

## Using Personas for Accessible Design

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*Developers and designers can incorporate accessibility from the beginning of a solution's design. One way is to create personas that are users with disabilities. Having a primary persona with a disability means that disability will never be far from developers' and designers' minds. Another way to keep accessibility present is including it in scenario design. Multiple benefits to involving characteristics of users with disabilities in persona and scenario development include saving time and money that would otherwise be spent remediating accessibility issues; making solutions available to all demographics; aligning with diversity and inclusion values; and minimizing legal risk.*

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### **WHAT IS UX AND WHY IS IT IMPORTANT?**

UX, or user experience, can be defined as how people feel when they use a product or service (Interaction Design Foundation, 2018). It is important to begin thinking about UX early in the development and design process, to shift UX as close to the beginning of the workflow as possible, because the desired user experience outcome can shape the project's direction. One aspect of UX is considering the end user's needs and finding solutions to meet those needs. Meeting the user's needs can influence the user's expectations of the project's results, which in turn shapes the project's trajectory and outcome.

Consider a pen. These devices have been in use for hundreds of years. They were created so that people could have a means of expressing themselves permanently, through writing and art. The user need, in this case, was to be able to set down thoughts in a lasting, consistent way. The user experience, however, has led to the pen's constant improvement, from quill pens which were dipped in ink, to fountain pens, to modern rollerball pens. Dissatisfaction with the user experience created a user need for an improved pen.

### **What Is Design Thinking?**

Innovation as a result of user need is the goal of design thinking. Design thinking is one framework for understanding the user experience and can be defined as:

*an iterative process in which we seek to understand the user, challenge assumptions, and redefine problems in an attempt to identify alternative strategies and solutions that might not be instantly apparent with our initial level of understanding. At the same time, design thinking provides a solution-based approach to solving problems. It is a way of thinking and working as well as a collection of hands-on methods. (Interaction Design Foundation, 2018)*

The Hasso-Plattner Institute of Design at Stanford has developed five phases of design thinking, which include empathizing with users, defining users' needs and problems along with the developer's insights, ideation by challenging assumptions and creating innovative strategies, prototyping solutions, and testing solutions (Interaction Design Foundation, 2018). Iterating through these five phases incorporates user-oriented thinking early in the development and design phase of the project. In fact, the first three phases focus primarily on the user and his or her needs. It is not until late in phase three that strategies to meet the user's needs are considered. Tim Brown suggests that "design thinking is firmly based on generating a holistic and emphatic understanding of the problems that people face, and that it involves ambiguous or inherently subjective concepts such as emotions, needs, motivations, and drivers of behaviors" (Interaction Design Foundation, 2018). A key to design thinking is spending time getting to know the user. This includes understanding how the user is likely to use the solution and requires the designer to think of creative and innovative uses for the solution.

Consider the pencil. Where the pen's purpose is duration, the pencil's purpose is practice. Putting this in the framework of design thinking, empathizing with the user means acknowledging the frustration that comes with the inability to redact mistakes when using a pen. The user's need, in this case, is a writing utensil with the capacity to be erased from a slate or paper, thus cutting down on paper waste. Challenging the assumption that the pen is the only or perhaps best writing utensil and proposing the pencil as an innovative solution is the third step in design thinking. Prototypes began with lead sticks and progressed towards the modern graphite pencil, even advancing towards a mechanical pencil. Iterating through prototypes and testing those prototypes has led to the current pencil.

### **Accessibility and the User Experience**

"Accessible" means that individuals with disabilities are able to independently acquire the same information, engage in the same interactions, and enjoy the same services within the same timeframe as individuals without disabilities, with substantially equivalent ease of use ("ICT Policy Procedures", 2019). Disability, according to the Americans with Disabilities Act As Amended (ADA), means a physical or mental impairment that substantially limits one or more major life activities ("The Americans with Disabilities Act ", 2017). Design thinking, therefore, needs to take into account the needs of users with disabilities; without this aspect, analysis of user experiences will be missing an entire user demographic.

Consider the pencil again. How will a user without use of their arms or legs be able to write using a standard pencil? The answer is quite simple: they cannot. Design thinking needs to revise the first step of empathizing with the user. Suddenly the user profile is much broader than the average user who has full ability in his or her limbs. This means that the user needs have dramatically changed from needing a writing utensil that can be erased to a writing utensil that can be used without the use of limbs. Challenging the assumption that the pencil is one of the only writing utensils available forces developers and designers to think outside the box and begin to consider how a person who does not have the use of their limbs may write independently. Innovative solutions include a word processor and speech-to-text technology, where users can speak, and the word processor transcribes their words. Another innovative solution is a touch screen device, where a user can use a mouth stick or other input device to type out words. Prototypes include basic text editors and keyboard-based software, and iterating through these has led to the development of complex word processors, assistive technology that recognizes speech and converts it to text, and touch screen devices.

### **UX, PERSONAS, AND USERS WITH DISABILITIES**

One way that accessibility can be shifted into the development and design phase is through personas. Personas are fictional representations of actual users, and they are applied in the early stages of product development (Segue Creative Team, 2016). They are used to bring common user needs to the forefront and are highly detailed, providing as much information as possible about the fictional user and how he or she may experience the solution. They can be based on actual user interviews or they can be created based on the solution's goals or vision (Segue Creative Team, 2016). Often, they are used as meaningful archetypes,

answering the question of how a given user would respond to a given scenario (Dam & Siang, 2019). Personas are a foundational point of design thinking because they provide concrete points with which the developer can empathize and express users' needs based on reactions to scenarios. Personas allow developers to challenge assumptions about how the solution will be used and assumptions about the users themselves, which then leads to innovations in the product's design.

Accessibility can be integrated into the design process by developing personas who are users with disabilities. There are many different types of disabilities, with invisible disabilities (e.g. learning disabilities, ADHD, and mental health disorders) being the highest population. Thus, the development of personas with disabilities necessitates basic knowledge of disabilities and understanding of how a disability can impact a user. It also requires some knowledge of assistive technologies and how they can support users with disabilities. For example, a blind screen reader user would need all images to have alternative text, while a keyboard-only user would need all elements to receive focus in the tab order.

It is common to overlook disability entirely when evaluating user demographics, because disability does not come to the forefront when developing many products. Furthermore, if developers and designers are aware of the extent of users with disabilities, often there is lack of understanding or misunderstanding of how disabilities can impact the user. Without understanding how different disabilities can impact users, it is impossible to develop an accurate sense of user needs and, from there, to develop realistic personas. Keep in mind, though, that every individual with a disability experiences it differently, and personas can only approximate a user's experience. Also, consider that disability is only one aspect of a user; therefore, it should be allotted the same weight as the persona's other characteristics. It is a challenge to keep disability in perspective, because it so often bars users from being able to access even the beginning stages of solutions. The inclination can be to weight disability needs more heavily than other user needs, as their impacts feel far-reaching. However, neglecting other user needs in order to provide access to users with disabilities undermines the solution's efficacy. This makes for a complex balance, providing for most user needs while also addressing the needs of users with disabilities, which may be only a small slice of users. It is easy to skew the balance towards either set of needs, but neglecting either side weakens the solution's potential. Though this balance may seem difficult, it prompts innovation and forces developers and designers to consider alternative ways to achieve the product's goals and vision.

### **The Accessibility Process**

There are a few steps that developers and designers can take to incorporate accessibility from the beginning of a solution's design. One way of doing this is to create additional personas that are users with disabilities. This may mean expanding the typical number of personas, as the standard four to seven personas will be unable to capture the varied impacts of disabilities on users. It is also advisable to make the primary persona a user with a disability (Dam & Siang, 2019). Having a primary persona with a disability means that disability will never be far from developers' and designers' minds, raising accessibility components' priority in the overall design process.

Another way to keep accessibility present is to include it in scenario design. Through scenarios, developers and designers can anticipate how a user with a disability might respond to the solution under given circumstances. This might be a different reaction than a persona without a disability, because the user with a disability may not even be able to initially access a solution, if the solution is inaccessible. This forces developers and designers to consider different types of input, including keyboard-only access and assistive technologies like alternative mice and screen readers. Developers and designers may want to include scenarios where the persona with a disability needs to use assistive technology, which can help discern design components' efficacy. For example, a screen reader user's persona can help developers and designers check fieldsets and IDs in a form.

There are multiple benefits to including characteristics of users with different disabilities and their needs in persona and scenario development. First, it saves time and money that would otherwise be spent remediating accessibility issues. It makes the solution available to all demographics, not inadvertently losing the users with disabilities market, which pervades all ages, sexes, etc. It also aligns with organizational values of diversity and inclusion. Finally, it minimizes legal risk.

## **The Benefits of Designing With Accessibility in Mind**

Minimizing legal risk is often the primary reason that accessibility is included in early development and design stages. It is insufficient for only quality assurance teams and company lawyers to know the laws surrounding accessibility; developers and designers also need to have a basic understanding of the laws in order to incorporate accessibility into early designs and prototypes. Understanding the laws leads to understanding obligations regarding accessibility and minimizing liability.

The key laws that govern accessibility federally in the United States are the Americans with Disabilities Act As Amended (ADA) and the Rehabilitation Act of 1973. While the ADA does not provide specific guidance on digital accessibility, it does prohibit discrimination and ensures equal opportunities for persons with disabilities in employment, state and local government services, public accommodations, commercial facilities, and transportation ("Policies", 2016). Websites and much of the current digital landscape are considered places of public accommodation, which means they are required by law to be accessible. The ADA does not offer guidelines for creating accessible content.

The Rehabilitation Act of 1973 has two sections, Section 504 and Section 508, that both relate to accessibility. Section 504 is a federal law designed to protect the rights of individuals with disabilities in programs and activities that receive Federal financial assistance from the U.S. Department of Education. Section 504 provides: "No otherwise qualified individual with a disability in the United States . . . shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance . . . ." The Office of Civil Rights enforces Section 504 in programs and activities that receive Federal financial assistance from the Department of Education. Recipients of this Federal financial assistance include public school districts, institutions of higher education, and other state and local education agencies ("Policies", 2016). Section 504 is similar to the ADA in that it prohibits discrimination and casts a wide net of responsible parties.

Section 508, refreshed in 2018, is a set of standards that requires Federal agencies to make information and communication technology (ICT) accessible to employees and members of the public who have disabilities in a comparable manner to the access experienced by employees and members of the public without disabilities. The revised Section 508 Standards apply to ICT that is "procured, developed, maintained, or used" by agencies of the Federal government. Section 508 was enacted to eliminate barriers to ICT, make opportunities available for persons with disabilities, and encourage development of technologies that will help achieve these goals ("Section 508", 2019). One of the benefits about Section 508 is that it specifies the Web Content Accessibility Guidelines (WCAG) version 2.0, level AAA, as the standard to which Federal agencies are held. Note that this section is intended for Federal offices only.

Case precedent, however, shows that Federal agencies are not the only offices subject to WCAG 2.0's rigor. Cases such as UC Berkeley (2016), Harvard and MIT (2016), and the Miami University of Ohio (2016) show in their resolution agreements requirements that the universities uphold WCAG 2.0, level AA. WCAG 2.0 has three levels, A, AA, and AAA. Federal offices are held to level AAA, while the majority of resolution agreements only specify that institutions meet level AA. It is also clear from recent cases, such as *Gil v. Winn-Dixie* and *Robles v. Domino's Pizza*, that organizations beyond higher education are being held to similar accessibility standards. Therefore, it is in the best interest of organizations to proactively create solutions that comply with WCAG 2.0, level AA at the least. Accessibility needs to be treated as an inherent component of a solution, similar to how a bug would be treated, as opposed to being treated as an optional feature (Urban, 2018).

An additional benefit to designing with accessibility in mind is that it saves both time and money. Bolting on accessibility features after the design phase typically takes either considerable time or great expense. Developers and designers will need to spend additional hours remediating the new solution's design in order for accessibility components to work smoothly with the solution's other components. Alternatively, external consultants can be hired to remediate the solution, which can make the design costs skyrocket. Including accessibility from the starting point may appear to cost time and money at the outset, but it ends up saving both in the long run.

Not only does initially including accessibility save money, but it can also make money. By creating solutions that are inherently accessible, companies open up their solutions to the users with disabilities market. As previously mentioned, this market is considerable, spanning all demographics. According to the Center for Disease Control, as many as 26% of Americans self-identify as having a disability, which makes users with disabilities the largest minority group in the United States (CDC, 2019). Because of this vast market, it is in a company's best financial interests to design products that are accessible out of the box.

Another benefit to including accessibility is less tangible but equally as important: aligning with organizational values of diversity and inclusion. Because there are so many individuals who identify as having a disability, it is highly likely that users with disabilities can be found within the company producing a solution. Building accessibility into a product publicly demonstrates a commitment to diversity of ability, which is encouraging to employees with disabilities. Also, companies that produce inaccessible solutions may inadvertently be limiting their employee candidate pool: it is difficult for a user with a disability to work on a solution that is inaccessible to them.

## CONCLUSION

Overall, designing with accessibility in mind saves time and money and broadens a solution's user base. Not only is accessibility legally required, it is also financially sound and accords with diversity and inclusion values. In conclusion, it is this author's recommendation to shift accessibility as close to the beginning of the design process as possible. This can be done using personas and scenarios in which users may access a product through alternative means. Using personas and scenarios of users with disabilities leads to stronger product development, because it forces developers and designers to innovate accessibility solutions, thus creating a more robust product with a broader vision. Accessibility involves everyone engaged in a solution's design; it cannot be left up to quality assurance to suggest bolting on accessibility features. Involving the entire solution team in the accessibility process creates solutions that are elegant, effective, and available to all users.

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