# CTC Link Accessibility Report

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## Introduction

At this time CTC Link is inaccessible to the point of being unusable for a screen-reader user. The system contains too many WCAG violations for me to document and explain as individual violations. As this agency’s IT Accessibility Coordinator designated by WA State Policy 188, I cannot recommend that Clark College move forward with an October go-live date from an accessibility perspective. Even with the most rigorous testing and remediation schedule, I fail to see how this system can meet Clark’s Accessibility policy by October. People Soft does not meet Revised Federal Section 508 accessibility standards.

This accessibility report will consist of the following sections:

* A review of Oracle’s VPATs, with emphasis on features which, by Oracle’s own admission, cause system-wide or specific accessibility failures.
* A review of system-wide accessibility issues I encountered in my week of user acceptance testing in the 9.2 environment. This review must necessarily encompass the parts of the system which utilize Fluid and the parts that don’t.
* An overview of Fluid, including Oracle’s accessibility recommendations for developing under the Fluid framework.
* Specific examples of pages in People Soft which are inaccessible to the point of being unusable.
* A review of auxiliary tools that I am aware of which are being used by the CTC Link project and which do not meet Clark’s accessibility standard.

Because of the numerous pages and technologies utilized by PeopleSoft, there is no way this report can be exhaustive in the way that a WCAG Compliance statement can be. I am positive that going through the system static page by static page and examining each UI element on that page in turn would generate tens of thousands of WCAG violations. hopefully SBCTC’s contracted accessibility testing will reveal and categorize violations at that level of granularity. It is my intent in this document to cover some system- wide issues which pose serious accessibility violations and delve into some specific pages which illustrate the consequences of those system-wide issues.

## VPAT Review

None of Oracles voluntary product accessibility templates (VPATs) which I have reviewed claim that their products completely meet WCAG 2.0 level AA guidelines. It is important to understand that these VPATS are Hierarchical, so, for example, the Campus Solutions VPAT depends on the PeopleTools VPAT and inherits all WCAG violations from it.

The following statement appears near the beginning of the most recent PeopleTools VPAT: “The administrative functions of PeopleSoft including but not limited to the Application Designer, Data Mover, and administrative SQR reports delivered with PeopleTools such as the Cross Reference reports, are not accessible products.” Oracle doesn’t even bother to supply a VPAT for these tools. Sadly, this means that any student or employee who relies on assistive technology will most likely not be able to use any of the above-listed features in the system or Oracle products.

The most recent PeopleTools VPAT highlights the following WCAG violations. it is important to note that this VPAT is working under the assumption that accessibility mode is activated, and these exceptions still exist. All of these exceptions are either A or AA criteria:

* Hierarchical tree structures in Pivot Grid do not have the correct markup to describe the relationship between tree levels. Bug 18351860.
* The feature “Notification Window” contains what is called “a dynamic badge” which can receive updates from the server periodically. The HTML for this region is incorrect in that does not have all the required keyboard shortcuts implemented. It also does not describe itself as a WAI-ARIA “live region” so screen reader users will not know when it updates itself. Bug 18694159.
* The Fluid landing page drop down is incorrectly marked up as a button, and does not have the correct keyboard operations associated with it. Bug 18794000.
* In Fluid two-panel pages, the correct WAI-Aria roles are not used to describe the purpose of each panel. Bug 18876375.
* Tab index issues on pagelets in the Portal Homepage and Dashboard, Work Centers and Related Content Framework have their own Tab index. This will result in an illogical tab order. Bug 13496529.
* In Fluid two-panel pages, the header is not accessible via the tab key. Bug 18876375.
* Tab index issues on pagelets in the Portal Homepage and Dashboard, Work Centers and Related Content Framework. Component pagelets have their own Tab index. Bug 13496529.
* Keyboard operations for adding or moving a Tile on a Fluid landing page are not currently available. This can only be done with touch or a mouse. Bug 17642367.
* Chart Types - bar, pie, line, scatter, bubble, funnel charts  dial, meter, and LED gauges, can  be configured so a user can click on the data items and/or the chart background to have an action take place. It is not possible to use the keyboard only to navigate to those clickable elements.  Bug 18763230.
* The Fluid Save indicator disappears in under 20 seconds. Bug 18887931.
* There is an issue with the Fluid Save warning Message. Focus should go to the title of the message and instead is going to the Yes button. Bug 18485513.
* In Fluid pages the focus is lost when returning from pop-up window. Bug 18756103.
* In Pivot Grids, the focus is not retained on control that invokes the page refresh. Bug 18415559.
* In Fluid two-panel pages, when making a selection on the left side, there is no indication to the user that the right pane has changed. Bug 18876375.
* Slide-Up Notification Window feature has a number of live regions on that page that are not marked up correctly. This information is also available on the Process Monitor page. Bug 18329338.
* Partition Manager pages have a number of dynamically loaded sections which are not marked up as live regions. This data can be accessed in the Process Monitor page. Bug 18329508.
* Hierarchical tree structures in Pivot Grid do not have the correct markup to describe the relationship between tree levels. Bug 18351860.
* The feature “Notification Window”  contains what is called “a dynamic badge” which can receive updates from the server periodically. The HTML for this region is incorrect in that does not have all the required keyboard shortcuts implemented. It also does not describe itself as a WAI-ARIA “live region” so screen reader users will not know when it updates itself. Bug 18694159.
* In Fluid pages, the focus is lost when returning from pop-up window. Bug 18756103.
* In Pivot Grids, the focus is not retained on control that invokes the page refresh. Bug 18415559.
* The Fluid landing page drop down is incorrectly marked up as a button, and does not have the correct keyboard operations associated with it. Bug 18794000.
* In Fluid two-panel pages, the correct WAI-Aria roles are not used to describe the purpose of each panel. Bug 18876375.
* In Fluid two-panel pages, when making a selection on the left side, there is no indication to the user that the right pane has changed. Bug 18876375.

These exceptions have the following serious system-wide implications for a CTC Link user:

* To the extent that any application built in people Tools uses grids it will not meet Policy 188 standards. This includes timesheets, the student registration shopping cart, and many other parts of the system.
* The administrative functions of PeopleSoft are specifically called out in this VPAT as being inaccessible. This means (among other things) that an institution can’t expect an AT user to perform duties with these tools such as building applications, running backend updates or running reports.
* There is no keyboard-accessible way for a user to manage tiles.

Campus solutions was tested with different methodologies than People Tools, in its case Oracle provided a WCAG 2.0 conformance statement. Presumably the below exceptions were found with an automated accessibility checker. Of the exceptions listed in the document, I consider the following to be serious violations:

* One page was identified where when the user tabs to a radio button with multiple radio buttons, the screen reader did not read the number of radio buttons.  Bug 21924829.
* Six pages were identified where not all form fields had a label in the left column. Bug 21924875.
* Three pages were identified where grids had their borders and controls hidden and were not visually a table in standard mode, yet they were identified as a table in accessibility mode.  Bug 21924938.
* Twenty-one pages were identified with improper tables (grids).  Bug 21924987.
* Twelve pages were identified where the labels in the table summary and column headers to did not make sense in accessible mode.  Bug 21925011.
* Two pages were identified where the tables identified by the Table Inspector did not appear as a table visually in standard mode.  Bug 21925047.
* Seven pages were identified where there were objects that did not look like a heading but were noted as a heading, yet there was no error.  Bug 21925072.
* Four pages were identified where there were objects that looked like a heading but did not get noted as a heading, yet there was no error.  Bug 21925103.
* Eleven pages were identified using a screen reader where grid column headings were not available for Add, Delete, Row Number or Row Selection Indicator Columns in a grid.  Bug 21925163.
* Two pages were identified where items did not appear in a logical order in the flow of the page.  Bug 21925219.
* One page was identified where directional text was used and did not provide specific instructions on what the user needed to do.  E.g., Instead of text stating “Press the below button” it should state “Press the Continue, Back, Save button below”.  Bug 21925247.
* Two pages were identified where labels were not close in proximity to the entry field/ field or were they were not on the left of the combo box.  Pages were identified where labels were not to the right of a check box for a consistent look and feel.  Bug 21925346.
* Twelve pages were identified where the color contrast analyzer identified issues.  Bug 21925384.
* Twenty-eight pages were identified where the title was not considered meaningful.  Bug 21925406.
* One page was identified where the tab order in accessibility mode was not the same as in standard mode.  Bug 21925424.
* Three pages were identified where the tab order was not in a logical form (e.g., top down or left to right and in sequence).  Bug 21925466.
* Two pages were identified where page objects were not ordered by tab order.  Bug 21925466.
* Three pages were identified where the mouse over text for a button did not convey a consistent meaning.  Bug 21925513.
* Three pages were identified where the mouse over text for links and images did not convey a consistent meaning.  Bug 21925604.
* Three pages were identified where the label did not appropriately describe the purpose for a link.  Bug 21925619.
* Seven pages were identified where the label was not appropriate for the control/field.  Bug 21925934.
* Ten pages were identified where the page lists were not tagged with the appropriate list titles.  Bug 21925965.
* Ten pages were identified without the appropriate header information.  Bug 21926013.
* Two pages were identified where the row headers did not uniquely identify the row.  Bug 21926112.
* Four pages were identified where grid columns did not have labels.  Bug 21926214.
* Eight pages were identified where grid boxes and grids did not have titles.  Bug 21926258.
* One page was identified where objects within the page did not operate consistently.  Bug  21926281.
* Four pages were identified where form fields do not have a unique label.  Bug 21926330.

These page counts pertain to Campus Solutions only, and again, are by no means exhaustive. the Campus Solutions conformance statement is “dependent on the PeopleSoft Enterprise Tools VPAT,” meaning that CS inherits all of the system-wide People Tools accessibility issues as well.

The PeopleSoft HCM Applications VPAT has the following A and AA exceptions:

* Closed captions are not provided for prerecorded audio content for the demonstration video for Activity Guide Composer.  Bug  27584068.
* The Activity Guide Composer demonstration video does not include audio description built into the main audio track. Bug 27581148.
* In Recruiting Solutions Classic Candidate Gateway, questionnaire is presented as a list but is not marked up in the HTML as a list.  Bug 19632823.
* Error messages which contain a list of error conditions or instructions are not marked as lists.
* During testing a small number of logical tab order issues were discovered in the product. Bug 19705003.
* During testing an issue was discovered in Talent Acquisition Manager where a job category used to categorize jobs uses color and alternative text to differentiate categories, but does not provide shading or different shapes.  Bug 27476321.
* During testing a small number of logical tab order issues were discovered in the product. Bug 19705003.
* An issue was identified in Fluid State Tax Information where the purpose of links cannot be easily determined.  Bug 27061729.
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* An issue was identified in Fluid Employee Snapshot where the Competencies tile has text content that is not labeled properly. Bug 25897726.
* An issue was identified in Fluid Report Time where the purpose of the Edit Date button cannot be easily determined.  Bug 25171630.
* An issue was identified in Fluid Personal Details where a region is labeled with ambiguous text and its purpose cannot be easily determined.  Bug 25113133.
* An issue was identified in Classic Timesheet where a heading does not properly describe the appropriate context. Bug 20008888.
* An issue was identified in Classic Time and Labor Self Service transactions where initial focus is not visible.  Bug 21309927.
* UI for administrative functions versus self service is inherently different since the frequency of use varies.  Administrators are trained users whereas self service users are typically infrequent and untrained users.  As such,  the UI for self service functions is different and much simpler than  the UI administrator web pages which results in an inconsistency of the UI across these functions of the product.
* UI for different product families (e.g.  payroll versus recruiting) have some differences in terminology.  The application is tailored for a particular set of business processes, concepts, and roles which in some cases do not span across product families which results in an inconsistency of the UI.
* UI for Classic versus Fluid transactions is different since Fluid transactions are a replacement for the legacy Classic transactions.

## System-Wide Accessibility Issues

For the purposes of this report, a system-wide accessibility issue is a WCAG violation (or other assistive technology failure-inducing issue) that appears as a UI element across multiple pages encountered in the system. This list is by no means exhaustive.

### Use of Tables for Layout

people Soft commonly employs the use of html tables for layout purposes in a way which is inconsistent with the recommendations in the Web Content Accessibility Guidelines. As a result, at many points throughout People Soft, (even with screen-reader mode enabled,) screen-readers and other assistive technologies will report the existence of a table when, strictly speaking, one does not appear on screen. This behavior occurs, for example, whenever the Oracle-defined PSPAGECONTAINER CSS class is present. html source is as follows:

<DIV class='ps\_pagecontainer' id='win0divPAGECONTAINER'><table class='PSPAGECONTAINER' role='main' aria-labelledby='app\_label'>
...

This class appears in the source code of many People Soft pages.

In this case, I suspect that the screen-reader is announcing the presence of a table because of the aria, but more thorough testing would need to be done to get to the bottom of this issue. Even without taking accessibility into account, using tables for layout is bad web design practice. Developers should avoid this practice in order to write compliant code.

### Inconsistent or No Heading Structure

There are several general problems with People Soft’s implementation and use of html headings. First, it is best practice to use a consistent heading structure, (I.E., <h1> for title text, <h2> for side navigation, <h3> for subsections of the main page, etc.) This insures, among other things, a predictable user experience when navigating a large number of pages quickly or for the first time, easy navigation with “quicknav”-like features of assistive technologies, and good semantic markup of pages in a UI. There is no such consistent structure in People Soft pages. More seriously, in many instances <h1>, <h2>, etc., tags are missing altogether. in their place are “fake” heading levels tagged with clever use of aria:

<td height='39' colspan='4'></td>
<td valign='top' align='CENTER'>
<DIV id='win0div$ICField29'><span role='heading' aria-level='1' class='PAPAGETITLE' >Account Activation</span>
</DIV></td>

There are actually several things going on in this code worth mentioning, but the “role=‘heading’ aria-level=‘1’” construct is not meant to be used in this context without an

tag. Aria is not supported (or not always supported) by all assistive technologies; this is why we use headings. Also notice the use of “padding” cells in this layout table. A screen-reader will announce these as a blank cell.

### Inconsistent, Incorrect, or No Aria

Aria is accessibility-specific technology which is typically added to a page after a well-defined heading structure or other navigational elements are present. As with headings, it is best practice to use consistent structure or naming conventions with aria regions. no such thought was put into people Soft aria. The following general aria issues occur system-wide:

* Many pages contain no aria.
* Some pages contain some working aria.
* There is Aria that appears in page source but does not announce or function in any meaningful way, indicating incorrect or unfinished coding by developers.
* Aria which functions sporadically or in a misleading way

### Inaccessible top-nav UI buttons

As far as I can tell, the following buttons appear at the top of the read order of many pages in PeopleSoft: Home, Search, Notifications, Actions List, and NavBar. These buttons are inconsistently labeled (or not labeled at all) across CTC Link pages. For example, in every HCM page which I’ve encountered these buttons are missing their form labels but they seem to be occasionally labeled in Fluid pages. Depending on the page or part of the system these buttons may or may not have tabindexes meaning that sometimes these buttons don’t appear in the tab order. When the buttons are labeled, the labeling is often inconsistent, for example “Notification New Notification 0” instead of “Notifications”, or “Global Search” instead of “Search.” This labeling issue is partially due to incorrectly configured Aria and is in direct contradiction with Oracle’s Fluid accessibility best practices cited elsewhere in this report.

## Fluid

Fluid is Oracle’s proprietary combination of Javascript, html, and CSS3 to achieve a responsive design. Because Fluid is a proprietary framework it is difficult to find development resources online, and difficult to determine the cause of accessibility issues in Fluid pages because of all the technologies involved.

Accessibility is inconsistent across Fluid pages I have encountered. Oracle offers accessibility recommendations for developing in the fluid framework in their “considering Accessibility for Fluid Pages” article linked to in the Resources section of this document. It is in no way clear to me that following these considerations results in an accessible user experience. I was told in an email from the state board that developers followed these considerations, but there are numerous accessibility issues in the Fluid pages I tested which leads me to conclude that following these considerations does not guarantee an accessible outcome. Failure to follow these considerations surely results in inaccessible UIs and there are several instances where it seems developers did not follow Oracle’s accessibility considerations.

A summary of key points of Oracle’s guidelines is below with My comments following each item.

|  |  |
| --- | --- |
| Oracle’s Accessibility Consideration Suggestion | My Comment |
| Use ARIA live regions sparingly | Aria is used inconsistently if at all. Depending on how a developer interprets “sparingly” this could cause WCAG violations. |
| Background and foreground colors | Several instances of high contrast came up in my testing. |
| Button or hyperlink row actions | This consideration was not followed in my opinion as evidenced by numerous missing form labels across the system. |
| Consistency with images and control labels | Inconsistent naming of form-labels or missing labels across every top nav button on every Fluid page. |
| Drag-and-drop | Oracle asks for a keyboard accessible mechanism whenever this functionality is present. this consideration has not been followed by Oracle itself on the Fluid tiles / homepage personalization page. |
| Focus indicator | inconsistent behavior with visual focus indicators / times when focus is completely lost. |
| Group box popups | Oracle’s comment for this consideration contains an admission that these controls may not be keyboard accessible: “Do not use the word ‘MENU’ in a title for a group box popup. Otherwise, a screen reader user will expect a keyboard that works with MENU to be available (up/down/left/right arrow keys), which is not available yet.”" |
| HTML areas | Several tabindex / keyboard accessibility issues in Fluid HTML areas. |
| Links versus buttons | This consideration wasn’t followed in our system; example: expandable / collapsible links. According to this recommendation these should be buttons. |
| List items | Oracle suggests using grids in place of lists in certain instances. Grids are inaccessible. |
| Read-only group box content | I suspect several instances where following this consideration would break compatibility with Voiceover screen-reader on iPhone / iPad, but more testing needs to be done. |
| Row headers | Using this for tables which do not contain data as Oracle suggests here is the cause of numerous WCAG violations. |
| Screen reader mode | Oracle suggests displaying a classic page whenever possible if a user is in screen reader mode. This consideration has not been followed. more testing would need to be done to see if following it would result in a more accessible user experience. |
| Table summaries | I encountered zero Table summaries in my testing; I can only conclude that this consideration was not followed. |
| Tab order | Fluid’s handling of tab order is out of the developer’s control. Problems arise with: invisible content, closed popup windows, and page refreshes. Following this practice causes keyboard accessibility issues. |
| Testing | Oracle suggests testing with: Windows high contrast Mode, VoiceOver or other native screen-reader. |

## Test results for specific CTC Link Pages

In my testing of specific pages within the CTC Link system I employed the following tools: NVDA Screen-reader (version 2019.1.1), Google Chrome (latest version), Windows magnifier (latest version) and the Wave Toolbar. I tested Fluid pages with the above configuration and Safari with VoiceOver in IOS 12. My testing is a result of combined application of these tools to the pages in question. Oracle’s Screen-reader mode was enabled whenever I tested pages that require a user to be logged in; however on public-facing pages such as the logon page or the account-creation page, testing with screen-reader mode was not possible. the fact that screen-reader mode is not enabled on public-facing pages has far-reaching implications for any public-facing content which utilizes PeopleSoft such as an admissions application created in PeopleTools. The below lists of errors are by no means exhaustive. Keep in mind that none of these errors appear in oracle’s VPATs.

### CTC Link login page ()

I tested the logon page at the following url: https://pt-uat.peoplesoft-nonprod-aws.ctclink.sbctc.edu/psp/ptuat/?cmd=login&languageCd=ENG& (note that the URL *does* end in an &). The following A and AA violations are present on this page:

* page does not scale to screen magnification of 200%. (1.4.4)
* Use of tables for layout.
* No heading structure
* Two empty headings. (WCAG 1.3.1, 2.4.1, 2.4.6)

### First Time User Login page

The following A and AA violations pertain to this page:

* page does not scale to screen magnification of 200%. (1.4.4)
* No Heading Structure (Note that NVDA detects a heading level 1 on the page, but this is due to the use of ARIA and is not a heading in the html sense which WCAG calls for.)
* Suspicious alt text on image: “Static Image”.
* 5 Missing form control labels
* 1 empty link (2.4.4)
* 1 Broken ARIA reference (1.3.1)

Unlabeled form elements are a serious violation which can make a page unusable for a screen-reader user. They can also cause the page to not scale under screen magnification. In fact, from a UX perspective, this page is unusable for most screen-reader users. For instance, an NVDA user would encounter the following when trying to interact with this page:

* When tabbing to the first control on the page NVDA announces the following, 90% of which is spurious information not related to the first textbox on the form which is all that would normally be announced: “table, Account Activation *First Name* Last Name *Date of Birth [MM/DD/YYYY] Calendar Submit row 1 column 1 table* First Name *Last Name* Date of Birth [MM/DD/YYYY] Calendar row 1 column 1 edit”
* If the user deduces that they are supposed to enter their first name into the first textbox and does so, tabbing to the next textbox causes NVDA to announce “Edit.” (Failure to announce “Last name” is due to missing form label.)
* If a user moves in and out of forms mode and tries to deduce the location of form labels by proximity to textboxes on the form or page read order, (a technique often employed by screen-reader “power users”) the user will encounter “*First Name" and "*Last Name” with no textboxes between those labels in the read order and two blank textboxes on either end of that text. (This is due to Oracle’s nonstandard use of html tables for layout purposes.)

### Clark’s CTC Link Homepage

The following A and AA violations are present on this page:

* 1 missing form label
* 1 empty link
* Missing first-level heading
* 1 instance of very low contrast

### Student Center

The following WCAG violations pertain to the Student Center page of People Soft:

* The page frame contains the following title text: “https://pt-uat.peoplesoft-nonprod-aws.ctclink.sbctc.edu/psc/ptuat/EMPLOYEE/EMPL/s/WEBLIB\_CTC\_SSO.ISCRIPT1.FieldFormula.IScript\_Student\_Center?PORTALPARAM\_PTCNAV=CTC\_STUDENT\_CENTER&EOPP.SCNode=EMPL&EOPP.SCPortal=EMPLOYEE&EOPP.SCName=CTC\_TAC\_SS\_NC&EOPP.SCLabel=CTC\_TAC\_SS\_NC&EOPP.SCPTcname=&FolderPath=PORTAL\_ROOT\_OBJECT.PORTAL\_BASE\_DATA.CO\_NAVIGATION\_COLLECTIONS.CTC\_TAC\_SS\_NC.CTC\_S201406011456087242651561&IsFolder=false&PortalActualURL=https%3a%2f%2fpt-uat.peoplesoft-nonprod-aws.ctclink.sbctc.edu%2fpsc%2fptuat%2fEMPLOYEE%2fEMPL%2fs%2fWEBLIB\_CTC\_SSO.ISCRIPT1.FieldFormula.IScript\_Student\_Center&PortalRegistryName=EMPLOYEE&PortalServletURI=https%3a%2f%2fpt-uat.peoplesoft-nonprod-aws.ctclink.sbctc.edu%2fpsp%2fptuat%2f&PortalURI=https%3a%2f%2fpt-uat.peoplesoft-nonprod-aws.ctclink.sbctc.edu%2fpsc%2fptuat%2f&PortalHostNode=EMPL&NoCrumbs=yes&PortalKeyStruct=yes” This text is read aloud by a screen-reader or other speech-to-text engine when a user navigates to the Student Center page at this time.
* Empty layout table with two columns and one row.
* Missing first level heading.
* 3 empty links

The student center page is unusable.

### Student registration shopping cart

I have not received access to a student registration shopping cart interface despite multiple requests for access and multiple assurances over a period of months from Clark College andSBCTC that I would be given it. Test results for a People Soft student enrollment shopping cart in May 2018 (access to which was given me by Grey heller) unearthed many specific WCAG violations in the interface. At this time I cannot recommend that Clark college use whichever student registration interface is being rolled out because of the below violations (from 2018 testing) and for the more general reasons given at the end of this list:

* Numerous nested layout tables which make the interface and navigating course schedules, student tuition account info and other critical student-specific data unusable.
* Complete lack of heading structure or aria throughout the entirety of the student center and student enrollment shopping cart specifically.
* Numerous unlabeled form controls in the shopping cart interface.
* Inaccessible dropdown menus in the student center
* Accessibility issues with Fluid in general documented elsewhere in this report
* Complete inaccessibility of the Student Center page (as reached via Clark homepage) at this time.

### Clark news pagelet

Peoplesoft includes the ability to publish news as a pagelet in the non-Fluid interface. this link is present on the Clark homepage, and the pagelet has the following accessibility issues:

* No VPAT or other accessibility documentation from Oracle on this feature.
* Entire page is displayed in an inaccessible modal dialog.
* Aria title text for heading level 1 for Clark news is: “Publication: Tacoma Comm Coll - Slideshow”
* Keyboard inaccessible “Drag to resize” element for news frame.
* Improperly configured aria on “Tags” link. (Announces collapsed / expanded but doesn’t announce on keyboard press.). In violation of Fluid accessibility best practices which would require a button here.

### Time sheet (non-fluid)

The classic (non-Fluid) timesheet page utilizes a construct known as a grid. Grids are documented by Oracle as being inaccessible so it comes as no surprise that from a UX perspective the timesheet page is unusable for a screen-reader user.

The following WCAG Violations occur on the timesheet page with screen-reader mode *enabled*:

* Missing first-level heading.
* 24 missing form labels.
* 5 Device dependent event handlers which cause keyboard accessibility issues.

From a UX perspective, this page is unusable by a screen-reader user. This is primarily due to PeopleSoft’s use of nested tables for layout. This applies to all grid controls in PeopleSoft with screen-reader mode enabled. A user will encounter the following issues when trying to fill out a timesheet:

* The timesheet title appears in a nested table used for layout, so a screen-reader user hears the following spurious semantic information when navigating to the first aria-defined header on the page (if screen-reader supports it): “table with 1 rows and 9 columns row 1 column 1 table with 1 rows and 2 columns row 1 column 1 out of table out of table clickable.”
* The timesheet interface is loaded in a frame which does not align with modern web practices.
* The Date field is missing its form label (label appears after in read order.)
* The column headers for the timesheet appear in nested tables so the screen-reader reports the following spurious semantic information when navigating to the “Monday” and “Tuesday” column headers: “table with 1 rows and 9 columns row 1 column 1 table with 1 rows and 2 columns row 1 column 1 column 2 Mon 6/10 out of table row 1 column 2 table with 1 rows and 2 columns row 1 column 1 column 2 Tue 6/11 out of table row 1 column 3 …”
* Because the tables containing date information in the header row are nested, it is impossible for a screen-reader user to use table nav functionality to navigate. in fact, each column heading element contains a spurious blank cell, so attempts to use table nav in this row will result in navigating to a blank “padding” cell.
* None of the textboxes on the timesheet are labeled form controls. A screen-reader user would not be able to begin filling out the timesheet.
* None of the dropdowns at the end of each row contain form labels. A user would not know which row a dropdown even applies to.
* Even if a user could successfully fill out one row, there would be no way for a user to report multiple leave events for one day because there is no defined relationship between rows in the table along a column.

Pasted below is a transcript of a screen-reader reading the whole timesheet frame from top to bottom. The amount of chattiness about tables is not normal and speaks to the poor design practices followed while implementing grids in oracle products:

[Begin speech output]

06/10/2019 button Calendar Date \* clickable Date Reported Hours 0.00 link Print Timesheet Reported time on or after 06/16/2019 is for a future period. clickable From Monday 06/10/2019 to Sunday 06/16/2019 graphic clickable Help From Monday 06/10/2019 to Sunday 06/16/2019 table with 1 rows and 9 columns row 1 column 1 table with 1 rows and 2 columns row 1 column 1 out of table out of table clickable From Monday 06/10/2019 to Sunday 06/16/2019 graphic clickable Help From Monday 06/10/2019 to Sunday 06/16/2019 From Monday 06/10/2019 to Sunday 06/16/2019 graphic clickable Help From Monday 06/10/2019 to Sunday 06/16/2019 table with 1 rows and 9 columns row 1 column 1 table with 1 rows and 2 columns row 1 column 1 column 2 Mon 6/10 out of table row 1 column 2 table with 1 rows and 2 columns row 1 column 1 column 2 Tue 6/11 out of table row 1 column 3 table with 1 rows and 2 columns row 1 column 1 column 2 Wed 6/12 out of table row 1 column 4 table with 1 rows and 2 columns row 1 column 1 column 2 Thu 6/13 out of table row 1 column 5 table with 1 rows and 2 columns row 1 column 1 column 2 Fri 6/14 out of table row 1 column 6 table with 1 rows and 2 columns row 1 column 1 column 2 Sat 6/15 out of table row 1 column 7 table with 1 rows and 2 columns row 1 column 1column 2 Sun 6/16 out of table row 1 column 8 table with 1 rows and 2 columns row 1 column 1 column 2 Total out of table row 1 column 9 table with 1 rows and 2 columns row 1 column 1 Time Reporting Code column 2 out of table out of table table with 1 rows and 7 columns row 1 column 1 table with 1 rows and 2 columns row 1 column 1 Override Reason column 2 out of table row 1 column 2 table with 1 rows and 2 columns row 1 column 1 Business Unit column 2 out of table row 1 column 3 table with 1 rows and 2 columns row 1 column 1 Combination Code column 2 out of table row 1 column 4 table with 1 rows and 2 columns row 1 column 1 ChartFields column 2out of table row 1 column 5 table with 1 rows and 2 columns row 1 column 1 column 2 out of table row 1 column 6 table with 1 rows and 2 columns row 1 column 1 column 2 out of table row 1 column 7out of table table with 3 rows and 9 columns clickable row 1 column 1 edit column 2 edit column 3 edit column 4 edit column 5 edit column 6 edit column 7 column 8 column 9 combo box collapsed clickable row 2 column 1 edit column 2 edit column 3 edit column 4 edit column 5 edit column 6 edit column 7 column 8 column 9 combo box collapsed clickable row 3 column 1 edit column 2 edit column 3 edit column 4 edit column 5 edit column 6 edit column 7 column 8 column 9 combo box collapsed out of table table with 3 rows and 7 columns clickable row 1 column 1 edit button Look up Override Reason column 2 edit HR140 button Look up Business Unit column 3 edit button Look up Combination Code column 4 link ChartFields column 5 button graphic clickable Add a new row at row 1 column 6 button graphic clickable Delete row 1 column 7 clickable row 2 column 1 edit button Look up Override Reason column 2 edit HR140 button Look up Business Unit column 3 edit button Look up Combination Code column 4 link ChartFields column 5 button graphic clickable Add a new row at row 2 column 6 button graphic clickable Delete row 2 column 7 clickable row 3 column 1 edit button Look up Override Reason column 2 edit HR140 button Look up Business Unit column 3 edit button Look up Combination Code column 4 link ChartFields column 5 button graphic clickable Add a new row at row 3 column 6 button graphic clickable Delete row 3 column 7 out of table Box 2 button Submit
[end speech output]

### Fluid Time sheet

The following WCAG violations occur on the Time sheet page when viewed through the Fluid interface:

* Page contains no heading structure to speak of.
* Suspicious ARIA label: “Main Landmark Title Long.”
* Time sheet data is not structured as a table.
* Aria labeling on “Week” Dropdown is inconsistent with what appears on-screen.
* 11 Missing form labels (all of the buttons)
* 8 empty links
* 1 missing fieldset
* 2 device-dependent event handlers
* 2 instances of very low contrast

I’m not even sure how to explain what a screen-reader user would go through when trying to fill this out. Below is a transcript of what NVDA reads while reading the main part of the page from top to bottom. Pay close attention to the suspicious Aria label, and notice all of the mislabeled buttons. There is no way for a user to determine the purpose of many of the UI elements on this page:

[Begin Speech Output]

main landmark Title Long Enter Time Job Title INFORMATION TECH SPEC 3 button graphic Previous Period Date edit 06/16/2019 button Calendar Date button graphic Next Period Semi-Monthly Period Scheduled 80.00 Reported 0.00 button unavailable graphic View Previous Week Week 1 of 3 \* Week combo box collapsed required Week 1 button graphic View Next Week Scheduled  40.00 | Reported  0.00 Time Reporting Code / Time Details Description Sunday Description 16 Description Monday Description 17 Description Tuesday Description 18 Description Wednesday Description 19 Description Thursday Description 20 Description Friday Description 21 Description Saturday Description 22 button button button button Descr 3 button button Scheduled OFF button button Description button button Reported   0 button button button button button Descr 3 button button Scheduled 8 button button Description button button Reported   0 button button button button button Descr 3 button button Scheduled 8 button button Description button button Reported   0 button button button button button Descr 3 button button Scheduled 8 button button Description button button Reported   0 button button button button button Descr 3 button button Scheduled 8 button button Description button button Reported   0 button button button button button Descr 3 button button Scheduled 8 button button Description button button Reported   0 button button button button button Descr 3 button button Scheduled OFF button button Description button button Reported   0 button button button table with 1 rows and 12 columns Weekly and Monthly Grid Display Options row 1 column 1 Time Reporting Code: combo box collapsed column 2 button graphic Time Details column 3 Sunday 16: edit column 4 Monday 17: edit column 5 Tuesday 18: edit column 6 Wednesday 19: edit column 7 Thursday 20: edit column 8 Friday 21: edit column 9 Saturday 22: edit column 10 button graphic Add column 11 button graphic Delete column 12 out of table Comments

[End Speech output]

## Auxiliary tools

The CTC Link project utilizes a number of auxiliary tools in an official project capacity to accomplish tasks such as cloud storage, hosting of training materials, tracking business processes, hosting online meetings, etc. In a phone conversation on May 29 2019, the CTC Link training manager explained that there is no organized effort being made at the state board level to inventory accessible or inaccessible tools being used on the project as policy 188 mandates. The training manager further explained that the CTCLink project and the State Board are separate entities. SBCTC sees the CTCLink project as temporary and as such, the board does not provide assistance in accessibility checking, remediation, or inventorying. The training manager’s section of the project does not have the resources to remediate or inventory in any meaningful way.

In my involvement with the CTC Link project I have encountered the following blatantly inaccessible tools, each of which could have their own accessibility write-ups. I made SBCTC aware of compliance issues around the below tools:

### Screensteps (CTCLINK Reference Center):

For the purposes of the CTC Link project, Screensteps (a more general content management system comparable to Canvas) has been rebranded as the CTC Link Reference Center. This is the CMS which hosts all of the CTC Link online help documentation and training materials available at the bottom of every CTC Link page and designed to be accessed by users in the system as an online help resource.

SBCTC is aware of accessibility issues with this CMS. The training manager performed the “tab-key test” and admitted that compliance is lacking." Screensteps has no VPAT. The project will continue to use this tool and attempt remediation with the vendor. SBCTC gave no time line for when this remediation would be complete.

### LucidCharts

LucidCharts is used by the CTC Link project to document business processes. Every page of training material or help documentation in the CTC Link Reference Center contains at least one embedded LucidChart since content creators appear to make great efforts to tie training materials back to business processes.

LucidCharts are embedded via widget / iframe in the Screensteps CMS and are not accessible. It is possible to export pdfs from LucidCharts but those pdfs are inaccessible. The company has no VPAT and admits in public forums online that their product does not meet WCAG standards. SBCTC is aware that the tool embeds completely inaccessible flowcharts and generates inaccessible pdfs. Isolated Efforts have been made by SBCTC staff to provide image descriptions for some of the business process diagrams but this is difficult because of the number of business process diagrams in training materials and because the tool generates pdfs that are a single image. I have not seen an example of these image descriptions. The CTC Link training teem does not have an accessibility / universal design specialist on staff, nor is anyone trained in or aware of guidelines and standards for describing technical images such as flowcharts. In spite of these difficulties and overall lack of accessibility of LucidCharts the project will continue to use this tool due to lack of resources.

### Box

Box is a Dropbox-like cloud storage tool. The CTC Link project uses this tool to host their “CTC Link Document Repository.” I was given access to this repository after reporting accessibility issues with Screensteps and LucidCharts. SBCTC staff asks college employees to create personal Box accounts with their state email addresses, after which they are given access to the repository via sharing links.

Box has a VPAT and a text-only accessible interface. (It should be noted that separate accessible interfaces are not current recommended web accessibility practice.) The “normal” interface is not accessible enough to be usable in any practical way, and the accessible interface is missing a key feature: the ability to accept invites to collaborate on shared folders!

SBCTC was unaware of accessibility issues in the Box UI. The project will continue to use Box for hosting training materials.

### Webex

Webex is used by the CTCLink project for all online trainings, user acceptance testing and other collaborative meetings. Webex is a notoriously inaccessible online meeting tool, even admitting lack of compliance such as limited keyboard accessibility and limited support for low vision accessibility features. SBCTC was unaware of these issues, but I did not confirm if they would continue to use this software for online meetings or look for a more accessible alternative.

## Resources

* Web Content Accessibility Guidelines (WCAG) 2.0: https://www.w3.org/TR/WCAG20/
* Policy 188: https://ocio.wa.gov/policy/accessibility
* Clark’s Accessibility Policy: http://www.clark.edu/accessibility
* Oracle VPAT landing page: http://www.oracle.com/us/corporate/accessibility/vpats/vpats-peoplesoft-162942.html
* PeopleTools VPAT: <http://www.oracle.com/us/corporate/accessibility/templates/t2-4023.html>
* Campus solutions VPAT: <https://www.oracle.com/corporate/accessibility/templates/t2-8152.html>
* HCM VPAT: https://www.oracle.com/corporate/accessibility/templates/t2-6744.html
* Intro to fluid: https://www.youtube.com/watch?v=o5-wQ2dHKsw
* Accessibility considerations for fluid: https://docs.oracle.com/cd/E91187\_01/pt855pbr2/eng/pt/tflu/concept\_ConsideringAccessibilityforFluidPages.html?pli=ul\_d41e59\_tflu
* people Soft News Pagelet documentation: https://docs.oracle.com/cd/E28003\_01/ps91fp1pbr0/eng/psbooks/pscm/chapter.htm?File=pscm/htm/pscm08.htm
* NVDA screen reader: http://www.nvaccess.org
* Wave toolbar extension for Chrome and Firefox: <https://wave.webaim.org/extension/>
* Windows Magnifier: https://support.microsoft.com/en-us/help/11542/windows-use-magnifier-to-make-things-easier-to-see
* LucidCharts Accessibility Forum Post: https://lucidchart.zendesk.com/hc/en-us/community/posts/360001424323-Accessibility
* Guidelines and standards for describing technical images: http://diagramcenter.org/table-of-contents-2.html
* Box VPAT:
* Webex accessibility page: : https://help.webex.com/en-us/84har3/Cisco-Webex-Meetings-and-Cisco-Webex-Events-Accessibility-Features