

2023

## REMOTE ASSISTANCE



**Il Tassello  
Mancante**

supporto al lavoratore con disabilità

**PROBLEM SOLVING PROCEDURE FOR THE MOST USED ACCESSIBILITY PROGRAMS**

### **DIGIVETT4VIP PROJECT**

KA210-VET Small-scale  
partnerships in VET - 2021-2-IT01-  
KA210-VET-000050949  
31/12/2023



Co-funded by the  
Erasmus+ Programme  
of the European Union



*The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors and the Commission cannot be held responsible for any use which may be made of the information contained therein.*

## **Project DIGIVETT4VIP – MISSING TILE**

*Tassello Mancante - Il Tutor Digitale per Non Vedenti e Ipovedenti*

Code 2021-2-IT01-KA210-VET-000050949

# **PROBLEM SOLVING PROCEDURE FOR THE MOST USED ACCESSIBILITY PROGRAMS**

***Sharing good practices and experiences in dealing with assistive ICT***

*Drafted within the Erasmus+ Programme, KA210-VET - Small-scale partnerships in VET by*

*UICI Unione Italiana dei Ciechi e Ipovedenti, Consiglio Regionale Toscana, Florence Italy*

*Centro Machiavelli, Florence, Italy*

*Polski Związek Niewidomych - Polish Association of Blind, Warsaw, Poland*



Sommario

Premise..... 4

PROBLEM SOLVING PROCEDURE FOR THE MOST USED ACCESSIBILITY PROGRAMS ..... 6

GENERAL INTRODUCTION ..... 6

1. The Procedure for remote technical assistance to VI workers (purposes) ..... 6

2. Who is the Remote Assistant? Main features and competences of the “Missing Tile” ..... 7

3. The visually impaired at work – proper conditions and accessibility requirements for the workstation ..... 8

4. The most used assistive ICT tools for accessibility by visually impaired workers ..... 10

5. Most recurring technical problems met by people with visual impairment in using assistive programs at work ..... 14

6. Possible options to carry out and manage remote technical assistance ..... 15

Operational Appendix ..... 16

General Rules ..... 3

In terms of visual impairment several factors must be considered:..... 3

## Premise

(Centro Machiavelli)

*This Procedure constitutes the key result of the DIGIVETT4VIP Erasmus+ KA2 KA210-VET - Small-scale partnerships project realized in cooperation by UICI (Unione Italiana dei Ciechi e Ipovedenti, Consiglio Regionale Toscana), Centro Machiavelli and PZN (Polski Związek Niewidomych - Polish Association of Blind).*

*Well known as "The Missing Tile", the project's core revolves around the concept of this connecting figure who acts as remote support to blind and visually impaired people in dealing with possible technical problems they could meet in using ICT and assistive devices for work or for daily use and needs. In partners' intention, the "Missing Tile" is a professional working with supporting and/or guidance assignments for blind and visually impaired users - mainly inside the Blind Associations or similar organizations - whose peculiar expertise is enriched by specific digital competences, enabling him to play the role of Digital Tutor. The Tutor acts as intermediary between the blind or visually impaired user and the full and inclusive use of ICT that, never than today, are becoming essential tools. It is undeniable that to take actively part of work processes as well as to manage normal daily activities such as the use of smartphone's Apps, through accessibility functions, or to deal with other simple routines based on the resorting to digital technologies (sending/receiving emails, internet browsing, etc.). Having digital skills is essential and the opportunity to have support in their management is very helpful, especially for people who could meet difficulties due to their own conditions. With special regard to the professional dimension, the incorporation of the latest assistive technologies has widened the potential range of work positions and tasks that can be covered by blind and visually impaired, contributing to improve their participation within the business process and to the effectiveness of their own professional supply (and satisfaction). For this reason, it seems essential to offer them a proper professional support - the so-called "Missing Tile" - who can lead these users to overcome the technological problems in using their assistive devices at work or in daily life and to consequently improve their working conditions and performance. At the same time, the specific function performed by the Digital Tutor can also help those users who are not accustomed in using assistive software or ICT for different reasons (e.g. advanced age, poor digital skills, poor usability of software/procedures, etc.) providing them tailored remote assistance & support service. According to these premises, we can affirm that the ideal fil-rouge standing out the whole Project is the social inclusiveness of blind and visually impaired, constituting at the same time the mission especially of UICI and PZN and permeating all the contents developed therein. It is proved - indeed - that social inclusion represents a key factor of wellbeing and mental health, both for person with visual impairment and for his relational network (family, job, etc.) and it has also positive impact on the whole community: reduces social tensions, prepares young generation to deal with complex and unpredicted problems; makes the inclusive community more competitive. Investing in solutions that could contribute to promote independent life of people with visual impairment means sparing for assistance and healing in a virtuous circle centered on the value of single empowerment and dignity.*

*This Procedure is conceived to be a practical Vademecum for the professionals who will perform the role of the Digital Tutor. It is structured in a **General Introduction**, framing the key operational contents later treated in the **Appendix**, where the most recurring technical problems possibly met by blind and visually impaired users are listed in several grids detailing the related solving solutions to be applied. The solving solutions have been split between problems that could be met by users in dealing with **assistive technology for touch-screen devices** and/or with **assistive technology for***

**desktop.** *This way, we would like to cover most of the range of the uses that could be done by blind and visually impaired people of their devices. The General Introduction will explain to the readers the context of intervention, the Procedure's purposes, and it will provide a synthetic overview on the main principles, concepts and meanings related to accessibility and to assistive technology in general, constituting a fundamental prerequisite of knowledge for the operators who will be supposed to be Digital Tutors. The opening part also clarifies what a remote assistant is, and it also introduces the ways to perform distance assistance to visually impaired workers at work. The Appendix constitutes the essence of the Procedure itself: for each detected technical problem it is shown the specific assistive program to which it pertains (e.g., JAWS for Windows, Super Nova for Windows, VoiceOver for Mac, etc.), when and how it happened, and the solving strategies that the Digital Tutor can suggest to the user to solve it.*

*The Appendix is organized to be easily and quickly consultable to become a real operational tool at the Tutor's disposal, enabling him/her to deal in real time with the users' needs and to give them a prompt answer.*

## PROBLEM SOLVING PROCEDURE FOR THE MOST USED ACCESSIBILITY PROGRAMS

### GENERAL INTRODUCTION

#### 1. The Procedure for remote technical assistance to VI workers (purposes)

*(Centro Machiavelli)*

The main purpose of this **Procedure** is to code and systematize proper standardized technical indications that can be applied by properly trained Operators to manage accessibility issues and to solve the possible technical problems met by users with visual impairment in using their assistive programs and applications. These methodological instructions are useful to operators to carry out a proper remote assistance action when more structured or specialized interventions made by programmers or computer experts are not necessary. This way, they can provide a quick and effective response to users' basic needs. It should not be forgotten that it is often the small difficulties that can negatively affect and block a work process and the Digital Tutor acts precisely to fill this gap.

The identification of the main technical problems to which the Digital Tutor can respond through his remote support action has been carried out starting from the direct and daily experience of the users. They contributed to providing an overview of their needs by outlining the main difficulties they can meet in using software or programs via assistive technology (screen reader, magnifier, braille display, and so on) more commonly adopted for daily use and work. Before developing the Procedure's contents, indeed, an initial mapping phase to highlight the most used assistive ICT tools for accessibility and most recurring technical problems met by visually impaired users in work and daily use has been carried out. Within the mapping it was also possible to highlight good solving practices already adopted by the users (if the problems don't require proper technical assistance done by an ICT expert). Therefore, we can affirm that the Procedure's setting up followed a participatory process and also included the direct contribution of the final beneficiaries of the remote assistance action so that it responded as much as possible to their concrete needs. Surely, it was later refined thanks to the contributions provided by technical experts, mastering tailored knowledge and competences related to assistive technologies, who worked to systematize the information converting them in a technical procedure.

The solving indications included in the core part of the Procedure – the Operational Appendix - are presented through tailored summary grids enabling Operators to immediately recognize the problem and to consult its solving indications easily and quickly. The schematic presentation of the instructions for tackling and managing the problem is functional to the remote assistance support to be provided to the user through distance means (e.g., phone contact, online assistance session, etc.).

The Procedure is mainly aimed at the operators in force of Blind Associations performing specific supporting and guidance services for blind and visually impaired people but also at HR professionals inside companies, who should be aware of how to help colleagues with visual impairment in solving the basic technical problems to not stop the work process. Also, the indications included in the Procedure can be useful (and applied) by trainers and tutors within the tailored VET pathways for these users focused on the use of the latest assistive ICT (software, programs, tools, devices) as interesting additional technical contents. Improving the technical knowledge of operators and strengthening their digital skills to better and more consciously manage and use accessible-assistive ICT represent the key goal of this Procedure. Thanks to the specific contents treated therein, the operators should be able to flank and support the visually impaired users, becoming able to run and

solve different kinds of technical difficulties that they could meet while interacting with user interfaces of software/web pages/services and so on, becoming exactly the “Missing Tile” of the project’s title: the key joining link between users and the Blind Associations, offering qualified and affordable help to visually impaired (especially the youngest ones and new blinds), who use ICT for their work and daily life.

More extensively, the solving indications and the technical information included in this Procedure contributes to set a specific digital competence centered on assistive technologies for blind and visually impaired people enriching the operators’ expertise with innovative and peculiar knowledge, laying the first seed for the born of a new professional figure: the Digital Tutor.

## **2. Who is the Remote Assistant? Main features and competences of the “Missing Tile”**

*(UICI - Unione Italiana dei Ciechi e Ipovedenti, Consiglio Regionale Toscana)*

A blind or visually impaired person may need help with some tasks which, due to their nature, or due to the limitations of digital applications and tools (including the so-called assistive technology), are difficult or impossible to manage independently. For this purpose, people with visual impairments often rely on assistance, even remotely. Thus, a Remote Assistant - the so called Digital Tutor - for a blind or visually impaired person is someone who can help them with inaccessible tasks that might require vision, such as reading paper-based documents, interacting with applications and web pages, shopping, or identifying objects. The Remote Assistant can be a friend, a family member, a volunteer, or a professional service provider who can see the blind user's situation through their smartphone camera and guide them with voice instructions.

There are several apps and programs that enable this kind of remote assistance for the blind, such as ‘Be My Eyes’ (XXX), Envision glasses, or simply via video calls. Usually, the basic idea is to connect blind and low-vision people with sighted volunteers and professional representatives for visual assistance through a live video call. These are just some examples of how remote assistance can help visually impaired people overcome the challenges they face in their daily life.

Nowadays, workers with visual impairments perform many tasks via digital tools, both on computers and mobile devices. User interfaces of applications and websites need to be designed accessible to allow assistive technology to interact appropriately with the content and thus the worker to complete tasks appropriately and efficiently. Unfortunately, interfaces are often not fully accessible, and even when they are, some tasks may be complex and sometimes impossible to complete using assistive technology. In order to overcome the limitations of assistive technology, or the problem encountered, the support of a sighted assistant may be necessary.

A remote assistant should therefore (1) connect with the visually-impaired worker, (2) understand what the worker's need is, and (3) support the worker in overcoming the problem.

Therefore, in order to perform their task properly, **the remote assistant should have specific knowledge and skills**. These can be summarized as follows:

**1. Able to use the main applications used in the workplace**, such as software for processing documents, data sheets, presentations, reading PDF documents, surfing the Internet, etc.

**2. Know how visually impaired people work with computers and touch-screen devices**. In particular, it is important to understand how the blind worker interacts using the keyboard, how the visually



impaired person uses the mouse and magnification, how gestures allow a blind person to interact with a touch-screen, etc.

**3. Know what the most common assistive technologies are used to interact with computers,** touch-screen devices and to perform other tasks independently, such as screen readers, magnifiers and other specific assistive applications for blind people. The hardware assistive technologies most commonly used by visually impaired people, such as braille displays, braille dot printers, and specific hand-held devices, should also be known to the remote assistant.

**4. Have an overview of the principles of digital accessibility and user interface design** in order to understand the most common accessibility problems that the visually impaired user might encounter during interaction.

**5. Have an overview of the most common tasks that workers with visual impairments** may have to perform, such as editing documents, working with spreadsheets, interacting with PDF documents, navigating and searching the web, consulting and filling out forms, etc.

**6. Have an overview of the most popular problems** and issues when interacting and performing the most common tasks encountered in work activities.

**7. Get to know the most popular video conferencing tools** in order to be able to connect and support the user remotely.

In order to acquire all this knowledge, the remote assistant should learn specific skills that enable them to perform the proper support, even remotely. These include:

- Commands, hotkeys and gestures of assistive technologies. For example, *'JawsKey+T' hotkey for reading the title of the current application window, 'JawsKey+Up-Arrow' to read the current line, etc., on the desktop platform; 'Left or right flick' to read the next or previous item on the touch-screen.*
- Operating system and application keyboard commands. For example, *'Ctrl+C' and 'Ctrl+V' for copy and paste; 'Shift+F10' for application menu (i.e. right mouse button); 'Tab key' and 'Shift+Tab key' for navigating among the interface items (e.g. buttons, text edit fields, etc.) via the system focus.*
- Main functions and screen sharing of video conferencing systems. For instance, *'Alt+A' and 'Alt+V' to switch on/off the mike and video in Zoom video conferencing tool; 'Ctrl+Shift+M', 'Ctrl+Shift+O' or 'Ctrl+Shift+E' for switching mike, video and screen sharing respectively.*

### **3. The visually impaired at work – proper conditions and accessibility requirements for the workstation**

*(PZN - Polski Związek Niewidomych)*

When a visually impaired person starts his or her new job, it is also a big challenge for an employer and staff whether this person will be able to carry out assigned tasks. The choice of equipment and adaptation of the environment is strongly determined by a profession in which a candidate is going to work. Since nowadays many professions are strictly related to ICT, we will focus on such conditions. A blind or low vision worker requires:

1. **A computer**, it can be a laptop or a standard PC. It can be a Mac computer (designed by Apple) or any Windows unit, the choice of computer depends on the company and software used. Both

Windows and MacOS can be operable by blind and low vision workers. Whenever possible, it is recommended to ask a blind person about a preferable computer: laptop or PC, Windows or MacOS.

2. **Screen-reading software** that enables blind and low vision users to navigate within the operating system. In the case of Windows, it is recommended to download a free screen reader - NVDA (Non-visual Desktop Access) or use the implemented screen reader - narrator. Jaws for Windows that costs approximately thousand USD is an alternative option. In most cases, a free NVDA screen reader will be able to assist blind persons while performing their tasks. MacOS users can only rely on a native screen reader (VoiceOver) that can be turned on in Accessibility settings or via a key shortcut CMD+f5. At any time in the case of Windows, it is recommended to ask a blind person which screen reader is better for them. Installing a preferable screen-reading software may be more fruitful and speed up work rather than spending time on how to learn how to use a new programme.
3. **A magnifying software**, usually unnecessary, as Windows and MacOS have advanced accessibility options, including contrast and magnification on the whole screen, mouse indicator or particular elements i.e., text that is highlighted by the cursor.
4. A **braille display**, although very expensive, may be an optional device especially when a blind person is engaged in text editing as specific errors cannot be presented explicitly via screen reader. There is a variety of Braille displays on the market and mostly all of them are compatible with above mentioned screen readers. Their price depends on a model and the quantity of Braille cells in which a text visible on the screen is displayed. The larger Braille display, the greater comfort in reading. Avoid purchasing 80-cell Braille displays, it is very expensive and consumes much table space.
5. **Headphones** - a necessary device to help blind workers work with the screen-reading software so as not to disturb other colleagues.
6. **Microsoft Office or alternative software for text processing.** Given advanced accessibility features, Microsoft Office is the best solution for blind and low vision.
7. **Software used in distance communication:** Microsoft Teams, Zoom, Google Meet etc. The above-mentioned software is accessible, other software such as Webex, Slack, etc. might not be compatible with assistive technologies. To reduce potential accessibility barriers, avoid software produced by small companies for distance communications. Such platforms may not be accessible for blind and low vision. Whenever possible, consult blind and low vision if software you are going to use is compatible with screen-reading and magnifying software.
8. **Space arrangement:** if a blind and low vision person is going to work in your company, make sure the spatial environment is friendly for them. Remove obstacles from communication corridors, arrange tables so that moving around the room is comfortable for a blind and low vision. Purchase a desk lamp for a low vision person. If possible, adapt space by adding contrasting elements to mark: doors, steps, entrance to the main building, labels corresponding with proper doors such as room numbers, etc.
9. **Training for staff** and a new worker: train staff how to approach a blind or low vision person. Train a new colleague to use ICT and software. Be open for questions and be ready to assist, especially at the initial stage.

#### 4. The most used assistive ICT tools for accessibility by visually impaired workers

*(UICI - Unione Italiana dei Ciechi e Ipovedenti, Consiglio Regionale Toscana)*

Assistive technology can be any device, software or piece of equipment that enables you to maintain or increase functional capabilities when living with visual impairments. There are many different types of devices and equipment available. If possible, it's a good idea to try out a device first and make sure it is the right option.

The Assistive Technology herein reported is not to be intended as fully exhaustive of the whole scenario, but as a convenient examination - especially of the current available technological opportunities for business and work.

ICT and assistive technology in particular, allow the blind person to use devices such as computers and smartphones / tablets, and so their applications, provided they have been developed with accessibility principles in mind. This allows the blind worker to be able to:

- Acquire skills in the use of computers, its applications and internet surfing;
- Acquire specific information related to a certain task or activity;
- Interact with web applications and services useful for carrying out the work.

In other words, Assistive Technology enables the blind person, firstly, to use computers and smartphones like any other person. Consequently, they can carry out activities and professions in which the computer plays an essential role for the related job activities, or, alternatively, it is an essential tool to acquire contents, information and data useful for carrying out their work (e.g. management of patient records, appointments annotation, information retrieval, note taking, event arrangement, etc.). Generally speaking, being able to use technological tools, such as computers or mobile devices, the blind person is able to do many activities, such as using social networks, instant messaging applications, home banking, etc. This allows a person to have a good level of autonomy in daily life.

**Computer and applications:** There are a wide range of options available to make computer easier to use. These include magnification, changing the colours on the screen, narrators and screen readers, or simply changing the position of computer and screen. Some of these features are built-in to computers while others are available to download. There is also a range of additional software and devices available to purchase. The best options for a person will depend on the level of vision and type of sight loss.

**Touch-screen devices:** Smartphones can be a very valuable device for visually-impaired people. There are two main types of smartphones, iPhone and Android. Both have built in screen readers and magnification software and support a range of apps that a person with sight loss may find useful.

More information can be found at: <https://www.fightingblindness.ie/how-we-can-help/advocacy/information-and-resource-hub/assistive-technology-and-devices>

Some examples of Assistive Technology are outlined below.

## SCREEN READER

A screen reader is an assistive technology software which uses synthetic voice or braille display to enable blind users to interact and navigate applications on both desktop and mobile platforms. It detects the content displayed on the screen and announces it aloud via voice synthesizer or shows it in braille format through a braille display. In order to work well and appropriately, the web and applications user interfaces have been designed in an accessible and usable manner.

A screen reader operates with both a desktop (computer) and mobile platforms. On a computer, a screen reader works mainly via keyboard-based commands. JAWS, NVDA and VOICEOVER are three of the most commonly used for desktop platforms. On a mobile device, specific gestures-based commands are available to interact with the apps on a touchscreen. VoiceOver and Talkback are screen readers for IOS and Android, respectively.

### ***JAWS for Windows***

JAWS (Job Access With Speech) is a screen reader for Microsoft Windows offered by Freedom Scientific, Inc. JAWS is developed for computer users whose vision loss prevents them from seeing screen content or navigating with a mouse. JAWS provides speech and Braille output for the most popular computer applications on the PC. JAWS has a variety of features, including Braille support, multi-lingual speech synthesis, and multi-screen support. JAWS is one of the most commonly used screen readers available. It is a commercial product, but it is possible to download and test a free demo version.

More information can be found at:

<https://support.freedomscientific.com/Products/Blindness/JAWS>

### ***NVDA***

NVDA (NonVisual Desktop Access) is a free, open source screen reader for Microsoft Windows. It is developed by NV Access in collaboration with a global community of contributors. Similarly to Jaws screen reader, it offers many features to the blind user. To learn more about NVDA or download a copy, visit the main NV Access website at: <https://www.nvaccess.org/>

### ***VoiceOver for MAC***

VoiceOver is a built-in screen reader integrated into the Mac OS X operating system. Using VoiceOver you control the computer primarily with a keyboard, braille display, or trackpad, instead of the mouse.

More info can be found at: [https://www.apple.com/voiceover/info/guide/\\_1121.html](https://www.apple.com/voiceover/info/guide/_1121.html)

### ***VoiceOver for IOS devices***

VoiceOver works also on mobile devices (i.e. iPhone, iPad, iPod touch and Apple Watch). When VoiceOver is on, you must use VoiceOver gestures to operate the touchscreen device. More information can be found at:

<https://support.apple.com/guide/iphone/turn-on-and-practice-voiceover-iph3e2e415f/ios>

## ***Talkback for Android Devices***

TalkBack is a screen reader-based gestures allowing you to navigate and perform frequent actions on your Android device. It works with Single-finger and multi-finger gestures depending from the device model. More information on how to use TalkBack are available at

<https://support.google.com/accessibility/android/answer/6151827?hl=en-GB>

## **SCREEN MAGNIFIER OR MAGNIFIER**

There are many devices and systems available to help people with visual impairment to read print and look at maps or photographs. These can include small telescopes, traditional magnifying glasses, a camera and display to magnify print and change colors. It is important to try out a device and make sure it is the right option for a visually impaired user before investing in one. There are screen magnifiers for desktop and mobile devices, traditional handheld magnifiers and electronic / video magnifiers.

### ***Screen Magnifier***

A screen magnifier is a software that interfaces with a computer's graphical output to present enlarged screen content. By enlarging part (or all) of a screen, people with visual impairments can better see words and images. This type of assistive technology is useful for people with some functional vision; people with visual impairments and little or no functional vision usually use a screen reader. Supernova Magnifier, ZoomText, and MAGic are popular screen magnifiers.

### ***Traditional handheld magnifiers***

There are a wide variety of magnifying glasses available. They provide different levels of magnification and are available in many sizes and shapes, including folding pocket magnifiers. Some also have a light to illuminate what you are looking at.

### ***Electronic / video magnifiers***

Electronic magnifiers or Closed-Circuit Televisions (CCTVs) are cameras that can help magnify text or images. There are generally two types, desktop and portable. A desktop magnifier allows you to place a document or piece of reading material under a mounted camera for it to be magnified and displayed on a monitor. Some have features that can change the text colour and contrast to make it easier to see. Some more advanced models can also read the text aloud to you as it appears on the monitor, this feature is called Optical Character Recognition (OCR). This device can be particularly useful in the workplace but can also assist with activities in the home.

Portable digital magnifiers have a camera on one side that you hold over what you are trying to read, the magnified image is displayed on the other side of the monitor. They come in a number of different screen sizes as a separate device or are also available as an app on your smartphone. Some portable video magnifiers can also connect to your own computer or laptop so that you can angle it in different directions to see something like a board or projector screen in a classroom.

## BRAILLE DISPLAY

A refreshable braille display is an Assistive Technology device that provides braille output from the computer, smartphone, or tablet. It is a hardware device that can be connected to a computer, smartphone or tablet via cable or via Bluetooth. It needs a screen reader to work with a computer or mobile device. Many models are able to work autonomously allowing the user to be able to take notes, edit documents or send e-mails. Later models of braille displays so offer notetaking and file storage capabilities.

The braille display is a device on which the screen reader directs the text captured from the screen so that it can be read with the hands by the blind user. It has a row of needles on the upper part that rise and fall according to the Braille encoding. The device is able to reproduce lines of 12, 20, 40 in Braille cells (some devices up to 80).

A braille display allows a blind person to read in braille format the contents of a display, one text line at a time in the form of a line of Braille characters. Each Braille character consists of six or eight movable pins in a rectangular array. This simulates the effect of the raised dots of Braille impressed on paper. Braille displays provide access to information on a computer screen by electronically raising and lowering different combinations of pins in braille cells. A braille display can show up to 20/40/80 characters from the screen and it changes continuously as the user moves the cursor around on the screen, using either the command keys, cursor routing keys, or Windows and screen reader commands. The blind person, therefore, reads the screen contents in a line and has the possibility to move sequentially or to jump directly to those points (beginning and end of the text, lists, etc.) that the screen reader is able to locate.

The braille display sits on the user's desk, often underneath the computer keyboard. The advantages of braille displays over synthetic speech (i.e. voice synthesizer) are that it provides direct access to information and it allows the user to check format, spacing, and spelling. A 40-character display is sufficient for most jobs. Examples of jobs that could require a 70- or 80-character display are computer programmer and customer service representative.

## BRAILLE PRINTER

Braille printers receive data from computer devices and emboss that information in braille onto paper through the use of solenoids that control embossing pins. Braille printers typically print on heavyweight paper and use up more pages for the same amount of information than pages printed on a regular printer. They are also slower and noisier. Interpoint printers are braille printers that emboss braille on both sides of a page.

More information are available at:

<https://www.afb.org/blindness-and-low-vision/using-technology/assistive-technology-products/braille-printers>.

## 5. Most recurring technical problems met by people with visual impairment in using assistive programs at work

In this section we would like to offer a general overview on what does it mean for VI-person meeting problems with assistive programs at work or in daily life and presenting – just exemplification -some of the most recurring problems (to introduce the operator who should manage remote assistance to the most recurring difficulties in which a VI user can run to, so as to frame his/her field of intervention).

Blind people and, in certain situations, low vision workers, have to acquire extra knowledge. They not only have to learn the operating system but also how to operate screen-reading software. These assistive technologies have a range of keyboard shortcuts so that usage and navigation within the operating system or on a document or website is much faster and more convenient. In short, an advanced blind ICT user knows keyboard system shortcuts as they do not operate with a mouse and tips and tricks as well as a list of shortcuts in order to use ICT more effectively and with greater speed. Although system keyboard shortcuts are general and widely known even to sighted people, screen-reading shortcuts or commands are programme-specific. Fortunately, documentation for screen-reading software contains user manuals and a list of keyboard shortcuts or gestures (in case of mobile devices) helpful in navigation and use.

Key problems a visually impaired person may encounter at work:

**Problem 1:** An update of software used may affect its accessibility to screen-reading software and a potential user may feel uncomfortable. In certain situations, an advanced user may quickly handle the situation but a less experienced person may feel insecure or uncertain.

How to address the problem: Collect the feedback from a user and ask prompting questions so as to understand the problem. Remember that simple statement „the software I am using does not work” is not satisfactory. Analyze the case and try to find the best solution; remember to keep a blind or low vision worker informed about the situation.

**Problem 2:** Accessibility is not granted forever. It may happen that software used may turn out to be inaccessible one day. If the software is designed by the company a blind person works for, engage them before releasing a final update so fast to limit the risk of lack of accessibility. Even if a blind worker is not an accessibility expert, he or she will indicate critical problems. If software the company is using is not produced by the company itself (e.g. dedicated internal system to exchange documentation between company’s staff) report the accessibility problem to IT support. It may happen that one day an accessibility bug will be resolved. If software cannot be used due to accessibility-related problems, engage a blind person to perform other tasks except using that inaccessible software.

**Problem 3:** Lack of knowledge of a blind person how to use ICT. Train your colleague and make sure he or she is familiar with the software used. Advice for IT support: it is suggested to familiarize with screen-reading software so as to know how to respond to reported bugs or problems.

**Problem 4:** Unexpected software behavior: it may happen software or device may behave unexpectedly i.e. blocking, stop responding, frozen focus or keyboard trap. As a blind person, be patient and find out if such behavior is repeated. As a supporting person, review the case and collect necessary information from the user, especially regarding frequency of the described error.

## 6. Possible options to carry out and manage remote technical assistance

Here are presented some general suggestions useful for the potential Assistance on the possible ways to perform his remote technical support action.

The Digital Tutor supports the visually impaired worker in 3 possible ways according to the type of help he or she will need. These cases are:

- Remote supervision with a video conferencing tool, such as Google Meet, Teams, or Meet; this kind of support will allow the assistant to follow step by step what the worker is doing on their device thanks to the 'screen sharing' function, and can guide him or her through specific steps.
- Remote guidance via a video call with tools such as Whatsapp, Skype mobile, or similar; the video camera will be useful to understand the context in which the worker is operating in order to provide quick directions or advice. This type of support may be less precise and detailed than the previous one due to less exact framing than the screen-sharing function.
- Remote connection via remote computer management software, with applications such as Teamviewer or similar. In this situation, the assistant acts directly on the user's system, thus directly resolving the problem.
- Traditional telephone call with which assistance can be provided in consultancy mode, with specific questions on assistive technologies and applications.

Intervention by the Remote Assistant/Digital Tutor may vary depending on:

- Type of help required or needed to solve the problem: whether to respond to a request, or to actually solve the critical issue.
- Workstation and possible restrictions. The type of support the assistant can provide may depend on the employee's workstation and company or professional conditions. There may be situations where the assistant may not be able to log on to the user's computer due to company restrictions or may not be able to view files or data for privacy reasons.

The Digital Tutor can intervene in different ways, depending on the type of support needed. Assistance can thus be:

- a) The Tutor follows the worker by watching his or her screen via 'screen sharing'. This will be done in synchronous mode and with a video conferencing tool.
- b) The Tutor connects to the worker's computer with a remote connection system, such as Teamviewer or similar service/application;
- c) The Tutor receives the material to be processed/settled and then returns the response/revised material.



## Operational Appendix

In this Appendix are listed the Solving Indications Grids related to a key sample of the most recurring accessibility issues due to technical problems linked to the use of assistive programs and devices by blind and visually impaired people. Each sheet is structured to be highly operational and easily consultable by the Operators as it includes: the specific type of ASSISTIVE TECHNOLOGY showing the problem and in which function the problem has been met by the user, the description of the detected problem and the description of the solution that could be offered to the user through remote assistance. To make easier the consultation of the solving grids by the operator so as to promptly find the reference for the issue he is dealing with, the Appendix is structured in **two Macro-Areas**, 1) *Accessibility issues for Assistive Technology for touch screen devices*; 2) *Accessibility issues for Assistive Technology for desktop*. The Appendix also includes a **list of relevant links and reference** to the User Guides of some of the most used accessibility programs (e.g. JAWS Screen Reader, NVDA 2023, Narrator, etc..) as well as links to the most used short-cuts and gestures (for touch screen devices, e.g. mobile phones), that can be applied by the Operator or suggested to the user for different uses and/or needs. The Appendix is finally completed by a general overview on the most common Applications and their requirements for accessibility (e.g. Office Pocket with Word, PPT, or Internet browsing).

The opportunity to have these reference online in official websites (Android, Apple, Microsoft, etc.) allows the user - the Digital Tutor or the visually impaired user - to access to info and technical indications steadily updated according to the rapid technological innovation in this peculiar field.

The starting information to later define and systematize the technical suggestions included in each sheet have been collected within the participatory initial researching phase, that involved a sample of 85 persons with visual impairment both from Poland (mainly Warsaw and hinterland) and Italy (Florence and the metropolitan area). The high number of involved people showed in both countries the users' interest (and curiosity) around the specific issues treated by the project. The sample's features certainly contributed to qualify the achieved results and – therefore - the contents covered by the sheets included in this Operational Appendix. The respondents were equally distributed between blind and visually impaired, with an average age between 30 and 49 years, a medium-high cultural background (having Secondary Schools diploma or academic qualifications) and a quite good knowledge and expertise in using assistive technological tools. The data collected within the survey as well as the above mentioned respondents' characteristics contributed to orient and determine the contents of the Solving Indications Grids as the sheets consider the operative systems and the type of programs indicated by the respondents as the most used ones (e.g. Microsoft Windows is the most used system, followed by Mac for pc, while for the mobiles the Android and IOs systems are equally diffused). The most used operating systems also determined the related assistive programs focused in the sheets (e.g. Jaws for Windows, Narrator for Windows) whose problems were identified precisely thanks to the direct experience of the users in daily use for work and/or personal purposes.

Thanks to the survey activities to which they participated, indeed, the blind and visually impaired became aware of the opportunity to be flanked in solving problems related to the daily use of assistive technologies and to the most popular programs for the accessibility of digital contents by a professional with peculiar competences (the Digital Tutor), who could be performed by the staff of the Blind Associations to which they are used to resort to for different kind of needs. This way, the Associations can raise the quality, expand, and update the range of the supporting services offered to their blind and visually impaired users, aligning them to the current needs of a society (and a job) that is increasingly technological and increasingly involves the use of digital media. The practical indications contained in the procedure go precisely in this direction, as they offer to the Associations'

staff the opportunity to update their own skills and specific technical knowledge to act also as a Digital Tutor.

## PROBLEM SOLVING INDICATIONS



ASSISTIVE TECHNOLOGY FOR TOUCH SCREEN

## ACCESSIBILITY ISSUES IN DEALING WITH THE SCREEN READER AND BRAILLE DISPLAY FOR TOUCH SCREEN

Note: unless stated otherwise, the following list of problems concern both systems iOS and Android respectively.

Future updates may add additional features and remove others respectively. Given that, it is recommended to find manuals for Android and iOS, including guidebooks on how to use a particular screen reader.

Both iOS and Android have native screen-reading software VoiceOver (iOS) and TalkBack (Android) and enhanced accessibility settings that allow a user to adjust various preferences.

N	<i>ASSISTIVE TECHNOLOGY: Screen-reading software - VoiceOver and TalkBack for iOS and Android respectively</i>
1	<b>APPLIED TO</b> mobile devices: smartphones and tablets
	<p><b>DETECTED PROBLEM 1 - Description of the problem</b>  <i>The entire application or its components are not accessible for screen readers, a blind person cannot activate buttons, buttons do not have proper labels, it is impossible for a blind user to enter the text in required fields</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>Support from a person who is familiar with screen readers and the app itself, a blind may send to the assistance team: screenshots, screen recordings all to illustrate critical accessibility errors. The team should then check the app and, if possible, provide relevant solutions. If possible, contact the developer and explain problems a blind person has experienced. Alternatively, suggest using a different application if it offers the same or similar functionalities.</i></p>

<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Screen-reading software</b>
<b>2</b>	<b>APPLIED TO</b> mobile devices: smartphones and tablets
	<p><b>DETECTED PROBLEM 2 - Description of the problem</b>  <i>Data presented in the application are not understood by a blind person. A blind person uses an app that presents grids and tables that contain information e.g. quality of the air, detailed weather conditions, statistical information. All these have the visual form, a sighted user is able to look at the whole table. Screen-reading software cannot present visible information so that a blind user is able to find relevant information or wrongly interprets displayed information. He/she is very frustrated as he/she needs this information immediately e.g. to write a report, etc.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>when a blind user informs helpdesk about the situation, an assistant may read aloud the information, send them via e-mail. As a next step, inform the developer or people responsible for preparing or publishing the information to make it more accessible so that blind users can also use or understand them.</i></p>

<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Screen-reading software</b>
<b>3</b>	<b>APPLIED TO</b> mobile devices: smartphones and tablets
	<p><b>DETECTED PROBLEM 3 - Description of the problem</b>  <i>Inaccessible form. A visually impaired user is unable to fill in the required form. He/she encounters critical problems: inaccessible form fields, unlabelled buttons and a button to send a form is not compatible with screen-reading software. What is more, it is hard to select required information such as select arrival/departure date, etc. in the form.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>if possible, provide information and ask an assistant to fill in the form. A blind user may provide relevant information. You may also direct a blind person to the dedicated website where they can fill out the same form. Afterwards, contact the developer and ask to remove accessibility barriers.</i></p>

N ASSISTIVE TECHNOLOGY: Screen-reading software	
	<b>APPLIED TO</b> iOS mobile devices
<b>4</b>	<p><b>DETECTED PROBLEM 4 - Description of the problem</b>  <i>One does not hear speech output, instead hears clicking noises. By accident, a person has turned off speech i.e. by tapping twice with three fingers, no text is read instead, characteristic noises are heard and it means VoiceOver is still on.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>advise a person to tap twice with three fingers and speech should be then on. Alternatively, turn VoiceOver off and then on.</i></p> <p><i>How to turn screen reader on on a mobile device: Follow these instructions: if you're using an iOS device: 1. Ask Siri to turn on VoiceOver, 2. Depending on the phone you have to press three times either the „home” or „power” button, 3. Ask someone to go to settings/ accessibility/vision/VoiceOver and turn it on. In Accessibility settings create a shortcut in accessibility settings to turn VoiceOver on/off by pressing three times „power” or „home” button.</i></p> <p><i>The use of the “power” or “home” button depends on the model of an iPhone one has but instructions in accessibility settings provide sufficient guidance.</i></p>

N ASSISTIVE TECHNOLOGY: Screen-reading software	
	<b>APPLIED TO</b> iOS mobile devices
<b>5</b>	<p><b>DETECTED PROBLEM 5 - Description of the problem</b>  <i>VoiceOver or TalkBack is off. Screen-reading software is off thus a blind person cannot operate the device he/she is currently using.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>provide the following instructions: if you're using an iOS device: 1. Ask Siri to turn on VoiceOver, 2. Depending on the phone you have to press three times either the „home” or „power” button, 3. Ask someone to go to settings/ accessibility/vision/VoiceOver and turn it on. In Accessibility settings create a shortcut in accessibility settings to turn VoiceOver on/off by pressing three times „power” or „home” button. The use of “power” or “home” button depends on the model of an iPhone one has but instructions in accessibility settings provide sufficient guidance. <b>If you are using an Android device:</b> 1. Ask Google Assistant to turn TalkBack on, 2. Hold for about 10 seconds both volume buttons, 3. Ask someone to open settings, then accessibility, then TalkBack and turn it on. On most devices, holding two volume buttons for about 10 seconds should turn TalkBack on/off. If this does not work, assign this shortcut in accessibility settings</i></p>

<b>N ASSISTIVE TECHNOLOGY: Screen-reading software</b>	
	<b>APPLIED TO</b> iOS mobile devices
	<p><b>DETECTED PROBLEM 6 - Description of the problem</b>  Text is read in a different language e.g. Polish text read by English screen reader. While browsing the content, the screen reader does not read the text in the language it should, e.g. it might read foreign text with English synthesizer thus making the whole text illegible for a blind person. This has been caused by the wrong definition of language in the app's interface. Automatic language detection caused reading the text by English voice.</p>
<b>6</b>	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b>  if you are using an iOS device: 1. Go to settings/accessibility.speech and turn off automatic detection of languages. 2. Add your language e.g. Polish to the rotor (settings/accessibility/vision/VoiceOver/rotor and once Polish text is read in English, find in the rotor option to change language and select the preferred language.</p> <p><b>If you are using an Android device:</b> 1. Swipe with two fingers up or down and once you hear language, swipe with one finger up or down. Once you hear your preferred language, you may carry on reading.</p>

<b>N ASSISTIVE TECHNOLOGY: Screen-reading software</b>	
	<b>APPLIED TO</b> iOS mobile devices
	<p><b>DETECTED PROBLEM 7 - Description of the problem</b>  Cannot activate a button in the app. While browsing through the app, a blind person is unable to activate the button by tapping twice with one finger</p>
<b>7</b>	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> Try making a so-called double tap: find the required button and tap twice with one finger and hold for a while. It may work.</p>

N ASSISTIVE TECHNOLOGY: Screen-reading software	
8	<b>APPLIED TO</b> iOS mobile devices
	<p><b>DETECTED PROBLEM 8 - Description of the problem</b>  <i>Typing text with Braille keyboard. Typing by using on-screen keyboard is very hard, I am fluent at Braille typing and want to enter character by using a Braille keyboard.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>If you are using an iOS device: 1. Go to settings/accessibility. VoiceOver/rotor and add Braille Screen Input (BSI) to your rotor. Once added, it should be available on almost any edit field. To activate BSI, use the rotor to select Braille Screen input and in this mode, you can type with a Braille keyboard. Note, BSI is not a Braille translator, it is the way of inserting characters with the use of a Braille keyboard.</i></p> <p><b>If you are using Android device:</b> <i>go to settings/accessibility/Braille keyboard, and add Braille keyboard. Once added, select Braille keyboard in keyboard settings and from now on, Braille keyboard should be activated in any edit field.</i></p>

N ASSISTIVE TECHNOLOGY: Screen-reading software, Braille display	
9	<b>APPLIED TO</b> iOS mobile devices
	<p><b>DETECTED PROBLEM 9 - Description of the problem</b>  <i>Graphic elements do not have alternative text. A blind user finds images in the application that convey meaning important to understand the content. No alternative text is provided and a blind user does not have an idea what meaning is conveyed through images.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>Assistant can describe the images when a blind person provides relevant information by telling exactly which images an app contains or provides an assistant with screenshots or screen recording. Alternatively, a user may perform three-finger tap on a finger in an iOS device to hear the description. Such a description is not accurate as it is provided by AI mechanism but may provide at least some information necessary to grasp the meaning of an image.</i></p>



N	<b>ASSISTIVE TECHNOLOGY: Screen-reading software, Braille display</b>
10	<b>APPLIED TO</b> iOS mobile devices, app with photos
	<b>DETECTED PROBLEM 10 - Description of the problem</b> <i>How to select a photo in a photo gallery with plenty of images. A user opens the photo gallery with plenty of images and does not have an idea how to select an image.</i>
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> Assistant may help when with the use of a computer camera, a blind user presents their screen. Alternatively, an assistant may suggest using screen-reading software and browse through the images. Screen-reading software will deliver auditory information on what an image contains. In fact this is not reliable information but might help to find the proper image.

N	<b>ASSISTIVE TECHNOLOGY: Screen-reading software, Braille display</b>
11	<b>APPLIED TO</b> iOS mobile devices
	<b>DETECTED PROBLEM 11 - Description of the problem</b> <i>Typing by using on-screen keyboard is not very effective and a user is not familiar with Braille. A user types a lot and wants to use a different keyboard instead of an on-screen keyboard. He/she does not know Braille or is a Braille reader but prefers not to use Braille on-screen keyboard either.</i>
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> Purchase an external Bluetooth keyboard and connect it to your device. Remember to adjust required settings in Android devices and, when you are using an iOS device, enable full keyboard access in accessibility settings. Alternatively, Braille displays and Braille notetakers may have a Braille keyboard so you may try using them if you connect your Braille device with the mobile device via Bluetooth or wired connection.

<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Screen-reading software that is a component of a mobile application</b>
<b>12</b>	<b>APPLIED TO</b> iOS mobile devices
	<p><b>DETECTED PROBLEM 12 - Description of the problem</b>  <i>After opening an app, in-built screen reader starts speaking and both screen readers overlap, native screen reader is blocked, or the instruction requires to turn it off.</i></p> <p><i>In some cases, app developers prepare solutions dedicated to their own application (own screen reader that works only in the app) this is because developers are not aware that an accessible app should be compatible with native screen-reading software. Thus, they design their own screen-reading systems to make their application accessible. Such a solution is very trouble-some as may cause anxiety among blind users or prevent them from using the device in case screen blocks or to accept an incoming call or control the device in other ways.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> turn VoiceOver or TalkBack off. It is recommended to assign a shortcut for this activity (see problem 11). Once you finish using the app, turn your screen reader on.</p>

<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Screen-reading software, Braille display, screen magnification</b>
<b>13</b>	<p><b>APPLIED TO</b> mobile applications, scanned content present in the application or delivered via different means of distant communication such as e-mail, Microsoft Teams, messenger, website, etc.</p>
	<p><b>DETECTED PROBLEM 13 - Description of the problem</b>  <i>A scanned document is displayed in the app or delivered otherwise to the user. A blind or partially sighted user receives, downloads or displays a scanned document that is illegible. Screen-reading software and Braille display do not present its content, the quality is very poor, and a partially sighted user has serious problems to read the entire document. This is a very important document a user cannot ignore.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> Ask an assistant to process the document and convert it into text (word, txt or html format) that is then sent to a user. Alternatively, an assistant reads the content to the user. iOS and Android users have applications for converting scanned documents into text such as VD Scan, Envision, Look Out (Android), Seeing Eye, etc. and can use them to process a scanned document and convert it into text.</p>

<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Braille display, screen-reading software, native magnification functions</b>
<b>14</b>	<b>APPLIED TO</b> mobile devices, apps that play music and videos
	<b>DETECTED PROBLEM 14 - Description of the problem</b> When music or a video is on, a blind person is unable to control the player. After playing a video or a piece of music, a blind person is unable to control the player. VoiceOver output overlaps with the music played in the background, gestures to pause or play (two-finger double tap on iOS and on some Android devices) have not been implemented in the app and it is hard to control buttons or other functions as they are not accessible and have low contrast
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> whenever possible, suggest using a different app that is more accessible.

<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Braille display, screen-reading software and magnification, when needed</b>
<b>15</b>	<b>APPLIED TO</b> mobile devices
	<b>DETECTED PROBLEM 15 - Description of the problem</b> Ads make displayed content illegible. Ads that appear on the screen cause serious problems for blind and low vision users. In this case, such ads hide the app's content and a button to skip the ad is not visible. In other cases, ads with video play without warning and a visually impaired person cannot stop them.
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> Offer an option to purchase no add option also called skip ads or suggest another app that performs the same or similar tasks.

<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Braille display, screen-reading software and magnification, when needed</b>
<b>16</b>	<b>APPLIED TO</b> mobile devices
	<b>DETECTED PROBLEM 16 - Description of the problem</b> Magnification functions of a device located in accessibility settings. Insufficient contrast of elements and components of the app
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> an alternative solution: assistance from helpdesk to read or process information, such information, provided in the alternative form, can be then sent via e-mail to the user. If possible, find an alternative app that has the same or similar functions.

## ACCESSIBILITY ISSUES IN DEALING WITH SCREEN MAGNIFIER OR MAGNIFIER FOR TOUCH SCREEN

N	<b>ASSISTIVE TECHNOLOGY: Screen magnifier, magnifier software</b>
<b>1</b>	<b>APPLIED TO</b> Operating system and applications
	<p><b>DETECTED PROBLEM 1 - Description of the problem</b>  <i>The magnifier user may have difficulty adjusting the contrast color, font type or size, or specific features related to the rendering of the page or user interface. These settings may relate to the operating system interface, the application or browser, or the document or web page. Other characteristics may be manipulated via magnifier.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>The operating system settings offer the possibility of customizing the font size and color in relation to the background colour, as well as the font size and characteristics.</i></p> <p><i>(1) Font size. To make the text more readable, adjust the font size.            For the iOS system, go to Settings &gt; Accessibility &gt; Screen and Text Size.            For the Android system, go to Settings &gt; Font size.</i></p> <p><i>(2) Colour contrast. To make text easier to read, you can invert the colours on the screen . This option can be particularly useful for apps and websites that do not support Contrast Customisation Mode (e.g. Dark Mode).            For the iOS system, go to Settings &gt; Accessibility &gt; Screen and Text Size.            For the Android system, go to Device Settings &gt; Accessibility &gt; Colour and Motion.</i></p>

# PROBLEM SOLVING INDICATIONS



## ASSISTIVE TECHNOLOGY FOR DESKTOP

## ACCESSIBILITY ISSUES IN DEALING WITH THE SCREEN READER, BRAILLE DISPLAY AND SCREEN MAGNIFICATION FOR DESKTOP

<b>N</b>	<b>ASSISTIVE TECHNOLOGY:</b> Screen-reading software, Braille display, screen magnification
<b>1</b>	<b>APPLIED TO</b> New application or web page
	<p><b>DETECTED PROBLEM 1 - Description of the problem</b>  <i>Approaching new applications or websites. The visually impaired user may find difficult when approaching a new application or website. Knowing how the user interface is designed can greatly help the user to move with greater agility. The remote assistant should support the user at this stage.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>The assistant must:</i></p> <ol style="list-style-type: none"> <li><i>(1) Describe the interface in its generality; in other words, it must provide an overview of the interface and the application in its whole.</i></li> <li><i>(2) Provide the user with information on the structure and main parts of the interface (e.g. title bar, menu, formatting bar, main areas, etc.).</i></li> <li><i>(3) Suggest to the user the most appropriate mode of exploration (via the Tab key, Alt, Arrows, and other main shortcut keys).</i></li> </ol>
<b>N</b>	<b>ASSISTIVE TECHNOLOGY:</b> Screen-reading software, Braille display, screen magnification
<b>2</b>	<b>APPLIED TO</b> Interface interaction
	<p><b>DETECTED PROBLEM 2 - Description of the problem</b>  <i>Problems with interface interaction. Screen reader user who interacts via keyboard needs to be able to work efficiently and effectively when working with spreadsheets, long and complex documents and web pages. Interaction with the interface via keyboard and screen reader is usually carried out sequentially by means of arrows and tab key, or by means of shortcut keys. Sequential reading via arrows and tab keys may not be sufficient to obtain content satisfactorily and quickly. Sometimes even shortcut keys may not be adequate to navigate through complex content and the screen reader could not respond as expected.</i></p>
	<p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>The remote assistant should:</i></p> <ol style="list-style-type: none"> <li><i>(1) Be able to provide information about the advanced and very specific commands of the application (e.g. how to navigate between sheets, columns, cells, etc.), and about the advanced commands of the screen reader, i.e. those commands that allow the user to be able to capture the column headings, jump to the next non-empty cell, etc., .</i></li> <li><i>(2) Intervene on the document or sheet to set those features or properties to simplify interaction with the contents.</i></li> </ol>

<b>N ASSISTIVE TECHNOLOGY: Screen-reading software, Braille display, screen magnification</b>	
<b>3</b>	<b>APPLIED TO</b> Word Doc
	<b>DETECTED PROBLEM 3 - Description of the problem</b> User may be unable to find a function. The functions in MS Word are organised in Tabs and icons grouped for each Tab. The user may be disoriented when navigating through all the icons associated with the various functions.
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> The remote assistant may: (1) Suggest to the user to move with the 'Alt' keys (to activate the tab bar), 'right arrow' and 'left arrow' to navigate between Tabs until reaching the one containing the function, then select the function with the arrow keys, and activate the function itself with 'Enter' or 'Alt+Down Arrow'. (2) Suggest to the user the hot key or key combination/sequence to be executed for activating the function.

<b>N ASSISTIVE TECHNOLOGY: Screen-reading software, Braille display, screen magnification</b>	
<b>4</b>	<b>APPLIED TO</b> MS Word for desktop
	<b>DETECTED PROBLEM 4 - Description of the problem</b> User may not be able to understand the structure of a data table or the understanding of an image/chart. A similar problem can occur with long documents without a table of contents or without the 'title' styles used to structure the document.
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> The remote assistant may: (1) Describe the table, image/chart, or read the section titles of the document. (2) Ensure that the user is using the right commands to navigate the document, and possibly suggest dedicated keys ('Insert+F6', 'Ctrl+Alt+Frecce' to navigate between cells in a table, etc.). (3) Assign 'Title' styles to document titles to create a table of contents (table of contents) automatically via Word itself.



<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Screen-reading software, Braille display, screen magnification</b>
<b>5</b>	<b>APPLIED TO</b> PDF reading on desktop platform
	<b>DETECTED PROBLEM 5 - Description of the problem</b> User may not be able to easily navigate between document sections (headings), understand images/charts, or complex tables.
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> The remote assistant may: (1) Ensure that the user is using the right commands to navigate the document, and possibly suggest dedicated keys ('Insert+F6', 'Ctrl+Alt+Frecce' to navigate between cells in a table, etc.). (2) Describe images/graphics, tables, or read out section titles in the document.

<b>N</b>	<b>ASSISTIVE TECHNOLOGY: Screen-reading software, Braille display, screen magnification</b>
<b>6</b>	<b>APPLIED TO</b> Screen reading, screen magnifier and operating system
	<b>DETECTED PROBLEM 6 - Description of the problem</b> Interaction with the operating system and applications requires that they and assistive technologies are properly configured and set up. For instance, the files shown in a folder should be presented in a list to facilitate navigation by keyboard and screen reader; the file name should also show its extension such as .exe, .docx, .xls to allow the screen reader user to know the type of file, which is often shown by icons or otherwise in a visual manner. As another example, shortcuts and desktop icons linked to more common applications may be needed to facilitate access to the most frequently used programmes. These features need to be set up by the user. The visually impaired user may find it difficult to configure such a features.
	<b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> The remote assistant should be able to configure operating system and application settings to facilitate interaction via screen reader or magnifier. The assistant can do this after connecting to the user's computer, or guide the user through this configuration via video conferencing tool or phone.

## ACCESSIBILITY ISSUES IN DEALING WITH SCREEN MAGNIFIER OR MAGNIFIER FOR DESKTOP

<b>N</b>	<b>ASSISTIVE TECHNOLOGY:</b> <i>Screen magnifier, magnifier software</i>
<b>1</b>	<p><b>APPLIED TO</b> <i>Operating system and applications</i></p> <hr/> <p><b>DETECTED PROBLEM 1 - Description of the problem</b>  <i>The magnifier user may have difficulty adjusting the contrast color, font type or size, or specific features related to the rendering of the page or user interface. These settings may relate to the operating system interface, the application or browser, or the document or web page. Other characteristics may be manipulated via magnifier.</i></p> <hr/> <p><b>SOLVING INDICATIONS - Description of the solution that could be offered to the users through remote assistance:</b> <i>The remote assistant must be able to configure these features either in the operating system or applications, or from the enlargement software.</i></p>

## LIST OF RELEVANT RESOURCES ON ACCESSIBILITY ISSUES USEFUL FOR THE DIGITAL TUTOR

Within the following list the Digital Tutor can find key links to the User Guides of some of the most used accessibility programs (e.g. JAWS Screen Reader, NVDA 2023, Narrator, etc..) as well as links to the most used short-cuts and gestures (for touch screen devices, e.g. mobile phones), that can be applied by the Operator or suggested to the user for different uses and/or needs.

The listed resources are related to the Operating System Microsoft and Mac, as they are considered the most used ones.



### **Complete user guide on how to use VoiceOver on Mac**

[Polish VoiceOver Guide on Mac](#)

[Italian VoiceOver Guide on Mac](#)

### **How to use Voiceover on iPhone**

[Polish VoiceOver Guide Support Apple](#)

[Italian VoiceOver Guide Support Apple](#)

### **How to change display settings on iPhone**

[Polish iPhone Guide Apple Support](#)

[Italian iPhone Guide Apple Support](#)



### **Complete Guide to Narrator**

[Narrator Guide Support Microsoft](#)

### **Microsoft Teams key shortcuts**

[Keyboard-shortcuts 1 Microsoft Support](#)

### **Keyboard Shortcuts in Word**

[Keyboard-Shortcuts 2 Microsoft Support](#)

## **Keyboard Shortcuts in Microsoft 365**

[Keyboard Shortcuts 3 Microsoft Support](#)

## **Keyboard Shortcuts in Excel**

[Keyboard Shortcuts 4 Microsoft Support](#)

## **Windows Keyboard Shortcuts**

[Keyboard Shortcuts 5 Microsoft Support](#)

## **ACCESSIBILITY ISSUES FOR DISTANCE COMMUNICATION PLATFORM**

*Useful for organizing meetings, conferences, webinar etc.*

*These Platforms are communications technology for videotelephony and online chat services platform used for video communications (Meetings), messaging (Chat), voice calls (Phone), conference rooms for video meetings (Rooms), virtual events (Events) and contact centers (Contact Center)*



### **Google Meet Accessibility**

<https://support.google.com/meet/answer/7313544?hl=en>



zoom

### **Zoom Accessibility**

<https://www.zoom.com/en/accessibility/>

## **OTHER HELPFUL LINKS**

### **JAWS Screen Reader - Documentation**

<http://support.freedomscientific.com>

### **NVDA 2023 Userguide**

<https://www.nvaccess.org/files/nvda/documentation/userGuide.html>

### **Chromevox Userguide**

<https://support.google.com/chromebook/answer/7031755?hl=en>

## MOST COMMON GESTURES FOR TOUCH SCREEN DEVICES FOR BLIND & PEOPLE WITH VISUAL IMPAIRMENT

For a rapid and effective consultation of the following suggested gestures for touch screen devices, they have been classified for both Operating System (Android, iOS) as considered the most used ones.

### BASIC GESTURES FOR IOS AND ANDROID

*These are gestures applied in both systems. To get more information, refer to user manuals.*



GESTURES	RESULT TO BE ACHIEVED
<b>Touch with one finger</b>	Screen reader announces an element visible by cursor
<b>Move one finger to the right</b>	Moves cursor to the next element
<b>Move one finger to the left</b>	Moves cursor to the previous element
<b>Slide one finger on a screen</b>	Explore by touch, underlined elements are announced by screen reader
<b>Double tap with one finger</b>	Activates an element such as: button, text field, status etc.
<b>Move one finger up or down</b>	Moves to the previous or next option either in the rotor (iOS) or selected menu (Android)
<b>Double tap with two fingers</b>	Pause/play initiate/finish phone calls

## SPECIFIC ACCESSIBILITY REQUIREMENTS FOR THE MOST COMMON APPLICATIONS

### General Rules

Blind and low vision people will benefit from accessible applications, no matter what operating system they use. An accessible app will:

- Be compatible with screen reading software,
- Display magnified elements on the screen with no need of too much scrolling and will not hide essential content,
- Be accessible with the use of an external keyboard, especially for people with motor impaired or multiplied disabilities
- Be clear and logic for people with cognitive disabilities
- Be friendly for those suffering from dyslexia
- Be friendly for elderly people
- Be used by everyone.

### In terms of visual impairment several factors must be considered:

**All elements should be properly labelled** - while scrolling the screen a screen-reader user should know what elements an app contains; an unlabeled element will cause anxiety as a blind person will not have an idea what an unlabeled element is for.

**Active elements compatible with screen readers** - any active element: button, form field, slider etc. should be compatible with specific gestures of a screen reader, e.g. double tap with one finger means activation of an element and if an essential button (e.g. to send a form to be submitted) is not compatible with screen-reading software, a blind person will not be able to submit a form.

**Mark visual elements as decorative** - a blind person explores the screen element by element and when the reading software reads all elements, he/she may have a feeling that an app is overloaded. If an image does not present essential content such as a piece of decoration, mark it as "decorative" if so, a screen-reading software will ignore such elements thus making the app clearer.

**Make forms accessible** - each element of a form should be clearly labelled so that a blind user knows what to put in each field. In case of specific information, clear explanation should be provided. Remember an explanation "insert the date in the format dd/mm/yyyy" may be unclear for beginners and elderly people or those with cognitive disabilities. Remember to provide text information if the form contains errors. Do not mark errors or mandatory fields only with a color: blind users and those who cannot differentiate colors will not be able to find out which form fields are mandatory, or which contain an error. In addition, provide text information when a form is sent such confirmation will be a clear information for any user.

**Ensure keyboard accessibility** - all elements of an application should be accessible with a use of an external keyboard: blind users may have additional disabilities, including motor impairments and operating with a keyboard will be easier than touching a screen. A broken arm, temporary hand impairment will also make it difficult for anyone to use touch screen.

**Avoid complicated gestures** - multi-finger complicated gestures, for the reasons provided above, will be a major obstacle for people with motor impairment, broken arm, suffering from other muscular diseases and for elderly people.

**Make an app predictable** - unexpected behavior or undesired action will cause anxiety among users with disabilities, especially when time matters.

**Provide appropriate contrast** - WCAG guidelines provide information on proper contrast, ensure that an app and its components have appropriate contrast.

**Provide warnings when an app opens another application** e.g. a web browser - any user should be aware and be able to decide if they want to open a web browser.

**In case of audio and video materials provide audio description and captions:** audio description will be helpful for the blind but also for other people who cannot look at the screen while watching a film. Captions will help people with hearing impairment but will be also helpful for those who don't want to play sound loud at the moment e.g. passengers in public transport.

**Use proper language** - screen readers can switch between languages when they are properly marked, be careful and assign proper language to the language of an app: Polish text read loud by English synthesizer will not be understood by the majority of blind users.

**Provide clear instructions so that an app is clear to everyone** - less advanced users, elderly people or people with cognitive problems will not understand complicated instructions.

**Check accessibility before releasing an update**- use screen-reading software, and magnifying functions, when possible, cooperate with different users but remember they will assess accessibility from their perspective and majority of them are not an accessibility expert.

**DIGIVETT4VIP PROJECT – MISSING TILE**  
**KA210-VET Small-scale partnerships in VET**  
**2021-2-IT01-KA210-VET-000050949**



Co-funded by the  
Erasmus+ Programme  
of the European Union