Accessibility Report for Libro.fm

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The opinions and interpretations in this publication are those of the author and do not necessarily reflect those of the Government of Canada.

About NNELS

The National Network for Equitable Library Service (NNELS) is a digital public library of ebooks for Canadians with print disabilities, and an advocate for an accessible and equitable reading ecosystem for Canadians with print disabilities[1]. NNELS supports principles of openness, inclusion, and choice. NNELS is hosted by the BC Libraries Cooperative, a community service not-for-profit cooperative and a national leader in information and technology services.

Our team of Accessibility Testers has expert knowledge in the areas of accessibility testing, analysis, software development, and leadership. The team works to educate and advise publishers, technology vendors, and public libraries on best practices for accessibility. Our testers have lived experience with a range of

[1] Print disabilities are defined by Canada's Copyright Act and include visual, mobility, or comprehension impairments such as dyslexia.

print disabilities, including blindness, low vision, and learning disabilities.

Accessibility Summary

Libro.fm offers both a website and mobile apps that are usable by blind and low-vision users. Our testers could locate, obtain, and listen to audiobooks on various devices. The details of each audiobook are readily available and can be read using assistive technology.

Though the platform is usable, it is not always efficient to do so. Low-vision users, in particular, found the experience widely inconsistent, with some screens magnifying effectively while others enlarging very poorly, causing difficulty locating and operating controls. The labelling of controls for screen reader users varies, with most having appropriate labels but some controls having verbose, vague, or no labels.

Introduction

Libro.fm is a digital audiobook store and player. The service comprises a website where customers can browse, purchase, and download audiobooks and mobile apps which users can download to play the audiobooks they have bought. Users can select a local bookstore to support, and that bookstore receives a portion of the proceeds when the user purchases an audiobook.

Our testers used screen-reading and magnification software to assess the usability of the Libro.fm website and mobile apps. Readers can find a complete list of all the software and operating systems used in this assessment in this report's *Systems and Assistive Technology* section.

This assessment aims to determine the usability experience of readers with print disabilities and to what extent they can access Libro.fm effectively and efficiently. While this report provides an overview of the accessibility performance across supported

platforms, this is not an in-depth review of Libro.fm itself. As a result, some functionality may not be discussed at all or in-depth.

Overall, Libro.fm was usable. Some of the processes were accessible, while other processes and screens were less compatible with assistive technology. Our testers could find their way through, but it was not always intuitive or efficient.

Introduction to Assistive Technology

All mainstream operating systems include built-in screen readers (Narrator on Windows, VoiceOver on Apple devices, and TalkBack on Android) that read the contents of the screen out loud, allowing users with visual disabilities to browse apps and websites, send and receive texts and emails, and accomplish many other tasks with ease. Keyboard commands and custom touch gestures provide a flexible way for users to find and interact with the controls on-screen. Windows also has alternative screen-reading software available, most notably a commercial option called Job Access with Speech (JAWS) and a free and open-source option called Non-Visual Desktop Access (NVDA). The text spoken by a screen-reader can be sent to a refreshable Braille device. Mainstream operating systems are also equipped with user interface magnification, large text options, and high-contrast viewing mode to assist people with low vision.

To ensure usability and accessibility of an application by people with print disabilities, all functions and controls must be accessible using assistive technologies. The DAISY Consortium explains that the basic assumption of accessibility evaluations is that reading systems "should support reading with eyes, ears, and fingers." (DAISY Consortium, 2017). It should be possible for users to read the content of the document by:

- Reading the text with screen readers or self-voicing text to speech (TTS) applications
- Adjusting the display, including font size, alignment, and colour contrast, or a combination of some or all these options

- Reading the text with a refreshable braille display
- Reading with assistive technologies designed for persons with dyslexia or other disabilities
- Reading with the app's built-in read-aloud functions

Accessibility Performance and Recommendations

This section will dive deeper into specific accessibility issues encountered while testing the Libro.fm website and mobile apps. Below you will find the testing results and their related recommendations as they pertain to:

- Sign-Up and Login
- Layout and Navigation
- Searching and Browsing
- Audiobook Details
- Audiobook Playback
- Visual Adjustment

Finally, the *Development Recommendations* sections contain suggestions for improving the interface on each platform. These suggestions will be relevant to any issues or observations noted above.

Libro.fm Website

- Tested operating systems: Windows 10 and 11, MacOS 13.4.1, iOS 16.5, Android 13
- Tested browsers: Chrome 113 and 114, Firefox 114 and 115, Safari 16.5

Sign-up and Login

Signing up for Libro.fm is a two-step process. The user enters their email address into the email field on the sign-up page and solves a CAPTCHA. Then an email is sent to that address with a link to complete the process. The CAPTCHA is implemented using Google’s reCAPTCHA service, which provides multiple accessible alternatives, including checking a checkbox and audio challenges.

None of our testers encountered any difficulties completing the first step.

Activating the link in the sent email brings users to the second step of registration, where the rest of the needed information is entered. One low-vision tester found the outlines around the edit fields too faint; otherwise, magnification and high-contrast users encountered no substantial issues completing this form. The contrast was sufficient, and magnification did not cause any complications or unexpected behaviour.

Screen reader users found that while the fields are labelled correctly and provide appropriate instructions, some caused unexpected behaviour when tabbed to or typed into. When using JAWS with Chrome on Windows, tabbing past the postal code field would cause focus to jump to the top of the page instead of the checkboxes and button after it. When using VoiceOver with Safari on MacOS, attempting to type into the postal code field would often input into the country field instead, causing the selected country to be changed. Additionally, each text field for entering credit card information is contained within a separate frame which VoiceOver must interact with to type into.

Selecting a bookstore to support also proved challenging for screen reader users. The default view for selecting a bookstore is a map with no alt text supplied for its images, causing screen readers to read nonsense strings of characters before the name of each bookstore. Typing into the search combo box was inefficient and laggy when using NVDA with Firefox on Windows, and it was not possible to review what was typed. A text view can be switched to, but this does not offer the same search and filter options as the map view, forcing a screen reader user to choose which pro and con they want to deal with.

Once accounts were created, some testers struggled to locate the login link. For instance, magnifying 200% on an iPad in landscape orientation would push the login link off the screen, leaving no obvious hint regarding how to find it. This is likely due to the

login link being located near the bottom of the menu rather than being featured prominently near the top.

The button to submit the login form is smaller than the equivalent button on the signup form, making it more difficult for some low-vision users to locate. Otherwise, all of our testers could enter their account details and log in.

Layout and Navigation

The Libro.fm website uses landmarks and headings to aid screen reader navigation. It also features a link to skip to the main content and another to skip to the footer, so screen reader users have multiple ways of quickly locating the section of the page they want. The heading structure is generally logical. The only missing markup element is a main region/landmark to clearly identify where the page's main content starts and ends.

Low-vision testers encountered some difficulties navigating the site. The number of advertisements displayed before a user signs in can overwhelm a first-time visitor. It may require some adjusting until they can get themselves signed in. The contrast scheme on the homepage changes frequently between dark on light and light on dark, which can be confusing and disorienting. The carousels and banners on the homepage take up a large percentage of the screen when using magnification at 125% or higher, requiring much more scrolling to access the rest of the page.

Libro.fm's various pages and features can be accessed via the menus in the header. Most links in these menus have appropriate text labels and screen readers announce whether submenus are currently expanded or collapsed. The "Wish list" link is the exception regarding labels; it lacks an alt text attribute if the user's wish list is empty. Or it only reads the number of items in the list and not the words "Wish list" (if the wish list contains any books).

Testers using screen readers could access all menus and links using arrow key navigation. Tab navigation proved much less

reliable, with many menu items not included in the tab order. Attempting to tab through the menu links skips over many of them and often causes screen reader focus to jump unpredictably. Even when links, which expand submenus, are located, activating them to expand or collapse them does not cause a screen reader to automatically announce their updated state; the user must have their screen reader speak the link again manually.

Low-vision testers did not encounter issues accessing and navigating via the navigation menu. Lower levels of magnification are required compared to what is needed for the main content. They are implemented as a static header that allows users to scroll down the page while retaining quick access to the menu.

Searching and Browsing

There are two search fields in the website's header which can be typed into to perform a search. Having two fields might be confusing to some users, but both offer identical functionality and accessibility, so there are no traps caused by one being less accessible than the other. Autocomplete suggestions populate as a user types and can be selected to jump straight to the details page for the associated audiobook, or a query can be typed in full and submitted to access a search results page.

No submit button accompanies the search field; the user has to submit their query a different way, such as by pressing enter. This is not necessarily an access barrier, but while screen reader users are generally accustomed to pressing enter to submit, some low-vision users might initially find this unintuitive. Low-vision testers did not report any other difficulties when performing searches.

Performing a search is generally a barrier-free experience for screen reader users. The search fields can be navigated using all of the standard keystrokes, including tab, which does not skip these fields as it does with many of the menu links. Screen readers do not announce that autocomplete results will populate as the user types, nor do they announce once they begin doing

so. Pressing the down or up arrow after typing does allow a screen reader user to cycle through them, and they are read out when the user highlights one. Because there is no announcement, a user may not realize this can be done without trial and error.

The search results page does not use headings effectively and would benefit from having a heading to mark the start of search results and headings for each result's title. Each search result features an image link with alt text containing the audiobook's title and author. There is also a text link containing the title and a label displaying the author. This is redundant; these images could be hidden from screen readers to reduce clutter. Activating a link loads the audiobook's details page.

Accompanying each search result is a button to show the details of the audiobook without navigating to its page. These buttons are problematic for screen reader users. They all have the label "Show audiobook details," which does not tell a user navigating from button to button which audiobook it corresponds to. Activating the button causes the details to appear on the screen, but the focus is not moved to the newly present content, nor does a screen reader announce that anything has happened. When using VoiceOver or Narrator, these buttons sometimes expand automatically when the focus lands on them without being activated. Perversely, continuing to navigate when this happens does cause focus to jump to the details which have appeared, even though the user did not intend to expand them.

The sort and filter options use combo boxes, expandable tabs, and checkboxes to select options, all of which report their state and respond to keyboard input from most screen readers. The exception is for Narrator, which cannot expand the various filter tab groups and, therefore, cannot navigate to or check any of the checkboxes.

Low-vision users found applying multiple filters inefficient when using the website in mobile layout because the checkboxes would disappear after one was checked, and the category would need to

be expanded again to select another. No issues were encountered by low-vision users when in the desktop layout.

Browsing audiobooks by theme or genre can be done via carousels on the homepage or through the navigation menus. Browsing a genre or a non-curated list, such as bestsellers, via the navigation menu displays a list of books in a format identical to that of search results, complete with the same sort and filter controls. Curated playlists are displayed using a different format, which shows more information about each book but denotes each with a heading, allowing for efficient and consistent screen reader navigation.

The carousels present significant challenges for both low-vision and screen reader users. As stated in the *Layout and Navigation* section, magnifying the screen causes a carousel to occupy much of the screen real estate. Arrows to control the carousels also disappear off the screen when magnified on some devices, such as iPads, making it difficult to see the contents of the carousel while navigating through them.

The carousels do not feature "previous" or "next" buttons that screen readers can access, and while there are tab controls for navigating between slides, they do not work natively with screen readers. Users must use advanced screen reader features, such as passing keystrokes directly through an application to access the rest of the carousel slides.

Audiobook Details

The record page for each audiobook contains all of the details for that book. Headings are used to mark the start of sections, and information such as author, narrator, and genres are presented as links which can be activated to browse for other books of that genre or by the author or narrator. Screen reader and low-vision users found most information accessible and easy to understand.

Some screen reader users found the carousel of bookseller reviews difficult to navigate without accessible buttons or labelled tabs. Some also found the controls for performing important

actions, such as playing an audiobook's sample or adding it to the cart, easy to miss because they are located before the level 1 heading rather than after it.

The audio playback controls for playing an audiobook's sample are compatible with all tested screen readers. Controls are labelled and behave as expected, and users can "Play," "Pause," "Read elapsed," and "Total" time, seek to a time marker, adjust playback speed, and download the sample. Low-vision testers using the mobile site found the controls too small and lacking contrast, making them difficult to see and manipulate.

Audiobook Playback

The Libro.fm website does not feature an audio player for listening to full audiobooks. Users can use the apps for iOS or Android or can download audiobooks and play them using a media player on their computer. None of our testers had difficulty locating or activating the control to download an audiobook, and there are several accessible media players available on a variety of platforms. It may be beneficial to provide a help article listing some, as less experienced computer users who have only ever known the ubiquitousness of streaming services may not be aware of their options for playing MP3 files.

Visual Adjustment

The Libro.fm website offers no built-in visual accessibility settings or customizations. Users must use the features or programs on their devices. As has already been outlined in various sections of this report, some elements of the website do not enlarge or adapt properly, making them difficult to see and navigate. Implementing size, contrast, and other visual options on the website would allow for greater compatibility and ease of use.

Development Recommendations

- Provide a role and tab index for all custom controls so that screen reader users can tab to, type into, or otherwise make use of them without unexpected behaviour.

- Write and provide alt text for all images without an alt attribute.
- Write descriptive labels for buttons and include them as text or ARIA labels.
- Implement visual accessibility options, which can be set directly on the website, to reduce the need for and improve the compatibility of screen magnification.

Libro.fm App for iOS and WatchOS

- Tested OS version: iOS 16.5 and 16.5.1, WatchOS 9.5.2
- Tested app version: 6.5.0

Sign-Up and Login

When Libro.fm for iOS is launched for the first time, the button to sign in is the first control to receive focus. This makes initiating the sign-in process quick and efficient for VoiceOver users. The button to create an account is not on the same screen, requiring an extra tap to find it. Once located, the create account form has a field for supplying an email address, which none of our testers had any difficulty with. The rest of the process must be completed on the Libro.fm website, which low-vision testers found to be preferable.

The sign-in form fields are labelled and function correctly with VoiceOver. The labels for buttons on this screen are not ideal: the back button contains the unnecessary word "arrow," while the "Show password" button does not update once the password is visible to reflect that tapping it will now hide the password. Additionally, the "Back" button is a custom button rather than a native iOS back button, which causes the two-finger scrub VoiceOver gesture to fail to work. None of these issues prevented VoiceOver users from being able to sign in, and low-vision testers encountered no challenges.

Layout and Navigation

The app uses a tabbed layout with tabs along the bottom of the screen. VoiceOver reads if a tab is currently selected, and the selected tab is visually distinct from other tabs, making all tabs

identifiable and easy to read. Screens loaded by activating a control within a tab include a “Back” button for easily retracing one’s steps, and these “Back” buttons do activate in response to the two-finger scrub VoiceOver gesture.

Searching and Browsing

Locating and typing into the search field is accessible for blind and low-vision users. When the “Search” tab is switched to, the search field is automatically focused, and the on-screen keyboard appears. VoiceOver behaves as expected when typing and reviewing text, and iOS Zoom can be used to magnify the text field without interfering with the on-screen keyboard.

The autocomplete suggestions which appear as the user types are not fully intuitive for VoiceOver users. VoiceOver does not announce that they are appearing; they are labelled with only the book's title. A VoiceOver user would be unable to distinguish between two autocomplete suggestions with the same title, even if the authors are different. They are not identified as buttons, so users may not realize they are loading a new screen when double-tapped.

Browsing search results is accessible and efficient using VoiceOver. Each search result is contained within one element, so excessive swiping is not required to navigate from result to result. Double-tapping a result works as expected, loading the details screen for the audiobook.

The “Sort” and “Filter” buttons are appropriately labelled, and VoiceOver identifies whether or not criteria are selected. Each sort and filter criteria includes a rotor actions menu containing “Activate” and “Apply.” Selecting “Apply” allows for applying filters without locating the “Apply” button. However, this proved confusing for some users, as it does not set or apply the criteria if that criterion was not already activated first.

Low-vision testers found browsing search results to be challenging. The text is very small, particularly on smaller screens, and does not meaningfully enlarge in response to iOS

accessibility settings. Enabling Zoom helps but at the cost of requiring much more scrolling. Enabling Zoom also makes it difficult to sort or filter results without accidentally selecting criteria while scrolling through the list.

Browsing via the "Explore" tab posed only minor issues for VoiceOver users. The screen features multiple playlists which can be double-tapped, but VoiceOver does not identify them as buttons, so users may not immediately realize they are tappable. The list of genres at the bottom of the screen does not share this problem and is read as buttons. The "Recent Recommendations" section contains an adjustable slider which does not do anything detectable to VoiceOver when its value is changed, and some buttons in this section have the non-specific label "Audiobook details," which does not identify which audiobook.

Low-vision testers praised the layout of the "Explore" tab, finding it familiar and appreciating how the header for the currently visible section always remains at the top of the screen. Audiobook covers are generally easy to see and are accompanied by text. However, the app's use of small text, which does not enlarge properly with iOS accessibility settings, posed a challenge on subsequent screens.

When selecting a playlist or genre to browse, the list of audiobooks is presented nearly identical to the search results screen, with the same accessibility features and shortcomings. When exploring a playlist, there is one additional button for sharing which has no label, causing VoiceOver only to read "button," which does not tell a user what the button does.

Audiobook Details

The "Details" page for an audiobook displays all of the information in a way that VoiceOver users can read. VoiceOver can focus and speak all of the details and controls. However, many elements which should be recognized as buttons are not announced as such, while some elements which should be plain text are erroneously announced as buttons. While this does not prevent a VoiceOver user from being able to learn about or play

an audiobook, it may make doing so confusing at first until the user is familiar with the app.

Low-vision users reported that the text on audiobook detail pages continues to be too small. Book synopses are made easier to read by being bolded when using a white-on-black theme.

Audiobook Playback

All testers could select and start playing audiobooks and reported the playback controls as being accessible and straightforward to use. The mini-player controls, and the button to set a sleep timer have slightly verbose labels, which cause VoiceOver to repeat information unnecessarily, but this does not interfere with being able to recognize and use the controls. The slider to adjust the current listening position is the only control which exhibited unexpected behaviour; swiping up or down would adjust the slider, but the audio would not jump to the newly indicated position until the user performed a double tap.

Low-vision testers found the playback controls easy to see and use, even while outside in the sun. The interface is not unnecessarily cluttered, which makes it easier to see and operate the necessary controls.

The Libro.fm audiobook player offers features which benefit a wide variety of users with or without disabilities. Playback speed can be decreased and increased, benefiting those with cognitive or auditory disabilities. A sleep timer can be set, allowing users to control how much of the audiobook to process before playback automatically stops.

Libro.fm offers a companion app for WatchOS. It allows users to use their Apple Watch as a remote for the app on their iOS device or to sync audiobooks to and listen to them directly on their Apple Watch.

VoiceOver reads and can activate most controls in the WatchOS app, but the interface is unnecessarily cluttered. Controls are read as images rather than buttons, and some of their labels are separate elements, requiring extra gestures to navigate past.

Some controls do not have labels, such as those found after "More" and "List." VoiceOver does not recognize when a button does nothing, such as attempting to start playback when no Bluetooth audio device is paired. Unlike on iOS, VoiceOver does not identify which sleep timer or playback speed is currently selected.

Visual Adjustment

The app does not offer visual accessibility settings. Switching from a light to a dark theme offers minimal assistance, but users must otherwise rely on their device's accessibility settings and Zoom feature. As noted, the text within the app does not enlarge sufficiently when users increase text size within iOS settings. Enabling Zoom drastically limits what will fit on the screen and makes it difficult to perform some actions without inadvertently performing other unwanted ones.

Development Recommendations

- Implement settings to adjust text size and contrast or improve the app's compatibility with iOS's visual accessibility settings.
- Apply appropriate roles to controls so VoiceOver will recognize tappable controls as buttons and not recognize plain text as buttons.
- Provide descriptive labels across the app, which include identifiable information while removing redundant/repeated words.
- Allow VoiceOver to recognize and announce when content on the screen changes, such as autocomplete search results populating.
- Remove the necessity to double-tap the playback position slider after swiping to adjust it.
- Apple Watch: Use appropriate control types or roles, so VoiceOver will recognize them as buttons, identify selected options, and announce if one is disabled.
- Apple Watch: Merge controls which have a separate label so they are identified as a single labelled button.

Libro.fm app for Android

- Tested OS versions: 11 and 13
- Tested app version: 7.2.1

Sign-Up and Login

Our testers were able to sign in to the Libro.fm app for Android without difficulty. TalkBack reads the edit fields, links, and buttons clearly. Users can autofill their credentials or paste them from a third-party password manager, eliminating the need to remember and type potentially complex passwords.

The account creation process is done on the website and is covered in the associated section of this report.

Layout and Navigation

The app uses a tabbed interface with four tabs. TalkBack reads the labels correctly and identifies the tab number within the tab list. The tab controls are located at the bottom of the screen, but they are near the beginning of the focus order, which causes TalkBack to focus and read them before the main contents of the screen. This is not standard behaviour and requires users navigating from the top of the screen to perform extra swipes every time. Low-vision users reported that it would be preferable for the tab menu to utilize the same contrast scheme as the rest of the page.

A “What’s new” screen is displayed when signing in for the first time. This screen contains buttons and tab controls which do not have labels. TalkBack users can read the “What’s new” information, but not the purpose of the controls to switch pages or close the pop-up.

Searching and Browsing

Locating and typing into the search field is accessible for blind and low-vision users. When the “Search” tab is switched to, the search field is automatically focused, and the on-screen keyboard appears. TalkBack behaves as expected when typing and

reviewing text, and low-vision users can magnify the text field without interfering with the on-screen keyboard. There is no cancel button to dismiss the keyboard, requiring users to activate the general back button on Android. This was found to be less efficient.

The autocomplete suggestions which appear as the user types are not fully intuitive for TalkBack users. Each of the suggestion's labels begins with the words "Cover art," which is repetitive and adds no value for somebody who cannot see the cover art. All this does is slow down navigation because the user must hear these words each time before the title is spoken. After the words "Cover art", suggestions are labelled with only the book's title. A TalkBack user cannot distinguish between two autocomplete suggestions with the same title, even if the authors are different.

Activating the "See all" button or the return key on the keyboard brings up the full list of search results. Each result is contained within one element, which requires only one swipe to read and navigate past. Each search result's label also begins with the words "Cover art," which is repetitive and wastes TalkBack users' time.

The "Sort" and "Filter" buttons are labelled, but the options on the sort and filter screens do not tell TalkBack whether they are selected. There is no way for a TalkBack user to be informed of how results are currently sorted. There are buttons to clear each currently selected filter which are labelled with the filter they would clear, so TalkBack users will be told which filters are active. However, these buttons' labels do not make it clear that their function is to clear the filter. The filter categories are not headings and cannot be collapsed to hide all options within that category, which leaves the filter screen rather cluttered.

The font and contrast options on the sort and filter screens accommodate low-vision users. The filter categories are visually identified as headings, and while this does not translate to TalkBack, it aids navigation for low-vision users. It was noted that

the back button does not work on this screen, so the “Apply” button must be activated to return to the results list.

The ”Explore” tab features playlists and genres which can be browsed. TalkBack reads everything on this screen, but elements are not recognized as headings, buttons, or links, which would aid navigation and make it clear to a user when something can be tapped. The featured carousel does not have a title, and swiping left or right with two fingers does not cycle between the slides as it should, requiring the user to navigate to the tabs, select one, then navigate back.

As with search results, each book within a playlist or genre is presented as one element, requiring only one swipe to read or navigate past. Unlike search results, some books contain their title twice within their label, while some do not. When a book’s title is not repeated, the author’s name is omitted, requiring the user to double-tap the book to load its details screen if they wish to hear that information. Playlists and genres can be sorted and filtered using the same set of controls as search results, complete with the same accessibility features and challenges.

The sample titles and advertisements displayed on the “Explore” tab’s main screen are visually consistent, and they use large font and a contrast scheme which is easy to see with a device’s high-contrast settings enabled. The list of genres is displayed using large, well-spaced, and clear white text. The layout remains consistent while browsing various genres. Switching tabs in the featured carousel causes the first image that is displayed to appear small and cut off, making it difficult to see and read.

Audiobook Details

The details screen for an audiobook displays information in a format that TalkBack and low-vision users can navigate and understand. The contrast and spacing between content is sufficient for low-vision users. TalkBack reads all information, and the table showing additional information such as publisher and publication date is easy to explore. There is one exception for audiobooks which are bookseller picks: the carousel showing

reviews is not identified with a heading, and there are no labels associated with its tab controls, so a TalkBack user may not understand its purpose.

Audiobook Playback

When an audiobook begins playing, a mini-player appears near the bottom of the screen. TalkBack and low-vision users can locate and interact with it, but it is not always an intuitive process. The playback controls within the mini-player work as expected, but tapping anywhere else in the mini-player bar will expand the full-screen player, rather than there being a specific button or icon to do so. Low-vision testers found this to be confusing.

The mini-player appears near the beginning of the screen when swiping through elements with TalkBack, which is confusing when it is visually located near the bottom. TalkBack users can double-tap the book title to open the full-size player. However, this does not have a label that explicitly states that this is its purpose, only identifying the book title with a generic "Double tap to activate" hint. When the full-screen player is opened, TalkBack can still swipe past it to the content from the previous screen, even though this content is no longer on screen and attempting to activate any such controls will not work.

The full-screen player posed no challenges for our low-vision testers. The contrast and spacing between elements made everything easy to see and read.

Testers using TalkBack could navigate to and utilize most of the full-screen player controls. All controls are labelled, but the labels for the "Playback speed," "Sleep timer," "Bookmarks," and "Track" buttons are unnecessarily verbose; "Playback speed" would be sufficient, for example, although including the currently selected playback speed would be helpful. In the "Playback speed" and "Sleep timer" dialogues, TalkBack does not identify which option is currently selected. Labels for the "Bookmarks" and "Tracks" buttons are somewhat ambiguous and do not

specify that the former adds a bookmark and the latter displays bookmarks as well as tracks.

The slider to seek a position in the current track proved problematic for TalkBack users. The instructions given are to swipe up or down, but in reality, a TalkBack user must double-tap and hold before dragging their finger left or right. This is much less precise than swiping up or down to move by a certain percentage or number of seconds. The slider's label also does not indicate that it is for the current track, as opposed to the entire book.

Visual Adjustment

The app does not offer visual accessibility settings. Users must rely on the built-in settings of their device, which may or may not magnify text to meet their needs adequately. Our low-vision Android testers found this sufficient, but visual disabilities vary widely. Implementing settings within the app to adjust the font size, contrast, and other aspects always makes for a more universally accessible product.

Development Recommendations

- Correct the focus order of elements so TalkBack users encounter them in the proper top-to-bottom sequence.
- Implement settings to adjust text size and contrast or improve the app's compatibility with Android devices' built-in visual accessibility settings.
- Write and apply labels to all controls which do not have them, notably carousel and other paging controls.
- Refine labels which are too verbose or not descriptive enough.
- Implement role and state information so TalkBack users can identify if an option is already selected.
- Fix the audio player's seek slider so TalkBack users can swipe to adjust it. Switch to a native control for this or ensure proper accessibility roles or interactions are applied.

Conclusion

Libro.fm does many things right when it comes to accessibility. Audiobooks are a naturally accessible medium for many people, and the website and mobile apps provide a platform where blind and low-vision users can enjoy them while supporting their local bookstore. There exist some accessibility shortcomings, particularly for low-vision users, which require attention if Libro.fm is to become a fully inclusive space for all audiobook lovers.

Systems and Assistive Technology

- Operating Systems
  - Windows 10 and 11
  - macOS 13.4.1
  - iOS 16.5 and 16.5.1
  - WatchOS 9.5.2
  - Android 11 and 13
- Mobile Applications
  - Libro.fm 6.5.0 (iOS, WatchOS)
  - Libro.fm 7.2.1 (Android)
- Browsers
  - Chrome 113 and 114 (Windows, MacOS, Android)
  - Safari 16.5 (MacOS, iOS)
  - Firefox 114 and 115 (Windows)
- Screen-readers
  - NVDA 2023.1 (Windows)
  - JAWS 2023 (Windows)
  - Narrator (Windows)
  - VoiceOver (macOS, iOS, WatchOS)
  - TalkBack (Android)
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  - ZoomText 2022 (Windows)
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