Social Media and Accessibility

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Abstract. Social media is an integral part of the web, and it is becoming even more important when it comes to employment prospects. People with disabilities already find it difficult to access employment and any web sites that are inaccessible to them makes the issue that much harder. LinkedIn is one social network that is becoming essential for employees in the twenty-first century. A subset of requirements from the W3C Web Content Accessibility Guidelines were used to test how accessible LinkedIn is to people with disabilities. A large number of issues were found, indicating that LinkedIn is not an accessible social network and is unlikely to provide the same functionality to people with disabilities using the system as those provided to the general public.

Keyword: Accessibility

1 Introduction

Social media is an incredibly important tool in modern society. There are five main reasons people access social media: personal (such as sharing photos on Instagram), work (such as finding jobs on LinkedIn), entertainment (such as following celebrities on Twitter), provision of goods and services (such as responding to user complaints on Facebook) and education (such as watching instructional videos on YouTube) [1]. It is not just the young who access social media, with close to 30 % of people over the age of 65 interacting on social networking sites, and 50 % of people aged 50–64 [2].

1.1 Social Media and Employment

Social media is becoming an essential part of negotiating the current working environment. Of all US adults who use social media, 35 % have used social media to look for or research a job, 34 % have used social media to inform friends of a job in their current company and 21 % have applied for a job found through social media contacts [3]. Thirteen percent of social media users state that their existing social media profile has helped with finding a job [3].

As the percentage of recruiters who use LinkedIn to review job candidates is now 95 % [4], this social network is integral to one's employment prospects. With over 414 million users [5] (including over 120 million registered members in the US [6]), two new users every second [5] and 3 million active job listings at any one time [7], it is a formidable network.

Thus the accessibility compliance of these social networks is of paramount importance to people with disabilities. People with disabilities are already discriminated against in the workforce, as the many instances of litigation under the Americans with Disabilities Act attests to [8]. Although the employment rate of people without disabilities has increased slightly over the last 25 years – from 76 % to 78 %, the employment rate of people with disabilities has almost halved – from 29 % to 16 %, despite no significant change in the percentage of people with disabilities over the twenty-five years [9]. With the employment participation rate of people without disabilities close to three times that of people with disabilities [10], any barrier to employment must be rectified.

When it comes to LinkedIn, one's success is greatly improved by interacting with the network. For example, adding a professional photo to one's profile means that one is fourteen times more likely to be found in LinkedIn [11]. Adding skills to one's profile increases one's views thirteen times [12]. The number of comments on a LinkedIn post doubles if that post contains an image [13]. Therefore, LinkedIn is not just about creating a profile, but updating it as required. It is therefore essential that these features are fully accessible.

1.2   About Web Accessibility

Web accessibility is about making sure web sites, web applications and mobile apps (including social media networks) are accessible to people with disabilities. There are four groups of people assisted by an accessible site: people with cognitive disabilities; people with vision impairments; people with physical disabilities; and people with hearing impairments. The estimate of people with disabilities in the US varies between 40 million [14] and 57 million Americans [15]. This is a conservative estimate.

W3C Web Content Accessibility Guidelines, Version 2.0. Web accessibility of web sites is best achieved by following the Web Content Accessibility Guidelines, Version 2.0. The World Wide Web Consortium (W3C) has worked in the area of web accessibility since 1998 and they have developed a set of recommendations called the W3C Web Content Accessibility Guidelines, which have been endorsed around the world. The W3C states that "following these guidelines will make content accessible to a wider range of people with disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech disabilities, photosensitivity and combinations of these" [16].

The W3C Web Content Accessibility Guidelines, Version 2.0 consists of four principles (Perceivable, Operable, Understandable and Robust) with 12 guidelines and 61 success criteria. There are three conformance levels: Level A (minimum), Level AA (medium) and Level AAA (high). Most countries require conformance to Level AA.

2 Methodology for Testing the Accessibility Compliance of Social Networks

The LinkedIn web site and mobile app was tested against the W3C Web Content Accessibility Guidelines on a desktop computer, an iPhone and an Android phone.

The following pages were tested:

- Homepage
- Create an account
- Login
- Profile page
- Add a post

2.1 Testing Against the W3C Web Content Accessibility Guidelines

A selection of success criteria from the W3C Web Content Accessibility Guidelines were used to assess the accessibility compliance of LinkedIn. These success criteria are representative of the most serious accessibility issues that people with disabilities encounter when accessing a web site.

Success Criterion 1.1.1: Non-text Content (Level A). This success criterion requires that text alternatives are provided for all non-text content, such as images, for assistive technologies to interpret. Without text alternatives ("ALT attributes") all images would be unavailable to screen reader users. Missing text alternatives to form features, such as image submit buttons, means that assistive technology users, such as screen reader users and speech recognition users (for people with vision impairments and physical disabilities respectively), will be unable to use a form at all.

This success criterion was tested using Chris Pederick's FireFox Web Developer Toolbar [17] using the following features:

- Outline all images without ALT attributes
- Outline images with empty ALT attributes
- Display ALT attributes

Images and other non-text content in LinkedIn were tested for the presence and accuracy of text alternatives. LinkedIn was also tested for the ability for a user to add text alternatives to user-generated content.

Success Criterion 1.3.1: Info and Relationships (Level A). This success criterion requires that important information about the content be coded so that it can be interpreted by assistive technologies. For example, headings can be coded in a particular way so that screen reader users can access a list of headings in the page, and therefore access an overview of the content of the page.

This success criterion was tested manually by reviewing the code of a social media site and with Chris Pederick's FireFox Web Developer Toolbar [17] using the following features:

- Outline headings

LinkedIn was tested for the presence and accuracy of headings and for the presence of appropriately coded form elements.

Success Criterion 1.4.3: Contrast (Minimum) (Level AA). This success criterion requires that the colour contrast between foreground text and the background meets certain requirements. People with failing eyesight and people who are colorblind have difficulty reading content with low colour contrast. Approximately 8 % of men are colorblind [18], therefore it is a common ailment (although it is not defined as a disability). Due to the high prevalence of colorblindness amongst the general population this success criterion was deemed integral to the accessibility compliance of the LinkedIn web sites, despite the fact that it is in the Level AA (medium) category, not the minimum category.

This success criterion was tested using the Paciello Group's Colour Contrast Analyser [19]. Items that were deemed mandatory to understanding and interacting with the social media site were tested for adequate colour contrast.

Success Criterion 2.1.1: Keyboard (Level A). This success criterion requires that all content and functionality in a web site be accessible via the keyboard. A number of different physical disabilities restrict a user's ability to use a mouse, and these people often rely on a keyboard to access a site. Keyboards can also be implemented with mobile devices, for people who have difficulty using the touchscreen feature.

This success criterion was tested manually on a FireFox browser (Version 44) on Windows 10.

Success Criterion 2.1.2: No Keyboard Trap (Level A). This success criterion requires that any component that can be entered via a keyboard can also be exited via a keyboard. There are some instances where features, such as video players, trap the keyboard focus and the user cannot escape the feature. In order to continue using the site the user must close the browser and begin again. Success Criterion 2.1.2 is one of the four "non-interference" success criteria in WCAG2 [20]. These four success criteria must be met across an entire site, even if part of the site is deemed to be inaccessible. Failing one of these four success criteria interferes so significantly with some user's interaction with the site that it is deemed a critical failure.

This success criterion was tested manually on a FireFox browser (Version 44) on Windows 10.

Success Criterion 2.4.1: Bypass Blocks (Level A). This success criterion requires that users that can only access content sequentially can jump over repeated content such as navigation straight to the body of the page. One of the most common methods of achieving this is to provide "skip links" which provide an anchor link to the content of the page. According to WCAG2, skip links must be the first focusable link on a page [21]. For example, this allows screen reader users to jump past the navigation, which, if there were no skip links, would be repeated on every page that they visit.

This success criterion was tested manually on a FireFox browser (Version 44) on Windows 10.

Success Criterion 2.4.3: Focus Order (Level A). This success criterion requires that the order of content is meaningful to the user. There are three different content orders:

- Visual order of content on the page
- Source order of the code
- Order in which items receive keyboard focus

It is important that these three orders are the same. Often people with disabilities will have access to more than one content order, and if there are differences between these content orders it can cause serious confusion to users. For example, a keyboard-only user of a site will have access to the visual order of the content of the page, as well as the order in which items receive keyboard focus. As another example, people with cognitive disabilities who use screen readers to assist in reading content will have access to the visual order of the content in the page and the source order of the code (which is used by the screen reader).

This success criterion was tested in conjunction with Success Criterion 2.1.1: Keyboard, by manually reviewing the visual order of the content on the page and by displaying the content with style sheets disabled using an internal AccessibilityOz FireFox bookmarklet.

Success Criterion 2.4.7: Focus Visible (Level AA). This success criterion requires that an element that has keyboard focus is visually indicated to the user ("keyboard focus indicator"). If this is the case, the user can easily follow keyboard movement through the page, and activate appropriate items. Where items do not have a highly visible keyboard focus indicator the user will not know where on the page their focus is located. This makes a site incredibly difficult, if not impossible to use. As this is a feature that is essential to keyboard-only users in interacting with a site it was deemed integral to the accessibility compliance of the LinkedIn web site, despite the fact that it is in the Level AA (medium) category, not the minimum category.

This success criterion was tested manually on a FireFox browser (Version 44) on Windows 10.

3   The Accessibility Compliance of Social Media

3.1   Results of Testing Against the W3C Web Content Accessibility Guidelines

Success Criterion 1.1.1: Non-text content (Level A). Surprisingly the LinkedIn site does not have many images, however they all include accurate ALT attributes. Unfortunately, there is no way for a user, when posting a status with an image, to add an ALT attribute to that image. As a result, all images added to a status or a post have empty ALT attributes.

Success Criterion 1.3.1: Info and Relationships (Level A). The forms in LinkedIn have been coded appropriately as specific form elements. This should make it straightforward for screen reader users to access the site.

Headings have been coded in the site, however the hierarchy of the headings are incorrect. In the example below the text 'Platinum Asset Management Limited shared:' is a heading 3. The article title 'Sugar addiction – breaking the cycle' is a heading 4. However, the names of the commenters on the article ('Alan Wallace', 'Brett Elliott') are also coded as heading 4 (see Fig. 1). These commenter names are sub-headings to the article name and should be coded as a heading 5.
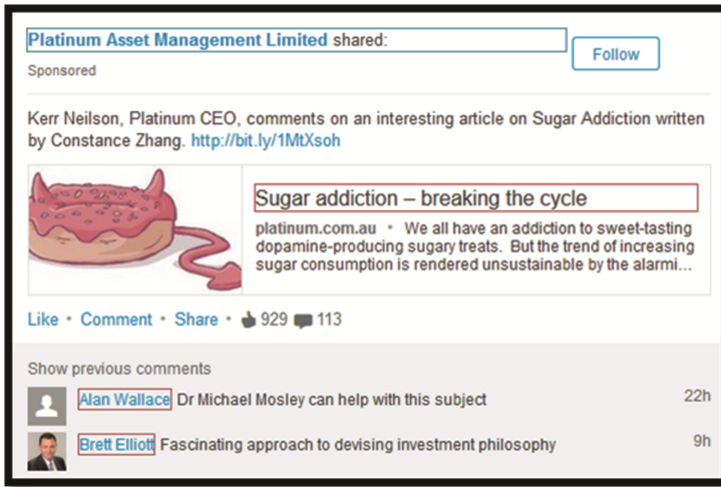
Fig. 1. Heading structure (headings outlined) in the main profile page of LinkedIn

Success Criterion 1.4.3: Contrast (Minimum) (Level AA). Colour contrast is problematic, with some information presented as medium-grey text on a light-grey background on a mobile device. Whether a person is a first degree contact or a second-degree contact is provided as medium-grey text on a light-grey background and fails WCAG2 colour contrast requirements (see Fig. 2).

When entering an incorrect password into the login box, the error text is red on a grey background (see Fig. 3) and this also fails WCAG2 colour contrast requirements.
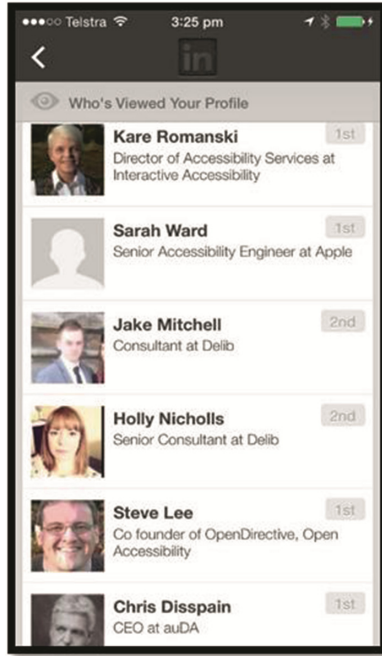
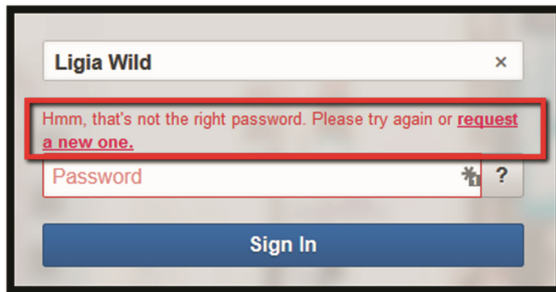**Fig. 2.** Colour contrast failures in the login feature (Color figure online)

Fig. 3. Colour contrast failures in the iPhone LinkedIn mobile app (Color figure online)

Success Criterion 2.1.1: Keyboard (Level A). When creating an account some important features are not keyboard accessible, including the ability to skip importing contacts (see Fig. 4), and sending another email if the original email was not received (see Fig. 5).
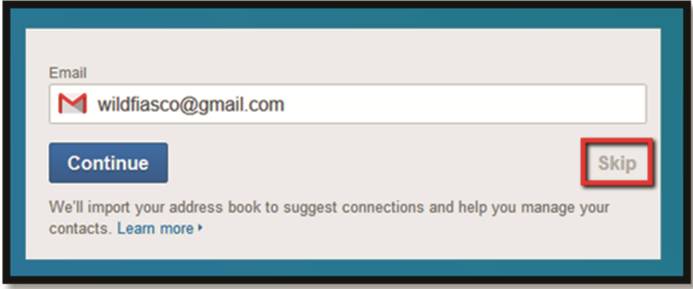
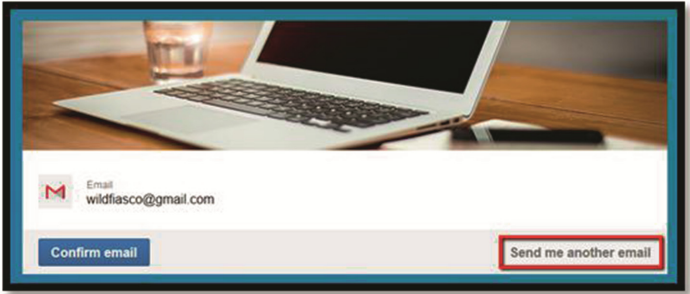**Fig. 4.** The 'Skip' importing contacts link can only be accessed via a mouse

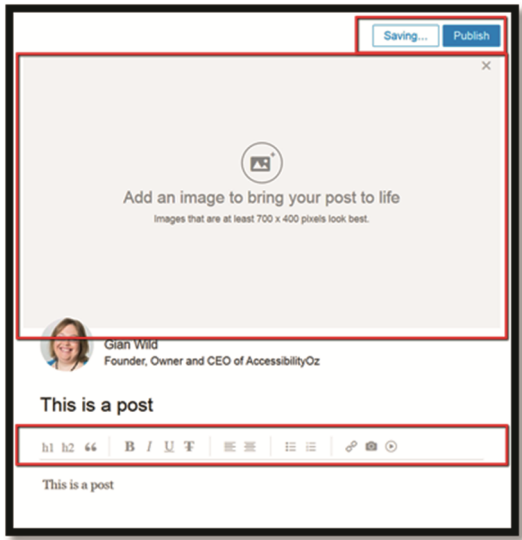**Fig. 5.** The 'Send me another email' option can only be accessed by the mouse

Fig. 6. Many options in the add post feature can only be accessed by the mouse

Some features are not keyboard accessible, such as saving, publishing or formatting functions when adding a post (Fig. 6).

Success Criterion 2.1.2: No Keyboard Trap (Level A). When first accessing the site as a new user a popup appears over the top-left navigation with information about messaging (see Fig. 7). This popup cannot be closed by the keyboard. In addition, a user tabbing through the navigation will not be able to see the items currently in focus as they are overlapped by the popup. This is referred to as a 'reverse keyboard trap' [22] – where content cannot be closed with the keyboard and this content overlaps important information. This can only be closed by leaving LinkedIn and logging in again – on subsequent logins this popup does not appear.
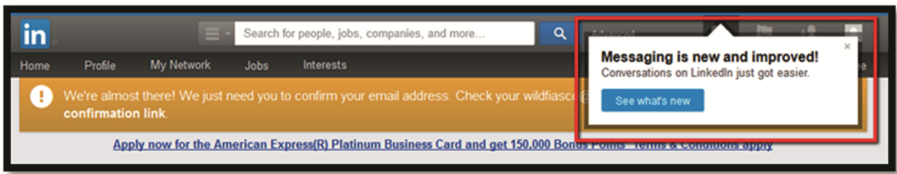

Fig. 7. The messaging popup overlaps important navigation items in the top-left and can only be closed using the mouse

Success Criterion 2.4.1: Bypass Blocks. LinkedIn contains quite detailed skip links. There is a popup available on keyboard focus that allows users to jump to sections such as profile activity, update status, network updates and search (see Fig. 8).
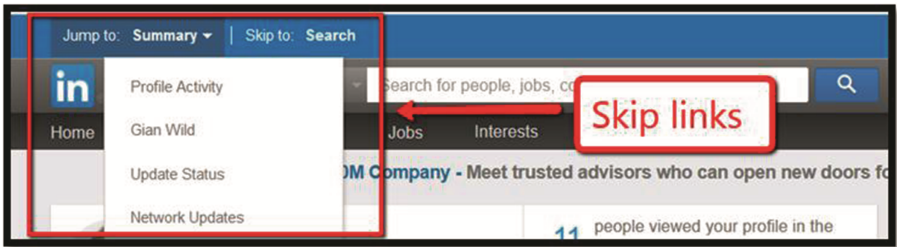

Fig. 8. LinkedIn includes comprehensive skip links that appear on keyboard focus

Success Criterion 2.4.3: Focus Order (Level A). In the sign up process the source and keyboard focus order do not match the visual order of content (see Fig. 9). The first item is the field, however the second item that receives keyboard focus is a 'Learn more' link which appears below the 'Continue' button. The 'Continue' button subsequently receives keyboard focus.
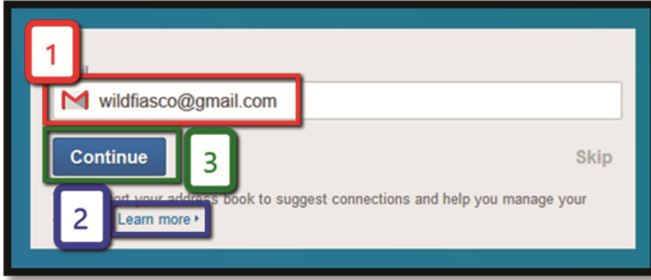
Fig. 9. The source order of content does not match the visual order in the sign up process

Success Criterion 2.4.7: Focus Visible (Level AA). LinkedIn often has a highly visible keyboard focus indicator so keyboard-only users know where they are positioned on the page. When looking at pending invitations in the menu the focus indicator is a bright blue outline (see Fig. 10).

Fig. 10. Some items, such as rejecting an invitation have a highly visible keyboard focus indicator (Color figure online)

Unfortunately, some items that have a keyboard focus indicator do not meet colour contrast requirements. In the dropdown for the menu, when an item receives keyboard focus it changes to a deep-blue colour (see Fig. 11). This colour, against the dark-grey background does not meet WCAG2 colour contrast requirements.
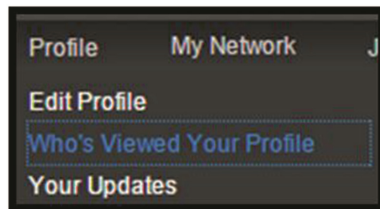

Fig. 11. The keyboard focus indicator is a deep-blue against a dark-grey background and does not meet colour contrast requirements (Color figure online)

4 Conclusions

In conclusion LinkedIn still has many accessibility problems that are likely to cause problems to different groups of people with disabilities. As a result, these groups are less likely to be able to find relevant employment, contributing to the under-employment of people with disabilities.

4.1 Why Is Social Media Inaccessible?

The main reason why social media is not accessible is that social networking sites and apps are almost continually refreshed. Facebook sometimes changes twice a day [23]. This, coupled with a lack of a formal testing process, means that what may be accessible today may be literally gone tomorrow. Although there have been some improvements in the accessibility of social networks over the last year; namely the removal of a CAPTCHA in the signup process for LinkedIn, any accessibility features can be instantaneously lost as the site or mobile app is updated.

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