

A Line of Code Can Change Lives

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Key Terms Related to Disability and Accessibility

- **Disability**
- **Short-term disability**
- **Environmental disability**
- **Assistive technology**
- **Accessible**

Disability and Diversity: A Missing Link

"Although huge progress has been made towards equality across boundaries of gender, race, and sexual orientation, one aspect of D&I is too often neglected: Disability." —
Harvard Business Review

The data:

- Approximately 1 in 5 people over the age of 18 in the US identifies as having a disability (15% worldwide)
- Disabled people are the largest minority group in the US (and worldwide)
- According to a [2020 Harvard business study](#), only 4% of companies include people with disabilities in their diversity programs

Technology and Disability: What's the Connection?

There are two primary ways we think of disabilities:

The medical model:

- Disability is a defect within the individual.
- Disability is an aberration compared to normal traits and characteristics.
- To have a high quality of life, disability must be cured.
- This is the classic, yet damaging, view of disability.

The functional model:

- Disability is a product of the environment that creates a barrier for the disabled individual.
- By changing the environment, we can remove that barrier.

Comparing Medical vs. Functional Model

Scenario 1

- A person with a hearing impairment is not able to watch my training video (the video does not have captions)
 - **Medical model thinking:** The person is deaf, they can't watch my video, hopefully someone will find a cure for deafness.
 - **Functional model thinking:** My video is not accessible to someone with a hearing impairment, I better add captions right away.
- **Benefits of the functional model:** The video is now accessible to all the people in the office who must watch it on mute.

Comparing Medical vs. Functional Model (Cont.)

Scenario 2

- To submit a web-based job application a user must hover over an icon with a mouse. A blind potential candidate complains about this.
 - **Medical model:** The person is blind. I hope someday someone will cure their blindness.
 - **Functional model:** Why is my web application not accessible? If I changed the mouse hover icon into a keyboard accessible button with the text “Apply”, the person (and all other blind people who use a screen reader) can apply for the job.
- **Benefits of the functional model:**
 - Any blind person can apply for the job.
 - People with mobility impairments, who require fully keyboard access, can also apply for the job.
 - Mobile device users, who cannot generate a mouse hover gesture, can apply for the job.

How Technology and Accessibility Changed My Life

From elementary school until my first encounter with a computer (1985/1993):

- All manual transcription (of text and my homework)
- Used a Perkins Braille to write
- Career prospects = protected workplace

High school (1993/1997):

- Blended manual/automated transcription of textbooks
- Able to create homework on a computer and print it out for teachers
- Able to get summer jobs that use technology (scanning and proof-reading textbooks)

University (1998/2002):

- Mix of manual transcription and eBooks for study materials
- Able to do/submit homework electronically (via email)
- Almost failed my computer science courses until I found accessible software development and debugging applications
- Able to get a summer internship with Microsoft
- Able to graduate directly to a fulltime job in financial banking



How Technology and Accessibility Changed My Life (Cont.)

Work/living alone (2002/2007):

- Had to purchase my apartment based on bus routes
- Unable to be spontaneous
- Had to hire a personal assistance for most errands
- Difficulty interacting with some crucial aps at work
- Unable to further my career through certifications

Today I can:

- Go anywhere at any time (Uber/ridesharing)
- Perform most errands without help (pay bills, grocery shop) via mobile apps or web (thanks Instacart, Uber Eats for being accessible)
- Check my mail (the Seeing AI mobile app)
- Manage my finances
- Lead a team of experts at a large (and awesome) international organization
- Go to the movies (audio description)

What Can I Do To Advance Accessibility in Tech?

Remember that accessibility is essential for some, and useful for all

Developers:

- Learn about accessibility standards
- Code for accessibility
- Involve users with different disabilities in your testing

Designers:

- Design for users with different disabilities (create user personas with disabilities and think how you would design for them)

Managers/Human Resources:

- Hire people with disabilities
- View their challenges through the functional lens, not the medical one. Their experience may improve the experience for all
- Have a clear accessibility and disability corporate policy

Appendix

Key Terms Related to Disability and Accessibility

- **Disability:** “Long-term physical, mental, intellectual, or sensory impairments which may create barriers that hinder full and effective participation in society on an equal basis” (UN Convention on the Rights of People with Disabilities)
- **Short-term disability:** A disability caused by a short-term medical condition (such as a broken arm or a migraine attack)
- **Environmental disability:** Disability created by the environment, e.g., a noisy environment (where the user is effectively deaf), or challenging lighting conditions, effectively resulting in impaired vision.
- **Assistive technology:** Hardware or software applications / application settings that let disabled people interact with digital information, e.g., screen readers, zooming, speech recognition.
- **Accessible:** (used with respect to a website, digital document, or application):
 - A perceivable, operable, understandable, and robust website or application that enables individuals with disabilities
 - to access the same information as,
 - to engage in the same interactions as,
 - to communicate and to be understood as effectively as,
 - and to enjoy the same services as
 - are offered to other individuals with the same privacy, same independence, and same ease of use as, individuals without disabilities.

From Website and Software Application Accessibility Act, draft

Accessibility Benefits Everyone!

- **Accessibility** = the practice of making content and services available to as many people in as many situations as possible
- **Examples of innovations inspired by accessibility:**
 - Captions – developed for the deaf, now over 85% of Facebook videos viewed without sound
 - Speech recognition – first civil application to let users control their wheelchairs, now used by everyone
 - Speech synthesis – developed primarily for the blind, now used by everyone (e.g., GPS devices)
 - Curb cuts – developed for wheelchair users, now used by stroller wielding moms, people pushing shopping carts etc.