Product guidelines

RNIB

See differently

# Contents

Introduction

The following guidelines are designed to provide a basic guide to assess products for an initial level of accessibility. It does NOT replace an expert assessment and user testing, but following these guidelines does ensure there is at least a minimum level of accessibility.

1: Instructions

- The user should be able to access the product easily so there needs to be clear instructions.
  - The instructions must be available in suitable alternative formats (braille, audio, electronic, large print).
  - The information contained in diagrams must be provided to users who cannot see them. This could be achieved by providing a textual description of the diagram, or the diagram could be explained within the text. There is no need to remove diagrams, only ensure that the information is available to everyone.
  - Instructions should be clear and easy to understand by someone unfamiliar with the product or type of product.
  - Instructions will need to in a clear sans serif font, a minimum size of equivalent to 14-point Arial and in a good colour contrast with a minimum ratio of 4.5:1.
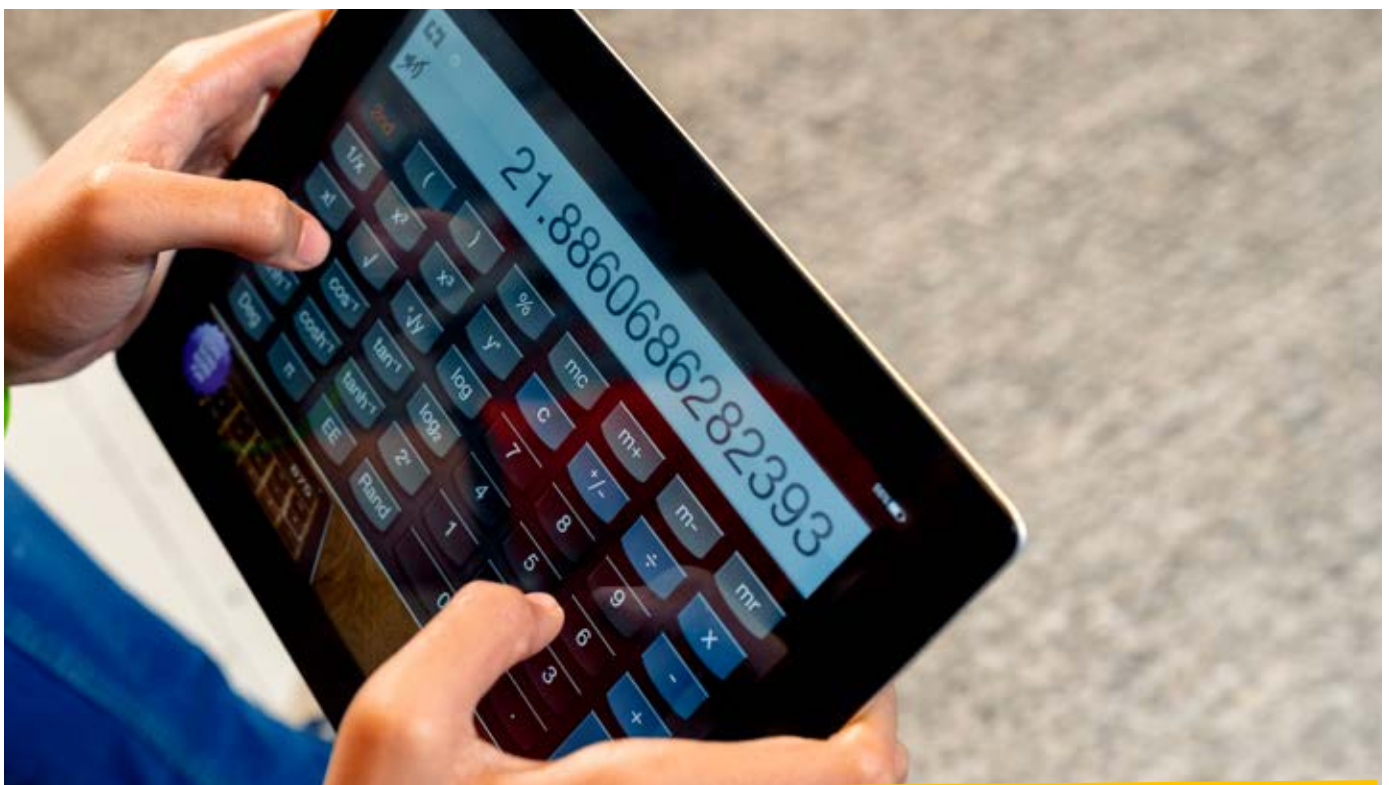
2: Packaging

- The user should be able to access the product easily and remove it from its packaging.
  - A user with limited dexterity can open the packaging without difficulties.
  - Any battery compartment can be opened, and someone with limited dexterity can insert new batteries easily.

2: Handling

- A product must be easy to orientate and use.
  - A visually impaired and/or older person can easily locate and identify the front, back, top, and bottom of the product by touch and sight.
  - A person with limited dexterity or strength, such as an older person with arthritis, must be able to able to lift, open, turn, grip or rotate the product effectively in order to use it as intended.
  - The product should be free from sharp surfaces and without finger traps. An older and/or visually impaired person may have limited vision, reduced reaction time, motor control and dexterity and sharp edges and finger traps will make it more difficult for them to use the product.
  - All functions of the product can be carried out easily without regular reference to instructions. The product is intuitive and/or easy to learn for someone who is not technically confident.
- Controls are easy to operate
  - The controls are located in an accessible place so that a blind person can easily find them even when investigating the product by touch.
  - The controls are easy to use even by a person with dexterity issues such as someone with arthritis or someone who has suffered a stroke or with reduced sensitivity in the fingers
  - Consider the pressure that needs to be applied when operating the controls.
  - Very light pressure does not give adequate tactile feedback and the user might not know they have activated it.
  - Very heavy pressure may reduce tactile sensitivity of a braille reader's fingers after prolonged use.
  - Heavy pressure will be difficult for people with reduced strength or arthritis.

- The controls are simple to understand
  - When using multi-function/mode buttons it needs to be clear to the user what is happening when. Good feedback is essential as well as the ability to undo something with ease in case of a mistake.
  - Keep irrelevant and/or decorative information to a minimum to reduce confusion.
  - Allow time for responses and learning the task. Make sure that time-outs allow for this where people might need additional time to complete a task.
  - Avoid control that require multiple actions as these are more difficult to use. For example, it is more difficult to push in and turn a dial than it is just to turn the dial.
  - Controls are well-grouped and logical in terms of importance, order of use and frequency of use.

4: Visual information (on product and via electronic displays)

A person with some useful residual vision will use the visual cues on the product so there are several areas which need to be considered to make the visuals as good as possible for as many people as possible.

Controls and Buttons

- The controls and buttons need to be clearly visible with good colour contrast, so the user knows what button to press and where it is. This applies to both tactile buttons and touch screen.

  - The button itself should contrast with the background of the product and the text on the button also needs to contrast with the button background.

  - If buttons do not contrast but the text or icons on them do then this could be sufficient to locate the button. However, on PIN pads or PIN entry devices for example it is important that people are able to see the buttons as well as the numbers on the buttons.

  - Tonal contrast (difference between light and dark) is more important than colour contrast.

  - Make a copy in grey scale, or take a photo in black and white, to help you judge the tonal contrast.

  - As a guide, when designing controls and buttons, a minimum colour contrast of 3:1 between the button and its background is required. However, a higher contrast is strongly recommended for important buttons such as power button, or a start button, or if the buttons are relatively small as a better contrast makes them easier to see.

  - If the buttons are tactile, then this will help users identify the different buttons even if the colour contrast is not ideal. (For more information see the section on tactile information below on how to make buttons and controls easy to feel and distinguishable).

Product finish

- The finish of the product (matt or shiny etc) will affect the contrast as well – partially sighted people will find it more difficult to read text on a shiny surface because of the glare. If a shiny finish has to be implemented, then the issue of glare can be diminished by having a matt finish for the background for labels and icons. Otherwise, the size and colour contrast of the text or icon needs to be increased.

Labels

- The labels for buttons need to be clearly visible with good colour contrast.

  - Text or icons used on the buttons or next to the buttons needs to have a good colour contrast with the background of the button or the appliance itself. Tonal contrast (difference between light and dark) is more important than the colour used.

  - As a guide, when designing text, numbers and icons, a contrast of 4.5:1 with the background is the minimum required to include people with typical visual acuity at age 80. For people with more serious sight loss a better contrast is required.

  - Therefore, for important information (such letters or numbers on a keyboard, PIN pads or important icons) the contrast should be at least 7:1. The maximum contrast is 21:1 and this is a combination of black and white, but other combinations can also provide a good contrast.

  - The background of any information provided needs to be a solid colour as this will make the colour contrast with whatever is presented on it better. Any patterned background must be avoided as it impairs readability.

- The textual labels must be easy to read in a font and size that aids readability.

  - The font used for the labels needs to be clear and easy to read. A sans serif font should be used as this is easier to read for partially sighted and dyslexic people as the hooks of a serif font make it more difficult to identify the shape of the letters. The characters and digits used must not be cramped and the shape of the individual letters and numbers need to be retained and easy to perceive.

  - The text needs to have a weight that makes it easy to see. Depending on the font type and size, bold or semi bold text can be considered, particularly for labels with only a few words. It is important to make sure that bold text is easy to read and that the letters do not bleed together, particularly for smaller font sizes.

- Sentence case should be used for the labels. However, conventions should be respected and when abbreviations are used. For instance, OK is always shown in upper case. If there are design reasons to have the words in upper case, these should be limited. A string of words all in uppercase letters are more difficult to read for partially sighted and dyslexic people as the shape of the word is missing.
- It is OK to say: Press the ENTER button as the button labels stands out.
- It not as easy to read the whole sentence in capital letters:
  PRESS THE ENTER BUTTON.
- If capital letters are used to make the text stand out and make it look bigger, it would be better to increase the font size and, possibly, make the text bold as this would be easier to read.

Edinburgh   (16-point Arial, mixed case)

EDINBURGH   (16-point Arial, all in capitals)

Edinburgh   (20-point Arial, mixed case) – preferred and does not take up more space than the word in capital letters

Edinburgh   (20-point Arial, mixed case bold) – preferred and only takes up slightly more space than when not in bold

- The font size should be as large as is sensible in the allocated space.
- For example, a shower or PIN Pad, for example, should have a minimum font size of 5 mm (numbers of capital letters) as people would not have their glasses on or able to use a CCTV or magnifier. However, on a remote control it would not be realistic to have the font as large as 5 mm.
- Important information should stand out. This can be achieved for example by enlarging the font, making the text bold, increasing the contrast or using a prominent location etc. RNIB considers 14-point Arial or equivalent size (3.5 mm capital letter) to be clear print and 16-point Arial or equivalent or larger (4 mm capital letter) to be large print. This applies to text documents, such as instructions.

- Font should not be so large as to merge with any lines on the product or to reduce the amount of text to a level where it is no longer useful (e.g. in a table such as an Electronic Programme guide on a TV or set top box).

- Abbreviations or well-known icons can be used as these often take up less space. For example, the on/off or a defrost or timer sign could be used instead of the corresponding words.

- Avoid placing tactile markings over visual information as this will make it more difficult to read the visual information. Tactile markings should, wherever possible, be placed adjacent to visual markings. It must also be clear which marks relate to which buttons (both visually and tactually).

- Letters or numbers should not be flashing or moving for example on a display. If flashing text has to be used, there should not be more than three flashes in one second. Text that moves or scrolls must be avoided as it is more difficult for a partially sighted person to read.

- Labels must be durable and remain visible on the product after prolonged use.

  - People with limited sight will handle products more, hence print rubs off more quickly. Rub over the printed information and labels to see if this comes off easily and try to simulate long term use.

Icons

- Icons used need to be clear visually and familiar.
  - Use conventional and well-known icons that are easier to recognise. For example, the symbol for power on is commonly used on products but other icons or symbols might be unfamiliar and will be difficult for many people and in this case, text might be required.
  - The icons used should be clear and distinguishable from one another which means that the design and shape of the icons needs to be different to make them easier to differentiate. If the icons have all a similar shape and colour, they will be more difficult to identify and remember.
  - Icons should be at least of equivalent size to the text and if the design of the icon is complex and intricate then the size of the icon should be increased.
  - No item should be identified by colour alone, at least one additional identifier whether text, shape, location etc. must always be used.

Errors

- It needs to be clear visually when an error has occurred or that there is a fault.
  - When a fault or error has occurred, the text showing the fault should not be just showing in red. Colour alone must not be used as people who have colour deficiencies might miss this warning. An additional method must be implemented such as the use of text or an icon or symbol. For people who cannot see the visuals audio feedback needs to be provided to make it clear that a fault or error has occurred.

5: Tactile information

Users who do not have useful residual vision will need to be able to differentiate between the buttons on the product.

- Buttons and controls are easy to distinguish by touch
  - If the buttons have different shapes and are different types of buttons their identification is easier. Different shape and size buttons can be used to differentiate between key functions
  - Buttons can be grouped according to function to make them easier to learn
  - The size of the buttons needs to be sufficient for people with dexterity problems to be able to push or turn. Consider that some people may have reduced sensitivity in the fingertips (due to diabetes and so on).
  - Additionally, any dials must not be too stiff to turn but on the other hand they cannot be too easy so that it is possible to turn the dial by mistake.
  - There is tactual feedback that makes it clear when a button has been pressed or when a dial has been turned.
  - When using physical buttons or dials there is a clear indication when one has reached a certain position. For example, in the case of a dial there is a definite tactile pointer that provides information about the location of the dial.
  - Avoid controls that require multiple actions as these are more difficult to use. For example, it is more difficult to push in and turn a dial than it is just to turn the dial.
  - It's important that the buttons are not activated by mistake, for example, if a touch screen had markings on it to identify buttons the user must be able to feel for the right button without activating anything on screen.
- Tactile markings on the product must be easy to feel.
  - Tactile markings should be embossed and not engraved. Embossed markings are easier to feel.
  - Tactile markings should, in general, be larger than their printed equivalent and should as a guide be raised between 0.5 and 1.5 mm (0.5 mm is the height of a braille dot).

- Tactile markings on the product should be easy to distinguish from each other.

    - Different shape and size buttons can be used to differentiate between key functions.

    - Buttons can be grouped according to function to make them easier to learn.

- Tactile markings should be suitable to the product they are going to be used on.

    - Only a limited number of blind people read braille. With this in mind consider whether braille is the correct type of tactile information to use, or if other tactile markings would be more appropriate if they fit better on the product and are useful to more people. For example, a pip on the number five on a standard telephone keypad is generally sufficient and does not need a braille number five added.

    - If braille is the appropriate tactile marking to use, it should be legible and optimally positioned in its role as labelling. Follow the correct braille dimensions / braille standard.

    - Single tactile letters should be in capitals and have a minimum letter height of 7 mm (Equivalent of 28-point Arial).

        i. If tactile letters are used for words these need to be larger (15 mm).

        ii. Tactile symbols (e.g. circular on/off symbol) should be a minimum of 11x13 mm.

    - A tactile marking must be positioned near enough to the feature it serves as a label, so it is clear that it is associated with it – without being too close as to make it difficult to feel

    - Haptic feedback, such as vibration or proprioceptive clicks, are useful indicators of position of a button or dial. This haptic feedback needs to be easy to detect and if multiple ones are used they need to be easily distinguishable from one another.

    - It needs to be clear that a position has been reached both tactually and audibly when haptic feedback is implemented. For example, on a washing machine the third click corresponds to the position for the wool cycle: this is clear both tactually and audibly.

- Tactile markings should not obscure visual information. Any tactile markings should not negatively affect the visual design.

6: Auditory information

- When a product is switched on there should be immediate audio response to indicate it is receiving power.
  - If the product is switched off, or to standby, using a button on the product then the user should be informed of this before the unit powers down.
- Audible tones emitted by the product easily distinguishable from each other.
  - Audio tones should be intuitive (e.g. don't use a discordant note to indicate a successful completion of an option).
  - The use of more than four or five different audio tones for different functions will make it difficult to remember what each audio tone means.
  - If audio tones are used to provide feedback when increasing or decreasing a feature, such as power or time changes, then there could be a definite trend in the pitch of the tones used that makes the direction of the change clear.
- Audio tones should be used to alert the user of a failure or error.
  - Any audio implemented needs to be intuitive and it should be immediately obvious that an error has happened or that there is a fault.
  - The audio tone for error needs to be repeated to make the user aware of the presence of an error. The repetition of the error audio warning needs to be repeated till the error is fixed or dismissed.
- If text to speech is implemented then the quality of the speech must be suitable to the type of product. Consider what the product is used for. Speech quality for reading a book is more important than speech quality for hearing the current time on a clock or watch.

- Consider that with age-related hearing loss, high-frequency tones are the first to be lost so the speech quality and pitch needs to take this into account.

- Consider the nationality and age group of the user group. For example, British people over the age of 65 generally prefer a British accent above others; it is familiar and easier to understand than an American or Australian accent.

- Personalisation of the speech (choose your voice, speed etc) should be provided depending on the product. This is more important when listening to longer bits of information rather than something where the task is short such as using a talking ATM. Customisation of the speech should be implemented depending on the function of the product. If you are reading a book you might want to change the voice of the reader. Additionally, if a lot of information is going to be provided you might want to change the speed of the speech. Basic customisation of the speech with regards to volume and speed should be implemented even if this is set up at the point of installation.

- The volume range must be suitable for the intended customer group. Consider hearing impaired individuals who might need to adjust the volume.

- If privacy is important than the option of headphones should be included. If the product is used in mixed user groups, then headphones can offer both privacy and convenience (as not everybody might want or need to hear the audio).

- Volume control is essential if the product is used in different environments (e.g. a talking ATM in a quiet location or a talking ATM in a busy high street)

- There should be an easy option to quickly turn the speech on and off which is useful in settings where more people not just a disabled user is using the product.

- There should be an option to silence the speech.

- It must be possible to interrupt the speech and move to the next speech feedback.

- Actions should be confirmed with audio feedback to make it clear to a user what is happening, and their choice or selection has taken effect.

- Speech feedback should be concise and not include unnecessary words.

- If a display is being used, then all text needs to be spoken but also all visual representation of information such as icons or symbols need to be voiced.

  i. Any contextual information that is needed to make sense of the information that is in focus needs to be provided in speech to make the information clear and meaningful.

  ii. Functionless design features can be ignored in audio.

- If a touchscreen is implemented it's important to consider how the speech feedback will be provided and how the user will navigate around the screen. If the electronic touchscreen is complex and provides several different areas, there needs to be a way to reach each area. This needs to be announced in speech.

- An overview of what is shown on screen needs to be provided to allow the user to carry out more in-depth exploration of the screen.

- Navigation can be provided by the user just touching the screen in different parts and having what is under their finger announced. Additionally, the navigating of the touchscreen could be carried out via gestures such as those implemented for navigation of a smartphone touchscreen.

- The navigation can be achieved with directional buttons e.g. up / down and left / right arrow buttons.

- If navigation of the interface is allowed, then it needs to be clear visually where the focus is.

- Feedback should be provided in speech to help the user know how they need to navigate the display. For example, if there are menus or list it needs to be clear how many items are in a list and on which one the user is and how to navigate them. For example, the feedback could be "One of six items, use left and right arrow to move through items".

7: Cleaning

- The product should be easy to clean and maintain.

  - If the product needs to be disassembled and reassembled for cleaning, then the process should be intuitive and there should be clear accessible instructions available for the user. Additionally, there should be clear tactile and visual indications on the product itself where parts come apart and fit back together so the task is made easier for an older and/or visually impaired person to carry out.

8: Battery compartment

- An older person and/or person with sight loss must be able to replace batteries for the product with ease.

  – There must be visual and tactual hints that make it clear which way round the batteries should be inserted (e.g. springs).

  – It should be easy to open the battery compartment bearing in mind those who are visually impaired, and/or have reduced manual dexterity or strength.

  – Depending on the product a low battery warning indicator can be used. This should ideally be visual and auditory.

9: Physical Dimensions and Build

- The weight and size of the product needs to be suitable for the intended user group(s).

  – Consider that as people age, their manual dexterity and muscle strength decreases.

  – Consider if this is something that people need to carry for a long period or is it something that is generally based on a table.

Further information

For further information please contact RNIB Learning Choices through our Helpline:

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