

STUDY SERIES  
*(Survey Methodology #2008-7)*

**An Accessibility and Usability Evaluation  
of the QUISP II Application**

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Report Issued: August 8, 2008

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# **AN ACCESSIBILITY AND USABILITY EVALUATION OF THE QUISP II APPLICATION**

Human-Computer Interaction Memorandum Series # 119

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Final, July 7, 2008

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## **INTRODUCTION**

Since June 2001, Federal regulations have required that U. S. Government Web sites and other software developed by or for the U. S. Government provide comparable access to the information for all users<sup>1</sup>. Computer users who have visual and/or other disabilities are entitled to have the same access as users who do not currently have any disabilities

Accessibility is a subset of usability. Accessibility guidelines have several checkpoints that address general usability issues, such as developing a logical tab order, dividing large information blocks into manageable groups, and using the clearest and simplest language appropriate. Even if the application complies with the law, it still may not be usable, as the Census Bureau's Usability Lab has found in other testing. Both usability and accessibility testing need to be done to identify problems that actual users may have.

## **BACKGROUND**

This accessibility evaluation was performed on the Quality Information for Successful Printing (QUISP) II application. The Decennial Systems Contract Management Office (DSCMO) requested that the Statistical Research Division (SRD) use its expertise to verify and/or identify accessibility problems in the SRD accessibility lab. This application enables inspectors to keep current on the quality control status of official Census Bureau forms and letters.

## **PURPOSE**

The purpose of this evaluation is to report and rate the severity of accessibility problems to the developer of the software so that the problems can be resolved. The priority for accessibility problems is rated high, medium, or low. An item flagged as high means that the user could not perform the task at all. An item flagged as medium means that the user could perform the task, but with difficulty. An item flagged as low priority means that the user is not presented the same information as the able-bodied user, but can still perform the task.

## **SCOPE AND METHOD**

This evaluation is primarily focused on testing accessibility for computer users with visual disabilities. Accessibility testing is usually performed using the Job Access With Speech (JAWS) 9 screen reader software<sup>2</sup>. However, the QUISP II application requires the user to have normal vision to be able to view form images, so the JAWS screen reader was not used for testing. The application must conform to the Federal regulations and the Census Bureau's IT Standard 15.0.2<sup>3</sup> to be accessible. For the purpose of this report, an item is judged to be accessible (compliant with the regulations) if it can be accessed by keyboard commands. Usability problems are detected by visual inspection by an analyst with usability experience. These problems are included in this report as issues to evaluate in formal usability testing if resources are available.

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<sup>1</sup> <http://www.section508.gov/index.cfm?FuseAction=Content&ID=3>

<sup>2</sup> <http://www.freedomscientific.com>

<sup>3</sup> <http://cww2.census.gov/it/ssd/slic/default1.asp>

## **FINDINGS**

This application cannot be fully accessible for people with severe visual impairments because some form inspection functions rely exclusively on sight, such as viewing a form, Gantt chart, or production curve. The application presents difficulties to individuals with deficiencies in color vision (i.e. the various kinds of color-blindness). Accessibility can be improved by providing full keyboard access for those persons who cannot use a mouse for long periods of time and modifying graphs and charts for individuals with a color deficiency. The QUISP II application has these keyboard and color accessibility issues:

- Help icons (shown as a “?”) are not accessible as shown in Figure 2.
- Color is used by itself to distinguish between red, yellow, and green status lights as shown in Figure 2.
- Color alone does not provide enough information to distinguish the difference between the red, yellow, and green sections of the Quality Control bar graphs as shown in Figure 2.
- Usage of yellow and green in the Production Chart may confuse users because these colors have a different meaning in the Quality Control Chart as shown in Figure 2.
- The Help PDF manuals do not have a link to download the Adobe Reader as shown in Figure 8.
- Tabbing order does not follow the natural reading order for weekdays as shown in Figure 10.

During the process of accessibility testing, these usability problems were detected:

- Focus is not placed on the first data-entry field on the Log-In screen as expected as shown in Figure 1.
- The button label “FILTER” is redundant within the context of the page and is not as descriptive as “SUBMIT” as shown in Figure 2.
- If there are no defects, the stoplight still shows a red light as shown in Figure 2.
- Icons on the Test Sample Defect Details screen all display the same tool tip as shown in Figure 4.
- Tool tips for links are redundant as shown in Figure 7.
- The “\*” indicating a required field has poor visibility because it follows the data-entry fields; one example is shown in Figure 9.
- Options within the Name combo box are cut off as shown in Figure 11.

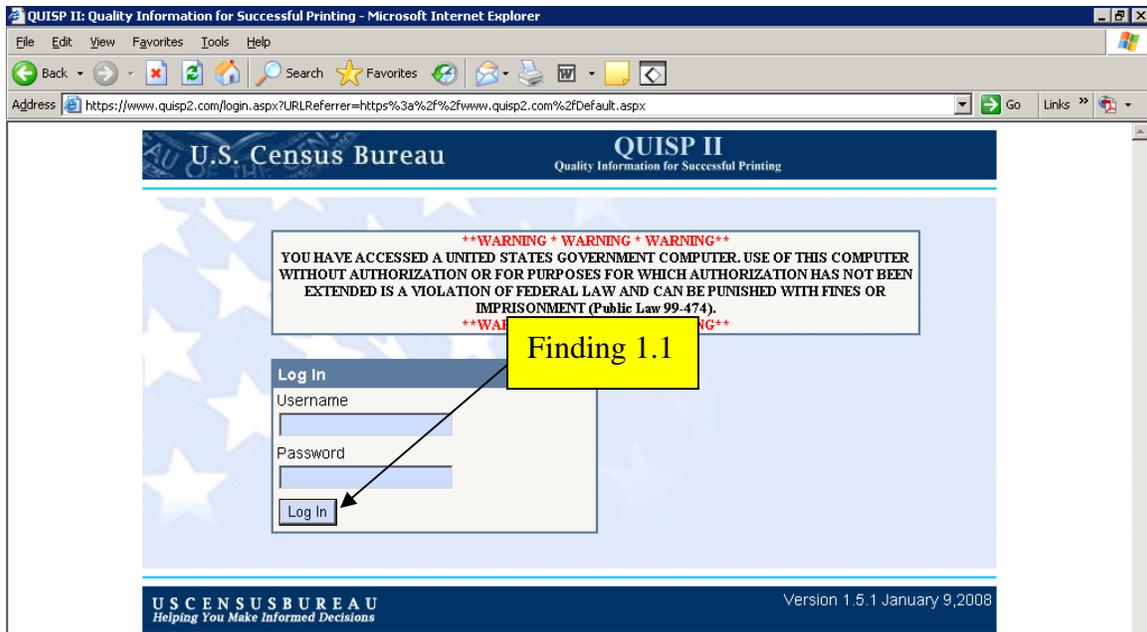


Figure 1. The Log-In screen does not automatically position the user on the Username data-entry field.

**Finding 1.1.** Focus is first placed on the Log-In button instead of the Username field as would be expected.

**Priority:** Medium

**Details:** Focus should be placed on the Username field so users do not need to first use the mouse or tab backwards to place focus on the Username field to enter their User name.

**Recommendation:** Use the development software to correct the tabbing sequence.

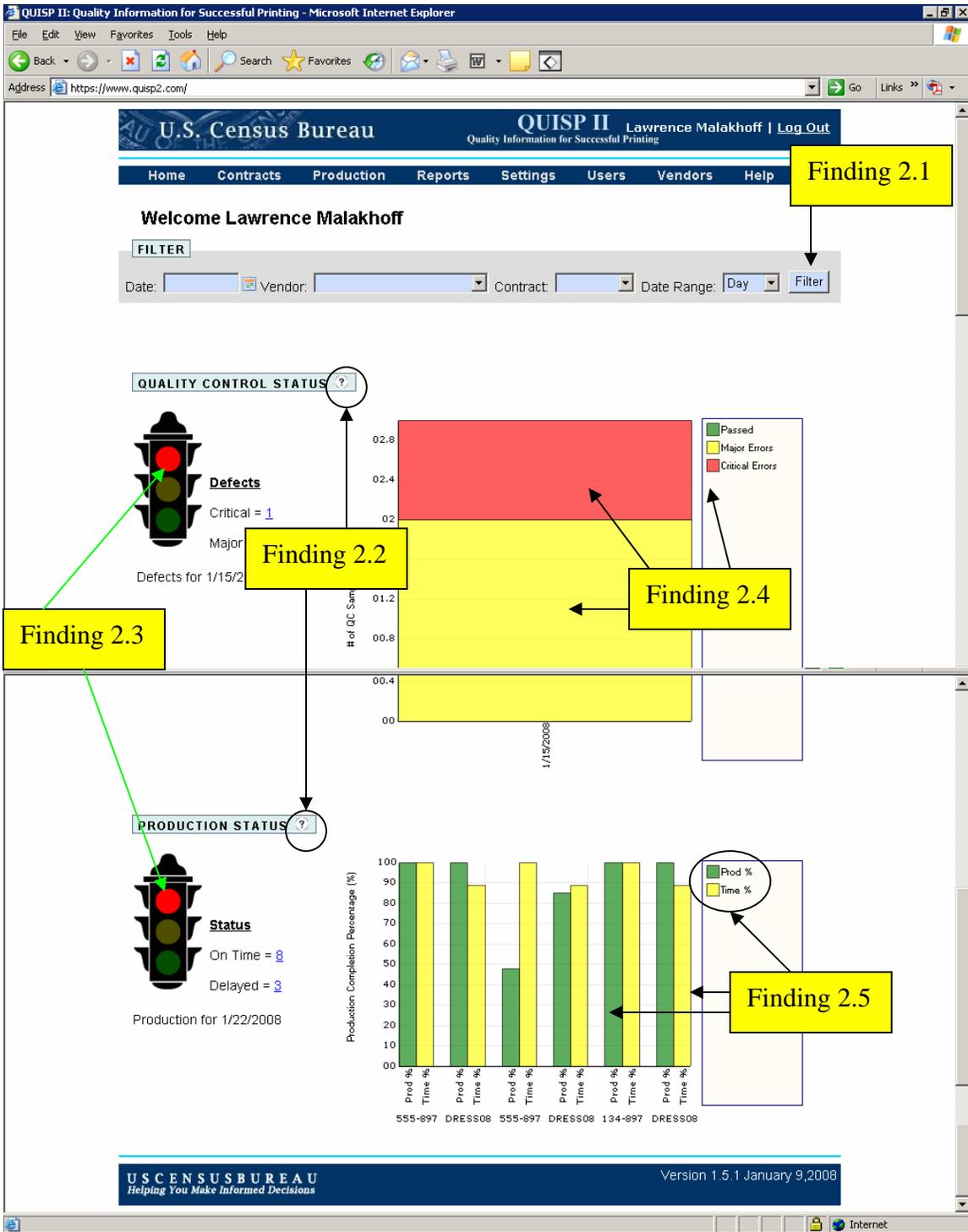


Figure 2. The Welcome screen has four accessibility issues and two usability issues.

**Finding 2.1.** The button label to retrieve quality control data is redundant.

**Priority:** Medium

**Details:** All combo boxes and the button used to retrieve quality control data are grouped under the title “FILTER.” The button label to retrieve these data is also named “FILTER,” which is redundant.

**Recommendation:** Use the development software to change the button label to “SUBMIT,” which better describes the button function than “FILTER.” (Global)

**Finding 2.2.** The Quality Control Status and Production Status instructions are not accessible because no box appears around the “?” icon when tabbing around the screen and the user must click on the icon to activate it.

**Priority:** High

**Details:** No visual focus is shown and the icon can only be accessed by a mouse click. These behaviors violate 1194.21 paragraphs A and C of the Section 508 regulation.

**Recommendation:** Use the development software to place the “?” icon in tab order following the FILTER button (which should be renamed SUBMIT). Ensure that a box appears around the icon when the user tabs to it. Use “Quality Control Status help” as the label for the top help (“?”) icon. Use “Production Status Help” as the label for the bottom help (“?”) icon.

**Finding 2.3:** Color alone is used to define defect status in the traffic light graphic.

**Priority:** High

**Details:** Many color-blind users cannot tell the difference between red, yellow, and green. Without additional text, these users will not be able to determine the status of a form or document. This lack of an alternate means to provide the defect status information violates 1194.22 paragraph C of the Section 508 regulation.

**Recommendation:** Enlarge the traffic icon and place the word “red” or “green,” depending on the defect status, in the illuminated light.

**Finding 2.4:** Color alone is used to define defect status in the bar chart and legend.

**Priority:** High

**Details:** Many color-blind users cannot tell the difference between red, yellow, and green. Without an alternate representation, these users will not be able to determine the difference between the critical and major errors in the bar chart. This lack of an alternate

means to identify critical and major errors violates 1194.22 paragraph C of the Section 508 regulation.

**Recommendation:** The bar chart needs to have a different cross-hatching pattern along with the color for the critical, major, and passed areas because all colors appear as the same shade of gray. The legend should indicate the color/pattern scheme.

### Usability

**Finding 2.5:** The Production status bar chart uses the same colors as the Quality Control status bar chart, which may confuse the user. Green could mean “major error” or “time per cent” and yellow could mean “passed” or “production per cent.”

**Priority:** Medium

**Details:** The same colors in the two charts on this screen have different meanings. Users may have problems telling them apart.

**Recommendation:** The Production status bar chart should use a dark and light color different from those used in the Quality Control status bar chart.

**Finding 2.6:** If there are no defects, the stoplight still shows a red light.

**Priority:** High

**Details:** Due to a programming error, the red light is on when there are no defects.

**Recommendation:** False negatives must be eliminated. Use the development software to display a green light when there are no defects.

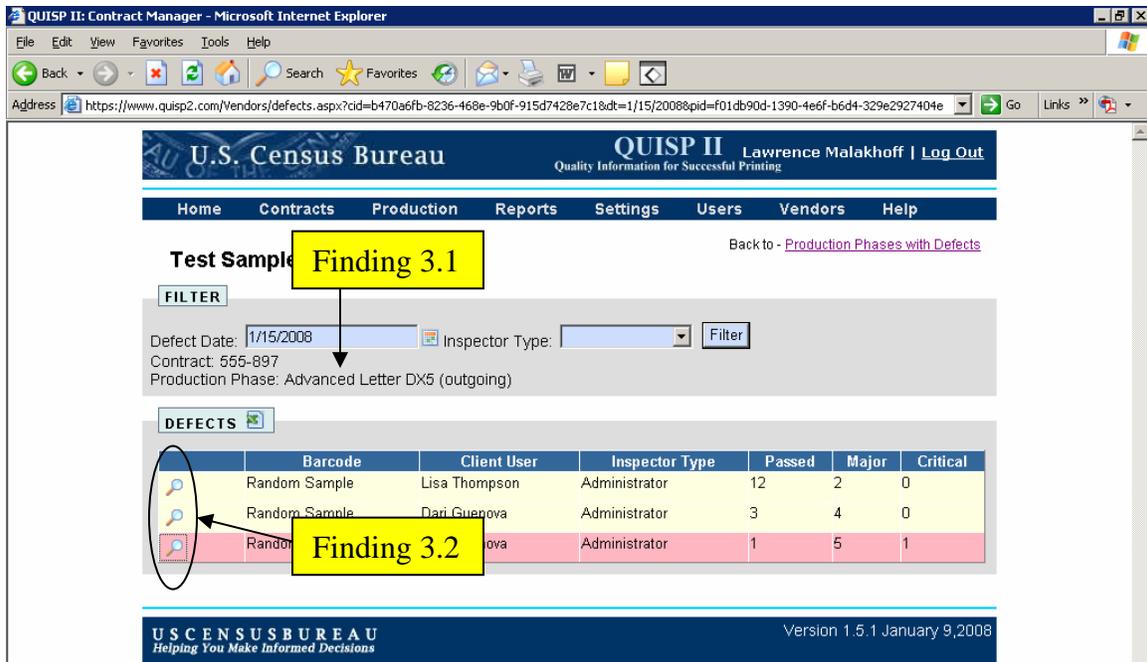


Figure 3. The Test Sample Screen has two usability issues.

**Finding 3.1:** There is a spelling error in the Production Phase text.

**Priority:** Medium

**Details:** The word “Advanced” does not apply to a form letter.

**Recommendation:** Change the spelling to “Advance.” (Global).

**Finding 3.2:** The magnifying glass icons all display the same tool tip.

**Priority:** Medium

**Details:** These icons all display “view sample.”

**Recommendation:** We recommend the tool tip indicate the actual form to be viewed. The user may then decide whether or not to proceed further.

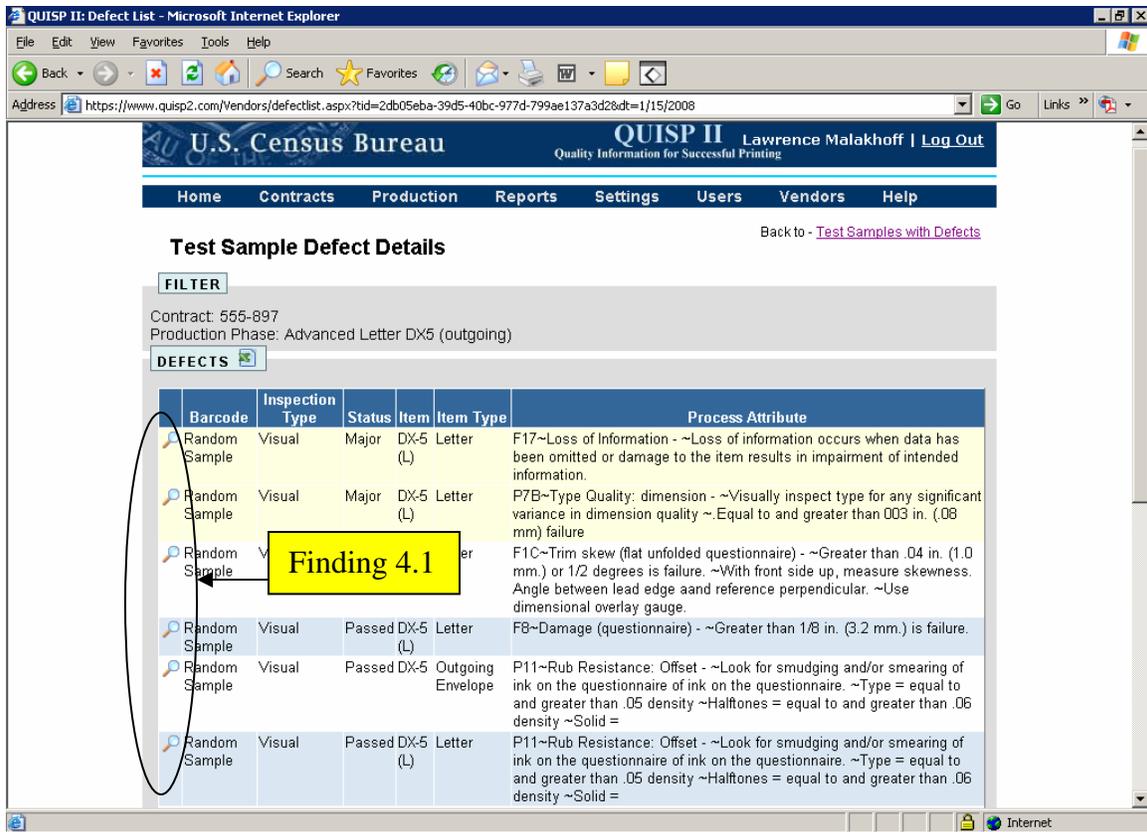


Figure 4. Icons on the Test Sample Defect Details screen all display the same tool tip.

**Finding 4.1:** The magnifying glass icons all display the same tool tip.

**Priority:** Medium

**Details:** These icons all display “view task.”

**Recommendation:** We recommend the tool tip indicate the specific “Item” and “Process Attribute” text instead of “view task” (e.g. DX-5 (L) & F17). The user may then decide whether or not to proceed further.

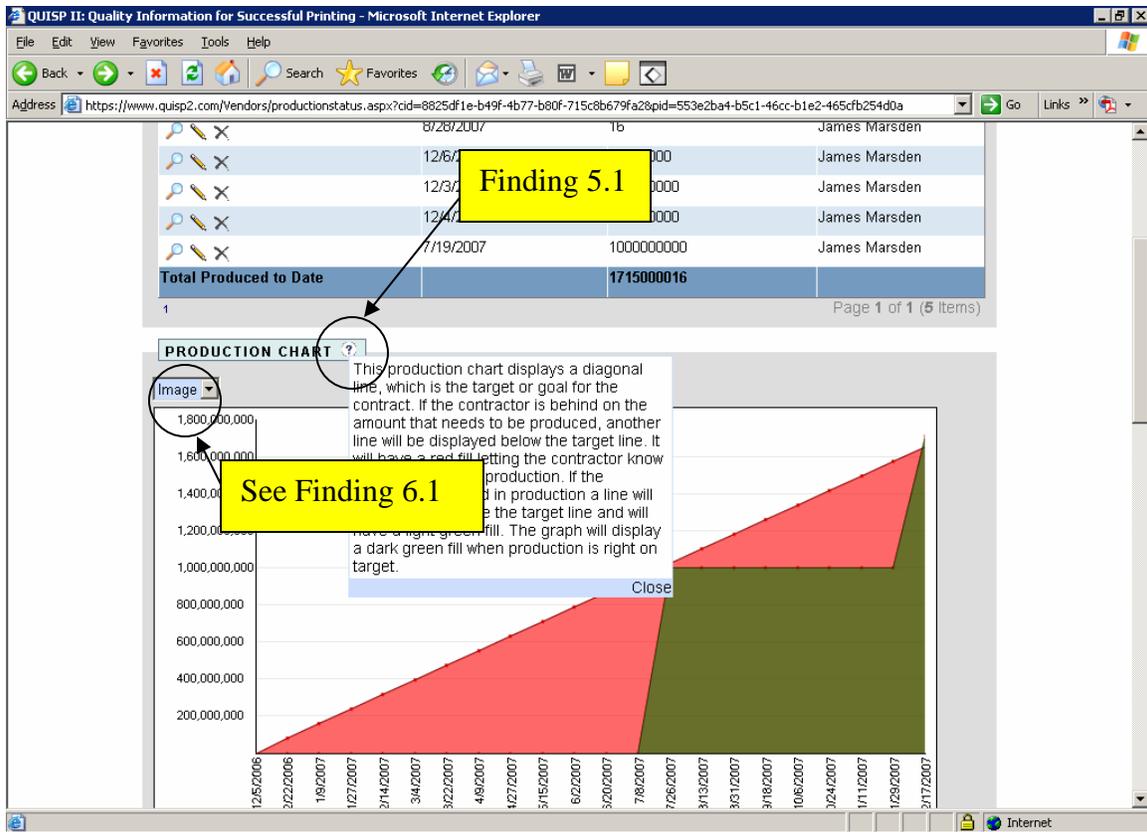


Figure 5. The Production Chart has inaccessible instructions.

**Finding 5.1.** The Production Chart instructions are not accessible because no box appears around the “?” icon when tabbing around the screen and the user must click on the icon to activate it.

**Priority:** High

**Details:** No visual focus is shown and the icon can only be accessed by a mouse click. These behaviors violate 1194.21 paragraphs A and C of the Section 508 regulation.

**Recommendation:** Put the “?” icon in tab order before the combo box showing “Image” as an option. Use “Production Chart Help” as the label.

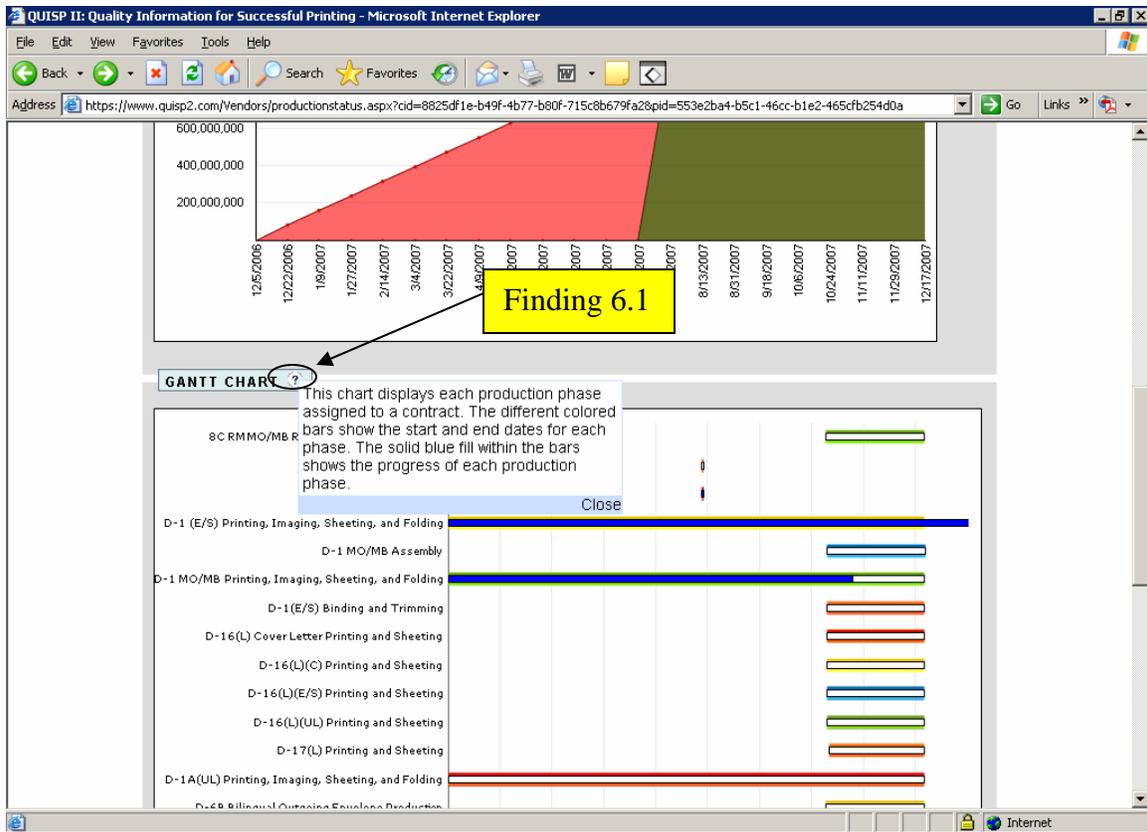


Figure 6. The Gantt Chart has inaccessible instructions.

**Finding 6.1.** The Gantt Chart instructions are not accessible because no box appears around the “?” icon when tabbing around the screen and the user must click on the icon to activate it.

**Priority:** High

**Details:** No visual focus is shown and the icon can only be accessed by a mouse click. These behaviors violate 1194.21 paragraphs A and C of the Section 508 regulation.

**Recommendation:** The “?” icon should be in tab order following the combo box currently showing “Image” on the Production Chart shown in Figure 5. Use “Gantt Chart Help” as the label.

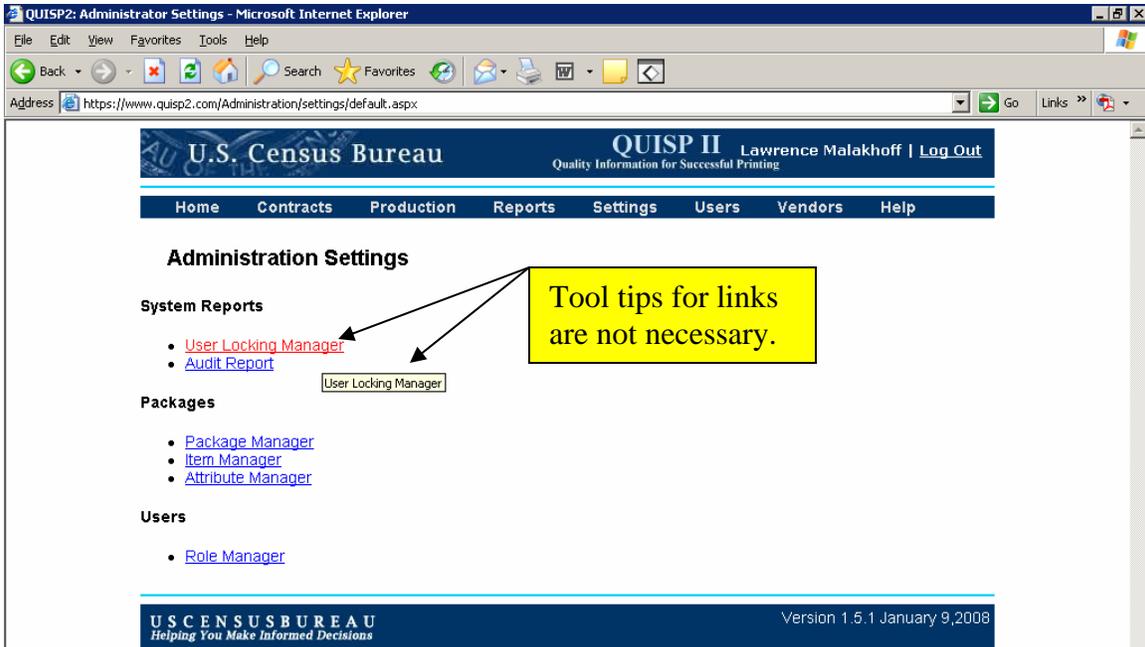


Figure 7. The Administration Settings screen has redundant tool tips.

**Recommendation:** Tool tips are not needed for links and can be eliminated.

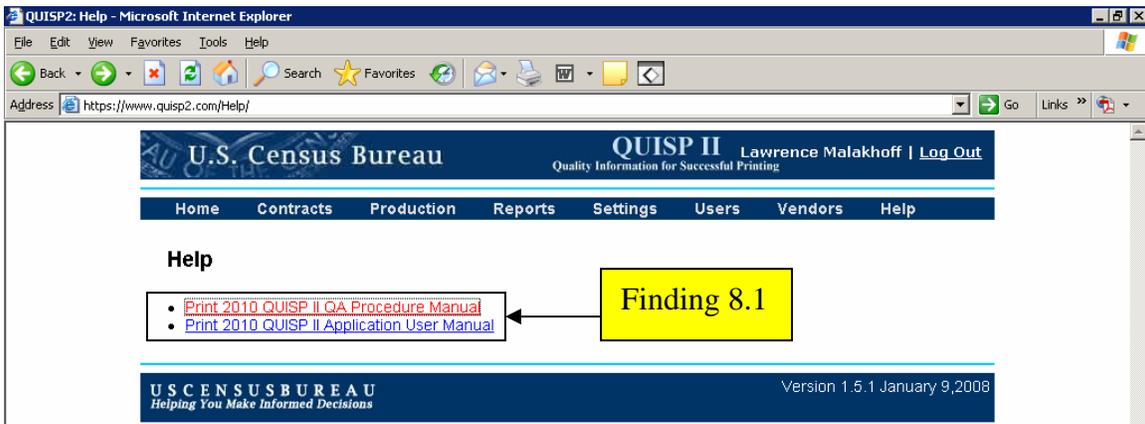


Figure 8. The Help screen does not have a link to download the Adobe Reader.

**Finding 8.1:** The help screen has links to two PDFs without another link to download Adobe Reader to read these manuals.

**Priority:** High

**Details:** Users will not be able to read either manual without Adobe Reader. The lack of a link to Adobe Reader violates of 1194.22 paragraph M of the Section 508 regulation.

**Recommendation:** Append (PDF) to the hypertext describing each manual so the user will know the document will be opened in the Adobe Reader. Place a link to download the Adobe Reader on this screen.

Next, we have usability findings for Figure 9.

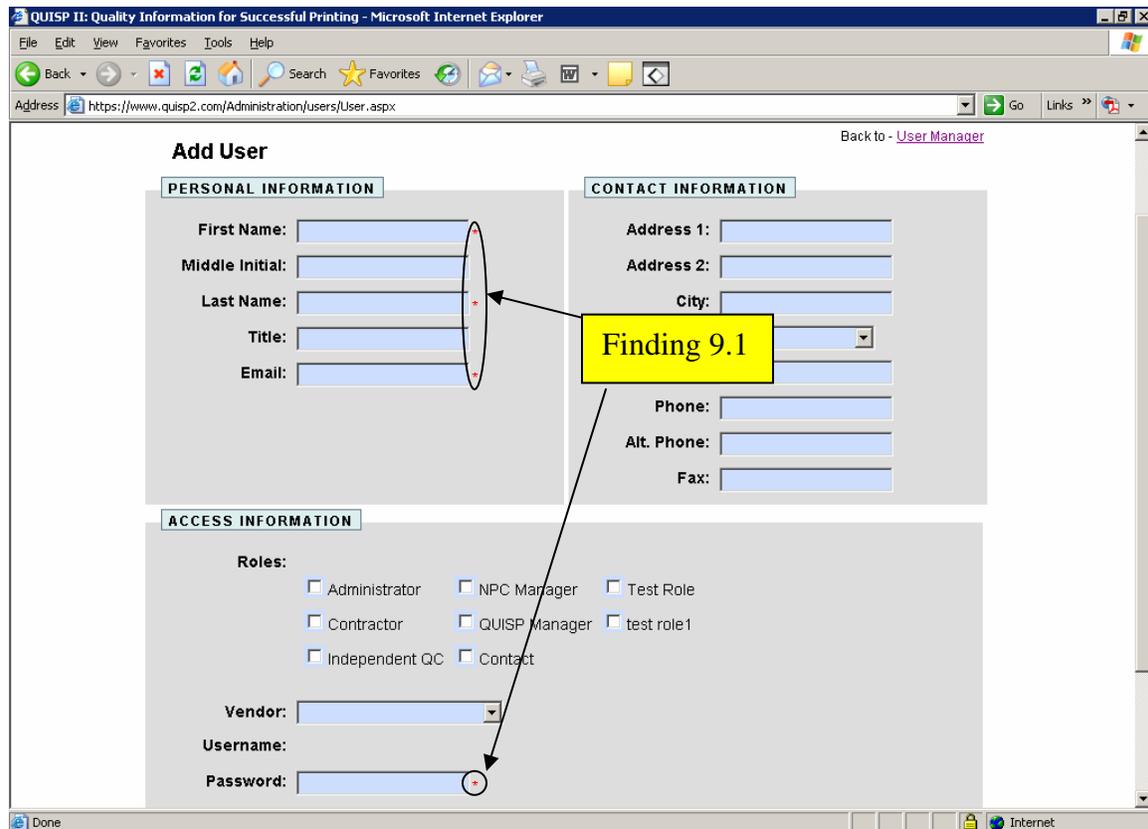


Figure 9. The Add User screen does not clearly identify the required fields.

**Finding 9.1:** Users are not informed about the meaning of the “\*” to the right of data-entry fields on this screen.

**Priority:** High

**Details:** Users may miss the “\*” because it is not near any text and there are no instructions as to its meaning.

**Recommendation:** Asterisks should precede the labels for better visibility instead of following a data-entry field (global). There should also be a note on screen stating fields marked with a “\*” are required (global).

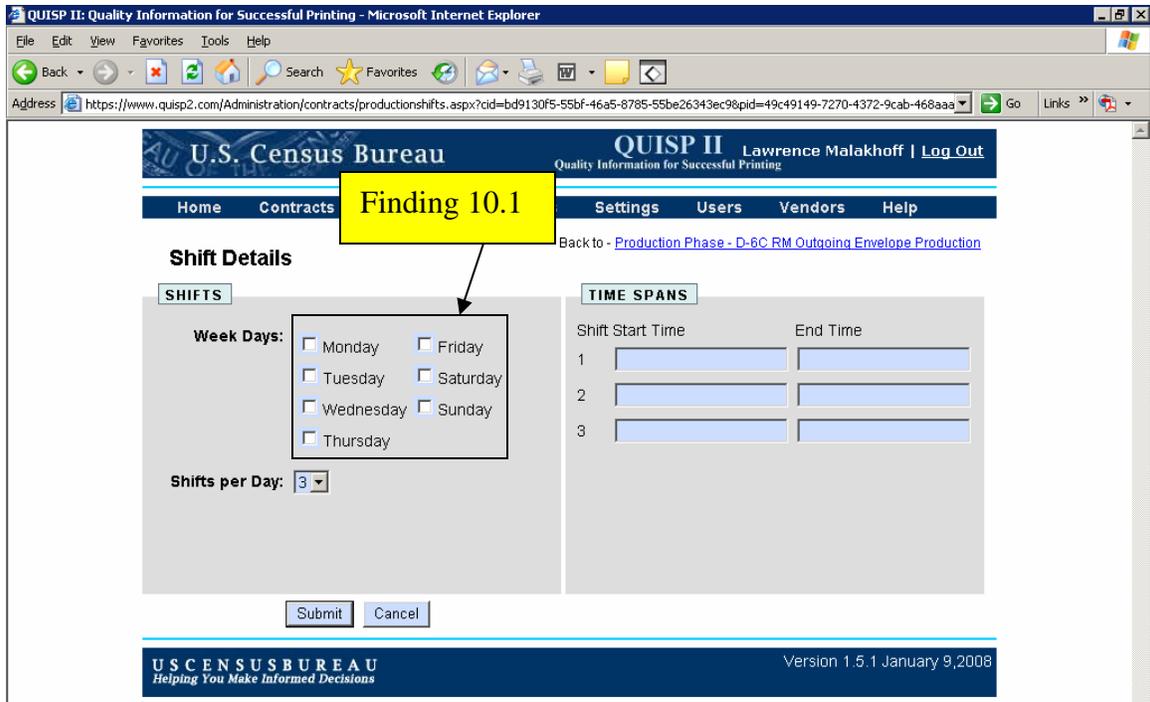


Figure 10. The Shift Details screen does not permit users to tab through weekdays by column.

**Finding 10.1:** Tabbing order does not follow the natural reading order for weekdays.

**Priority:** High

**Details:** Tabbing order occurs from left to right and top to bottom in the two columns with the weekday checkboxes. This has the effect of scrambling the expected sequence of Sunday – Saturday. This may cause users difficulty in finding the weekday to be selected. The lack of normal reading order violates of 1194.22 paragraph N of the Section 508 regulation.

**Recommendation:** Tabbing order should go down column 1 (Monday-Thursday) then column 2 (Friday-Sunday). Use the development software to make this correction.

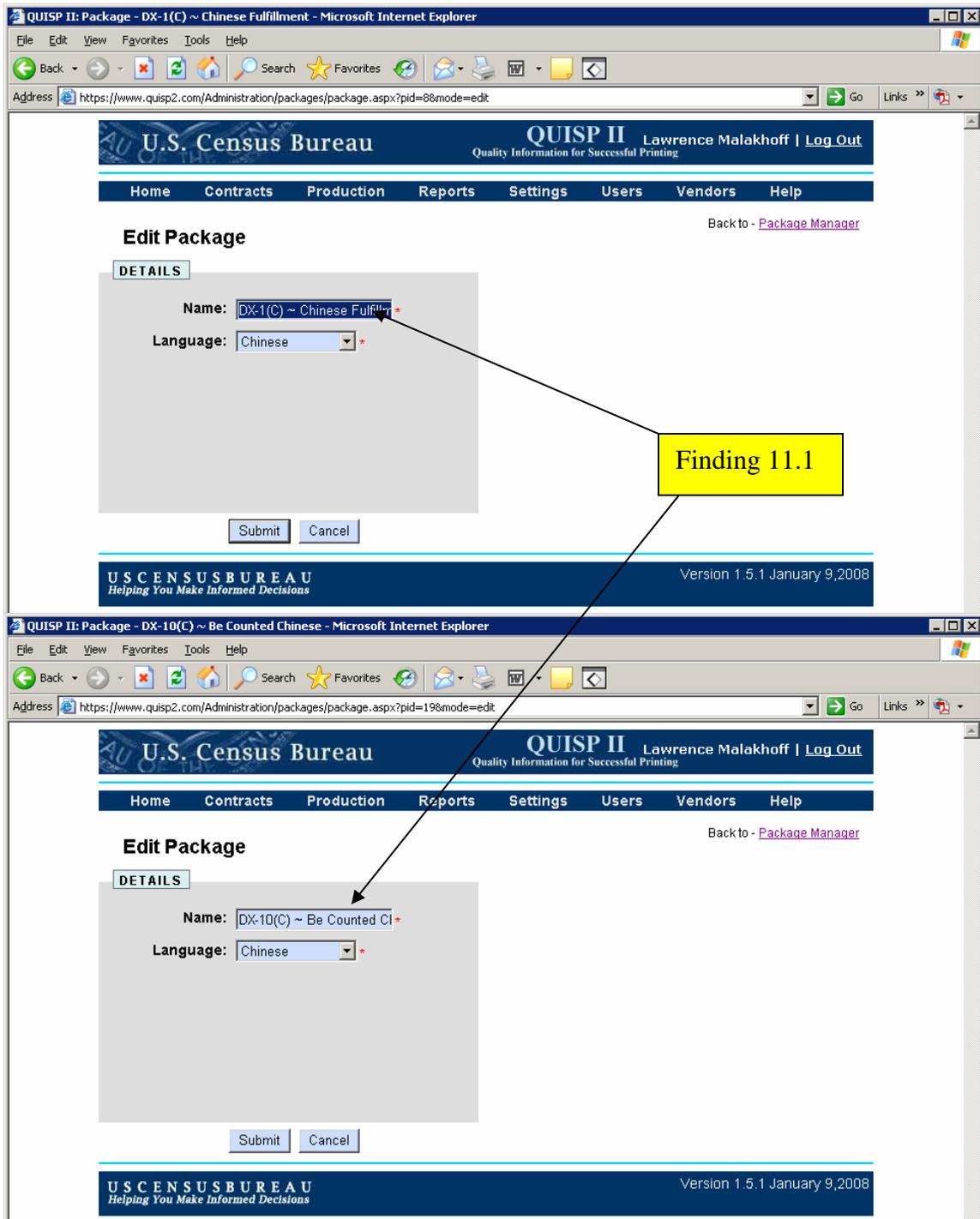


Figure 11. Options within the Name combo box are cut off.

**Finding 11.1:** Entries in the Name combo box are cut off.

**Priority:** High

**Details:** The first and last words are truncated on some entries in the Name combo box. Users will need to guess what the missing words say.

**Recommendation:** Use the development software to increase the width of the Name combo box so all words are visible.

## **Summary**

### **Accessibility**

This application cannot be fully accessible for people with severe visual impairments because some form inspection functions rely exclusively on sight, such as viewing a form, Gantt chart, or production curve. The application presents difficulties to individuals with color-blindness. Accessibility can be improved by providing full keyboard access for those persons who cannot use a mouse for long periods of time and modifying graphs and charts for individuals with a color deficiency. The QUISP II application has four types of accessibility problems. 1) Help icons (shown as a “?”) are not accessible; 2) Color is used by itself to distinguish between red, yellow, and green status lights and bar graphs; 3) The Help PDF manuals do not have a link to download the Adobe Reader; and 4) Tabbing order does not follow the natural reading order for weekdays.

### **Usability**

During the process of accessibility testing, six usability problems were detected;

- 1) Focus is not placed on the first data-entry field on the Log In screen as expected.
- 2) The button label “FILTER” is redundant within the context of the page and is not as descriptive as “SUBMIT.”
- 3) The stoplight still shows a red light when there are no defects.
- 4) Tool tips do not uniquely identify a form.
- 5) Users may not see or know the meaning of the “\*” used to identify required fields.
- 6) Options within the Name combo box are cut off.

This application requires a moderate effort to improve keyboard functionality. If accessibility and usability recommendations are followed for the QUISP II Web application, users seeking printing defect information codes will be able to accomplish this task more efficiently, quickly, and with greater satisfaction.