



The Landscape of Accessibility Skill Set in the Software Industry Positions

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ABSTRACT

In the software industry, good design often translates into good user experiences. As accessibility is a key component of usable software, there are opportunities for software professionals to include accessibility in their skill set. However, despite a push to motivate more companies to include accessibility as a desired knowledge and skill set, little is known about how much companies are seeking to recruit employees with accessibility proficiency. In this paper, we investigated the extent to which companies seek software designer and developer skills in accessibility by analyzing software job posts on LinkedIn. Our results showed that the majority of job posts did not require any accessibility skills, and that educating developers and designers about accessibility was a required qualification for many of the accessibility-focused software jobs.

CCS CONCEPTS

• Human-centered computing → Accessibility technologies.

KEYWORDS

accessibility skills, job posts, software developer, designer, tester

ACM Reference Format:

Lilu Martin, Catherine M. Baker, Kristen Shinohara, and Yasmine N. Elglaly. 2022. The Landscape of Accessibility Skill Set in the Software Industry Positions. In *The 24th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '22)*, October 23–26, 2022, Athens, Greece. ACM, New York, NY, USA, 4 pages. <https://doi.org/10.1145/3517428.3550389>

1 INTRODUCTION

Along the years, software companies were blamed for producing inaccessible technology, including websites and mobile applications [17, 28]. Several researchers studied the barriers to creating accessible software [20]. Some researchers found that empathy is necessary for creating accessible software, and discussions and solutions were proposed to foster empathy [8, 27]. Tools and frameworks used in

design and development were assessed to uncover whether they support accessibility [1, 15]. Practices of accessibility requirements in software development were also investigated [16]. Additionally, researchers identified how accessibility can be better taught in undergraduate education [7]. Many companies are working on improving the accessibility of their products [21]. Large software companies that own enough resources created positions for accessibility experts to facilitate the production of accessible products [6]. However, the landscape of accessibility jobs in software companies and the desired accessibility qualifications in software jobs is unknown. To cover this gap in literature, we studied the accessibility skill set required by software companies, based on their job posts, in various software roles, e.g., developer, designer, and tester. Our goal was to determine what the software industry is seeking in new hires in terms of accessibility skills; shedding some light for tech professionals on what they need to learn with respect to accessibility.

By analyzing a little more than 5900 software job posts, retrieved from LinkedIn, we found that accessibility skill set is *not* in demand in any of the general software engineering roles. Accessibility best practices, without further explanation or specifics, was required in a relatively small number of the general developer, designer, and tester roles. Job posts with “accessibility” in their title required a large and diverse set of accessibility experiences that go beyond the technical experience to teaching and advocacy experiences. In essence, convincing and coaching the software development team to implement accessibility will be falling on the shoulders of those that will be hired in accessibility roles.

2 METHOD

We chose LinkedIn from which to collect publicly available job posts as it has the best availability for Application Programming Interfaces (API) to do the scraping. Also, when we compared the data on multiple jobs websites, e.g., Google Jobs, Indeed, and LinkedIn, we found that most jobs were duplicated across these sites. We searched for job types that are important in the development of accessible technology. The search terms we used were: Web Developer, UX Designer, UI Designer, Software Engineer, Software Developer, Front End Developer, UI/UX Accessibility, Software Accessibility, and Accessibility Tester. The location was set to the USA. We collected the data in May-June 2021. These search terms were plugged into the API called PhantomBuster, first with the

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ASSETS '22, October 23–26, 2022, Athens, Greece

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ACM ISBN 978-1-4503-9258-7/22/10.

<https://doi.org/10.1145/3517428.3550389>

LinkedIn Search Export to get the results of the different searches, then with the LinkedIn Job Scraper to get the actual data in each of the scrapes. In total there were 5,920 posts, after removing duplicates, grabbed off of LinkedIn using these APIs. We considered job posts with the Job Title field containing the word “Accessibility” to be accessibility-specific jobs. Two researchers manually analyzed the Job Description field associated with the accessibility-specific jobs to identify the required accessibility qualifications. We then searched automatically via ctrl+F for the accessibility qualifications in the generic software job posts to check whether generic development and design roles require accessibility knowledge. We created Python scripts to calculate the frequency and percentage of these accessibility keywords.

3 RESULTS AND DISCUSSION

Our dataset is comprised of 5920 posts from 2061 different companies. The main industry of 1551 companies is computer software or information technology. The other companies’ main industry includes financial services, marketing, and media, among others. While we did not filter our search by company size, and there is a range of small companies in our dataset, most of the companies are large ones, such as Amazon, Apple, Microsoft, GitHub, Esri, Oracle, Samsung, Google, Twitter, and IBM, in no particular order. 1886 posts (31.85%) were accessibility-focused, and 4034 posts (68.14%) were not. Table 1 shows a comparison of the frequency and percentage of a sample of accessibility-related keywords in both accessibility and non-accessibility job posts. The keywords “accessibility” occurred in 66.9% of the accessibility job posts, while occurred in 5.68% of the non accessibility posts. The keywords “WCAG” [26], “Accessibility Guidelines”, and “Section 508” [22] occurred in 23.6% of the accessibility job posts, while occurred in only 0.97% of the non accessibility posts. All keywords related to assistive technology such as “Assistive Technologies”, “Screen Readers”, “JAWS” [14], “NVDA” [19], “VoiceOver”, “Talkback”, “Zoomtext”, “Dragon Naturally Speaking” [12], and “Voice Recognition” appeared in 19.7% of the accessibility posts, and in 0.17% of the non accessibility posts. This data about the job qualifications for various software professional roles portrays the image that accessibility knowledge is generally not expected from software engineers, developers, designers, or testers.

3.1 Non Accessibility-Specific Job Posts

With the exception of the Engineer role, there were few job posts that required accessibility skills in roles that are not accessibility-specific. For the Developer role, a few posts listed understanding web accessibility and familiarity with ARIA [4] and WCAG 2.1 as part of the job qualifications. Usually, accessibility was referenced in these posts as one of the software quality criteria. For example:

“Understanding of front-end development best practices (accessibility, 508/WCAG compliance, performance optimization, SEO).”

Similarly, a few job posts for the Designer role included accessibility skills in the qualifications, such as familiarity with WCAG. Other posts mentioned accessibility in generic and broad terms. For example:

“A solid grasp of user-centered design, usability testing methodologies and accessibility best practices.”

The Tester role was the one with the most frequent occurrence of accessibility qualifications in non-accessibility specific job posts. The accessibility statements were also generic in most cases, such as knowledge of web standards and accessibility standards, and performing accessibility testing. In one post by a federal contractor, accessibility testing for Section 508 compliance was specified.

3.2 Accessibility-Specific Job Posts

The accessibility-specific roles in job posts had titles such as Accessibility Support Engineer for the engineer role, and Accessibility Designer and Product Designer - Accessibility for the designer role. The accessibility-specific tester role had a wide range of job titles such as Accessibility Tester, Accessibility/A11y/ADA/508 Trusted Tester, Quality Assurance (QA) Tester with Accessibility Testing experience, Accessibility Scrum Tester, Automation Accessibility Tester, and WCAG Accessibility Tester. We did not find any accessibility-specific job posts for the developer role. We grouped the skills and qualifications required by the accessibility-specific job posts into the following categories:

3.2.1 Accessibility Guidelines and Implementation. Solid understanding of WCAG (2.0 and 2.1 AA) was one of the most prevalent required qualifications across all accessibility-specific roles. It was rare to see posts requiring experience in WCAG Level AAA compliance. Other guidelines mentioned in the job posts were Apple accessibility Guidelines, Microsoft Accessibility Standards, Android accessibility guidelines, and inclusive design guidelines. Several job posts required familiarity with accessibility implementation techniques like proper use of Accessible Rich Internet Applications (ARIA) [4] attributes, logical order, and correct semantics. Another common qualification was localization and knowledge of multiple platform and browser accessibility practices, including iOS and Android mobile devices, and desktop operating systems: Windows, MacOS and ChromeOS.

3.2.2 Accessibility Regulations. The majority of job posts with reference to regulations were for the Tester role, and required knowledge of Section 508 and ADA. This is expected as our data was limited to positions in the US. In a few instances, knowledge about more specific accessibility regulations were required, such as Section 255 of the Telecommunications Act, the Communications and Video Accessibility Act (CVAA) [11], and the European accessibility standard EN 301 549 [13]. Most of the job posts discussed knowledge of accessibility regulations in terms of compliance.

3.2.3 Assistive Technology. In Design role job posts, experience using assistive technology and designing for assistive technologies were common qualifications. In Tester role job posts, solid experience testing with assistive technology and configuring test tools and assistive devices for testing was an in-high demand skill. Assistive technologies often cited were Zoomtext, Dragon Naturally Speaking [12], screen readers (JAWS [14], NVDA [19], MACIOS VoiceOver, TalkBack, Narrator), keyboard only (navigation, focus, input), magnifiers and voice recognition products. Several job posts mentioned in the job description that being a *native assistive technology user* is preferred. A blind person, for example, that uses a

General Software Roles (4034 posts)			Accessibility Specific Roles (1886 posts)		
Keyword	Frequency	Percentage	Keyword	Frequency	Percentage
Accessibility	229	5.68%	Accessibility	1262	66.9%
WCAG	30	0.74%	WCAG	208	11%
Accessibility Guidelines	4	0.09%	Accessibility Guidelines	126	6.7%
Section 508	5	0.12%	Section 508	111	5.9%
Localization	14	0.3%	Localization	75	3.9%
JAWS	1	0.02%	JAWS	87	4.6%
NVDA	1	0.02%	NVDA	71	3.7%
Assistive Technologies	2	0.05%	Assistive Technologies	66	3.5%
VoiceOver	1	0.02%	VoiceOver	42	2.2%
Talkback	1	0.02%	Talkback	31	1.6%
Zoomtext	0	0%	Zoomtext	30	1.6%
Screen Readers	1	0.02%	Screen Readers	26	1.37%
Voice Recognition	0	0%	Voice Recognition	10	0.5%
Dragon Naturally Speaking	0	0%	Dragon Naturally Speaking	9	0.47%
Magnifiers	0	0%	Magnifiers	4	0.2%
CVAA	0	0%	CVAA	1	0.05%

Table 1: The frequency and percentage of the occurrence of a sample of accessibility keywords in general and accessibility specific job posts.

screen reader on daily basis is considered a native screen reader user [18]. **So, this job qualification implies that people with disabilities, that use assistive technology on daily basis, will be highly considered for the job.**

3.2.4 Testing Strategies and Tools. There were various testing strategies that were listed, mostly in the Tester role job posts, such as accessibility audit, third-party audits, test and validate accessibility acceptance criteria, creating automation scripts for WCAG compliance, testing using assistive technology, evaluating and formulating a Voluntary Product Accessibility Template (VPAT)[23], and performing usability testing with reference to accessibility. Experience with specific testing tools were often cited in required qualification such as Wave[25], Axe[5], CCA[9], Accessibility Management Platforms (AMP)[2], Accessibility Inspector, ANDI[3], Contrast Analyzer, and Color Blindness Simulator. In at least one job post, experience with document accessibility testing, e.g. and PDF, Excel, was required.

3.2.5 Accessibility Certificates. Certification in accessibility was preferred in a handful of job posts in the Engineer and Tester roles. Examples are Trusted Tester, Certified Professional in Accessibility Core Competencies (CPACC)[10], 508 Certified Accessibility Tester, and Certified IAAP Web Accessibility Specialist (WAS)[24].

3.2.6 Coaching and Educating. Many Designer and Tester job posts added to the qualifications list the ability to train and coach others on various accessibility topics. These topics ranged from accessibility acceptance criteria to inclusive design principles and practices, and WCAG. The new hires are expected to provide consultative

support to others currently working in the company, e.g., designers, product managers, developers, and engineers.

3.2.7 Advocacy. It was interesting to see that advocacy was a frequent job qualification for many Designer and Tester job posts. The required qualifications included the ability to promote the importance of accessibility, experience driving organizational change through advocacy, advocate for inclusive design methodologies, and help developers think with an accessible mindset.

“Talent for building relationships and trust within teams who have been resistant to accessibility in the past.”

3.2.8 Disability Knowledge and the Disability Communities. A few posts specified disability knowledge as required qualifications. This requirement was holistic and included understanding for all aspects of disability, including visual, mobility, hearing, cognitive, and speech. Several job posts required active participation in the accessibility community, empathy for people with disabilities, or experience working directly with people and communities of consumers with disabilities.

To sum, **job posts for developers, designers, and testers rarely mention accessibility in the job qualifications.** When accessibility is mentioned, it is usually listed as one of the software quality criteria, e.g., performance, or in generic terms, e.g., experience in accessibility best practices. On the other hand, **accessibility-specific jobs require from applicants to have extensive technical accessibility knowledge, and to function as accessibility educators and advocates within the company.**

Another insight from our data is that **the majority of accessibility qualifications were related to accessibility testing, and little attention was given to accessibility in the earlier stages of software development, e.g., requirements and design.** This points to a broader structural issue with tech job posts as accessibility is seen as an afterthought rather than a way to restructure the system to benefit a wider variety of people.

4 CONCLUSION

We analyzed position announcements and job descriptions for accessibility skills to determine the extent to which industry companies are seeking such skills. We then distinguished between general software positions that may require skills and knowledge in accessibility from accessibility specialist positions. Our results indicate that accessibility skills are rarely sought in general software roles, while professionals in accessibility positions were tasked with educating and mentoring software professionals in understanding and implementing accessibility. The expectations of the required accessibility knowledge in general roles and accessibility roles are unbalanced. We hope that this snapshot of accessibility demand in software jobs motivates companies to seek employees with accessibility skills in general roles, and motivate software professionals to acquire accessibility knowledge, e.g., through training. Finally, we hope that accessibility as a skill and a mindset will be covered in college education, so software professionals become well-equipped to create accessible software. We recognize that the Job Description on LinkedIn job posts may not consistently reflect the accurate and complete information about the advertised role. In the future, we will further investigate the process of recruiting candidates with accessibility skills, and whether there is specialization within accessibility, e.g., accessibility specialists in particular disabilities.

ACKNOWLEDGMENTS

This material is based upon work supported by the United States National Science Foundation under grants #2121606, #2121428, #2121549, and Henry Luce Foundation - Clare Boothe Luce Fund.

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