



Accessible Kiosks

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Today



- Key factors regarding kiosk accessibility
- Laws, regulations, guidelines and standards related to Kiosk/ITM Access
- Major Approaches for Kiosk Access - with demonstrations
- Quick review of the specific accessibility issues / areas
- Demonstration of Hybrid approach to providing cross-disability access
- Importance of getting it right with accessibility requirements in RFPs

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What do we mean by Kiosk?

Characteristics of a kiosk

- Interactive Information and Transaction machines
- Usually in public areas
- Shared with many users
- Used at about arm's length

Uses of Kiosks

- ATMs & financial kiosks
- Ticketing kiosks
- Check-in kiosks
- Healthcare kiosks
- "Smart city" information kiosks
- Directory and wayfinding kiosks
- Restaurant ordering kiosks
- Vending kiosks
- Museum interactives
- Self-checkout
- Prescription Kiosks
- Any device that electronically presents information or services to the public

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Warm up Quiz:

Why is there Braille on drive-up ATMs?

1. A blind person might be a passenger in a taxi and not want to share their card and PIN with driver – (and hope the driver doesn't take extra cash).
2. In some places, drive-up ATMs are the only ones available after hours
3. ATM is same production unit as used inside a bank entrance.

Important to KNOW your users and not make assumptions based on your assumptions of what they need.



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Key factors regarding kiosk accessibility

- Most kiosks provide the only way, or a more efficient way, to provide a service. In these cases (most cases) kiosk accessibility is required to provide equivalent service.
- Must work in environments that are often noisy and full of distractions
- Usage is often harried or hurried. So accessibility must be efficient
- Many unfamiliar users – many may use it 1 to 2 times a year. Also must work on first use. So accessibility must be obvious
- Often data must be kept private while in public. So public audio not an option.
- Public kiosks can be used by a very wide range of users. Accessibility must work for full range of types, degrees and combinations of user ability.

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Different US laws for different applications

- **Airport kiosks** – Air Carrier Accessibility Act (ACAA) 14 CFR 382.57
- **Government procured kiosks** – Section 508
- **Voting Machines** – Help America Vote Act (HAVA)
 - Specific technical provisions in Voluntary Voting System Guidelines (VVSG)
- **ATMs & Ticketing machines** – ADA Accessibility Guidelines (ADAAG 2010)

NOTE:

While the **ADA Accessibility Guidelines** (ADAAG) only provide specifics for ATMs & ticket machines...

... the **Americans with Disabilities Act (Law)** (ADA) applies more broadly, and includes kiosks and other ICT in public

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And different laws and standards in other countries



- **European Union** – EN 301 549
- **Canada** – “Accessible design for self-service interactive devices”
 - CAN/BSA-B651.2-07
- **Ireland National Disability Authority** kiosk guidelines
- **Web Content Accessibility Guidelines (WCAG)**
and the **WCAG2ICT** working group note

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Equivalent Alternatives



When determining that there is an alternative to the Kiosk for those who cannot use it

- the alternatives must be truly equivalent
- that means the same locations, hours, privacy, and speed of access and use.

This is rarely true or most everyone would generally prefer the alternative (which usually involves humans) rather than the kiosk.

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Risks to owners & users

- **Risks to Owners**

- Lawsuits because of inaccessible kiosks
- Inability of vendors to sell to governments and others with accessibility req's.
- Rules apply to all technologies that interact with the public that provide information or services – even if not specifically described in a current accessibility standard.

- **Risks to Users**

- Loss of privacy
- Loss of time, missed plane/train
- Loss of money (Charging and taking additional cash from card)

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The lawsuit, filed Thursday in U.S. District Court, also claims that an employee at the Walmart in Owings Mills allegedly attempted to take money from one of the plaintiffs while she was checking out at the store.

The suit claims that a staff member at the Owings Mills store on Reisterstown Road was assisting Cynthia Morales with a purchase at a self-checkout kiosk in July 2017 when the employee selected an option for cash back from her debit card and took \$40 without her knowledge.

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Accessibility requires both **hardware** and **software** to work together

- Cannot make a kiosk accessible though
- design of the physical kiosk only
 - or through software only

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Two Major Accessibility Strategies:

1) Direct selection

(with "Cue and Respond" for non-visual access)

- View (or listen to) a menu
- Press a button or enter a code for the one you are interested in
 - System does not rely on timing of a button press. Enter choice at any time – even during reading of choices.



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Demonstration

Direct Selection
with **Cue and Respond** for non-visual access.

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2nd Major Accessibility Strategy

2) Navigation

(with speech feedback via
headphone for non-visual access)

- Use buttons to move cursor through the elements on a screen,
(which are spoken through headphones)
- Use "Activate" button when on the one you are interested in.
- Linear navigation is used to ensure non-visual discovery of everything on the screen



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Demonstration

Linear Navigation with Focus Cursor with **Speech Feedback** for non-visual access.

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Comparison of 2 approaches

Direct-Selection (cued)



- (+) Familiar to most (most people have used phone menus)
- (+) Simplest to understand and use.
(Instructions are integral part of cueing)
(" ... for deposits, press 3, for")
- (-) Practically limited to menus of up to 8 or 9 choices (or cues are more complex)
- (-) Inefficient when there are more choices.
(Need to nest choice menus. Takes a long time to voice them all)
- (-) Limited to simple, choice-based interfaces

Navigation



- (+) More efficient because a person can move at own pace
- (+) Can navigate and activate relatively complicated interfaces
- (+) Only real option with large number of selections
- (-) Although obvious for those who can see and those who use screen readers and self-voicing products – it is no way near as easy as Cue & respond for new users without instruction
- (-) Many would need training for initial use (if not navigators already)

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WINNER for Public Kiosks?



- **Cue and respond **** when appropriate
 - small number of simple choices
 - keypad is present
- **Navigation** – otherwise

** Never use Cue and Respond without keypad (i.e. if x, press now). That requires timing.

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Other Complimentary strategies



(used along with – not as primary method)

PROs and CONs

1) For touchscreen non-visual access (iOS and Android etc.)

- **"Talking Fingertip"**
 - Touch or slide across elements on the screen, and items are spoken as they are touched.
 - Activate with a button, tap, double-tap, or other gesture
- **"Swipe to Step-Scan"**
 - Each finger swipe advances to next item which is read – in linear order.
 - Same as navigate except that swiping is used instead of arrow keys
 - Activate with a button or gesture

Talking fingertip

(+) can be fast for people with low vision
– once they learn it.

(–) Not reliable for people with no or very limited vision.
Might miss things on the screen

Swipe to Step-Scan

(+) Works for those who use it on their phones
(But would be better if all phones worked the same)

(–) Harder to discover/ learn /describe without training.

(–) Easier to accidentally activate things.

(–) Not all people have dexterity to make clean swiping gestures – and errors can cause things to jump and confuse.

BOTH are insufficient by themselves since tactiley discernable controls are often required but...

(+) good as a familiar alternative way for those familiar.

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Another complimentary strategy

Speech Input

- This is a powerful approach – that will only get better with time.
- However not everyone can use speech input.
 - Some are not able to hear or speak well enough to use it successfully
 - Noisy environments can interfere with hearing or having speech recognized.
 - Some just don't understand what exactly they should say unless it is simple enough that a basic cue and respond process can be used.

So Speech is a good complimentary approach where it works, but cannot be the only method provided for accessibility.

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Overview of Guidelines

Legend for the next section:

[H] = Hardware

[S] = Software

[HS] = Hardware & Software

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Visual output concerns


Legend:

[H] = Hardware

[S] = Software

[HS] = Hardware & Software

- **Text** – Sans serif & Capital letter height of 3/16 in. (4.8 mm) available [HS]
- **Color coding** – must be redundant with other visual cues [HS]
- **Contrast** – of at least 3:1 (4.5:1 or better preferred) [HS]
- **Captions** – or text available for a) multimedia that has speech and b) any other spoken information [S]
- **Flashing** – must be less than 3 times per second – or – it must be below the flash threshold in WCAG [HS]
- **Any auto-playing audio, video or animations** – must be short [S]

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Audio output concerns


Legend:

[H] = Hardware

[S] = Software

[HS] = Hardware & Software

- **Speech output** – for all information needed for full functionality [S]
- **Speech output** – is coordinated with what is shown on the screen [S]
- **Privacy** [S]
 - Do not read masked text aloud (even through headphones) (unless user requests)
 - Do not blank screen automatically with speech output (only if user requests)
- **Speech** – can be interrupted and repeated [S]
- **Speaker and/or 3.5mm headphone jack** – is provided [H]
- **T-coil compatibility** – for any speaker held to the ear [H]
- **Volume control** – available that **does not require vision** [HS]
- **Volume reset** – after each session [S]
- **Braille instructions** – on how to start speech output mode [H]

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Controls & Operable parts concerns

Legend:

[H] = Hardware

[S] = Software

[HS] = Hardware & Software

- **Controls discernable by touch** – without activation [H]
 - Discernable does not mean identifiable.
- **Controls Positioned** – within ADA reach ranges [H]
- **Controls Operable – with one hand** [HS]
- **Controls Operable** – without twisting of the wrist, grasping, or pinching [H]
- **Nothing that protrudes** – more than 4 inches (10 cm) into paths [H]
- **No auto repeat of keys** – (or auto-repeat adjustable) [S]
- **Standard layouts with tactile landmarks** – where defined in standards [H]

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Input & Operation concerns

Legend:

[H] = Hardware

[S] = Software

[HS] = Hardware & Software

- **Screen visible (readable)** – from 40-inch (1 m) height from floor [H]
- **No specific timing** – requirements for input methods, devices [S]
- **Any timeouts** – give at least 20 seconds to respond (unless real-time event) [S]
- **Installation instructions** – specify clear floor/ground space necessary [H]
- For navigation-based interfaces [S]
 - **Logical, linear sequence**
 - **No Keyboard Navigation Trap** – Focus moves to and from elements using same mechanism without getting trapped in the element (e.g. list element)
 - **Focus Cursor** – must be highly visible

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Voting machines have more specific requirements

For example

Voting machines require...

- Help
- Higher default contrast
- Adjustable font size & contrast
- Specified color conventions
- Specific minimum response times to user input

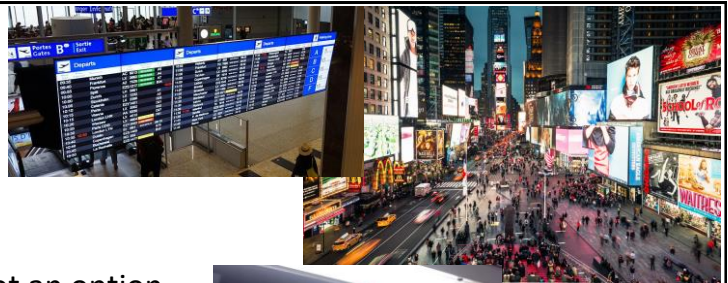


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Digital Signage

- Viewed from distance
- No interaction
- Always changing so braille is not an option
- Therefore different rules and approaches



TODAY

- No rules today to make all displays accessible to people who cannot see
- Basically rules try to maximize the number who can see and read them.
- Important information has to be provided auditorily (stops on subway, changes in airline gates at airport, emergency messages, etc.)

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Demonstration

Cross-disability Access

Using a Hybrid of
Linear Navigation and
Talking fingertip (Drag to read)
 Techniques.

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Action Item – for you

Best method for getting true accessibility into the world

Make sure that ALL kiosk RFPs (requests for proposals) include a provision requiring 3rd party certified conformance to a neutral checklist of accessibility provisions.

- Saying that it must be accessible is NOT sufficient. Accessibility is undefined.
- Providing an accessible keypad or accessible reach ranges – is not sufficient.
- Saying it must meet the ADA is NOT sufficient. The ADA is a law, not a set of rules or standards. (and the ADA Accessibility Guidelines (ADAAG) do not have kiosk specifications in them).
- Do NOT let the manufacturer certify that it is accessible. Many do not know what this entails and think they are done when only a couple things are done.
- Do NOT set it up so the purchasing agent has to determine conformance – this puts them in an impossible situation.

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Neutral Composite KIOSK/ITM Accessibility Guidelines

- We are working on a compilation of all accessibility guidelines that might apply to Kiosks and ITMs
 - Compilation underway
- Also working on a Kiosk / ITM accessibility INFORMATION PACKAGE
 1. Introduction to all of the basic approaches (used by anyone)
 2. Compilation of all regulations
 3. Unified Checklist for Kiosk/ ITM accessibility
 4. Compilation of all known Kiosk Accessibility Packages and Tools along with information on how they address the checklist.

Will post information on this as it develops in the **DeveloperSpace**

<https://ds.gpii.net> and at <https://trace.umd.edu>

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Thank You



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And one more thing...



- We are working on a new open-source tool for making computers easier to use.
- We hope to do a webinar on this for you on a later date.
- In the meantime – check out **Morphic** at <https://morphic.org>



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Accessible Kiosks

Type and submit questions in the Q&A box

Questions & Archive

The webinar today was recorded and will be archived
at www.ada-accessibletech.org

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Learn more and register at
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 Artificial Intelligence (AI)
 Fairness for Persons with Disabilities in Workplace Technologies
JANUARY 21, 2021 AT 2:00 PM ET



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