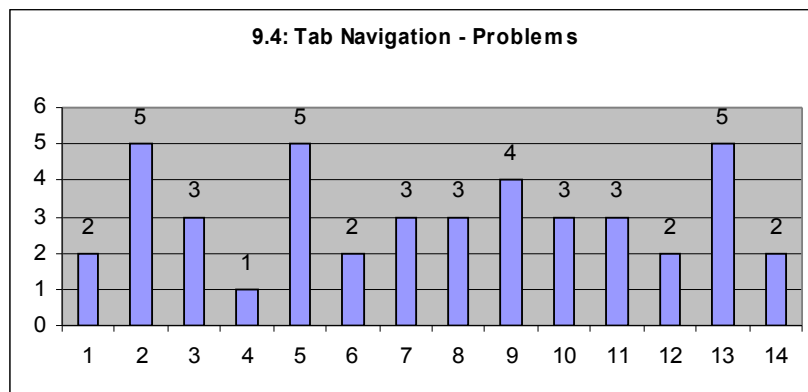
1= catastrophe

2= major problem

3= minor problem

4= cosmetic problem only

5= not a problem



To help identify the level of problems experienced and to assess whether any other problems unrelated to the checkpoint were experienced, participants were asked to comment further. As mentioned above, some of the problems identified could be attributed to the fact that participants would not usually use the tab key to navigate:

"Not knowing where the tab would next take me, but eventually it was quite logical. A new technique for me; therefore I would expect some confusion" (visually impaired participant using screen magnification).

"The cursor tabbed to the links but just did not seem to be an e-mail address except for the one with the full path at the top of the window " (visually impaired participant using (visually impaired participant using on-screen adjustments).

Other problems identified were not necessarily related to tab navigation:

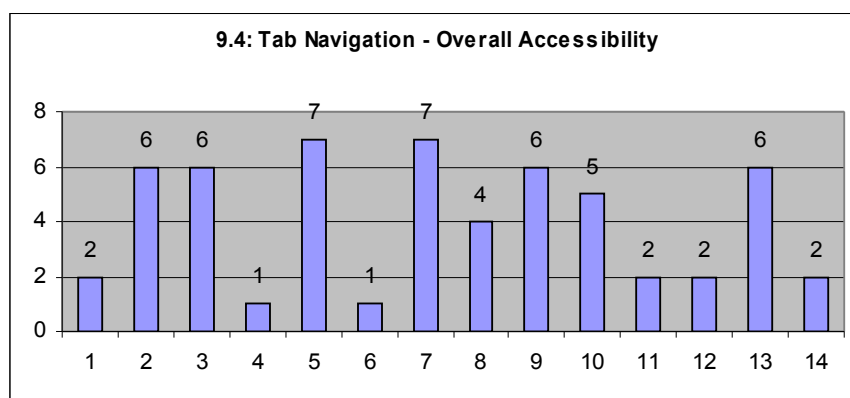
"It was mainly because the task asked for an email address and the links did not read out what the links were for; other links were perfectly understandable since they did have a meaningful description in the link text. I often use the tab key to navigate around web pages provided" (visually impaired participant using screen magnification and a screen reader).

"On certain links the site brought up a message about leaving the site even though I did not want to leave the site. Once the message was gone I was able to continue through the site" (control group).

"The pop up box stating that I was going to leave the site and coming across the "contact us" when I was on that page" (control group).

5.3.4 Overall accessibility of the page

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page and were asked to comment on their overall experience:



Participants were generally less satisfied with the overall accessibility of the page. Comments did not necessarily reflect a failure of the checkpoint, relating more to link descriptions and page layout:

"I use the tab key often to navigate around a web page, however this requires the text of the links to be meaningful. For example "click here" is totally meaningless, the email address was in a similar category" (visually impaired participant using screen magnification and a screen reader).

"Had I not been wide awake and used this sort of thing I would have press TAB a few times and seeing nothing happening either gone and done something else or given up. Anyone who programs using TABS MUST ensure that each section that the TAB takes you to changes colour or really flashes. It took 21 TABS to get to "Contact Us". Very hard and very frustrating if you are PC minded. "Contact Us" leading nowhere!

and the Email address leading to the goal" (dyslexic participant not using assistive technology).

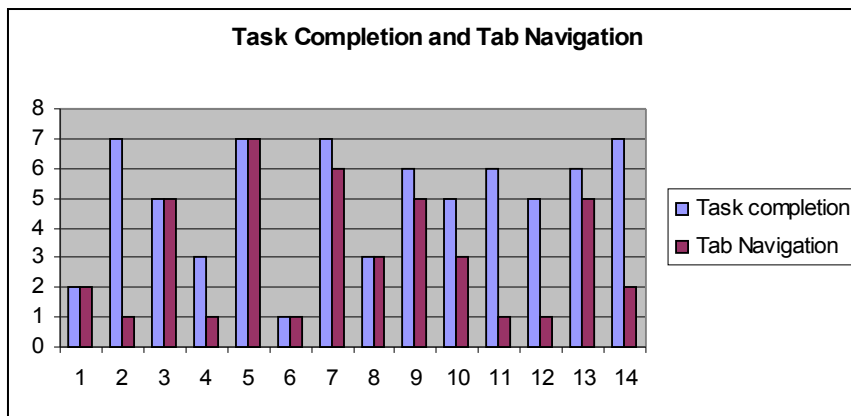
"I did need to tab around the screen as the information was not immediately there" (dyslexic participant not using assistive technology).

"Ideally you should not have to scroll to find the most important information - like contact details" (control group).

5.3.5 Further analysis of Task

Task completion and tab navigation

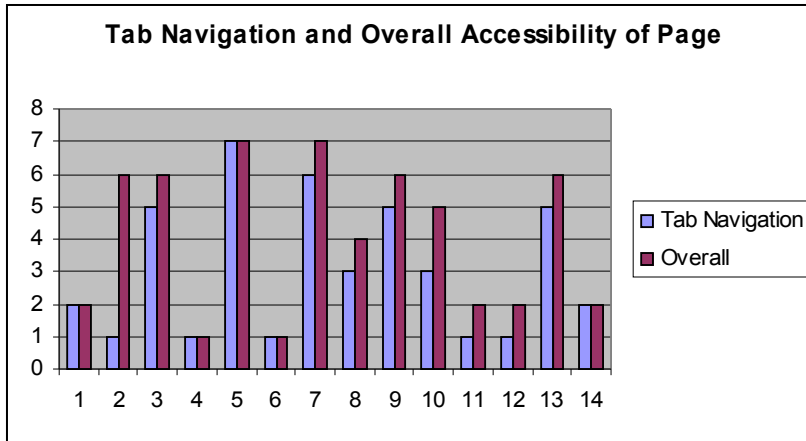
Some differences can be identified between these two variables. Whilst most participants were generally satisfied they completed the task, 9 were not very satisfied or less with the ability to tab logically to the information required.



Problems and task completion

Again, differences can be identified between the two variables where problems experienced were minor or below, participants were still satisfied they had completed the task.

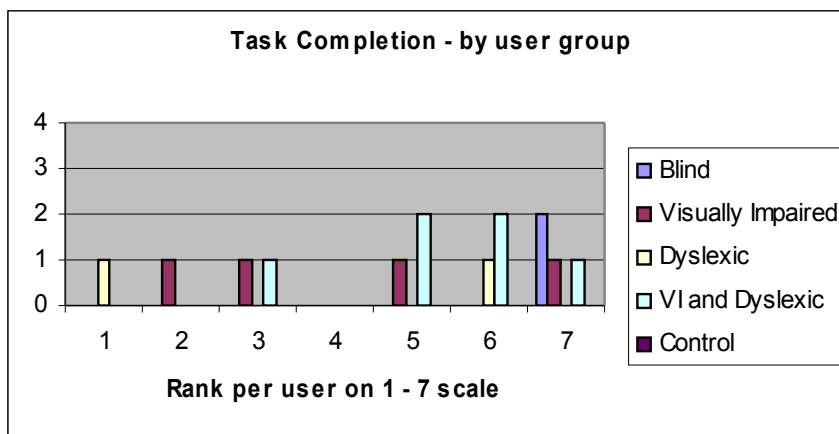
Tab navigation and overall accessibility of the page

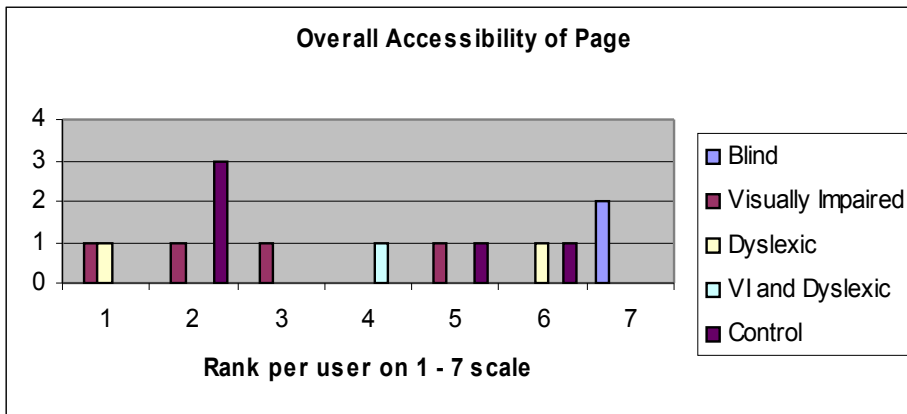
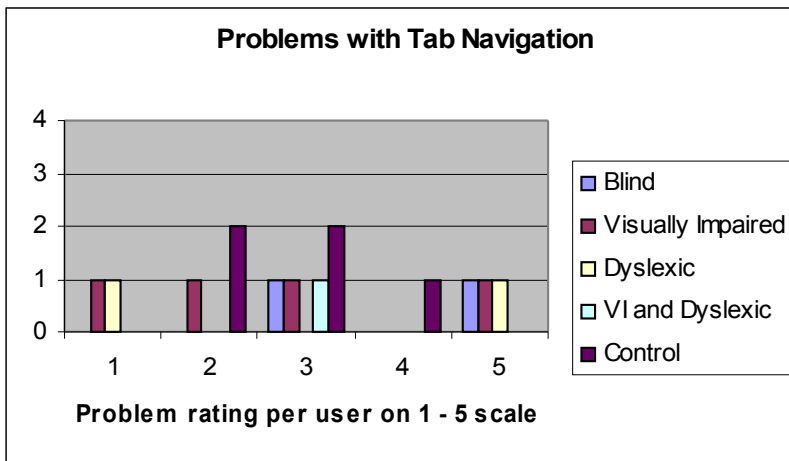
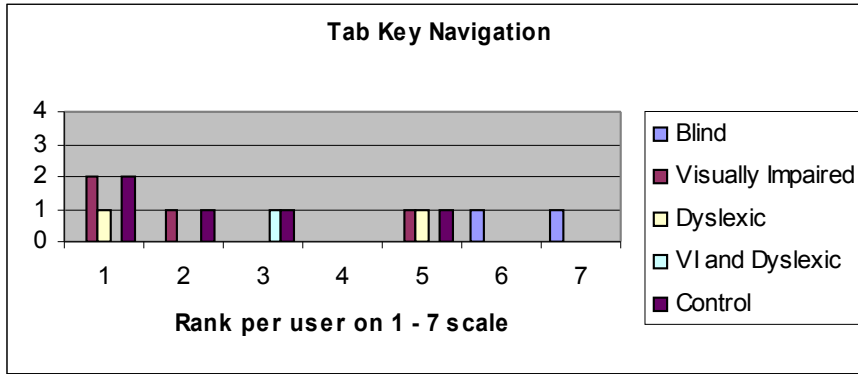


Differences can be identified between the two variables. Generally, overall satisfaction with the accessibility of the page is slightly higher than ability to navigate logically using the tab key.

5.3.6 Comparison across user groups

Apart from the blind participants, participants across the user groups were less satisfied and experienced more problems with this task than for task one and two. In particular they were not satisfied or lower with the ability to use the tab key to navigate logically through the page. Apart from those from the blind user groups, overall accessibility of the page was also ranked as not satisfied or less by all participants, citing problems such as poor link descriptions and page layout.





5.3.7 Summary

Screen reader (and Braille output) users found this task very easy because the tab key did move logically (for them) through the page and they were able to find the information required despite no order being specified in the HTML. Further testing of other pages which have no order specified would be needed to verify whether this is always the case. Problems experienced by the other user groups were attributed to the fact that they would not normally use this as a method for navigation, and to other accessibility problems such as poor link descriptions and page layout.

5.4 Task Four: WCAG Checkpoint 12.1

The purpose of this task is to test the accessibility of frames.

The WCAG recommend providing a title for each frame to facilitate frame identification and navigation. The web page which was tested does not conform to this recommendation.

Participants were asked to complete two tasks using a web page with two frames (see Appendix Two, Task Four), firstly to find information displayed in the right-hand frame, then to find a link to contents displayed in the left-hand frame. The web page uses two frames to display data. The left-hand frame displays a list of contents and the right-hand frame displays data relating to the content item selected. Neither frame has been given a title. If frames are not given titles, someone using screen reading technology or Braille output may not be able to navigate between each frame.

Following the task, participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

5.4.1 Task completion

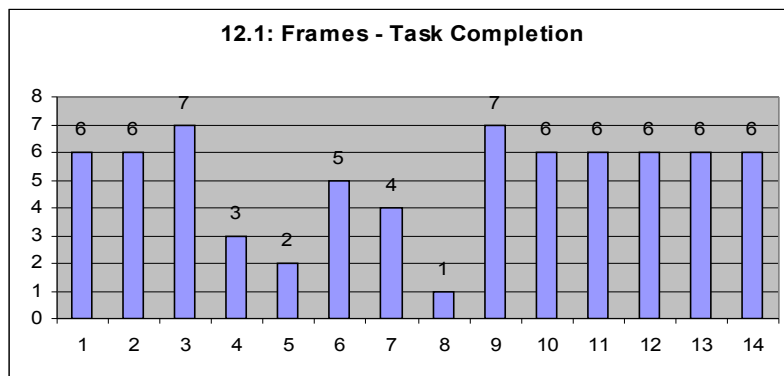
Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

1= not at all satisfied

2= not satisfied

- 3= not very satisfied
- 4= neither dissatisfied or satisfied
- 5= quite satisfied
- 6= satisfied
- 7= very satisfied.

Participants were also asked to comment on this by providing an answer to the question (in order to verify whether the task had been completed correctly or not).



The majority of participants felt satisfied they had completed the task. Four participants were neither dissatisfied or satisfied or less. These participants were from the visually impaired and blind user group:

"It took some swapping between screens. I listened to my screen reader reading the contents of the web pages and then used the arrow and tab keys to open the various links to what I heard relating to the questions" (visually impaired and dyslexic participant using a screen reader).

"It was really not easy..... all far too jumbled. No clear direction or structure. If your questions had not been so clear I would have failed" (dyslexic participant not using assistive technology).

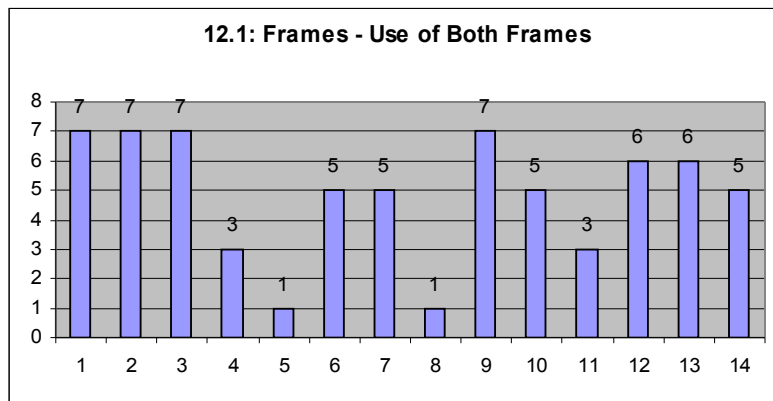
"Only the text of the link was read out" (visually impaired participant using screen magnification and a screen reader).

A blind participant using a screen reader did not provide comments but rated satisfaction with task completion as not at all. This participant went on to provide

comments for other questions which suggest that although the screen reader could move from frame to frame, it was difficult to establish what the frames were about.

5.4.2 Use of page

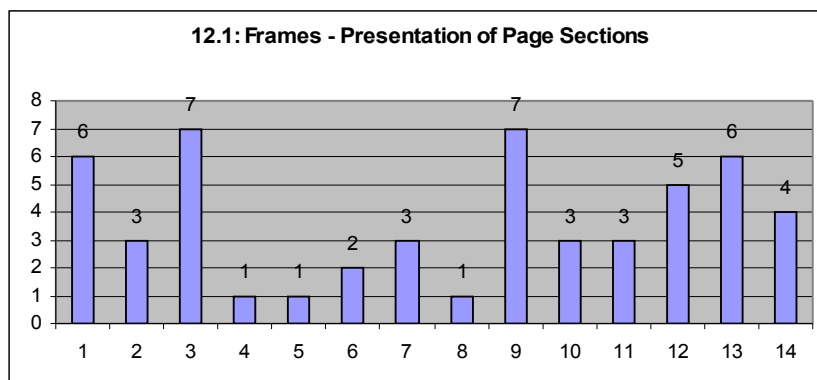
Participants were asked to rank the ability to use the whole page for both tasks:



Four of the participants were not satisfied or not at all satisfied. These were from all four user groups.

5.4.3 Presentation of page sections

Participants were asked to rank their satisfaction with the presentation of the sections of the page as a whole:



Nine participants were neither dissatisfied or satisfied or less, again these ranks were from all four user groups.

5.4.4 Problems

Using the following description, participants were asked to rank any problems experienced:

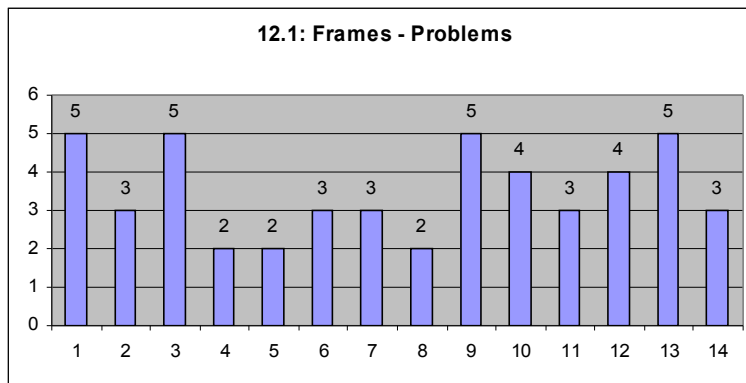
1= catastrophe

2= major problem

3= minor problem

4= cosmetic problem only

5= not a problem



Eight participants experienced problems, three of which were major problems. To help identify the level of problems experienced and to assess whether any other problems unrelated to the checkpoint were experienced, participants were asked to comment further. Comments could be related to the failure of the checkpoint and were from the blind, visually impaired, dyslexic and control user groups:

“Not really sure what the whole web site was about, let alone what the individual frames were for” (blind participant using a screen reader).

"Far too much on the page, not a particularly friendly site. You need to know what it is about before you can access it properly" (visually impaired participant using on-screen adjustments).

"I had to reduce the size of the frame on the right hand side of the page in order to see the whole page on the left" (control group).

"Page opened with the side bar still open from the initial page so had to scroll in order to read all the information" (control group).

"Looking for publications was fairly simple on the right screen but when I spotted the word publication on the left screen I tried there as well. I did not open up a new screen and displayed in the exiting frame size. I HAD TO MOVE EVERYTHING ACCROSS. The was not good... Bad" (dyslexic participant not using assistive technology).

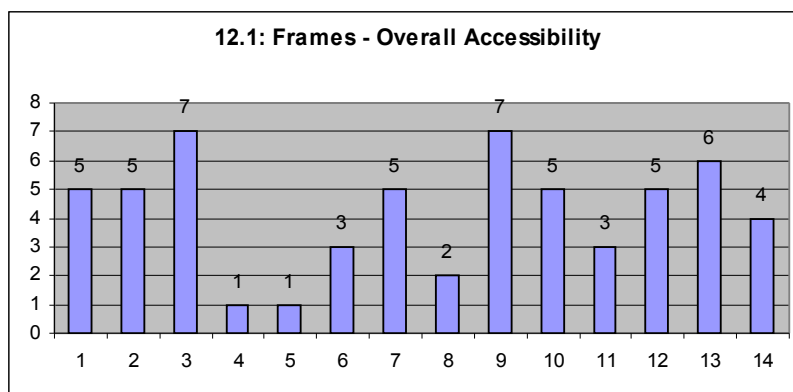
Other problems related to poor descriptions given to links and general layout:

"I often find with a lot of web sites that there is so much information that unless it is well indexed it is sometimes difficult to navigate and find the necessary information required and that the link headings are not always very obvious" (visually impaired participant using a screen reader).

"The link for task b could have been labelled more clearly" (control group).

5.4.5 Overall accessibility of the page

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page and to comment on their overall experience:



Six participants were less satisfied with overall accessibility (neither dissatisfied or satisfied or below). Comments identified 3 could be related to the failure of the checkpoint:

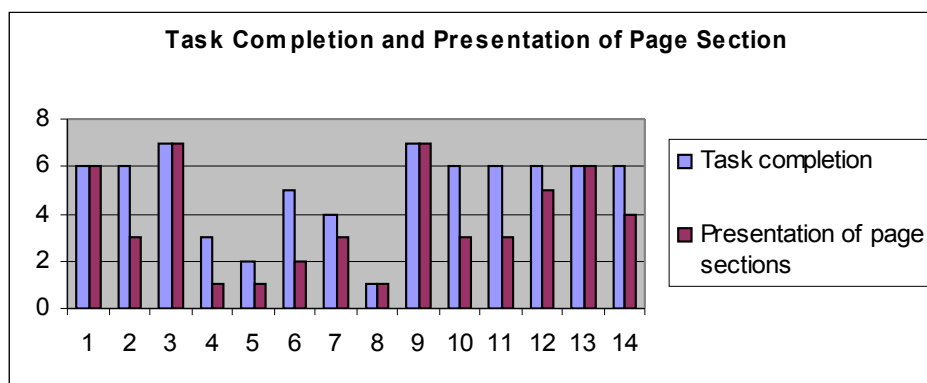
"Annoyance at not seeing what I was required to find easily" (visually impaired participant using on-screen adjustments).

"I was unsure what the site and frames were about. Navigation by links etc. seemed easy enough but there appeared to be no meaningful content at any stage. Unless I had a really strong reason to visit this site I would leave fast" (blind participant using a screen reader).

"It took a good look to work out this site, I think that the frame on the right confused the overall appearance of the page" (control group).

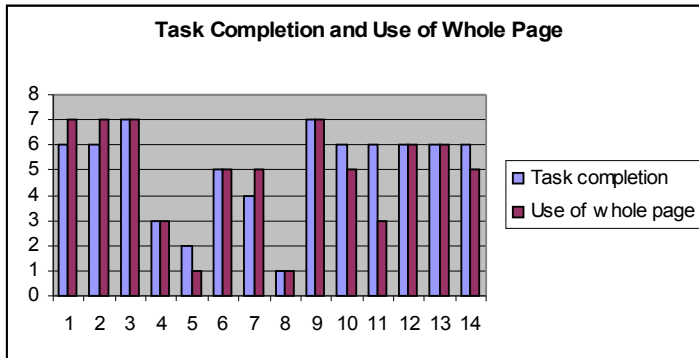
5.4.6 Further analysis of Task

Task completion and presentation of page sections



Some differences can be identified between these two variables. Where participants were generally satisfied they completed the task they were not always as satisfied with the way the page sections were presented.

Task completion and use of whole page

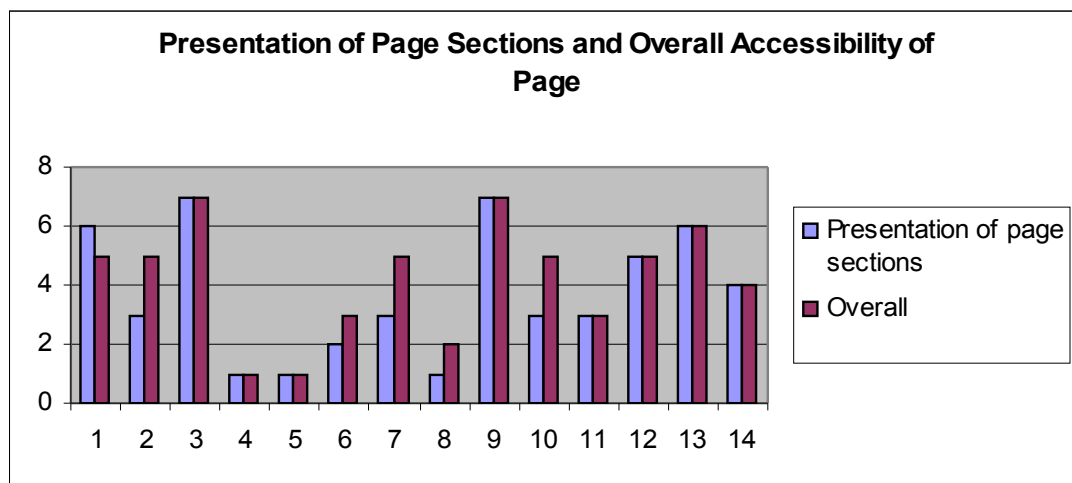


No major differences can be identified between these two variables. Only one participant (from the control user group) was satisfied with task completion but not very satisfied with use of the whole page.

Task completion and problems

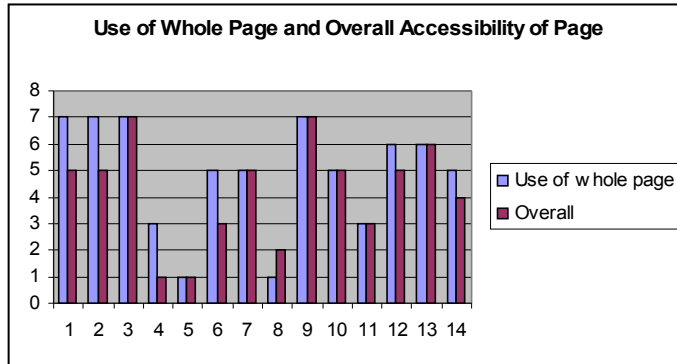
Some differences can be identified between these two variables with a high level of satisfaction of task completion but identification of minor problems. This suggests problems experiences do not necessarily impede task completion.

Presentation of page sections and overall accessibility of the page



No major differences can be identified between these two variables. Minor differences occurred where participants were not very satisfied with presentation of the page sections, but quite satisfied with overall accessibility of the page.

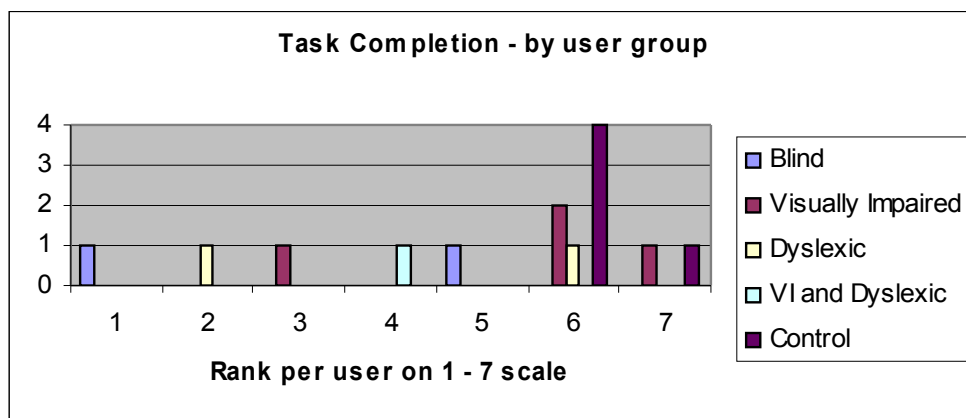
Use of whole page and overall accessibility

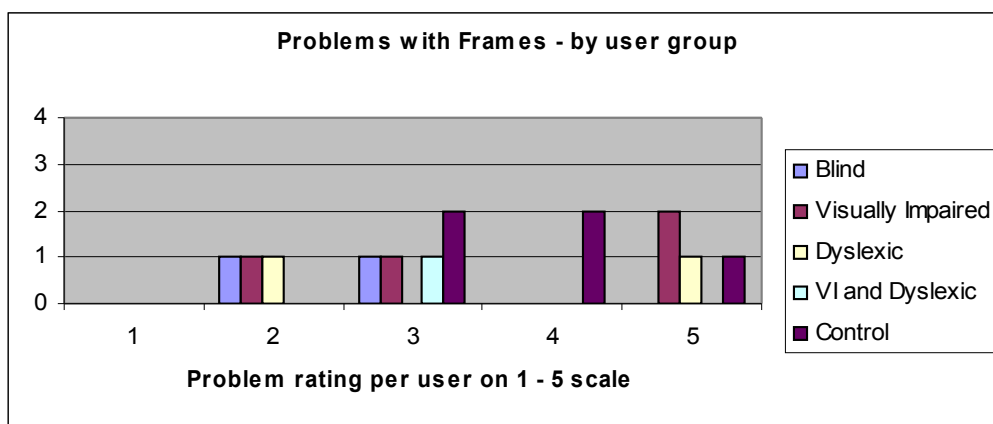
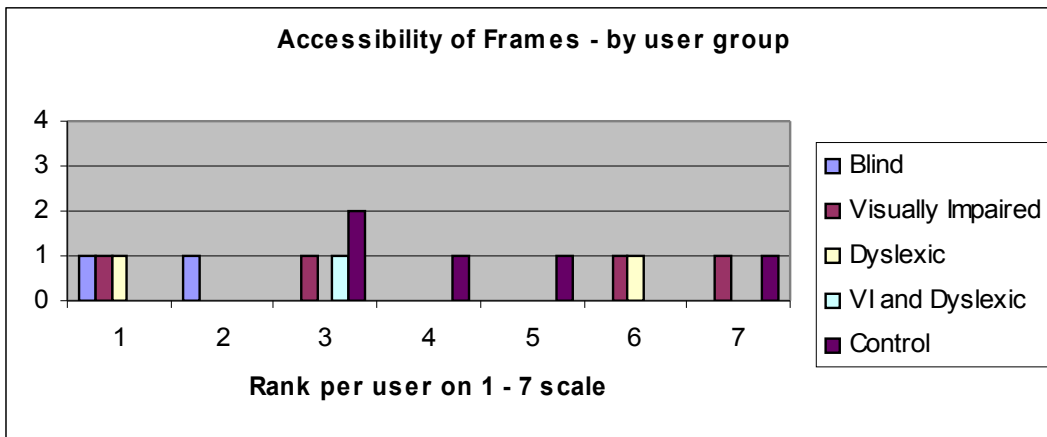
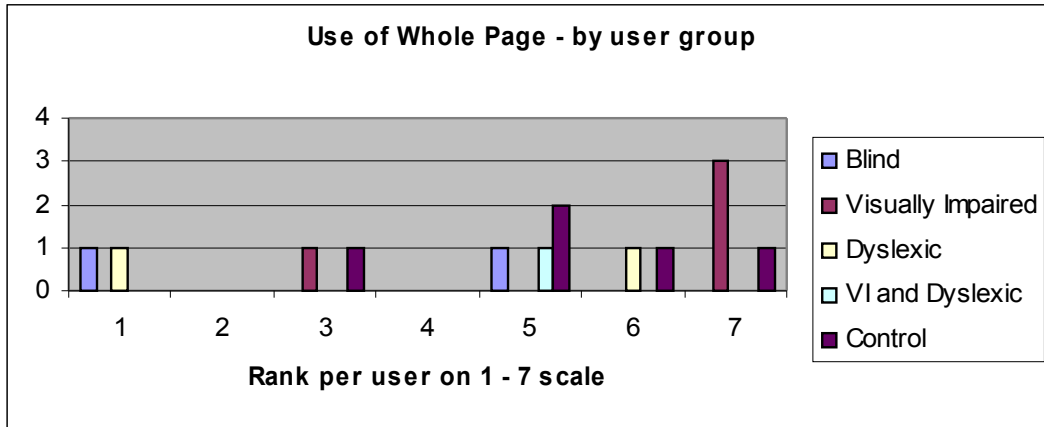


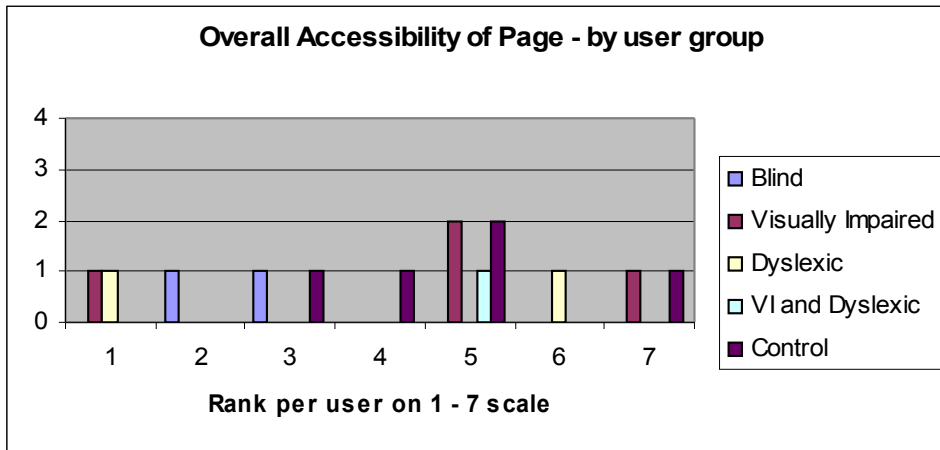
Minor differences can be identified between these two variables. In this case some participants were very satisfied with the use of the whole page, but quite satisfied or not very satisfied with the overall accessibility of the page.

5.4.7 Comparisons across user groups

The blind, visually impaired and dyslexic user groups were less satisfied that they had completed the task and were generally less satisfied with using the frames in this task. They also experienced more problems than other user groups, although all user groups were less satisfied with the accessibility of the frames and the overall accessibility of the page.







5.4.8 Summary

Blind, visually impaired and dyslexic participants appear to be most affected by the failure of the checkpoint, confirming that this could be an accessibility problem and that there is a need to ensure frames are provided with meaningful titles. User groups also experienced other problems with this task and identified accessibility issues not necessarily related to the checkpoint failure.

5.5 Task Five: WCAG Checkpoint 12.4

The purpose of this task is to test the ability to navigate through forms.

The WCAG recommend labels are associated with its form control either through markup or positioning on the page. The web page which was tested conforms to this recommendation.

Participants were asked to complete an online form (see Appendix Two, Task Five), but not submit it. The web page provides an online form for visitors to complete. Each form field has been labelled in a way that users should find logical. Problems can occur if form fields do not have labels or have been labelled in a way that forces a screen reader or Braille output to navigate in a way that is not logical.

Following the task, participants were asked a series of evaluation questions. The questions aim to establish whether the checkpoint tested is an accessibility problem, and if so how much of a problem; also to identify any other accessibility problems experienced.

The questions are further analysed to look for patterns and relationships. For example, the possible impact an accessibility problem identified has on overall accessibility of the page; whether failure to complete a task impacts on overall accessibility of a page.

5.5.1 Task completion

Participants were asked how satisfied they were that they managed to complete the task. They were asked to rank this on a satisfaction ranking scale of 1 – 7 as follows:

1= not at all satisfied

2= not satisfied

3= not very satisfied

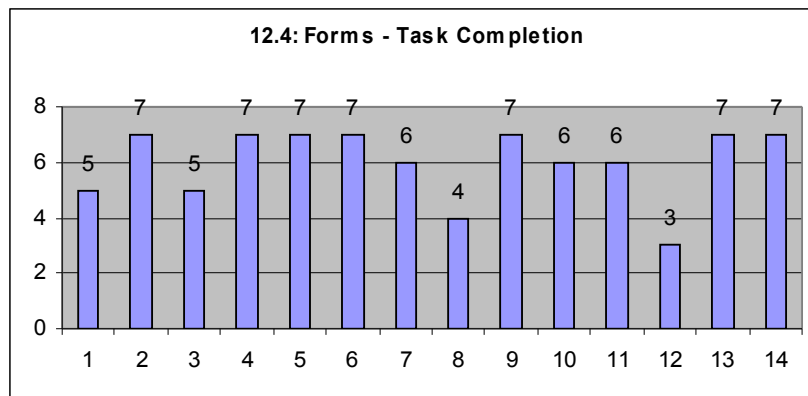
4= neither dissatisfied or satisfied

5= quite satisfied

6= satisfied

7= very satisfied.

Participants were also asked to comment on this by providing an answer to the question (in order to verify whether the task had been completed correctly or not) and to describe how they undertook the task:



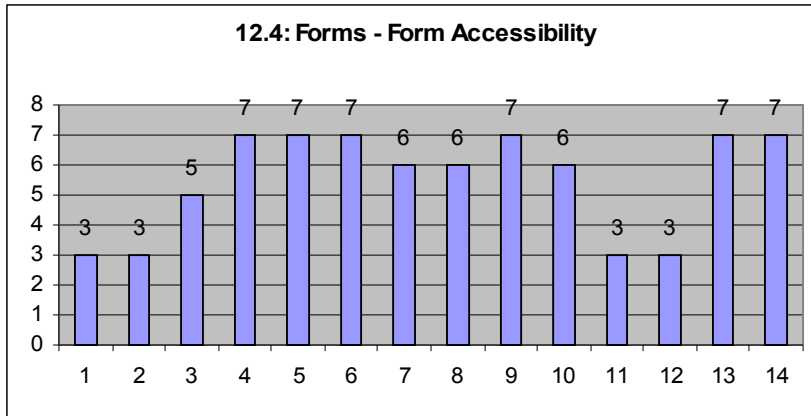
Overall most participants were satisfied they had been able to complete the task. One participant was not very satisfied but this was more of a language issue than one related to the checkpoint tested. Despite high levels of satisfaction for task completion, some participants went on to describe problems they had, but these were not necessarily related to the checkpoint tested:

"It was not easy. By tabbing from box to box and either typing the answer or using the up and down arrows to select my answers" (visually impaired participant using on-screen adjustments) (implying it took some effort to complete the task)>

"contrast was poor making it difficult to read the field labels. Used tab key to progress through fields and mouse to click on option arrows when required" (visually impaired participant using screen magnification).

5.5.2 Presentation of the form

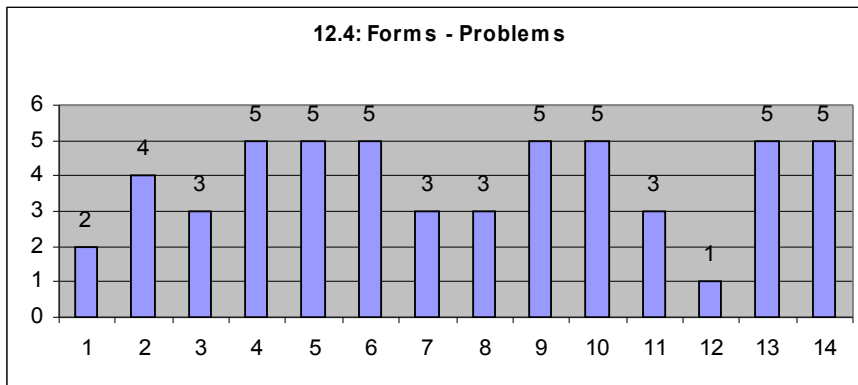
Participants were asked to rank their satisfaction with the presentation of the form:



5.5.3 Problems with form

Using the following description, participants were asked to rank any problems experienced:

- 1= catastrophe
- 2= major problem
- 3= minor problem
- 4= cosmetic problem only
- 5= not a problem



Participants from the visually impaired user group experienced minor and major problems, but these related more to display of the page than to the checkpoint tested. To help identify the level of problems experienced and to assess whether any other problems unrelated to the checkpoint were experienced, participants were asked to comment further:

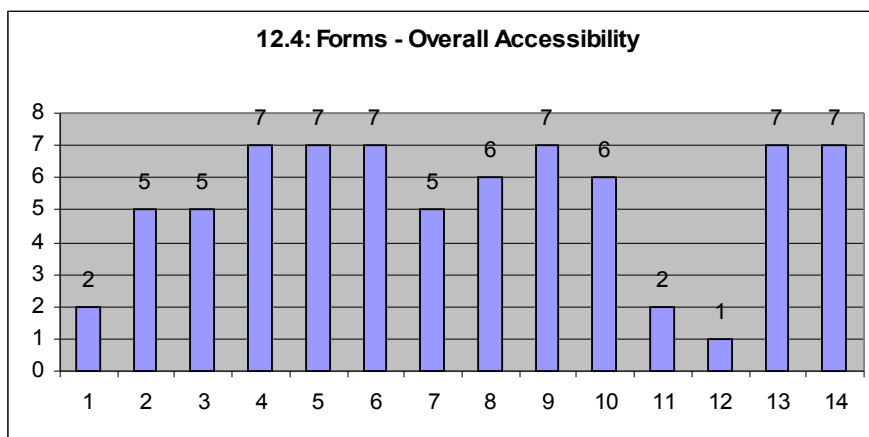
"The whole page was pale, and the font size was small and faint. My screen reader did not read the instructions or questions" (visually impaired participant using on-screen adjustments).

"Text size was minute, I put it on max but it was still not very big. I could read it" (visually impaired participant using on-screen adjustments).

"The text on this page is not clear enough, the font is in to pale a colour to be seen easily" (control group).

5.5.4 Overall accessibility of the page

Using the satisfaction level ranking, participants were asked to rank the overall accessibility of the page and to comment on their overall experience::



Overall most participants were quite satisfied or above with the accessibility of the page, one participant's comment directly related to the checkpoint tested:

"I was quite pleased that I did not need to use the forms mode in Jaws (my speech programme), to fill out the form and this was easier than some other forms I have tried to fill out in the past" (visually impaired and dyslexic participant using a screen reader).

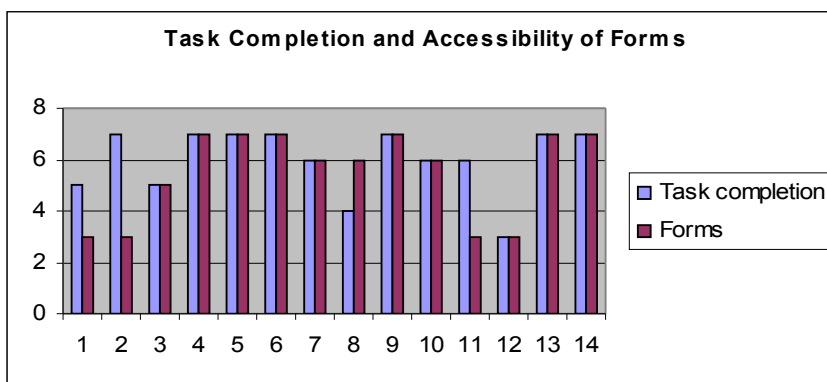
Low satisfaction ranks were from participants from the visually impaired and control user groups and again comments related to display rather than the checkpoint

tested. One blind participant commented favourably on the use of form fields, but not on the text used:

"The date of birth fields were obvious, at times not sure when asked for dd/mm/yyyy" (blind participant using a screen reader).

5.5.5 Further analysis of Task

Task completion and accessibility of forms



No major differences between these two variables. The differences identified are where task completion has been ranked as quite satisfied and accessibility of forms as not very (visually impaired participant using on-screen adjustments); and task completion ranked as satisfied, but accessibility of forms as not very (control group).

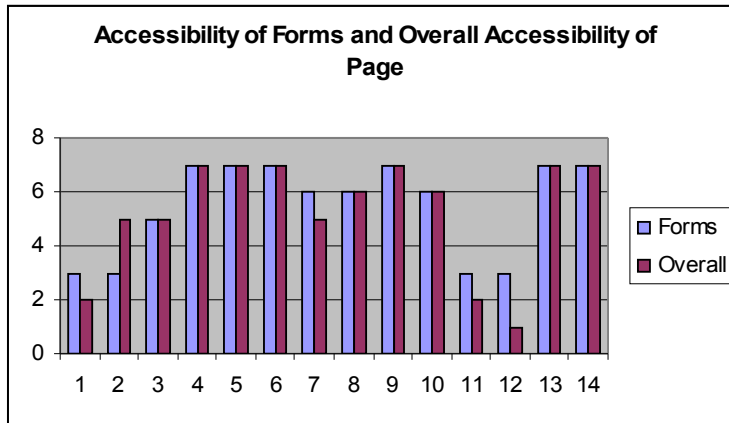
Task completion and problems

No major differences between these two variables can be identified. Minor differences are where task completion is ranked as quite satisfied and satisfied but a major problem has been experienced (visually impaired participant using on-screen adjustments, and a visually impaired and dyslexic participant using a screen reader).

Problems with forms and overall accessibility of the page

No major differences between these two variables can be identified. Very minor differences are where a minor problem has been identified but overall accessibility of the page is ranked as satisfied.

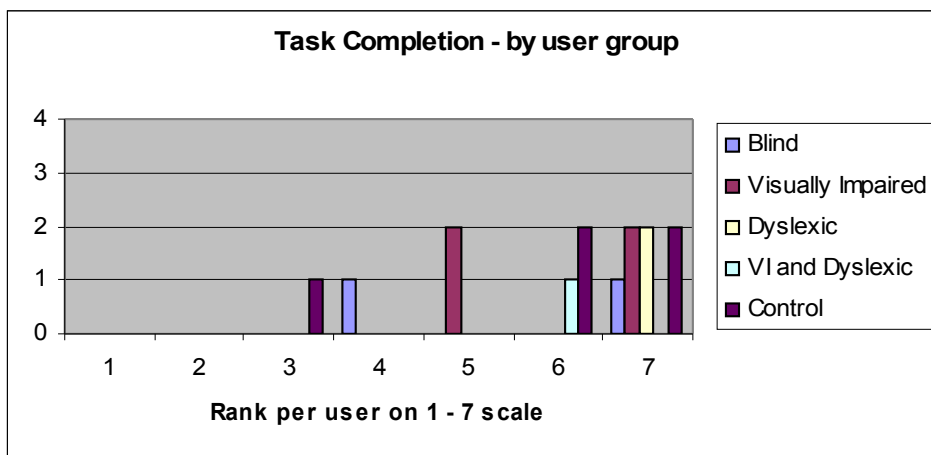
Accessibility of forms and overall accessibility of the page

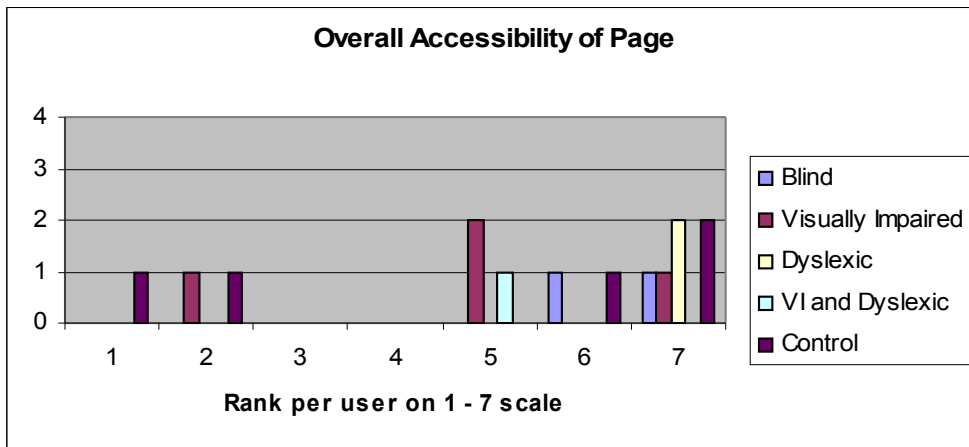
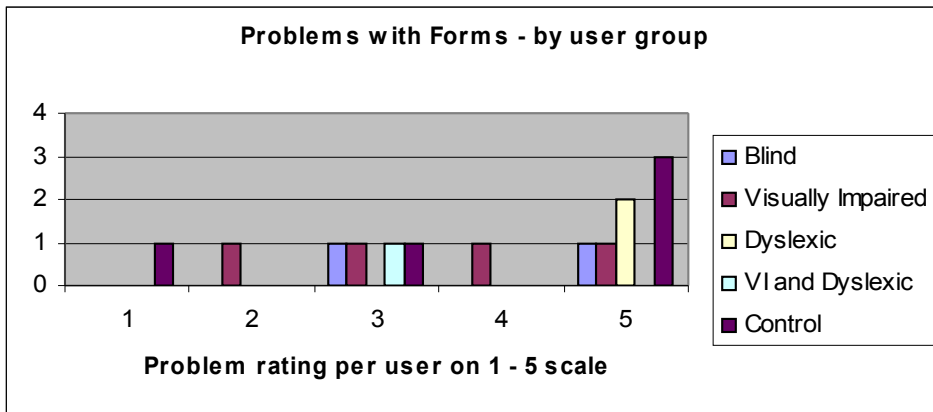
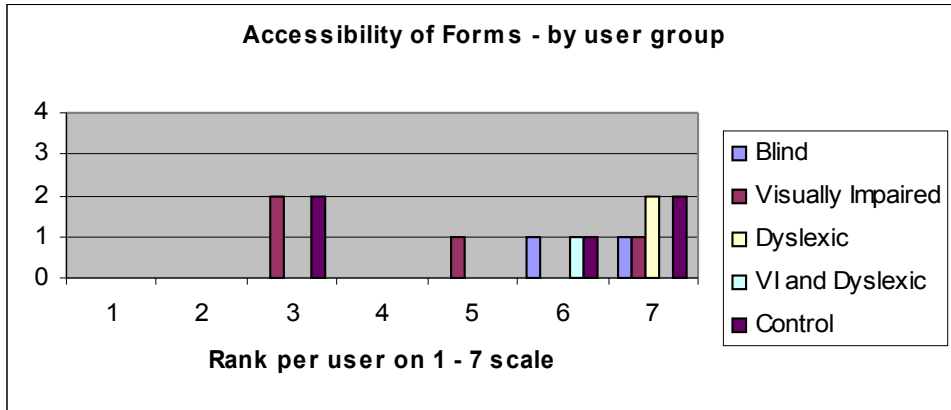


No major differences between these two variables can be identified.

5.5.6 Comparisons across user groups

User groups were mainly satisfied with task completion, with the accessibility of the forms and the overall accessibility of the page. The visually impaired and control user groups were less satisfied with this task, and all user groups experienced some problems.





5.5.7 Summary

Most participants were able to complete the form and task without any major accessibility problems. Those accessibility problems that were identified were not necessarily related to the checkpoint tested, but to colour, contrast and general language used. This suggests the correct application of form fields does enhance the accessibility of online forms.

6 Conclusions

The responses received from this first iteration have shown that the process of remote user testing can provide useful results and, with some revisions, should be used to improve the user testing framework for the next iteration of user testing. Tests using the Observatory should be carried out with the same web pages that were tested with the participants so that the results can be compared. This will help establish whether the Observatory findings are in-line with those of the end-users.

The user testing of WAM relevance has revealed that whereas it is clearly important to ensure the correct and consistent application of accessibility features, responses show that some checkpoints are becoming less important to users. Problems can be identified with non-compliance of certain checkpoints, in particular non-compliance to the provision of headings, labelling of frames, and use of fixed font sizes and link description and barriers can be differentiated by disability. For example, the user testing revealed blind participants using screen readers experienced most problems with non-conformance to checkpoints 1.1, 3.5 and 12.1; visually impaired participants using screen magnification or making on-screen adjustments to enlarge text experienced problems with non-conformance to checkpoint 3.4; and blind, visually impaired and dyslexic participants experienced problems with non-conformance to checkpoint 12.1.

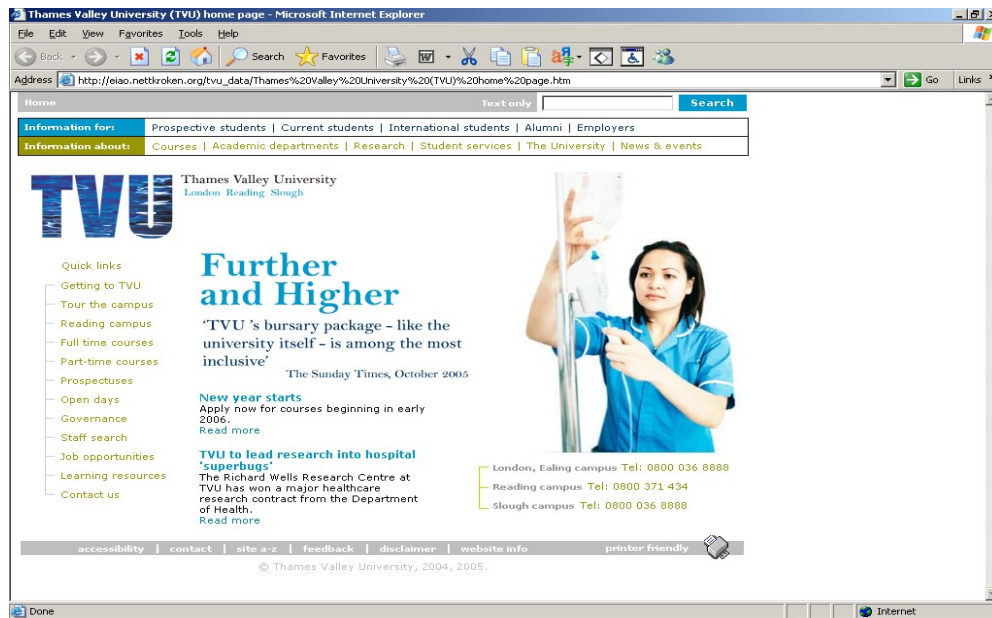
Responses show that complete accessibility barriers are not experienced by all disabled participants, who often seemed to be able to work around potential barriers and do not necessarily impede the completion of a task. For example, tables that did not include a summary or abbreviations were not necessarily an accessibility barrier.

Accessibility barriers experienced by participants, but not necessarily relating to the checkpoint being tested again show that while some potential barriers can be overcome, others remain more problematic. Colour and contrast remain an accessibility barrier experienced predominantly by visually impaired participants, but not exclusively, again reinforcing the need for a design for all approach. Automated testing of colour and contrast as developed by the BenToWeb project is therefore an important checkpoint that should also be included for testing by the Observatory.

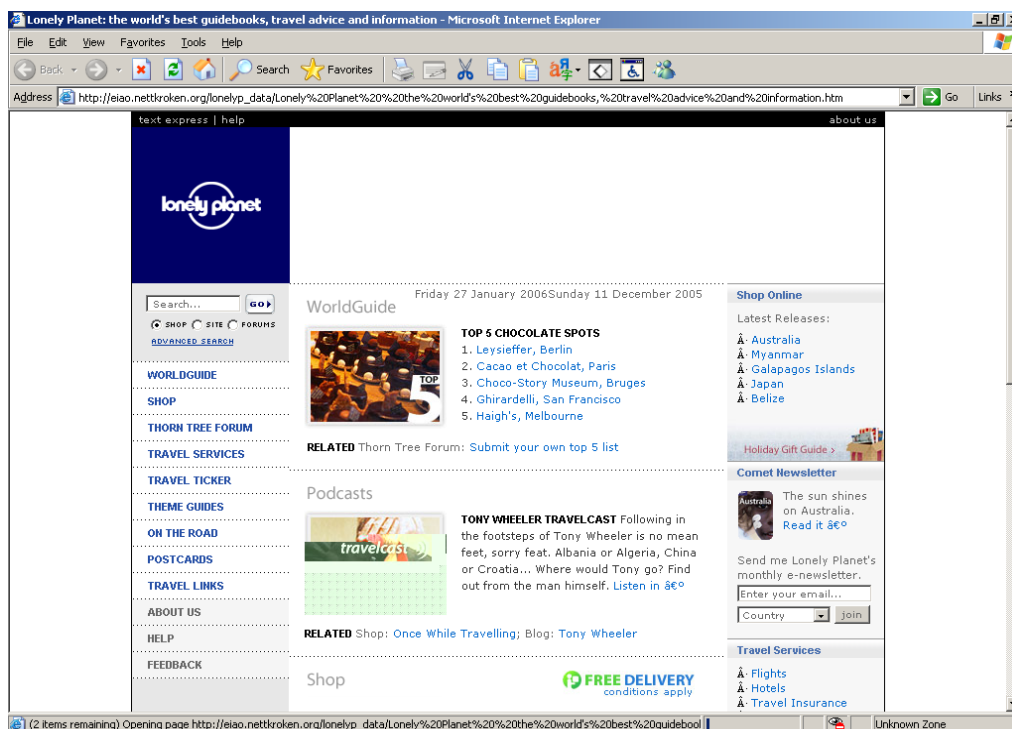
The control group of non-disabled participants, included for comparison with responses from the disabled participants, revealed instances when they experienced accessibility barriers normally associated with disabled people. This reinforces the 'design for all' approach to web design.

7 Appendix One: Web pages for Test Site One Tasks

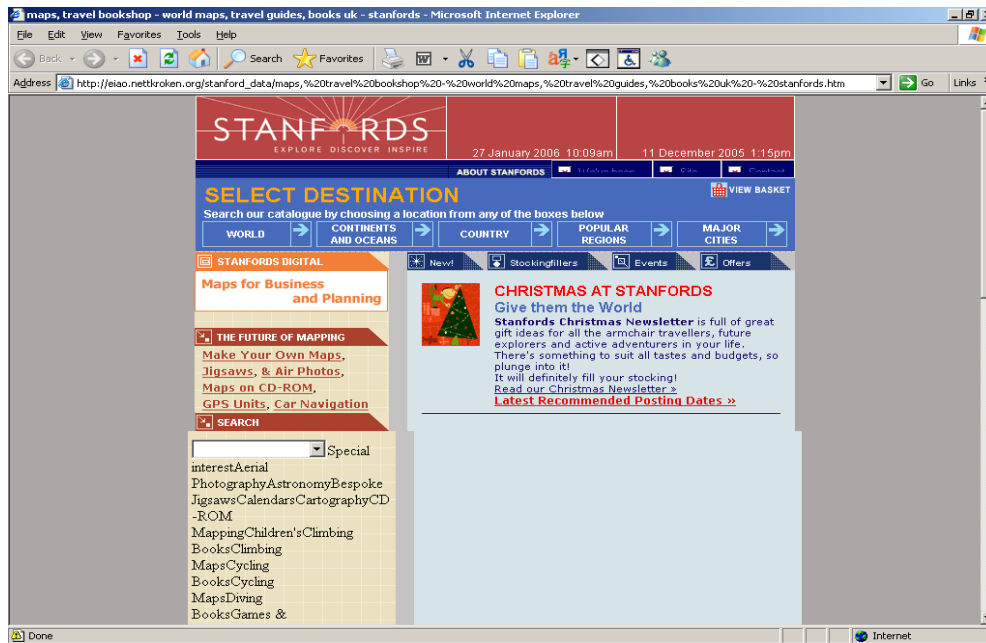
Task One



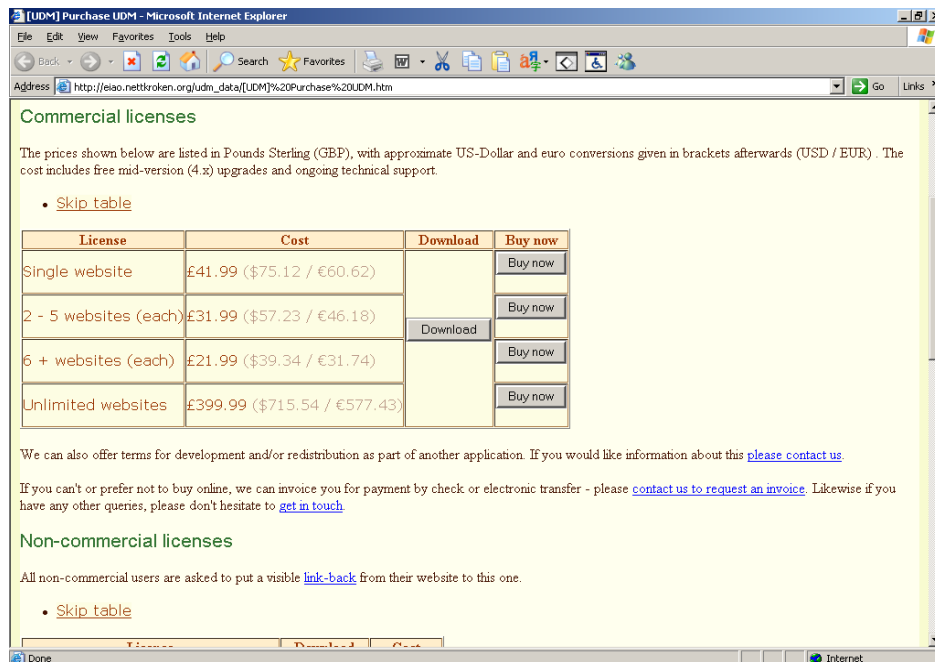
Task Two



Task Three



Task Four



Task Five

WinZip® - The Zip File Utility for Windows - Zip/Unzip, Encrypt/Decrypt - Microsoft Internet Explorer

Address: http://elao.nettbroken.org/winzip_data/winzip.htm

New WinZip Companion for Outlook

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8 Appendix Two: Web pages for Test Site Two Tasks

Task One

News, Events, and Associations

As a leading player in the wireless industry, Quios is active in the press, in industry events, and in respected industry associations, as shown below:

Recent Releases

July 1, 2004	Quios announces ContentWeb™, a Worldwide Mobile Content Delivery Service based on Sun Java™ System Content Delivery Server
Sep 9, 2003	Quios Partnership Launches Global Real-Time SMS for TV
Sep 8, 2003	Quios Introduces Q-200 for Small and Medium Businesses
May 21, 2003	Quios Secures US \$1.5M Funding
Oct 17, 2002	Quios is First Mobile Messaging Gateway to Roll Out MMS
May 07, 2002	Quios Launches SOAP Based SMS Services - Leading Application Centric SMS Gateway Integrates Web Services Standard
Feb 10, 2002	One World, One Number - Quios Offers Global 2way Interactive SMS Using a Single Number
Jan 15, 2002	Quios Introduces Premium Mobile Billing Services Across Europe
Dec 28, 2001	Quios Defies Industry Gloom Closing 2001 on a High
Sep 18, 2001	Cable & Wireless and Quios Collaboration
Aug 31, 2001	\$3.5M Series A Financing, New Board Members

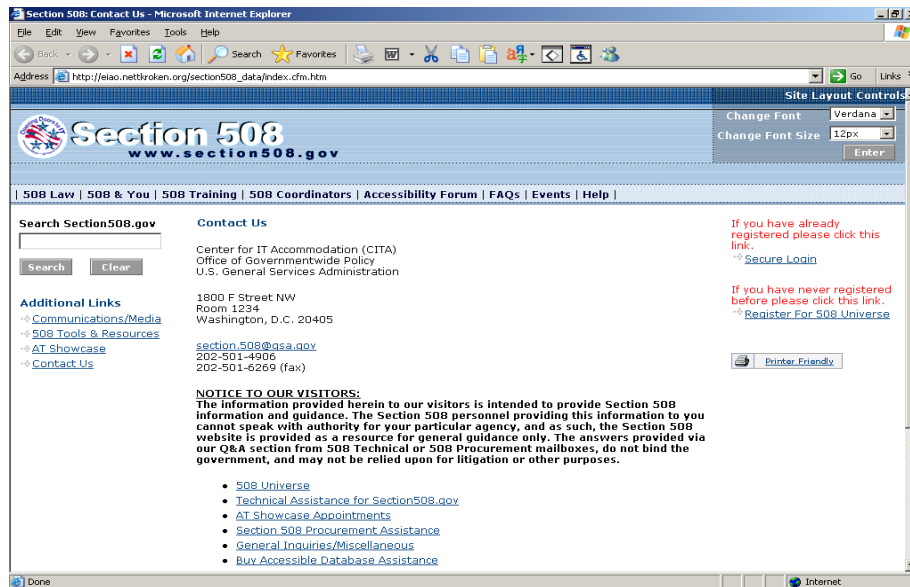
Task Two

Sentinel Region Data Table: PERCENTAGE OF ILI VISITS For Week 47, 2003-2004

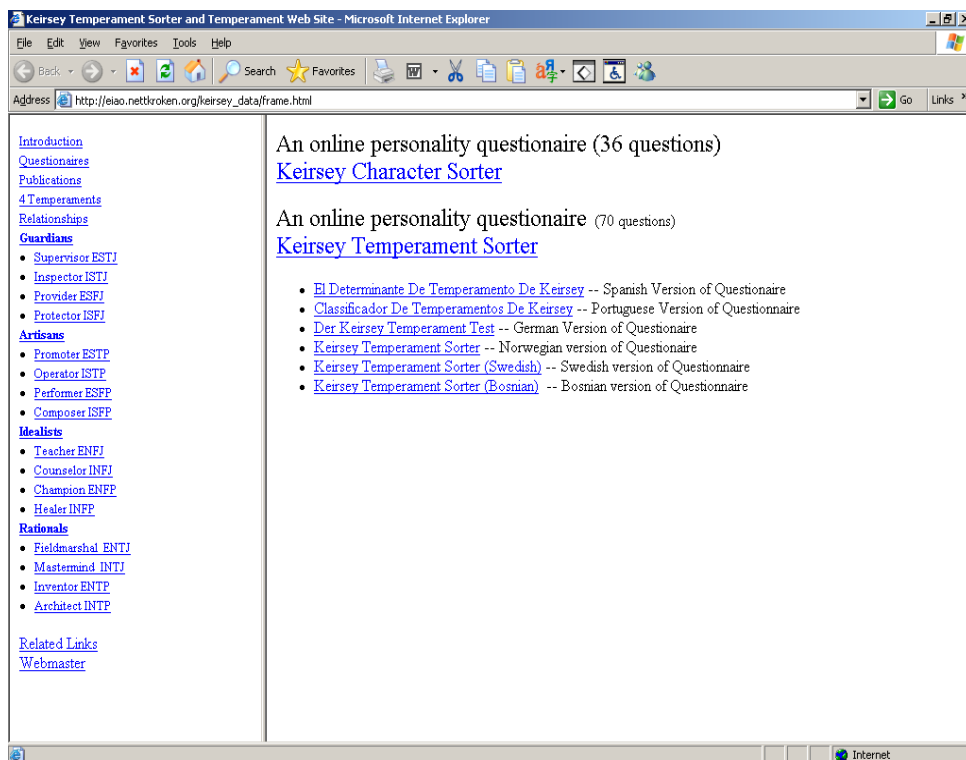
Week	Age 0-4	Age 5-24	Age 25-64	Age over 64	Total ILI	Total Patients	% Unweighted ILI	% Weighted ILI
40	708	760	532	108	2108	235501	0.895	0.862
41	892	1050	654	176	2772	258892	1.071	1.156
42	854	1063	766	180	2863	264406	1.083	1.456
43	960	1281	842	201	3304	285586	1.157	1.468
44	1124	1871	1052	247	4294	289061	1.485	2.060
45	1394	2373	1130	229	5126	281564	1.821	2.784
46	1853	3362	1414	261	6890	258566	2.665	3.320
47	1566	3691	1607	316	7180	215570	3.331	3.809

[Return to Current Report](#)

Task Three



Task Four



Task Five

Dove.com | Join YourDove - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites

Address http://jelaio.nettkroken.org/dove_data/newmember.asp.htm Go Links

Join YourDove

STEP 1 of 2

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Your Contact Information

Please provide your name and address. This will be used to send your samples, information and offers through the mail.

First Name <input type="text"/>	Last Name <input type="text"/>
Mailing Address <input type="text"/>	Mailing Address 2 <input type="text"/>
City <input type="text"/>	State <input type="text"/> Zip <input type="text"/>
Date of Birth	
Month <input type="text"/>	Day <input type="text"/> Year <input type="text"/>
Marital Status <input type="text"/>	Gender <input type="text"/>
<input type="text"/>	<input type="text"/>

To login and manage your account, please provide your email address and a password:

Email address <input type="text"/>	Password <input type="text"/>
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Done Internet