

Japanese Industrial Standard (draft, Tentative translation) JIS

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Guidelines for older persons and persons with disabilities
– Information communication equipment and services
Part 1: Common guidelines

Introduction With the progress of the information society, people are increasingly using information communication equipment and services. This Standard specifies guidelines for improving the accessibility to information communication equipment and services when it is used mainly by the older persons and persons with permanent or temporary disabilities.

1. Scope In order to give older persons and persons with permanent or temporary disabilities (hereinafter referred to as older and disabled persons) higher accessibility to information processing equipment, electrical communication facilities, office machines, software, the Internet, and other kinds of information communication equipment and services, this Standard specifies the basic considerations for planning, development and design of those equipment and services.

Note 1. Presentation of examples: This Standard offers guidelines that are common to all types of information communication equipment and services. In order to promote understanding of this Standard, the examples related to items 5. and 6 of this Standard are presented in Annex 1 (informative).

Note 2. Individual guideline: When an individual guideline for accessibility is drafted about each information communication equipment and services, it shall be drafted with reference to this Standard.

Note 3. Use of this Standard for designing: When individual information communication equipment is designed, if any individual guideline exists in that field, the said guideline and this Standard shall be referred to. On the other hand, if any individual guideline does not exist in that field, this Standard shall be referred to. However, when this Standard is applied to individual equipment, depending on their types and other conditions, only appropriate items from this Standard should be selected and applied.

Note 4. Use of this Standard for evaluation: When individual information communication equipment is evaluated in terms of accessibility, if any individual guideline exists in that field, the said guideline and this Standard shall be referred to. On the other hand, if any individual guideline does not exist in that field, this Standard shall be referred to. However, when this Standard is applied to individual equipment, depending on their types and other conditions, only appropriate items from this Standard should be selected and applied.

2. Normative references The standards indicated in the Attached Tables contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions (including supplements) of these normative references shall be applied.

JIS Z 8071: 2003, Guidelines for standards developers to address the needs of older persons and persons with disabilities

ISO/IEC Guide 71: 2001, Guidelines for standards developers to address the needs of older persons and persons with disabilities

3. Definition For the main terms used in this Standard, the following definitions apply.

a) **information accessibility:** State in which older and disabled persons can access and

operate information/information technology without any hindrance of information communication equipment and/or services.

- b) **basic function:** Primary function that is provided by information equipment and services, that is common to product category, and that is not auxiliary.
- c) **accessible information communication equipment and services:** Information equipment and services which are intentionally developed and designed so that the older and disabled persons can use them.
- d) **information accessibility developer:** Individuals, organizations and business enterprises which develop and design accessible information equipment and services.
- e) **Service:** Provision of the required benefit for producers and consumers by using information communication equipment.
- f) **Support:** Assistance or supply of information about utilization of information communication equipment and services.

4. General principles In order to maintain and improve accessibility, all information equipment and services shall abide by the following general principles.

4.1 Basic policies

- 1) When planning, developing, and designing information technology equipment and services, consideration must be given so that the older and disabled persons can use and operate the equipment/services as much as possible.
- 2) Safety shall be ensured about accessibility-related functions provided.

4.2 Basic requirements The basic requirements for improving the accessibility of information equipment and services are as follows. In addition, each requirement should be considered independent of any other items.

- 1) It can be operated and used even if visual information is missing.
- 2) It can be operated and used even if auditory information is missing.
- 3) It can be operated and used if its speech is difficult.
- 4) It can be operated and used regardless of differences in physique and/or muscular strength.
- 5) It can be operated and used by persons with impaired lower limbs.
- 6) It can be operated and used by wheelchair users.
- 7) It can be operated and used with only one hand, either left or right.
- 8) It can be operated and used by individuals that have limited motion of hands, fingers, or artificial limbs.

4.3 Recommended considerations In addition to the above requirements, the following considerations are recommended for further improving accessibility of information equipment and services are as follows.

- 1) Consider product operation and use that does not impose excessive burden on ability of cognition and memory.
- 2) Consider product operation and use irrespective of differences in culture and/or languages.
- 3) Consider product operation and use by novices/new users.

5. Common requirements about operation To assure and improve information accessibility, all information processing equipment and services should meet the common requirements as follows.

5.1 Scope of accessible function and specification Basic functions that are common in the equipment-specific categories shall realize accessible function. Other auxiliary functions are addressed in the recommendable range. Furthermore, based on this Standard, the equipment-specific guidelines of industrial associations shall be created, and they shall present information about accessible function and specification of equipment.

5.2 Equivalent information accessibility function matters If information accessibility for older and disabled persons is assured and improved at the level substantially equivalent to or higher than the function and technology specified in this Standard, then, it is allowable to use such specification, function and technology that are not specified in this Standard.

5.3 Requirements about operation When developing and designing accessible information processing equipment and services, developers must consider requirements regarding equipment/services operation and functional requirements about operation. These requirements are as follows.

5.3.1 Requirements to be considered about operation During design and development, developers must consider the following product operation requirements so that users can achieve the intended tasks.

- a) **Requirements about preparation before operation** Irrespective of user's conditions, consider so that preparation before operation can be performed easily.
- b) **Requirements about work during operation** Irrespective of user's conditions, consider the following functional elements required to use equipment and services so that users can operate easily. In that case, study the correspondence between functional elements of equipment and services and user's mental and physical functions (sensory, cognitive, and physical functions).
 - 1) **Ease of obtaining the presented information** Consider detectability, clarity, brevity and ease of differentiation so that users can pay attention to the necessary information and obtain clearly the content of information.
 - 2) **Intelligibility** Consider the brevity and clarity so that grasping is easy. Consider classification (classification by logic, habits, search time etc.), sequential allocation, stratification, presentation of clues, illustration, etc. so that users can easily understand.
 - 3) **Consistency** Consider consistency that would allow particular mental and physical functions to routinely obtain, grasp and process information.
 - 4) **Possibility of alternative means** When the operation by the particular mental and physical functions is difficult, consider ways that make operation possible by the alternative mental and physical functions.
 - 5) **Adaptability to individual person (customization)** Consider the ability to customize/change the settings to meet individual mental and physical function needs.
 - 6) **Intelligible procedure and possibility of resume** Consider procedure that is simple to learn, intelligible and reasonable. Consider the resume function so that users can go back to the prior procedure or to the initial state, even in the case of wrong operation. Consider presentation of appropriate feedback after (each) operation is finished.
 - 7) **Safety and warning** Consider signals that warn of user's possible inadvertent motion that may result in unintended operation of equipment. Depending on the situation, consider the ability to safely stop the equipment and system, and without endangering a user. Consider so that the warning is displayed.
 - 8) **Physical load** Consider the appropriateness of the position of operational elements and physical load (e.g., load of button, roughness of surface etc.). If reduction of physical load is difficult, then, study the assistive functions.
 - 9) **Appropriate allocation of time** Consider so that the operation time etc. may be allocated appropriately.
 - 10) **Error tolerance** Consider so that the minimum correction work by users can obtain the intended effect, even in the case of wrong operation.
- c) **Requirements for termination after operation**
 - 1) Consider the ability for users to safely terminate work, switch off the power supply, and store equipment.
 - 2) Upon termination of operation, you can easily store data if you want to.
 - 3) Consider ability to easily disengage peripheral devices and network.

5.3.2 Functional requirements about operation Consider the following matters to enable older and disabled persons to easily operate the information communication equipment and services.

- a) Consideration about sensory ability**
- 1) **Easy identification** The position of control unit, display and keys of function to be operated, the state of equipment etc. can be easily identified.
If users can adjust the color and contrast setting of a product, a wide range of color selection shall be offered.
 - 2) **Possibility of identification by alternative means** Consider multiple means for users to identify and select the main operation elements.
Transmission of Information, instruction for operation, identification of display shall not rely on a single means of voice, a blinking lamp, different color alone.
 - 3) **Possibility of change of setting conditions** Users can, if necessary, change the setting conditions. When users can save the content of setting conditions, operation shall be possible by the setting conditions saved at the time of use.
- b) Consideration to cognitive ability**
- 1) **Ease of understanding and grasp** Consider ability to use without imposing excessive burden on memory ability and learning ability.
 - 2) **Possibility of change of setting conditions** Users can save the content of their setting conditions. When users can save the content of their setting conditions, they can operate equipment by the setting conditions saved at the time of use.
 - 3) **Possibility of recovery** It is always possible to return to the initial state, the state set by users, or the arbitrary setting conditions saved.
 - 4) **Cancellation and interruption of display** When the displayed information moves, blinks or scroll, it can be cancelled or interrupted.
- c) Consideration to physical ability**
- 1) **Ease of operation** Consider operation that is possible regardless of user physical functions/abilities or other physical characteristics.
 - 2) **Possibility of alternative measures** Operation measures shall have accessible alternative functions or operation assistive functions.
 - 2) **Possibility of change of setting conditions related to physical ability** Users can set and adjust physical operational functions on equipment.
It can be operated without needing time limitation. When time limitation is needed, time limitation setting is adjustable, or is extendable after prior warning.
- 5.4 Requirements for vocabulary** The vocabulary about operation shall use expressions and vocabulary that is as easy as possible to understand, and is irrespective of differences of culture, language, or level of expertise of users. As necessary, explanation of glossary shall be offered.
- 5.5 Interchangeability and combination with assistive technology for persons with disabilities** Combination of multiple assistive equipment for persons with disabilities shall not disturb the functions of respective assistive equipment.
- 5.6 Alternative measures** When the operation by particular product function is difficult, equipment shall be additionally provided with the alternative measures that enable users to operate by other physical function.
- a)** As necessary, assistive equipment for persons with disabilities can be connected.
 - b)** Information accessibility function can be switched on and off. The state of on and off can be confirmed by multiple means.
It can be selected from among multiple input operation measures and output measures.
 - c)** To operate equipment, equipment is provided with a touch screen and other input devices that react sensitively to contact by inadvertent fingertip, etc. In that case, it is desirable to offer auxiliary tactile measures, measures that are operated easily with one-hand etc. When an input repeat operation is possible, the waiting time for input interval should be adjustable.
- 5.7 Requirements for operation environment** When information communication equipment and services are used, consider the user's situation and influence on neighboring persons.
- a)** When information communication equipment and services are used, users shall be able to approach equipment easily.
- 5.8 Requirements for information security** It offers the accessible operation method that ensures information security when information communication equipment and

services are used. When biometrics is used for identification validation and control unit, consider selection of alternative start-up scheme that does not rely on physical characteristics of users.

5.9 Requirements for maintenance such as care and exchange by users

Consider ease of care and exchange of consumables that are needed to use equipment normally and safely.

6. Common requirements for development, design, and environment In order to maintain and improve information accessibility, common consideration shall be given to the following matters of information equipment and services in relation to development, design, and environment.

6.1 Basic requirements for development and design Information accessibility developers shall develop and design them so that they meet the basic requirements specified in this Standard. General managers and development managers shall be fully aware of development and design of accessible information equipment and services, and have concrete information accessibility policy.

6.2 Requirements for development and design specifications When developing information communication equipment and services, developers must consider the following development and design specifications.

- a) They shall develop and design information communication equipment and services to ensure that all people can use them to a maximum without special modification and special design.
- b) If multiple companies cooperate to develop, design and offer information communication equipment and services, then, implementation methods of information accessibility shall predetermined among companies.
- c) Upgrade, model change and localization shall not lower the accessibility quality that was already offered.
- d) In order to develop and design information accessibility technology and to use assistive equipment, interface specifications etc. necessary for connection should be disclosed.
- e) Application should be developed and designed according to industrial criteria. Application should not interrupt or invalidate the functions of other equipment that are recognized as the information accessibility functions. Application should not interrupt or invalidate the functions on operating systems that are recognized as the information accessibility functions.

6.3 Conformity of requirements for information accessibility Information accessibility developer shall eliminate mismatch between user's needs and specifications of equipment and services when information communication equipment and services are used. For that purpose, they shall clarify the information accessibility function needed by users and the range to be considered for independence of basic requirements.

6.4 Requirements for evaluation As necessary, information technology developers must evaluate accessibility of information communication equipment and services, evaluate interchangeability with assistive equipment (alternative input devices etc.), and keep the evaluation records in presentable forms. The evaluation methods should be of such type that was confirmed by older and disabled people.

6.5 Requirements for feedback Information technology developers shall establish the contact unit to collect user's opinion and should use that information to enhance accessibility of information communication equipment and services.

6.6 Requirements for support Product developers shall provide explanatory information of accessibility and interchangeability functions in the means appropriate to users. They shall establish the contact unit to support information communication equipment and services and notify users of it in an appropriate means. Consider so that users can contact the contact unit with multiple means to ensure satisfactory communication with disabled users in the suitable means. The contact unit should be accessible for users via multiple means to ensure sufficient communication with disabled users.

6.7 Requirements for environmental burden In the case of other functions, they shall minimize the environmental burden of the product in which the information accessibility functions are mounted.

Annex 1 (informative) Examples concerning common guidelines

(Guidelines for older persons and persons with disabilities –Information communication equipment and services -- Part 1: Common guidelines)

Introduction This Annex 1 (informative) describes the examples concerning chapters 5. and 6 of this Standard. It is not a part of this Standard.

1. Scope This document is treated as informative. But, in order to realize information accessibility, all information processing equipment and services should be designed to meet as many requirements as possible mentioned in the examples.

2. Example of Chapter 5 and Chapter 6

5. Common requirements about operation To assure and improve information accessibility, all information processing equipment and services should meet the common requirements as follows.

5.1 Scope of accessible function and specification Basic functions that are common in the equipment-specific categories shall realize accessible function. Other auxiliary functions are addressed in the recommendable range. Furthermore, based on this Standard, the equipment-specific guidelines of industrial associations shall be created, and they shall present information about accessible function and specification of equipment.

5.2 Equivalent information accessibility function matters If information accessibility for older and disabled persons is assured and improved at the level substantially equivalent to or higher than the function and technology specified in this Standard, then, it is allowable to use such specification, function and technology that are not specified in this Standard.

5.3 Requirements about operation When developing and designing accessible information processing equipment and services, developers must consider requirements regarding equipment/services operation and functional requirements about operation. These requirements are as follows.

5.3.1 Requirements to be considered about operation During design and development, developers must consider the following product operation requirements so that users can achieve the intended tasks.

a) Requirements about preparation before operation Irrespective of user's conditions, consider so that preparation before operation can be performed easily.

Example 1 Consider covers etc. that can be easily opened with one-hand.

Example 2 Consider the ability to easily hold during use the information communication equipment display unit or control unit.

Example 3 Consider the ability to easily connect and set-up printers and other peripheral devices.

Example 4 Consider the ability to easily define or configure information communication equipment network settings.

Example 5 Consider the weight, balance and handle shape of portable accessories connected to information communication equipment.

b) Requirements about work during operation Irrespective of user's conditions, consider the following functional elements required to use equipment and services so that users can operate easily. In that case, study the correspondence between functional elements of equipment and services and user's mental and physical functions (sensory, cognitive, and physical functions).

1) Ease of obtaining the presented information Consider detectability, clarity, brevity and ease of differentiation so that users can pay attention to the necessary information and obtain clearly the content of information.

2) Intelligibility Consider the brevity and clarity so that grasping is easy. Consider classification (classification by logic, habits, search time etc.), sequential allocation, stratification, presentation of clues, illustration, etc. so that users can easily understand.

- 3) **Consistency** Consider consistency that would allow particular mental and physical functions to routinely obtain, grasp and process information.
Example Consider the positions and shape of operation switch of information communication equipment, outline of operational menu, command expression within menu, help explanation, response from equipment to operation, expression format of operation manual etc. with reference to 2) Intelligibility. Unify the format as much as possible.
 - 4) **Possibility of alternative means** When the operation by the particular mental and physical functions is difficult, consider ways that make operation possible by the alternative mental and physical functions.
 - 5) **Adaptability to individual person (customization)** Consider the ability to customize/change the settings to meet individual mental and physical function needs.
 - 6) **Intelligible procedure and possibility of resume** Consider procedure that is simple to learn, intelligible and reasonable. Consider the resume function so that users can go back to the prior procedure or to the initial state, even in the case of wrong operation. Consider presentation of appropriate feedback after (each) operation is finished.
 - 7) **Safety and warning** Consider signals that warn of user's possible inadvertent motion that may result in unintended operation of equipment. Depending on the situation, consider the ability to safely stop the equipment and system, and without endangering a user. Consider so that the warning is displayed.
Example 1 It has the cancellation function.
Example 2 Consider prevention of wrong operation about the necessary keys and buttons.
Example 3 Blinking of the screen and other excessive photic stimulation must not cause adverse effects, such as epileptic seizure. If product/service design includes the blinking of screen(s) or light(s), include also an option that allows the user to select a frequency that does not induce photosensitive epilepsy.
Example 4 If the equipment intended for non-exclusive and joint use is provided with assistive function (e.g., assistive lever etc.) for particular disability, consider safety for other users who operate and use it. (Consider safety of those persons who stay near the equipment or who approach the equipment.)
Example 5 Information communication equipment shall have multiple means to present the operation state of hardware and software and warning. The means are, for example, the screen display, sound (voice or alarm sound), vibration, etc.
 - 8) **Physical load** Consider the appropriateness of the position of operational elements and physical load (e.g., load of button, roughness of surface etc.). If reduction of physical load is difficult, then, study the assistive functions.
 - 9) **Appropriate allocation of time** Consider so that the operation time etc. may be allocated appropriately.
Example Consider that the response time for operations differs based on the conditions of users. Offer the operation method that considers such response time.
 - 10) **Error tolerance** Consider so that the minimum correction work by users can obtain the intended effect, even in the case of wrong operation.
Example The information communication equipment shall be capable of restoring (canceling, undoing) the changed state of the software produced by key input operation etc. to its original state.
- c) **Requirements for termination after operation**
- 1) Consider the ability for users to safely terminate work, switch off the power supply, and store equipment.
Example 1 Users can confirm that the power supply is switched on.

Example 2 A power supply switch is so located as to enable users to find it easily.

- 2) Upon termination of operation, you can easily store data if you want to.
- 3) Consider ability to easily disengage peripheral devices and network.

5.3.2 Functional requirements about operation Consider the following matters to enable older and disabled persons to easily operate the information communication equipment and services.

a) Consideration about sensory ability

- 1) **Easy identification** The position of control unit, display and keys of function to be operated, the state of equipment etc. can be easily identified. If users can adjust the color and contrast setting of a product, a wide range of color selection shall be offered.

Example 1 The size, shape and color of the control unit, keys and buttons shall be easily identifiable. Especially consider the swelling height of sheet keys, contour of button display, enclosure display, etc.

Example 2 Attach the convex symbol (convex spot and convex burr) etc. to the key used as a reference. Moreover, attach Braille, as necessary.

Example 3 There is feedback for depression of keys.

Example 4 When combining display characters and background color, consider brightness, contrast and color.

Example 5 Consider the ease of hearing of alarm sound and voice output.

Example 6 Important changes of state of equipment shall be made known.

Example 7 For a telephone set, the receiving part and transmitting part of a handset shall have a different shape and color to ensure easy identification. When a handset is engaged, it shall be easily identifiable by a different shape or color of cradle, or alarm sound.

Example 8 For a telephone set, lighting and blink of display shall identify the dial-in state. Conversation shall be possible by volume-control and bone conduction functions.

Example 9 For a mobile phone and PHS, the functions of voice recognition and voice output shall be provided. Buttons shall be identifiable by different shape, convex spot/burr, or other tactile means.

Example 10 For a mobile phone and PHS, the dial-in state shall be conveyed by color of light or vibration. The display pattern shall be capable to identifying the caller.

Example 11 For information communication equipment, all image information shall be enlarged or reduced with such magnification factor that ensures ease of seeing. The area to be enlarged or reduced shall be designated with a cursor-moving key, a mouse, etc.

- 2) **Possibility of identification by alternative means** Consider multiple means for users to identify and select the main operation elements. Transmission of Information, instruction for operation, identification of display shall not rely on a single means of voice, a blinking lamp, different color alone.

Example 1 Keys and buttons can be identified without relying on color information.

Example 2 When color display used, screen display shall not rely on color information alone.

Example 3 According to equipment, users can confirm feedback of the depression of a key.

Example 4 Without relying on the sense of hearing, receipt of telephone, character mail etc. is confirmed. If functions of receiving differ, the receiving sound shall be different. Alternatively, the vibration pattern of the receiving vibrator shall be different.

Example 5 A display can be used without being seen. When the telephone

number registered in the telephone directory and that of the caller, the name of caller shall be read aloud. When the caller is not registered in the telephone directory, the telephone number of caller shall be read aloud.

Example 6 Without relying on the sense of hearing, receipt of telephone, character mail etc. is known. When they are received, it shall be known with lighting or blinking of the visible display. If functions of receiving differ, the vibration pattern of the receiving vibrator shall be different.

Example 7 The status of the telephone line (calling, connecting, busy etc.) shall be indicated visibly.

Example 8 As for information necessary for operation (for example, key status of lock, toggle etc., communication status), its state shall be known from auditory information or tactile information.

Example 9 Function of the control unit (a handle, a controller, a key, etc.) shall be known from its shape. As necessary, Braille, convex spot/ convex burr shall be attached.

Example 10 When a business machine uses auditory information (for example, communication status), the content shall be made known also via means that does not require the sense of hearing.

3) Possibility of change of setting conditions Users can, if necessary, change the setting conditions. When users can save the content of setting conditions, operation shall be possible by the setting conditions saved at the time of use.

Example 1 Brightness and contrast of a display should be adjustable. When a color display is used, if color is used as a clue, the setting of color scheme should be adjustable.

Example 2 Display size of display characters etc. Image information is displayed in the size easy to see. The display of fonts whose size is not adjustable is excluded from application of this Standard, but it is desirable to design equipment by considering the font size easy to see.

Example 3 Volume can be controlled simply. Furthermore, it can easily be returned to an initial state. Adjustment of the sound quality is simple, and it should be easily returned to an initial state.

Example 4 When response from users is required within a specified time interval, users are warned. When users need more time, this time interval can be extended.

Example 5 A loudspeaker sound volume can be adjusted during a hand-free talk.

Example 6 If users can adjust color and contrast a business machine, they can select from a wide range of colors and contrasts.

Example 7 When auditory information is important for operation of a business machine, volume is adjustable to enable persons with hypacusis to use a machine (if possible, sound tone should also be adjustable). In that case, users are allowed to use a hearing aid, an artificial cochlea and other assistive technology for hearing.

Example 8 When users must simultaneously press function keys, such as the SHIFT key, the CTRL key, and the ALT key, and character keys, sequential key input shall be possible, where a single key is pressed one by one in the order of function keys, character keys.

Example 9 Information communication equipment shall be capable of presenting repetitive input (key repeat) and setting of the start time and repeat interval. These functions shall be activated or inactivated for each arbitrary key.

- Example 10** Information communication equipment shall be capable of operating and selecting all software by particular keys on a keyboard or its combination alone.
- Example 11** Information communication equipment shall be capable of adjusting the stroke of pointer so that it corresponds to the stroke of pointing device.
- Example 12** Information communication equipment shall be capable of changing the size, shape and color of pointer and cursor, displaying of trace, and adjusting the blink interval.
- Example 13** Information communication equipment shall be capable of allocating the functions (click, double click, drag etc.) of pointing device to either the left or right button. It shall be capable of setting the click speed etc.
- Example 14** Information communication equipment shall be capable of changing a color scheme displayed on the screen.

b) Consideration to cognitive ability

- 1) **Ease of understanding and grasp** Consider ability to use without imposing excessive burden on memory ability and learning ability.
- Example 1** Display of the operation functions on the control unit shall use vocabulary that is easy to understand.
- Example 2** Consider so that users are reminded easily of the starting operation of equipment and the operation required equipment and services.
- Example 3** Procedure of operation, configuration of screen etc. can be understood easily.
- Example 4** Menu items shall be so structured as to be understood easily, and the display method shall be so contrived.
- Example 5** When graphic symbols are used, they shall be used together with characters.
- Example 6** Interfaces of peripheral devices, etc. should be easily identifiable by means of convex symbols, color, shape, etc.
- Example 7** Keys for main or frequently used functions shall be designed so that one key corresponds to one function.
- Example 8** Buttons for main and/or frequently used functions shall be easily identifiable by arrangement, shape, size and color.
- Example 9** In case of an emergency button and a one-touch button, a single operation can start communication with the partner registered beforehand.
- 2) **Possibility of change of setting conditions** Users can save the content of their setting conditions. When users can save the content of their setting conditions, they can operate equipment by the setting conditions saved at the time of use.
- 3) **Possibility of recovery** It is always possible to return to the initial state, the state set by users, or the arbitrary setting conditions saved.
- 4) **Cancellation and interruption of display** When the displayed information moves, blinks or scroll, it can be cancelled or interrupted.
- Example** When information in animation is displayed, users can select and display information in still mode.

c) Consideration to physical ability

- 1) **Ease of operation** Consider operation that is possible regardless of user physical functions/abilities or other physical characteristics.
- Example 1** Key operation is possible with appropriate force.
- Example 2** Keystroke is easy to press.
- Example 3** A business machine can be operated with appropriate operating force.
- Example 4** A business machine can be operated from a seating position posture like a wheelchair. Consider also visibility.
- Example 5** A business machine shall have a minimum of delicate operation

and complex operation (rotate and press simultaneously). A machine shall not require a large body movement and shall be capable of being operated within a reach of hands and with appropriate force.

Example 6 Consider the ease of operation of an operating handle and prevention of slip.

Example 7 Information communication equipment shall have a key guard to cover a keyboard. This will be effective for the following cases. Users with reduced muscular strength cannot continue to hold hands above the keyboard. Tremor and involuntary movement of hands cause users to touch unintended keys.

Example 8 Information communication equipment shall be capable of forecasting and displaying, during operation, the next character or sentence after the input of the first several characters.

2) **Possibility of alternative measures** Operation measures shall have accessible alternative functions or operation assistive functions.

Example 1 When pinching, twisting, or rotating is required, alternative measures should be offered.

Example 2 Selection of an alternative measure is possible from means, such as a keyboard, a mouse, a pointing device, voice operation, hand-written characters, Braille input, etc.

Example 3 Equipment to play back multimedia contents shall be capable of displaying and playing back alternative information, such as closed caption and sub voice. Image and voice information shall have alternative information, such as voice narration, alternative text, and caption.

Example 4 A television receiver shall be capable of displaying and playing back alternative information, such as closed caption and sub voice.

Example 5 Voice error message, voice guide, and alarm sound shall be offered in other measures, such as visual information.

Example 6 The hand-free operation for receiving telephone call shall be possible by the following functions.

- After calling of the specified number of times, hand-free talk will be possible automatically.
- After recognizing voice responses such as "Yes", the hand-free talk will be possible automatically.

Example 7 A telephone shall connect to the line after input of the complete information of telephone number.

Example 8 As for information communication equipment, point movement by a pointing device, click, double click, drag etc. shall have alternative operation with a keyboard.

2) **Possibility of change of setting conditions related to physical ability**

Users can set and adjust physical operational functions on equipment. It can be operated without needing time limitation. When time limitation is needed, time limitation setting is adjustable, or is extendable after prior warning.

Example 1 When voice output is available, speed adjustment, interruption, resumption, etc. are possible.

Example 2 The time setting of key repeat is possible.

Example 3 Without simultaneous pressing of keys, operation is possible.

Example 4 Each key of information communication equipment becomes definitive, not immediately after pressing key but after the specified lapse of time. Moreover, it is possible to adjust the time required until operation becomes definitive.

Example 5 As for information communication equipment, tremor and involuntary movement of hands, reduced muscular strength, and limitation of reach of hands will prevent a pointing device

from moving over a long distance. In that case, a point shall be able to move automatically over the active window, button and menu. As necessary, operation can be set or released.

Example 6 When keys of a business machine have a repeat function, the time required for start of repeat function and the repeat interval can be adjusted to be sufficiently long.

5.4 Requirements for vocabulary The vocabulary about operation shall use expressions and vocabulary that is as easy as possible to understand, and is irrespective of differences of culture, language, or level of expertise of users. As necessary, explanation of glossary shall be offered.

5.5 Interchangeability and combination with assistive technology for persons with disabilities Combination of multiple assistive equipment for persons with disabilities shall not disturb the functions of respective assistive equipment.

Example 1 Sound information shall not disturb a hearing aid and other assistive equipment. A loudspeaker to convey sound information shall not generate noise in a hearing aid.

Example 2 As necessary, assistive equipment for persons with disabilities can be connected.

Example 3 Accessibility function can be switched on and off. The state of on and off can be confirmed by multiple means.

Example 4 It shall not disturb operation of assistive software for persons with disabilities, such as reading of screen display, enlargement of letters, and scan input.

Example 5 Application shall not invalidate brightness, contrast, color selection and other individual display attributes that were selected by users.

Example 6 For a telephone set, a hand set with the voice adjustor or a sound-volume amplifier can be connected.

5.6 Alternative measures When the operation by particular product function is difficult, equipment shall be additionally provided with the alternative measures that enable users to operate by other physical function.

Example When a keyboard is mounted on a business machine as an alternative means, operation is possible with the keyboard alone.

a) As necessary, assistive equipment for persons with disabilities can be connected.

Example In a telephone set, the terminal in which the voice output for hearing aid is possible shall be prepared. Or the receiver that can correspond to the hearing aid with a magnetic induction coil shall be provided. When using the telephone with a hearing aid attached, the hearing aid picks up background noise at the same time. It is effective to add connection function that can directly convey voice signals. In this case, as necessary, a hearing aid shall have a countermeasure to shield electromagnetic noise.

b) Information accessibility function can be switched on and off. The state of on and off can be confirmed by multiple means.
It can be selected from among multiple input operation measures and output measures.

c) To operate equipment, equipment is provided with a touch screen and other input devices that react sensitively to contact by inadvertent fingertip, etc. In that case, it is desirable to offer auxiliary tactile measures, measures that are operated easily with one-hand etc. When an input repeat operation is possible, the waiting time for input interval should be adjustable.

Example A touch panel of a business machine shall be operated with a prosthetic arm. A electrostatic type touch panel cannot be operated with a prosthetic arm. So, such type of touch panel shall not be used.

5.7 Requirements for operation environment When information communication equipment and services are used, consider the user's situation and influence on neighboring persons.

a) When information communication equipment and services are used, users shall be able to approach equipment easily.

Example 1 Free space is required around equipment when wheelchair users operate equipment. When equipment is installed and used, such space should be presented and secured.

Example 2 Free space for operation is required when information communication equipment and services are used. When equipment is installed and used, such space should be presented and secured.

Example 3 Consider to minimize inconvenience of persons who stay near equipment which operate and use information communication equipment.

5.8 Requirements for information security It offers the accessible operation method that ensures information security when information communication equipment and services are used. When biometrics is used for identification validation and control unit, consider selection of alternative start-up scheme that does not rely on physical characteristics of users.

5.9 Requirements for maintenance such as care and exchange by users

Consider ease of care and exchange of consumables that are needed to use equipment normally and safely.

Example 1 Consider one-touch exchange for exchange of paper and ink for a printer, and operation that does not require more than necessary.

Example 2 Attach easily identifiable part numbers to replacement parts.

6. Common requirements for development, design, and environment In order to maintain and improve information accessibility, common consideration shall be given to the following matters of information equipment and services in relation to development, design, and environment.

6.1 Basic requirements for development and design Information accessibility developers shall develop and design them so that they meet the basic requirements specified in this Standard. General managers and development managers shall be fully aware of development and design of accessible information equipment and services, and have concrete information accessibility policy.

Example In order to improve the accessibility of information communication equipment and services, development and design must include consideration of various individual user situations and ensure that the equipment and services can be used regardless of user (dis)ability.

6.2 Requirements for development and design specifications When developing information communication equipment and services, developers must consider the following development and design specifications.

a) They shall develop and design information communication equipment and services to ensure that all people can use them to a maximum without special modification and special design.

Example 1 The shape and materials of handles and operation buttons shall be so selected as to be nonslip.

Example 2 The materials of screen shall be non-reflective.

Example 3 Operation shall be possible with prosthetic limbs.

Example 4 For a telephone set shall have the speakerphone function. Nonslip materials shall be used so that it can be easily used by users who are not good at grasping, pinching, twisting, rotating, or stretching arms. Buttons shall be shaped concave and easy to press. A handset shall be shaped easy to store.

Example 5 For a mobile phone and PHS, the buttons shall be shaped easy to press. Alternatively, buttons shall be so arranged as to minimize movement of fingers.

Example 6 When a business machine uses a voice output, it shall be possible to hear with a commercial headphone and a commercial earphone. Moreover, at any time, a voice output can be interrupted, stopped or restarted.

Example 7 When the display blinks, select a frequency that does not induce photosensitive epilepsy.

- b) If multiple companies cooperate to develop, design and offer information communication equipment and services, then, implementation methods of information accessibility shall predetermined among companies.
Example Predetermine whether Speech recognition and other assistive technologies are offered with hardware, operating system, or application.
- c) Upgrade, model change and localization shall not lower the accessibility quality that was already offered.
- d) In order to develop and design information accessibility technology and to use assistive equipment, interface specifications etc. necessary for connection should be disclosed.
Example Interface specifications etc. necessary for connection of alternative input devices should be disclosed.
- e) Application should be developed and designed according to industrial criteria. Application should not interrupt or invalidate the functions of other equipment that are recognized as the information accessibility functions. Application should not interrupt or invalidate the functions on operating systems that are recognized as the information accessibility functions.

6.3 Conformity of requirements for information accessibility Information accessibility developer shall eliminate mismatch between user's needs and specifications of equipment and services when information communication equipment and services are used. For that purpose, they shall clarify the information accessibility function needed by users and the range to be considered for independence of basic requirements.

6.4 Requirements for evaluation As necessary, information technology developers must evaluate accessibility of information communication equipment and services, evaluate interchangeability with assistive equipment (alternative input devices etc.), and keep the evaluation records in presentable forms. The evaluation methods should be of such type that was confirmed by older and disabled people.

6.5 Requirements for feedback Information technology developers shall establish the contact unit to collect user's opinion and should use that information to enhance accessibility of information communication equipment and services.

Example They shall establish the contact unit about in-house equipment and describe it clearly in explanatory documents etc.

6.6 Requirements for support Product developers shall provide explanatory information of accessibility and interchangeability functions in the means appropriate to users. They shall establish the contact unit to support information communication equipment and services and notify users of it in an appropriate means. Consider so that users can contact the contact unit with multiple means to ensure satisfactory communication with disabled users in the suitable means. The contact unit should be accessible for users via multiple means to ensure sufficient communication with disabled users.

Example 1 They shall prepare electronic documents to explain equipment. Consider individual user needs by offering documents in multiple electronic formats/delivery means.

Example 2 Manuals shall use a minimum of technical terms, words of foreign origin, and abbreviations, and they shall be easy to understand. If such words are used, a glossary shall be attached.

Example 3 In the case of telephones, alternative communication means, such as fax, shall be provided concurrently.

Example 4 When customers purchase equipment, they need explanation of information accessibility and interchangeability functions. Such explanation shall be provided in the method in which customers can obtain it easily, for example, on a Web site.

Example 5 They shall establish the contact unit about in-house equipment and describe it clearly in explanatory documents etc.

6.7 Requirements for environmental burden In the case of other functions, they shall minimize the environmental burden of the product in which the information

accessibility functions are mounted.

Annex 2 (informative) Composition of standards series

(Design guidelines for older persons and persons with disabilities– Information communication equipment and services)

Introduction This Annex is not a part of this Standard.

1) Scope This Annex describes the composition of standards series concerning information communication equipment and services for design guidelines for older persons and persons with disabilities.

2) Common guidelines "Part 1: Common guidelines" is intended to offer guidelines common to all information communication equipment and services.

3) Individual guidelines "Part 2: Information communication equipment" and subsequent standards are intended to offer accessibility guidelines for individual information communication equipment and services. These standards are based on "Part 1: Common guidelines".

Individual guidelines, when they are developed, shall be subsequently numbered "Part 2", "Part 3", and so on.