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Reaching for the Stars IS an option

A conversation

1. Why?

Why would the aerospace industry, and society generally, want to invest in such inclusiveness?

Why not?



Why?

- ~20% US population aged 5 > (~50 million) with sight or hearing loss
- ~10% with limited basic physical activity
- > 6.5 million US students have some form of disability

(US Census Bureau)



definition of disability

- The **Americans with Disabilities Act (ADA)** defines a person with a **disability** as a *person who has a physical or mental impairment that substantially limits one or more major life activity.*

2. What are the challenges?

Visible -

Invisible

Meet . . .

Dr. Robert Shelton, JSC



Dr. Craig Moore, MSFC



Dr. Wanda Diaz-Merced
International Astronomical Union

Technology

Classic Perkins
Braille



Smith Corona
Typewriter



Reel to Reel
Recorder



Talking Book
Machine

Use Accessibility iPhone X

Say hello to the future.



Federal Times| Section 508

9 examples of tech making it harder for people with disabilities

By: [Aaron Boyd](#) April 18, 2016

While outlining the ways cloud technologies can help and hinder disabled persons' access to government information, the National Institute of Standards and Technology offered nine use cases that illustrate these challenges and potential technological solutions.

Unexpected software updates make it harder for the blind

Cora is a customer service representative in a specialized work group that covers income from foreign sources. She is blind from birth and uses a Braille display connected to her computer. Most of the information she handles shows up in specific blocks on the screen and she has learned the keyboard commands to give those blocks focus on the Braille display as needed. Unexpected software updates to the internal cloud application sometimes change the layout and cause the Braille display to lose focus. This requires some assistance from the IT support center to get her back on track; in the meantime her productivity is compromised. The IT support people have come to expect her calls whenever there is a software update. They serve other blind users, who use a range of screen readers and Braille output devices. Cora and her blind peers have tried to escalate this problem but have had limited success.

No resources to fix a fixable problem

Garrett is a wounded veteran with a moderate cognitive disability as a maintenance technician in a remote area. He drives between work sites and uses a mobile phone to check his schedule by GPS and retrieve his work orders through a mobile app. The app is often slow and confusing and he has to call his supervisor to have the app read aloud the work order and occasionally must text him a question. The app is also slow, so he often has to call his supervisor to have the app read aloud the work order and occasionally must text him a question. Keeping track of the company's app updates and the separate text messages can be confusing as well, and makes Garrett's recordkeeping less accurate but it does let him get his maintenance work done. He and his supervisor talk about creating a simpler solution but they do not have any resources to develop software or even explore what their organization may already have that they could use.

Section 508 (<http://www.federaltimes.com/smr/section-508>)

9 examples of tech making it harder for people with disabilities

Unexpected software updates make it harder for the blind

No resources to fix a fixable problem

Strict digital access can hamper productivity

Bad captioning leads to confusion and missed opportunities

Lack of requirements leads to work stoppage

Poor requirements leaves some out of the game

No way to turn off distractions

Latest updates don't work with old interface(s)

Some dragons shouldn't be slain



Learning Styles

- Auditory
- Visual
- Tactile
- Kinesthetic



Let's explore

A Marsden Giberter

Glis was very fraper. She had dermarpen Farle's marsden. She did not talp a giberter for him. So, she contanted to plimp a marsden blinky for him. She had just sparved the binky when he gibbed in the gorger.

“Clorsty marsden!” she bolfed.

“That'a a crouistish marsden blinky.” boffed Farle, “but my marsden is on Stansan. Agsan is Kelsan.”

“In that ruspen,” boffed Glis. “I won't wank you your giberter until Stansan.”

1. Why was Glis Fraper?
2. What did Glis plimp?
3. Who jibbed the gorger when Glis sparved the blinky?
4. Why didn't Glis wank Farfle his giberter?

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A Birthday Present

Glis was very happy. She had received Farle's birthday (invitation). She did not have a present for him. So, she wanted to make a birthday card for him. She had just finished the card when he came in the room.

"Happy birthday!" she yelled.

"That's a beautiful birthday card." replied Farle, "but my birthday is on Sunday. Today is Tuesday."

"Is that right," replied Glis. "I won't give you your card until Sunday."

1. Why was Glis happy?
2. What did Glis make?
3. What was the reply when Glis showed the card?
4. Why didn't Glis give Farle his card?





"Human Touch" by Pat Rawlings

Jim Allan's Tag lines (TSBVI)

- Changing a tire on Mars.
- Astronaut in spacesuit in left foreground looking at a small hand-held device. Fingers of gloves are covered in orange dust, orange smudges on suit.
- NASA 6 wheeled vehicle in the middle of the picture. Vehicle's front left wheel is lying on the ground in front of the vehicle. The vehicle has 3 manipulator arms, one with a 2 prong claw, one with a drill(?), and one with a camera(?),. There is also an antenna mounted on the vehicle.
- Near the wheel on the ground, another space suited astronaut is kneeling holding a replacement part for the vehicle.



NOTE: The description really depends on the purpose of the picture. The purpose determines what you focus on to describe and leave out the other stuff.

3. How might learning and task accomplishment be affected?

Accommodations are key



Examples / Recommendations

Use high contrast

- lighter text – black / white or white / black
- Stay away from default blue / yellow, red or blue / black

Use SIMPLE fonts – sans serifs

- Arial, Tahoma, Comic Sans, Verdana, Microsoft Sans Serif
- vs. Times Roman, Bookman

Use descriptive text links for each image/figure included in any web site (508 compliance)

Use color images / dynamic graphics whenever possible

Include an autoloading software component and a read-me file for each CD (instructions)

- Use descriptive file names that indicate file/folder contents (NOT numbers or letters)

THINK of the USER!



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THINK of the USER!

4. Are the job skills the same?

Recall . . .

Dr. Robert Shelton, JSC



Dr. Craig Moore, MSFC



Dr. Wanda Diaz-Merced
International Astronomical Union



Mission Control

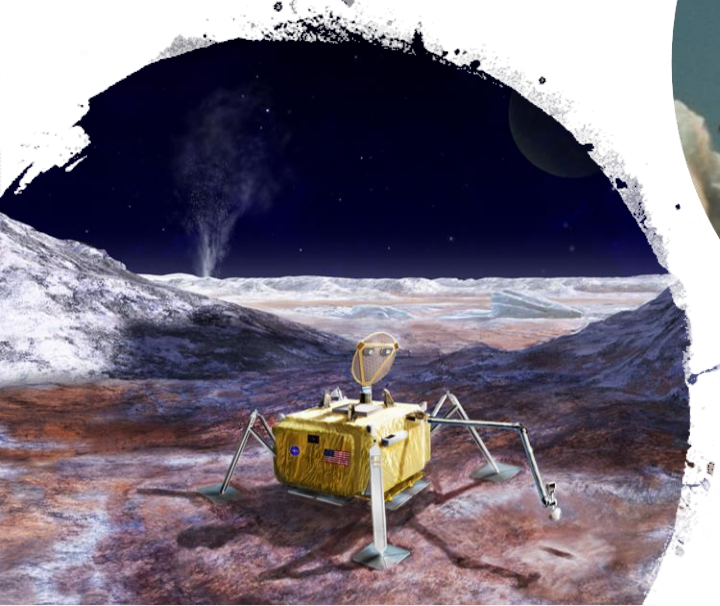
Supporting Space Shuttle

Johnson Space Center





Physical Chemistry
Software Engineering Branch
NASA Marshall





5. How are these challenges overcome?

Key: Focus on the person's ability.

Consider
Blindness
as an
Engineering
Problem

Loss of
signal

- Visual inputs are blocked
- Loss of access to information

Impact on
actuators –
examples
of affected
activities

- Driving
- Walking
- Writing
- Brain surgery



Approach to Solutions

Define

Define the problem

Assess

Assess impacts

Identify
and
implement

Identify and implement work arounds

- Mobility: Learn independent travel skills
- Reading: Alternative media, e.g. recordings, Braille, digital, the internet
- Writing: Typing, word processing, specialized tools

Identify
and
exploit

Identify and exploit talents and interests

- Level the playing field. Find areas that present problems for most humans but which are largely unaffected by blindness

Dyslexia

- The most common reading errors of dyslexia are swapping, mirroring, changing, turning and melting letters together.
- In the Dyslexie font, every letter is uniquely shaped, eliminating the common reading errors of dyslexia.

FONT


- makes files (from Word, PDF to jpeg) easier to read
- adapts font, size and background
- easy to use online
- suitable for many devices (including Chromebooks)

dyslexie
font.com

6. How successful are these approaches?

7. Can these folks be
valuable contributors
to the community?

Absotively!



Focus on
ability

Etiquette



The basics

Ask	Ask before you help
Be sensitive	Be sensitive about physical contact (respect personal space – equipment included!)
Think	Think before you speak – and speak directly to the person, not to a companion
Don't assume	Don't make assumptions – they are the best judge of what they can / cannot do
Be respectful	Respond graciously to requests

People with mobility impairments



- Wheelchair users are people, not equipment. Don't lean on the it or ask them to hold your belongings.
- Don't push or touch a person's wheelchair – it is a part of their personal space.
- People who use crutches or cane need them (and their arms) for balance – don't grab them!

Blind / Visually Impaired

Identify yourself before making physical contact and/or moving their things

Remember – they too need their arms for balance. Offer your arm – don't take his/hers – if he/she needs to be guided (ask ...)

If the person has a guide dog – walk on the side opposite the dog. Verbally note hazards / obstacles.

If providing directions, give specific, non-visual information

Don't touch the person's cane or guide dog unless instructed to.

Deaf / Hard of hearing

Writing back & forth for casual interaction / conversation is OK if OK with the person

If an interpreter is present, look directly at the person who is deaf and talk directly to him/her

Before speaking to the person who is deaf or hard of hearing, make sure that you get his/her attention

Speak clearly, but don't shout

Don't obscure your face – many people who are deaf/hard of hearing read lips

Hidden disabilities

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graph LR; A[Hidden disabilities] --> B[Not all disabilities are apparent – yet the disabilities are real]; A --> C[These may include]; C --> D[Learning disability]; C --> E[Dyslexia / dyscalculia]; C --> F[Medical conditions such as cancer / heart problems]; C --> G[Side effects from medication];
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Not all disabilities are apparent – yet the disabilities are real

These may include

Learning disability

Dyslexia / dyscalculia

Medical conditions such as cancer / heart problems

Side effects from medication

8. Can they be competitive?

Again, Absotively!

9. What is their impact on their colleagues?

10. How is the industry
and society better?

Remember

“People with disabilities are individuals with families, jobs, hobbies, likes and dislikes, and problems and joys. While the disability is an integral part of who they are, it alone does not define them. Don’t make them into disability heroes or victims. Treat them as individuals.”

United Spinal Association