Literature Review on Accessibility Guidelines for Self-service Terminals

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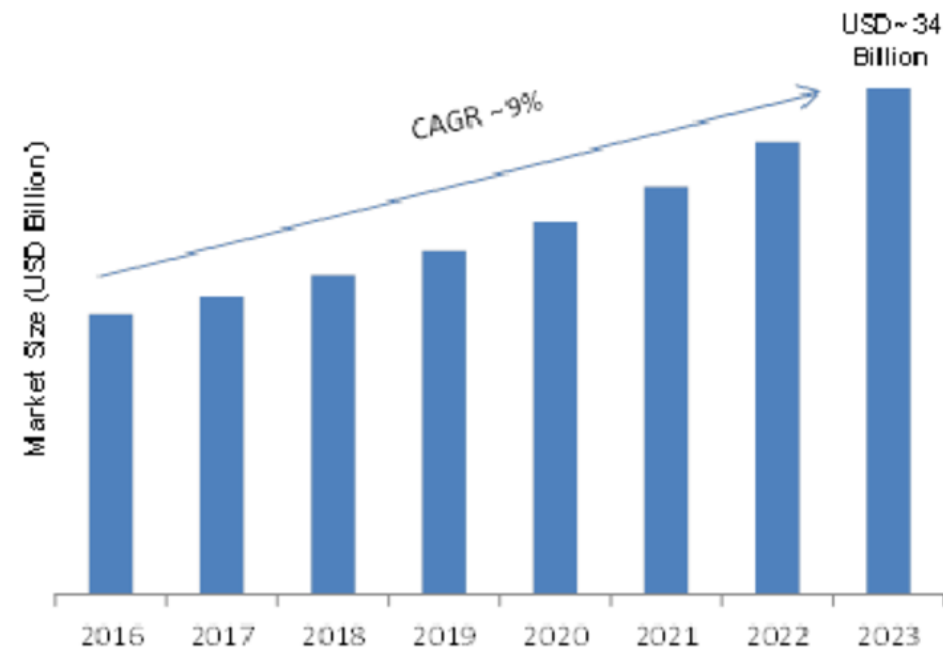tkdenddl74@kw.ac.kr

Presenter

Yuryeon Lee

✓ Student at Kwangwoon University in Republic of Korea

✓ Major in Information Convergence Contents Technology.

✓ Interested in HCI and having participated in research on VR and KIOSK.

✓ Working on Kiosk-related research.

1. Introduction

Kiosk Trends

[Global Interactive Kiosk Market]

The global interactive kiosk market is expected to grow at USD ~34 Billion by 2023, at ~9% of CAGR between 2017 and 2023.

1. Introduction

Kiosk Trends

✓ In the era of untact, unmanned service in the service industry is accelerating, and the services that kiosks replace are increasing.

✓ Compared to research on laws/functions related to mobile accessibility, research on kiosks is insufficient.

- kiosks are public devices, mobile devices are personal devices, and two accessibility features are different, requiring

  further research.

✓ The time/cost required to develop accessibility features makes it impossible for companies to develop voluntary functions.

- We need some enforcement through the law.

1. Introduction

Research Purpose

"Accessibility Guidelines and Legal Research Related to Kiosk Accessibility"

➢ **Kiosk Guidelines/Law Trends Analysis**

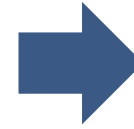➢ **Presenting the characteristics and complementing elements of accessibility guidelines**

2. Method

Kiosk Guidelines and Legal Collection

- Guideline for accessibility of automated financial devices 1.0

- Mobile Application Content Accessibility Guidelines 2.0

- Mobile Device Accessibility Guidelines 1.0

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- Public Access Terminal Accessibility (PATA)

- Section 508 of the Rehabilitation Act (RA)

- The US Air Carrier Access Act (ACAA)

- 2010 Americans with Disabilities Act (ADA)

- European Accessibility Act (EAA)

A total of five guidelines/laws are selected in consideration of the law's enforceability, the importance of literature, and the kiosk accessibility.

✓ The accessibility function was derived by referring to previous studies, and the UI function was derived using provisions common to domestic/overseas guidelines and laws.

✓ Kiosk accessibility-related guidelines and laws have been categorized based on accessibility functions, and reclassified in detail based on UI functions.

✓ The type of disability is limited to three types of visual impairment, hearing impairment, and physical impairment that are judged to have an effect on kiosk operation.

2. Method

Kiosk Guidelines and Legal Collection

[Selected Guidelines]

Law	Country	Establishment year	Contents
PATA	KOREA	2016	A national standard for designing devices that are used in public places to provide access to people with disabilities.
RA	AMERICA	1998	Regulating procurement rules for all government agencies under the US federal government.
ACAA	AMERICA	1986	To allow users with disabilities to access the website when using airline services, and to use them equally when ticketing at the airport.
ADA	AMERICA	2010	In order to prohibit discrimination against persons with disabilities in American society, the right to participate in society is guaranteed, and the government/corporate is regulated to have institutions/facilities that do not interfere with their social activities.
EAA	EUROPE	2019	This is a common accessibility rule for each country in Europe, and it is mandatory to comply with the accessibility of the disabled in IT devices.

2. Method

Kiosk guidelines and laws classification

[Accessibility function : Complement of color identification ability > UI function : Contrast] [Visual impairment]

PATA : Text should be presented in a color that contrasts well with the background.

EAA : Provide for flexible magnification and contrast;

ADA / ACAA : Contrast. Function keys shall contrast visually from background surfaces.

-> The UI function is written as a contrast because it is a question commonly related to 'contrast'. / Color contrast is related to vision and is classified as blind.

[Accessibility function : Recommended by manufacturers and service providers > UI function : Privacy] [Visual impairment, Hearing impairment, Physical disability]

PATA : It should be designed to minimize exposure of terminal users' sensitive personal information to people around public terminals.

ADA : Privacy. Automatic teller machines shall provide the opportunity for the same degree of privacy of input and output available to all individuals.

ACAA : Privacy. Automated airport kiosks must provide the opportunity for the same degree of privacy of input and output available to all individuals.

-> Since it is a question commonly related to'Privacy', the UI function is written as privacy. / Privacy applies to everyone.

2. Method

Kiosk guidelines and laws classification

Accessibility function	UI function	Contents
Complement of color identification ability (A)	Avoid color coding	Color coding shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.
	Contrast	
Compensation of reaction time (B)	Enough time	When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.
Hearing Compensation and Replacement (C)	Volume control	Provide for user control of volume.
Complement and replacement of vision (D)	Identification of input control	Text should be provided in sufficient size to read and controls appearing on the touchscreen should be provided in a way that can be recognized (audible or tactile) without being executed.
	Tactile information	
	Input keypad	
	Braille	
	Text size enlargement	
	Audio output	

2. Method

Kiosk guidelines and laws classification

| Accessibility function	UI function	Contents
Complementation of cognitive ability (E)	Display seizure	Products shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.
Recommended by manufacturers and service providers (F)	Display visibility	The installation site for public terminals should be flat floor and designed to minimize the exposure of users' sensitive personal information. In addition, alternative means should be provided for users who cannot use biometric devices and should be operable without assistive technology.
	Privacy	
	Possibility of operation without assistive technology	
	Floor or ground space	
	User identification method	
Complementing hand or arm movement (G)	Fine control alternatives	Provide for sequential control and alternatives to fine motor control.

3. Result

Percentage of Disabilities by Guidelines

✓ Provisions related to visual impairment accounted for the highest proportion, whereas those related to hearing impairment accounted for the lowest proportion.

✓ Provisions related to physical disabilities were highest in the Guidelines for PATA.

  Ex) The installation site of public terminals should be on a level surface.

✓ The number of provisions related to visual impairment was highest in ACAA.

Number

	RA	ACAA	PATA	EAA	ADA
Physical impairment	4	6	14	2	3
Hearing impairment	4	7	6	3	2
Visual impairment	7	19	15	5	12

■ Visual impairment   ■ Hearing impairment   ■ Physical impairment

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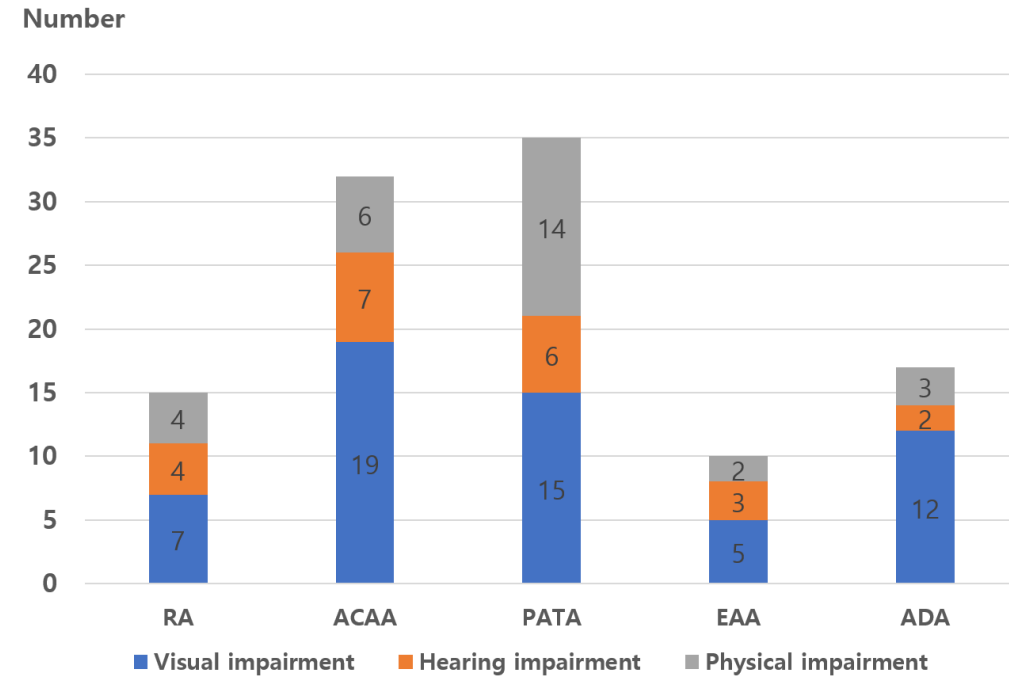
3. Result

Percentage of Guidelines by Accessibility Function

✓ The complement of color identification ability (A) and complement and replacement of hearing (C) items are included in all the five guidelines and law clauses.

✓ The complement hand or arm movement (G) item is included in only PATA and EAA.

✓ the recommendation of manufacturer and service provider (F) item was primarily noted in PATA.
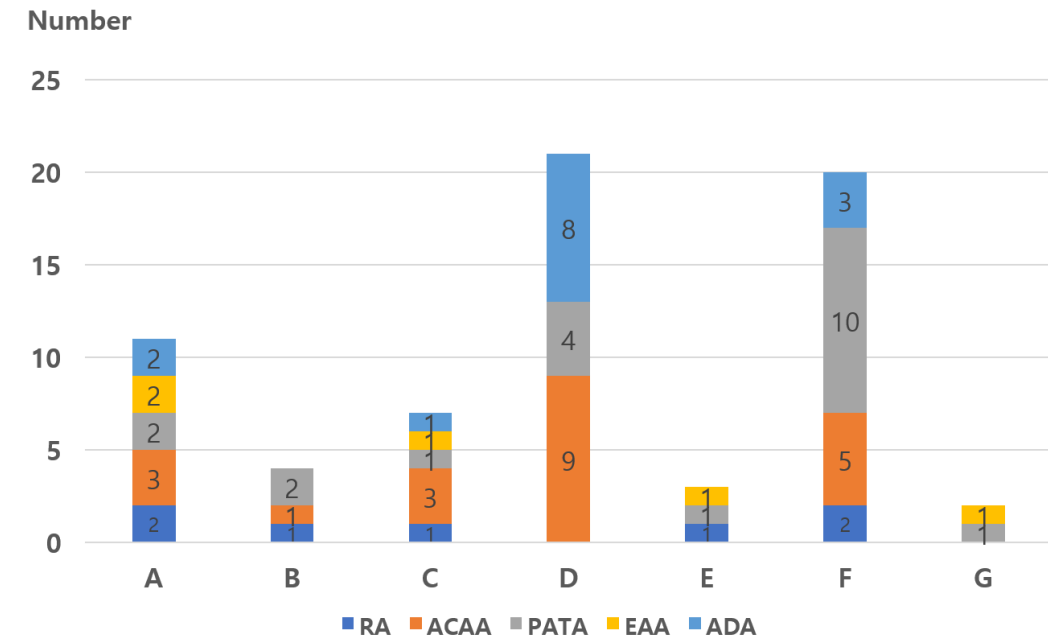
4. Discussion

✓ Due to the nature of self-service terminals using touch screen technology, there are more provisions related to visual impairment compared to hearing and physical impairments.

✓ Since the barrier-free content that must be observed during construction is mixed together, provisions related to physical disability occupy the highest proportion in PATA.

✓ When looking for guidelines related to vision, you should research the ACAA.

✓ The complement hand or arm movement (G) are only included in national standards and European accessibility laws, so they should be considered further when developing guidelines.

✓ Compared to mobile guidelines, kiosk guidelines have provisions that consider physical space.
   EX) An activity space that can be accessed while in a wheelchair must be secured in front of a public terminal.

4. Discussion

✓ There are many areas that require further research in ux/ui.
EX) Privacy protection method, input waiting time

✓ Other types of disability were not considered because the type of disability was limited to the visual impairment, hearing impairment, and physical disability, which are highly related to the kiosk.

-> Further research is needed for mental disorders such as intellectual disability.

✓ A, C> F> B, D, E> G, the order of clauses derived from the guidelines, so the importance can be determined according to the frequency.

-> **BUT,** In addition to the importance according to the frequency, it is necessary to proceed with the process of selecting major guidelines

based on actual accessibility experts and actual users.

✓ Statistical calculations were performed with the number of guidelines, but detailed evaluation methods that can be accurately evaluated are needed.

EX) Weighting method according to importance, etc.

5. Conclusion

▌ Research summary

✓ The domestic and foreign guidelines related to kiosk accessibility are classified according to 3 types of disability and 7 accessibility functions, and statistics are calculated.

✓ Through statistics, the UI functions and types of failures that are characterized by each guideline are identified.

✓ The characteristics of the overall kiosk accessibility guidelines and points to be supplemented were identified.

▌ Further Research

✓ Analysis of Kiosk Accessibility Guidelines Complements

✓ Improve kiosk accessibility

Q&A