ITUPublications

International Telecommunication Union
Development Sector

Guidebook on accessibility of online job application and recruitment systems

In Partnership with:

International Labour Organization

Guidebook on accessibility of online job application and recruitment systems

December 2022

In Partnership with:

International Labour Organization

Acknowledgements

This Guidebook was written and developed by ITU expert Ricardo García Bahamonde. It was prepared within the scope of the ITU-ILO project on accessibility of online job application and recruitment systems, under the supervision and guidance of the ITU Telecommunication Development Bureau Digital Society Division, with input provided by Jürgen Menze (Disability Inclusion Officer, ILO) and Stefan Tromel (Senior Disability Specialist, ILO).

ITU and ILO appreciate the strategic advice and technical inputs provided by the members of the project's Advisory Committee:

- Danielle Dubois, Public Service Commission, Canada
- Facundo Chávez Penillas, Office of the United Nations High Commissioner for Human Rights (OHCHR)
- Jesica Rivero Espinosa, Fundación ONCE
- Sakunthala Mapa, Leonard Cheshire

ITU and ILO appreciate the collaboration and cooperation of the entities and individuals that participated in, and supported, the assessment of several online job application and recruitment systems, e-recruitment systems, and related content:

- International Labour Organization (ILO)
- United Nations High Commissioner for Refugees (UNHCR)
- World Health Organization (WHO)
- World Intellectual Property Organization (WIPO)
- United Nations Secretariat
- Leonard Cheshire
- Fundación ONCE and the validators that provided end-user experience feedback during the assessments

Disclaimers

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of ITU and of the Secretariat of ITU concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by ITU in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by ITU to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader.

The opinions, findings and conclusions expressed in this publication do not necessarily reflect the views of ITU or membership.

ISBN

978-92-61-37041-1 (Electronic version)
978-92-61-37051-0 (EPUB version)
978-92-61-37061-9 (MOBI version)

Please consider the environment before printing this report.

Foreword

Information and communication technologies (ICTs) have the potential to help build stronger communities and assist people to pursue their goals and ambitions, including in the world of work. Every person should have the right to benefit fully from the digital transformation, regardless of factors such as disability, gender, age, race or where they live.

Over 1 billion people in the world live with a disability, 80 per cent of whom are of working age. Yet, persons with disabilities are often at risk of discrimination and socio-economic exclusion, including in today's digital society. The COVID-19 pandemic has exacerbated the challenges they face in access to essential services such as education and health, and in terms of employment opportunities.

Guaranteeing that ICT tools meet accessibility requirements is critical for persons with disabilities to enter and thrive in the labour market. ICT tools, however, are still too frequently designed and developed without accessibility requirements in mind. A lack of accessible digital content in many online job application and recruitment systems is one of the many barriers that persons with disabilities face in accessing employment opportunities.

Removing such obstacles throughout the recruitment process will enable persons with disabilities to compete for jobs in conditions of equality, whilst giving employers access to a larger talent pool and enhancing their chances of attracting the best candidates. Workplaces with greater accessibility tend to be more diverse and inclusive, which brings fresh ideas, skills viewpoints and innovation to the organization.

This *Guidebook on accessibility of online job application and recruitment systems* has been developed jointly by the International Telecommunication Union (ITU) and the International Labour Organization (ILO) to help employers understand the barriers that persons with disabilities may face when applying for a job online, and the accessibility and usability requirements that job portals and digital tools used in recruitment processes should meet to support the overarching goal of promoting inclusive employment.

To complement the guidebook, ITU and ILO have developed the self-paced e-learning course *'Inclusive employment: How to ensure that online job applications and recruitment systems are accessible to all'* designed for all stakeholders (including public and private sector, trade unions, academia, civil society and international organizations). The course is particularly useful for individuals involved in the recruitment process of their organizations and maintenance of their job portals, who wish to enhance their knowledge on the topic of digital accessibility and their understanding of the principles of universal design which are fundamental to building inclusive online job applications and recruitment systems.

This collaborative effort also aims at supporting entities in the implementation of indicators 6 (Accessibility) and 13 (Employment) of the United Nations Disability Inclusion Strategy (UNDIS), which establishes the highest levels of commitment and a vision for the UN system on the inclusion of persons with disabilities.

We encourage all stakeholders to strengthen their endeavours to promote inclusive employment, retention and career advancement, by ensuring that their online job applications and recruitment systems are accessible and usable for all persons, including persons with disabilities.

We trust that this guidebook will be a useful contribution to those endeavours.

Sylvia Poll, Head of the Digital Society Division, Telecommunication Development Bureau, International Telecommunication Union

Chidi King, Chief of Gender, Equality, Diversity and Inclusion branch, International Labour Organization

Table of contents

List of abbreviations

AI	artificial intelligence
CAPTCHA	Completely Automated Public Turing Test to Tell Computers and Humans Apart
COVID-19	Coronavirus disease 2019
CPRD	Convention on the Rights of Persons with Disabilities
HTML	HyperText Markup Language
ICF	International Classification of Functioning, Disability and Health
ICT	Information and communication technology
ILO	International Labour Organization
IT	information technology
ITU	International Telecommunication Union
ITU-D	ITU Telecommunication Development Sector
PDF	Portable Document Format
PEAT	Partnership on Employment & Accessible Technology
SMS	short message service
UNHCR	United Nations High Commissioner for Refugees
W3C	World Wide Web Consortium
WCAG	Web Content Accessibility Guidelines
WHO	World Health Organization
WIPO	World Intellectual Property Organization

1 Introduction

Accessible information and communication technology (ICT) can level the playing field for persons with disabilities across many areas of life, including education and employment. Technology can be a major catalyst for the full participation of persons with disabilities.

The Convention on the Rights of Persons with Disabilities (CRPD) is an international human rights treaty adopted by the United Nations in 2006 with the aim of ensuring that persons with disabilities enjoy the same human rights as persons without disabilities. As of 2022, over 95 per cent of countries have ratified the treaty, reflecting the firm global commitment to guaranteeing inclusion and equal rights for all people, without discrimination. Given that ICTs have an impact on almost all aspects of life and that many modern activities take place in the digital space, the CRPD recognizes digital accessibility as a key priority in ensuring that no one – including persons with disabilities – is left behind in the digital world. Article 9 of the CRPD identifies ICT and accessible technology as important enablers of access to systems and services, including education, health, employment and political participation.

Estimates indicate that 1.3 billion people around the world live with some form of disability (17 per cent of the global population), making them the largest minority group worldwide. However, only a small percentage of organizations make their digital offerings – including careers sites, job portals and electronic applications used by employers seeking to diversify their applicant pools – inclusive of disability. Organizations seeking to hire new talent are increasingly placing their job advertisements online and frequently require applications to be submitted digitally. In theory, this allows millions of job seekers to find and apply to jobs easily and quickly by filling out online application forms, while helping employers to systematically retrieve and assess information pertaining to thousands of candidates for a given job vacancy.

At the same time, research shows that the participation rate of persons with disabilities in the labour force remains very low (7 out of 10 persons with disabilities are inactive, compared with 4 out of 10 persons without disabilities).[1] The median unemployment rate among persons with disabilities is also higher (7.6 per cent) than among persons without disabilities (6 per cent). It is worth remembering that anyone could, at any point, develop a temporary or permanent disability. All persons should therefore have the right to apply to a job vacancy and participate in the related selection process on equal and equitable terms, limited only by their knowledge, experience and suitability for the post rather than their personal disability. In this context, employers may unknowingly be discriminating against candidates with disabilities before they even reach the interview stage, as many online job application and recruitment systems have not been designed or developed with web accessibility requirements or the Universal Design Principles in mind. Studies show that almost half of all persons with disabilities who attempt to apply for a job online find it almost impossible to do so owing to accessibility challenges.[2]

Examples of critically severe barriers include:

- Application forms not indicating the kind of information required
- Videos lacking closed captioning
- Complex navigation
- Links not clearly indicating where they point to

[1] ILOSTAT, "New ILO database highlights labour market challenges of persons with disabilities", 13 June 2022.
[2] Harvard Gazette, "Seeing past disabilities in the job search", 28 November 2016.

- Images lacking alternative text descriptions.

The reason for this may be that many employers are not familiar with basic accessibility principles or best practices or how to apply them, and most do not understand the meaning and consequences of a website or online job application portal being inaccessible. Not only may this result in job seekers with disabilities becoming frustrated and employers missing out on potentially competent and capable talent, but also the organization could see its reputation negatively affected or could even face legal consequences on the accusation of discrimination on the grounds of disability.[3]

The goal of this guide is to help employers understand the accessibility and usability barriers that persons with disabilities may face when applying for a job online, in addition to the accessibility and usability requirements that career websites and other digital tools used in recruitment processes should meet to support the overarching goal of preventing discrimination against persons with disabilities and promoting their inclusion in employment.

1.1 Accessibility of job portals in the United Nations system

The United Nations is committed to fostering diversity and inclusion and is taking practical steps to create a work environment that is open to, inclusive of and accessible to persons with disabilities and staff members with dependents with disabilities. Ultimately, disability inclusion is the responsibility of all managers and staff within the United Nations system.

Article 27 of the CRPD encourages State Parties to build legislation and regulations to safeguard and promote the realization of the right to work of persons with disabilities, by prohibiting employers from discriminating on the basis of disability, including in recruitment and hiring.

The main pillars of the United Nation's commitment to disability inclusion are:

1. the CRPD
2. the UN Disability Inclusion Strategy (UNDIS)
3. The eight guiding principles of the CRPD, which underpin the Convention and each of its articles:

    1. Respect for inherent dignity, individual autonomy including the freedom to make one's own choices, and independence of persons
    2. Non-discrimination
    3. Full and effective participation and inclusion in society
    4. Respect for difference and acceptance of persons with disabilities as part of human diversity and humanity
    5. Equality of opportunity
    6. Accessibility
    7. Equality between men and women

[3] In many countries, it is unlawful to discriminate against persons with disabilities in employment. In the United States, the Americans with Disabilities Act of 1990 prohibits discrimination against persons with disabilities during job application processes, among other things. In the United Kingdom, the Equality Act 2010 makes it unlawful for employers to discriminate against persons with disabilities, including in application forms, interview arrangements, aptitude or proficiency tests and job offers.

8. Respect for the evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities.

Guiding principles 2 to 7 are relevant to online application processes. UNDIS is a comprehensive strategy that underpins all disability inclusion-related policies and actions by United Nations entities. It includes an accountability framework which mandates United Nations entities to define and implement accessibility policies and strategies and ensure that websites and online job application platforms meet accessibility requirements. The framework includes a set of indicators to monitor how well each entity has met those requirements. The following are of particular relevance:

- Indicator 6: Accessibility (part of the core area of "Inclusiveness"), which measures whether an organization:
    - approaches the requirements (a baseline assessment on accessibility has been completed);
    - meets the requirements (an accessibility policy or strategy is in place and has been implemented);
    - exceeds the requirement (an accessibility policy or strategy is in place and has been implemented; and a review or assessment of the accessibility policy or strategy is undertaken at least every five years).
- Indicator 13: Employment (part of the core area of "Organizational culture"), which measures whether an organization:
    - approaches the requirements (has an employment policy or strategy and other human resources-related policies or strategies that include provisions to attract, recruit, retain and promote the career development of employees with disabilities);
    - meets the requirements (has an employment policy or strategy and other human resources-related policies or strategies that include provisions to attract, recruit, retain and promote the career development of employees with disabilities; and employees with disabilities report satisfaction and well-being at a level similar to the general staff body);
    - exceeds the requirement (has an employment policy or strategy and other human resources-related policies or strategies that include provisions to attract, recruit, retain and promote the career development of employees with disabilities; employees with disabilities report satisfaction and well-being at a level similar to the general staff body; and the number of persons with disabilities entering the organization through targeted or mainstream recruitment practices has increased).

United Nations entities can use this guide to help define and implement such policies and strategies. For more information about UNDIS, see Annex 1.

Research by the International Labour Organization (ILO) indicates that a diverse workforce that includes employees with disabilities may contribute to increased productivity, creativity, job retention and workplace morale, as many persons with disabilities have unique talents and problem-solving and adaptation skills which can help drive innovation, build strong business ideas and strategies and develop competitive products and services. Despite being the world's largest minority group, persons with disabilities and their families constitute a large, often-overlooked demographic with considerable purchasing power and one of the largest voting blocs in many countries. These are solid grounds on which to build a business case for disability inclusion and workplace accessibility in United Nationsagencies.

Source: ILO, "Disability in the workplace: Employers' organizations and business networks", Working Paper No 6, 2011.

1.2 Accessibility standards

As established in Article 9 of the CRPD, the right of persons with disabilities to accessibility must be ensured through the strict implementation of accessibility standards.[4] Article 9 sets out the accessibility requirements and standards which States Parties must develop, promulgate and monitor. Web accessibility standards provide organizations with practical direction on how to implement guidelines aimed at making web content and online services accessible and inclusive to everyone, including job seekers, candidates and employees with disabilities, including those who need to use assistive technologies to interact with such content and services.

Level AA compliance with the Web Content Accessibility Guidelines (WCAG) 2.1, developed as part of the World Wide Web Consortium's (W3C) Web Accessibility Initiative, sets the global standard (including success criteria and best practices) for making web content more accessible to persons with different types of disabilities. Following the adoption of the CRPD in December 2006, the United Nations system has published a series of accessibility recommendations to assist content providers, designers and developers in all United Nations entities in producing accessible web content, including online job application platforms. Based on WCAG 2.1, these recommendations aim to ensure that websites comply with accessibility standards while still in the development phase, as a prerequisite for their deployment. It is worth noting that WCAG 2.2 expands on WCAG 2.1 without undermining or superseding it. WCAG 2.2. adds the following new success criteria, including new definitions and guidelines for their organization:

- accessible authentication
- dragging movements
- consistent help
- page break navigation
- focus appearance (minimum)
- focus appearance (enhanced)
- visible controls
- target size (minimum)

[4] United Nations, Committee on the Rights of Persons with Disabilities, *General comment No. 2 (2014), Article 9: Accessibility*, 22 May 2014, CRPD/C/GC/2.

- redundant entry.

In turn, WCAG 3.0 (currently in draft version) incorporates content from both the User Agent Accessibility Guidelines 2.0 and the Authoring Tool Accessibility Guidelines 2.0. Compared with earlier versions, WCAG 3.0 includes additional tests and different scoring mechanisms; it is therefore not backwards-compatible with the second series of WCAG and must be viewed as an alternative set of guidelines. New content in WCAG 3.0 covers:

- the needs of persons with a wider range of disabilities;
- mobile and desktop applications, alongside web content;
- new guidelines and new tests;
- new scoring, by which a site or product is deemed accessible as long as persons with disabilities can use it (and no longer has to pass 100 per cent of the guideline criteria).

In the European Union, Harmonized European Standard (EN) 301 549 applies to all forms of ICT, including online job application platforms, and includes technical requirements for digital accessibility. EN 301 549 provides presumption of conformity with the accessibility requirements set out in Directive (EU) 2016/2102 on the accessibility of the websites and mobile applications of public sector bodies (the Web Accessibility Directive), and the section of EN 301 549 that covers web accessibility standards draws on WCAG 2.1. This standard can be used by public authorities and other public sector bodies during procurement to ensure that ICT products and services, including websites, software, digital devices and online job application platforms, are more accessible and can be used by persons with a wide range of abilities.

More information about standards can be found in Annex 2.

1.3 The business case for the accessibility of job portals

Organizations need to develop a better understanding of why building a business case for the accessibility of online job application platforms can help create a more diverse workforce that includes persons with disabilities. A business case is a tool often used by organizations to justify dedicating resources (such as money, time or effort) to supporting a specific policy or strategy or pursuing a goal. Building a powerful business case for digital accessibility requires the authors to highlight the tangible and intangible benefits that digital accessibility will bring to the organization. Indicators such as direct return on investment, while important, may not be helpful in measuring the benefits of accessibility; other factors, such as the cost and risk of not taking action to improve accessibility, may be more useful in building a strong business case.

In summary, the ultimate goal of this guide is to raise awareness among United Nations staff of the importance of making online job application processes accessible to and usable by candidates with disabilities, and to describe some of the most common accessibility and usability challenges faced by persons with disabilities when interacting with online job application processes. The guide also provides some recommendations to help organizations improve the accessibility and usability of online job application platforms.

2 Implementing information and communication technology/ digital accessibility requirements and standards to ensure the inclusivity of online recruitment systems

Employers worldwide, including United Nations entities, are encouraged to make their careers websites digitally accessible to avoid preventing or dissuading job seekers with disabilities from applying and to make the applicant base as broad as possible. Accessing a larger talent pool can help employers fill jobs more quickly in an increasingly competitive job market.

2.1 Identifying and overcoming accessibility and usability barriers

Long, complicated and potentially inaccessible online job applications risk preventing applicants from moving forward with the recruitment process. According to a study conducted in the United States, almost half of all persons with disabilities who had applied for a job online described the experience as "difficult to impossible", while only 1 in 10 were able to complete the application, and 1 in 4 required technical assistance. Almost 6 in 10 individuals were unable to complete the job application even with employer-provided technical assistance.[5]

Accessibility

The lack of accessibility in online job applications is typically one of the main barriers faced by persons with disabilities during the employment process. Accessibility issues frequently present in job application platforms include the following:

- **Inaccessible form fields**: Most online job application platforms contain a variety of "form fields", such as checkboxes, data fields, radio or option buttons, and other places for applicants to enter data or make selections. If these form fields are not explicitly labelled as such, they are often inaccessible to individuals who use certain types of assistive technology, such as screen readers.

Recommendations for making form fields accessible:

Explicitly label all form fields in job applications, so that users know when they have encountered a field. Explain what type of field it is, and provide additional cues to let the user know what type of information the application requires.

[5] Partnership on Employment & Accessible Technology (PEAT), "Infographic: The accessibility of online job applications".

- **Keyboard-inaccessible website navigation**: Online job application platforms often cannot be navigated using only a keyboard or may not be compatible with assistive technology devices, such as screen readers, screen magnifiers and voice recognition software.

Recommendations for making website navigation keyboard-accessible:

- Set a logical reading order for content in the online job application platform programmatically, so that when users are navigating the form using assistive technology tools, the tab key or voice commands, the focus will move in the order needed to complete the application.
- Ensure that the input focus does not jump to advertisements or skip entire sections.

- **Untagged images and graphics**: When a person using a screen reader encounters an image in an online job application, it may not be clear what the image is (or if it is there at all) unless it is correctly tagged with meaningful alternative text. As a result, users with visual impairments may be at risk of missing out on key components of the online job application.

Recommendations for making images and graphics accessible:

Tag all relevant graphic elements (photographs, logos, graphic buttons and any other type of non-text image) with meaningful alternative text descriptions that can be recognized by a screen reader.

- **Lack of support for mobile devices**: Online job application platforms are not always optimized for mobile access.[6] Optimizing job applications for mobile devices is crucial, given that an estimated half of all Internet traffic comes through mobile devices and the number of mobile-only users exceeds the number of desktop-only users. Moreover, many persons with disabilities are most comfortable using mobile devices, which often include robust accessibility features that traditional web-based systems lack.

[6] The national survey of persons with disabilities conducted by PEAT found that, while 56 per cent of individuals had searched for jobs via a mobile device, only 28 per cent had applied for a job via a mobile device, most likely because of display variations and the difficulty of completing form fields and uploading résumés via mobile devices. Source: PEAT, "Infographic: The accessibility of online job applications".

Recommendations for making website navigation keyboard-accessible:

- Ensure that users can resize text up to 200 per cent without using third-party assistive technology.
- Ensure that colour-contrast ratios between the foreground and the background are sufficient for both large and small text.
- Make touch targets large enough to accommodate persons with motor disabilities.
- Provide enough space between elements of the interface.
- Make touch gestures as simple as possible. Demonstrate how to use touch gestures with on-screen indicators.
- Avoid restricting content to a particular device orientation, such as portrait or landscape, unless absolutely essential.
- Make features that are activated through user motion accessible through a user interface as well, where possible.
- Allow motion-activated features to be disabled to avoid accidental activation.

- **Inaccessible videos**: Some employers include videos on their online job application platforms. However, videos that are not captioned or audio-described are not accessible to people with hearing and vision impairments.

Recommendations for making videos accessible:

- Always provide captions to ensure that job applicants who are deaf or who have hearing impairments can access the content.
- Provide audio descriptions of videos for persons with visual impairments by adding voice-over narration that describes general imagery and reads any on-screen text.

- **Lack of user support**: Often, online job application platforms lack contact information for customer/user support, leaving users with and without disabilities helpless in the event that they experience technical difficulties with the application.

Recommendations for providing user support:

- Provide contact information within the online job application, including an accessible way for users to receive technical assistance.
- If the information technology (IT) department cannot provide such assistance, consider outsourcing support to an accessibility consultant who can be on call to respond to incoming user requests and provide assistance to employers in the event of accessibility problems.

Usability

Usability issues may also make online job application platforms challenging to use, especially for candidates with visual impairments or cognitive disabilities. Issues include:

- too many steps, layers of screens, and sections, which can be hard for users to navigate;
- a lack of consistency across screens or steps, which can make navigation difficult;
- a system "timeout", which deletes user data and forces users to start again or drop out entirely.

Recommendations for improving the usability of online job application platforms:

- Break applications up into manageable, easy-to-follow sections.
- Keep the page simple by limiting the number of graphics and text.
- Provide clear instructions and alternative ways to apply for persons experiencing technical difficulties.
- Present text in a font size of 10 or higher, and ensure that text can be enlarged.
- Include a spell check feature.
- Format questions to require less typing in the response (such as by using multiple-choice checkboxes).
- Allow enough time to complete sections, in the knowledge that some individuals may need more time than usual. Ask users if they need more time with a prompt or provide a way to disable the timeout feature if the application has a time limit.
- Allow the user to easily move back and forth throughout the application without loss of data, and ensure that there is an option to save sections and return to complete the application later.
- Notify the user when a form is complete and submitted.

2.2 Making recruitment processes more accessible and inclusive: The impact on employment among persons with disabilities

For the last decade, the employment gap between persons with and without disabilities has remained approximately 30 per cent. With many organizations struggling to recruit and retain talent, tapping into the under-utilized pool of talent of persons with disabilities has become more important than ever. To do so, it is essential that persons with disabilities are not discouraged from applying to job vacancies and are given the chance to demonstrate their talents and abilities to perform a role. Making recruitment processes inclusive and accessible enables employers to open them up to a much wider talent pool, reach more highly qualified applicants and diversify the workforce.

Today, most job seekers must engage in some form of digital or online interaction when looking for and applying for a job, as online recruitment websites have replaced printed advertisements as the most popular and scalable method for job searching.

Digital technology can be a great ally in facilitating access to employment for persons with disabilities. For many persons with a disability, however, online interactions can make the job search process much more difficult. As described above, assistive technology users may be unable to read job websites and locate vacancies. Job seekers may not correctly understand

the vacancy description if it is not properly structured, if there is copious internal jargon or if the sentences used are too long and difficult to read. Users with hearing loss, blindness or low vision may not understand the content and key messages of recruitment videos if these are not captioned or if transcripts are not provided. The use of poor colour contrast between the text or graphics and the background may prevent users with low vision from reading the information conveyed; it is therefore recommendable to check the contrast ratio between all elements and the background.

At the same time, it is essential that technological advances are accompanied by intense awareness-raising work to eliminate prejudice, indifference and discrimination and promote real inclusion. Research indicates that 48 per cent of persons with disabilities have used adaptive technologies to overcome physical and/or digital barriers (such as virtual mice, or keyboards with covers) and complete their studies, thereby gaining access to a wider job market.[7]

United Nations entities are encouraged to make their recruitment processes (including online job application portals and systems) inclusive and accessible so that all candidates, including persons with disabilities, can participate. To achieve this, they not only need to have strategies and policies in place but must also ensure that accessibility permeates every area, activity and process, beginning with recruitment.

Recommendations for making recruitment processes more accessible and inclusive:

- Ensure that job vacancy advertisements are web-accessible and are advertised in accessible websites and media (such as specialist disability recruitment portals).
- Use plain language to describe the essential requirements of the role.
- Avoid making assumptions about who might have a disability (80 per cent of persons with disabilities have hidden impairments).
- Make candidates feel comfortable about disclosing their disabilities by being open about the organization's approach to disability early on.
- Allow candidates to submit information in alternative ways, such as by offering the possibility of preparing a video as an alternative to a face-to-face interview.
- Be transparent about any medical questionnaires or health checks that the role may require.
- Involve at least two persons in candidate shortlisting to mitigate the risk of unconscious bias.
- Consider inviting persons with disabilities to test the whole recruitment process (from finding the vacancy on a website, through to applying for the job, conducting an interview and undergoing onboarding).

[7] Fundación Adecco, "Informe Tecnología y discapacidad 2022", July 2022.

- Make sure all persons involved in the recruitment process have disability-related training.
- Provide accessible applications so that candidates can communicate any specific needs or concerns regarding the process without having to declare their disabilities.
- Provide captions via all video conferencing platforms. Include captions and audio descriptions for all recorded videos.
- Make sure that accessible templates are used when building IT or digital assets to be used internally.
- Use accessibility checking functionalities present in authoring and editing tools to test whether digital documents, media and other content created within the organization are accessible to all internal and external users.
- Provide candidates with limited mobility or dexterity issues with easier methods of using services, such as tablets instead of standard laptops, or mobile telephones with biometric security features (e.g. facial recognition) to avoid the need to type a passcode.

2.3 Algorithms and artificial intelligence: Disability discrimination risks in hiring and how to prevent them

As organizations receive more and more applications for a single vacancy, they have no choice but to use software to automate the process of examining and narrowing down the pool of candidates.

For example, employers might use technology for a variety of goals, including sending targeted job vacancy notices to candidates, using computer-based tests to evaluate an applicant's skills or abilities, analysing and scoring applicants' résumés, assessing whether a candidate meets the required job qualifications and recognizing candidates' facial expressions in video interviews.

Many of these hiring applications use artificial intelligence (AI) and machine learning algorithms to perform tasks in place of a human being. These algorithms are programmed by humans who may not be fully aware of the needs of candidates with disabilities, and they may be trained on data from millions of biased hiring decisions made regarding previous applicants, thereby increasing the risk of adding more human bias into the hiring process and making those same biases more efficient.

As a result, candidates with disabilities may be at risk of being excluded because AI-based hiring software discounts them early in the process.

The report on artificial intelligence and persons with disabilities issued by the United Nations Special Rapporteur on the rights of persons with disabilities in December 2021 (A/HRC/49/52) lists some of the potential negative impacts of using AI algorithms in recruitment tools:

- Time-based assessments may penalize candidates with disabilities who need more time to complete assessments or who use assistive technologies.
- AI-powered chatbots used in online interviews may not be accessible to keyboard-only candidates or to those using screen reading software.

- Companies that develop AI-powered video screening tools do not normally test them with persons with disabilities before launch, meaning that the atypical attributes of some candidates with disabilities may not be recognized and such candidates may be excluded.
- Some AI algorithms that measure the levels of eye contact and vocal enthusiasm of interviewees may be unable to read the facial expressions of persons with disabilities, thereby putting them at risk of exclusion.

Employers must avoid using hiring technologies that discriminate against persons with disabilities. For example, some employers use AI algorithms to predict which candidate might be a productive employee by comparing applicant data to that of current successful employees. As persons with disabilities have historically been excluded from many jobs, they may not form part of the employer's current staff, meaning that there are no equivalent data to compare them to, which results in discrimination.

Recommendations for avoiding the discriminatory use of AI:

- Tell candidates in advance about the type of hiring technology that will be used and how they will be evaluated.
- Provide candidates with enough information for them to determine whether they need to request reasonable accommodations.
- Provide candidates with clear instructions for requesting reasonable accommodations.
- Make sure that asking for reasonable accommodations does not have negative consequences for the candidate's chances of getting the job.

Recommendations for government and policy-makers:

- Explicitly prohibit discrimination against persons with disabilities in national AI regulations.
- Consider imposing a moratorium on facial and emotion recognition technologies.
- Mandate the provision of reasonable accommodations in the operation of AI tools.
- Include disability-inclusive requirements in the public procurement of AI tools.
- Build capacity among organizations of persons with disabilities to enable them to advocate the use of responsible and disability-inclusive AI.
- Monitor and report on how AI is being used to advance the provisions of the CRPD.

Recommendations for the United Nations system and specialized agencies:

- Include disability in AI strategies, and devise action plans to assess and address the impact of AI on persons with disabilities.
- Cover the use of disability-inclusive AI in UNDIS.

2.4 Case study: Good practices in recruitment processes for persons with disabilities in Serbia

I couldn't wait to get started: Voices from inclusive workplaces in the Republic of Serbia is a good practice guide on the employment of persons with disabilities, written by the Serbian Association of Employers with the support of ILO. It includes an overview of the Serbian legal framework and case studies to help employers understand good practices in the implementation of these obligations and to illustrate the process of recruiting persons with disabilities.

Legal framework: In Serbia, the Labour Code sets out the rights of employed persons with disabilities and employers' obligations towards all employees, including with regard to the hiring, rights and treatment of employees with disabilities. The Code explicitly prohibits discrimination against employed persons with disabilities. In turn, the Professional Rehabilitation and Employment of Persons with Disabilities Act establishes hiring quotas, under which organizations of 20 to 49 employees must hire at least one person with disabilities, in addition to one further person with disabilities for every additional 50 employees.

Practical steps for recruiting persons with disabilities:

1. Define the essential job requirements, shape the job description according to the necessary skills and competencies, and define any other non-essential requirements by answering the following questions:
    a. What tasks already exist and why are they being implemented?
    b. How are these tasks implemented and how often?
    c. How long does it take for employers to create and/or adjust these positions?
    d. What knowledge and skills does a person need to carry out this specific task?
    e. What skills and competencies does this task require?
    f. How necessary is it for this activity to be carried out?
    g. Who carries it out? Does it have to be carried out by all employees or can only certain persons carry it out?
    h. How important is it to complete the task within a certain deadline and what happens if it is not completed?
    i. How are the results measured?
2. **Advertise job vacancies:** The National Employment Service is the main public institution that facilitates the recruitment of persons with disabilities in the country, by providing a database in which unemployed persons with disabilities can register as job seekers and a website where employers can post vacancies indicating whether they are open to persons with disabilities. Infostud is another website on which employers can post vacancies that is highly popular among jobseekers with disabilities. Many non-governmental organizations and associations of persons with disabilities (such as the Youth with Disabilities Forum) also actively work with employers by playing the role of an employment service to support the recruitment of jobseekers.
3. **Monitor the selection process**: To avoid discrimination, focus on how well a candidate meets the skills and knowledge requirements and not on the type of disability experienced by the candidate.
4. **Interview shortlisted candidates**: Ask candidates about their individual needs and the type of accommodations that they may require (such as a fully accessible, ground-floor interview space, an accessible parking space, sign language interpreters, or tests in a specific format). Make sure that candidates:

a. are aware that they can request reasonable accommodations;
b. receive reasonable accommodations (unless doing so creates an undue burden);
c. are addressed and talked to directly, regardless of the presence of an interpreter;
d. can ask to repeat a response if the interviewer does not initially understand;
e. are not asked about their actual disabilities.

5. **Finalize recruitment and provide reasonable accommodations**: Examples of this include part-time work, job sharing, flexible hours and working from home.
6. **Integrate new hires into the new working environment**: Introduce the new employees to their tasks and positions in their team and assign them a mentor.

3 Accessibility of online job application platforms

3.1 Introduction

In 2021, ILO and ITU conducted a project entitled "Accessibility of online job application and recruitment systems" with the aim of assessing the accessibility of the online job application and recruitment systems used by several United Nations entities and one non-profit organization. To that end, an accessibility audit was carried out, consisting of an in-depth evaluation of a set of pages on each organization's website or web/desktop application with the aim of documenting the types of accessibility issues experienced and any violations of level AA compliance with WCAG 2.1, in addition to providing detailed recommendations on how to remedy the violations.

The project also included remote user testing sessions performed by users with different types of impairments with the aim of assessing the general usability of the website's interface design, information flow and architecture, services and functionalities. Testers provided relevant user feedback data on their experiences of executing different tasks, in addition to identifying and describing any barriers, difficulties or commendable aspects encountered and the feelings and perceptions that they triggered in users. Collaboration with Spanish organization Fundación ONCE and with the United Nations High Commissioner for Refugees (UNHCR) was instrumental for recruiting testers.

Violations of WCAG detected during the project entitled "Accessibility of online job application and recruitment systems":

- Many images lacked alternative text, thereby preventing screen readers from informing users about the information contained in the images.
- Headings (which provide structure to web page content by breaking information down into different ordered sections) were either missing or wrongly designated, which can confuse assistive technology users.
- The degree of colour contrast between some sections of text and the background was insufficient, which could make the text harder to read for some users.
- Some sections of instructional text on job application systems or new user forms were visually linked to form fields, but not programmatically associated with them; as a result, screen reader users miss such information.
- Many forms lacked mechanisms to allow screen reader users to navigate from an error message at the top of the form to the field containing the error.
- Some fields were marked as "Required" with a red asterisk, but screen reader users may be unaware that the field is required. Many input fields for collecting certain types of user information (such as first and last names and date of birth) lacked an autocomplete definition compatible with assistive technology, which makes it harder for people with disabilities to fill out such fields.
- Some pages adapted for mobile telephone use were not responsive, forcing users to scroll through the page horizontally.
- User menus at the top of some job search pages expanded correctly, but VoiceOver users on iOS/Safari were unable to navigate the expanded menu using gestures or touch, thereby preventing them from accessing their profile and account details.

All the United Nations job portals assessed in the project presented significant accessibility and usability issues that pose serious barriers for – and represent a form of discrimination against – persons with disabilities who are seeking job vacancies with those organizations. Many of the most basic issues can be easily fixed as part of a short-term web accessibility strategy. However, other issues require a broader and deeper understanding of accessible web development techniques and should therefore form part of a medium- to long-term strategy. For a more detailed description of the barriers identified during the project and for recommendations for overcoming such barriers, see the executive summary of the project in Annex 3.

For the purposes of this guide, the accessibility barriers identified across all the job portals analysed during the project may provide useful orientations for United Nations agencies seeking to advance towards a more accessible Internet. It is of the utmost importance that each United Nation entity takes the initiative and invests effort into ensuring that their job portals can be used by a broader audience. Greater awareness and increased web accessibility education will also help ensure that persons with disabilities are able to use job portals.

3.2 Designing and developing inclusive online job application platforms: Improving accessibility and user experience

Accessibility is what gives applicants an equitable way of controlling and using technology through a user interface. Both accessibility and usability help improve the user experience and the effectiveness of technology: usability focuses on the user experience in broad terms, while

accessibility addresses the specific needs of users with functional differences or limitations. The point of overlap between accessibility and usability during the consideration of online application features (such as a volume control feature that benefits everyone) is referred to as "universal design", namely designing products so they can be used by the widest range of people possible. Many usability issues can become insurmountable barriers for users with disabilities.

The following elements must therefore be accessible to, and usable by, all candidates, including those with disabilities:

- online job advertisements
- job application platforms
- screening tools
- videoconferencing platforms used for interviews.

Recommendations for improving the usability of online job application platforms:

- Identify form fields clearly.
- Indicate all required fields clearly.
- Indicate data format preferences clearly.
- Provide accessible feedback where users enter incorrect information.
- Provide textual equivalents of inaccessible maps.
- Ensure that all data fields make logical sense (for example, avoid requiring an end date for a job that participants have marked as their current job).

Source: Lazar, Jonathan, Abiodun Olalere, and Brian Wentz, "Investigating the accessibility and usability of job application web sites for blind users", *Journal of User Experience* 7, No. 2.

3.3 Testing online job application platforms for accessibility

Evaluating the accessibility and usability of online job application platforms can help determine the level of difficulty that some persons with disabilities face when attempting to search and apply for jobs, in addition to identifying which specific components of the application (such as finding an open position, creating an account or entering details of previous education or references) cause the greatest problems. It is important to remember that persons with and without disabilities often face the same usability problems.

The report of the project entitled "Accessibility of online job application and recruitment systems" included an extensive and detailed list of recommendations for resolving both the accessibility issues highlighted by the accessibility assessment and the usability issues identified during user testing. To view the complete list of recommendations, see Annex 3.

Recommended web accessibility remediation strategies:

1. From a broad perspective (determining which digital systems and content to engage with): Teams within United Nations entities must understand the scope of the impact that digital assets and online applications have on persons with disabilities. For the purposes of this guide, focus should be placed on online job application platforms and career sites. In this respect, it is important to ask whether the platform or site is required for the completion of candidate registration or job vacancy applications, whether there are any alternative accessible services, systems or processes and whether there is any way of providing accommodations without adversely affecting the experience, opportunity or dignity of jobseekers or candidates with disabilities.
2. At a more focused level: Determine which portions or aspects within the digital assets to engage with.
3. At a detailed level: Identify individual accessibility bugs, their severity and the fixes required to increase the accessibility of digital assets.

4 Creating accessible digital content

This section includes practical, easy-to-follow guidance and recommendations for creating accessible digital content in commonly used formats. For more detailed guidance, and given the abundance and variety of guides, best practices and methodologies available on the Internet, readers are encouraged to review the resources at the end of the guide and perform their own Internet research.[8]

4.1 Word

When generating a document, it is often unknown whether the document will ultimately be distributed through the organization's website, mobile application or intranet. Therefore, it is recommended that all documents are generated in line with the recommendations below.

Recommendations for making accessible Word documents:

- To facilitate understanding of the text, write in clear and simple language, and incorporate a glossary.
- Do not use fonts with serif. From among the sans-serif fonts, the use of "Verdana" is recommended rather than "Arial", since the latter does not distinguish between the uppercase "I" and the lowercase "l".
- Provide the expanded form or meaning of an abbreviation or acronym the first time that it appears in the document.
- Specify the primary language of the document.
- Provide alternative text for all non-text elements (e.g. graphics and images).
- Apply sufficient colour contrast (at least 4.5:1) between the background and any foreground text and text images.

[8] The ITU Telecommunication Development Sector (ITU-D) has produced video tutorials on the creation of accessible digital documents in English, French and Spanish, which are available free of charge and in a digitally accessible format.

- Create numbered or unnumbered lists using the tool designed for this purpose rather than tabs or spaces.
- Ensure that all information conveyed through colour is also visible without the colour (using context or markup).
- Clearly specify the destination of any links, and ensure that they are not too small to press easily.
- Use and apply styles to different types of text, instead of selecting the text and modifying it directly.
- Use header or title elements to convey the organization of the document's content and make it easier to read.
- Row headers must be identified with the appropriate bookmarks in data tables. At a more advanced level, if you have two or more levels of row headers, use bookmarks to associate the data cells with the header cells.
- Provide a summary of data tables using the appropriate markers.
- Use the Accessibility Checker to identify possible accessibility issues in the Word document. Depending on how severe the issue is, the Accessibility Checker will classify each issue as an error, warning or tip. When clicking on the "Check Accessibility" option, a panel on the right-hand side of the window will appear detailing what that Checker understands to be the accessibility issues that must be addressed.

4.2 PowerPoint

PowerPoint slide show presentations are used to convey visual information, including text, images, graphics, tables and charts. It is important to make sure that presentations and slides are made accessible so that assistive technology software and Braille devices can convey their content. The following steps should be taken to ensure that a PowerPoint presentation is accessible:

- Use built-in slide layout templates so that the reading order for persons with vision is the same for persons using assistive technologies, such as screen reading software.
- Always place text on a flat background, never on an image.
- Ensure that the colour of the text provides enough contrast against the background colour to make it easy to read. For persons with low vision, yellow text against a black background is the best option.
- Add alternative text to describe the content of images in a concise, summarized way. To do so, select the object, select "Format Picture", select the "Alt Text" option, and add summary alternative text to the description entry area. The brief description of content should include 1-2 sentences and no abbreviations. Consider whether the graphic could be formatted as text or a table instead.
- Do not use text boxes, because if there is more than one text box on the same slide, assistive technology (e.g. screen reading software) may read them out of order.
- Use unique, descriptive, intuitive slide titles so that users of screen reading software can quickly scan through a list of slide titles, find the slide that they want and go straight to it. Unique tiles make navigation easier, make the presentation much clearer, help organize ideas and help focus the viewer's attention.
- Avoid using the same title for different slides.
- Give links a clear and accurate description of their destination. Create hyperlinks with text describing the destination so that screen reader users can scan lists of links and easily find the one to which they want to navigate.
- Make tables clear and simple (including descriptions and row headers), and make sure that the table has headings. If there is no clear relation between the rows and columns, consider that it might not actually be a true table. Set a logical reading order from left to

right, top to bottom. If there are meaningful headings, designate the first row as a "Header Row" in the table properties. In the table properties, ensure that "Allow row to break across pages" is unchecked. Avoid merged cells. Describe all tables with a helpful caption where appropriate. A sentence should precede the table giving an overview of what is inside the table, as this can help users of screen reading software to focus on and interpret the data.

- Set the reading order of the elements in a slide in the intended order using the selection pane and arranging each element into the desired order; the reading order shown in the selection pane is arranged from the bottom up, so that the title (read first) should be at the bottom.

Use the built-in Accessibility Checker to verify the presentation for possible accessibility issues. Depending on how severe the issue is, the Accessibility Checker will classify each issue as an error, warning or tip. When clicking on the "Check Accessibility" option, a panel on the right-hand side of the window will appear detailing what that Checker understands to be the accessibility issues that must be addressed.

4.3 Excel

There are general recommendations that must be considered when generating Excel documents, regardless of how they are distributed (whether through a website, a mobile application or an organization's intranet):

- To facilitate understanding of the text, write in clear and simple language, and incorporate a glossary.
- Avoid using fonts with serif. From among the non-serif typefaces, use "Verdana" instead of "Arial", since the latter does not distinguish between the uppercase "I" and the lowercase "l". Use a font size of 12 or larger.
- Provide the expanded form or meaning of an abbreviation or acronym the first time that it appears in the document.
- Specify the primary language of the document.
- Provide alternative text for all non-textual elements (e.g. graphics and images). On occasion, even if alternative text is added to non-cell images in Excel, there is no guarantee that all screen reader applications will detect it; if they do detect it and can read it, it may be out of context, since it is an object placed in a layer above the spreadsheet cells and will be read in the order in which objects were created, instead of in the order that elements are displayed on the spreadsheet. To access these objects through screen reader software, it is recommended to use the Control-Alt-5 key combination and then use the tab key to navigate to the object. To enter alternative text for an image, select the image and click with the mouse's right button (or press Shift-F10) to bring up the context menu. In the context menu, select "Edit Alt Text..." and in the description box enter the descriptive text or check the "Mark as descriptive" checkbox, as appropriate.
- Apply sufficient colour contrast (at least 4.5:1) between the background and any foreground text, text images and graphics that contain information or are functional, such as graphics buttons.
- Clearly specify the destination of all links and ensure that they are not too small to press easily.
- Use and apply cell styles to different types of text instead of selecting the text and modifying it directly.
- Preferably apply the predefined styles defined in Excel rather than self-created styles. This makes it easier to recognize similar content.
- Use styles consistently by applying the same styles for the same uses within the document, such as headers.

- Do not merge or split cells, as this makes it difficult for support products to interpret the cell structure.
- Avoid using floating elements, as they often make it difficult to assess the content, thereby generating accessibility problems.
- Avoid using colour as the only means of transmitting information. For example, in addition to using colour to convey the increment of a variable, add an alternative that can be "textualized", for example the symbol (-) in negative cases or an icon with its corresponding textual alternative.
- Ensure that an appropriate language declaration is set to allow assistive technologies to read the Excel document.
- Give names to cells and ranges. Naming cells and ranges allows screen reader users to identify the purpose of the cell or range. Press Ctrl+G to open a dialogue box containing all the defined cell range names and select a name to navigate to the named location. To name a range of cells, select a contiguous rectangular range of cells, click on "Formulas" in the top menu, select the "Define Name" option, enter a name for the range into the Name field and then define the scope to determine the sheets that are affected by this range name.
- Give descriptive names to sheets. To rename a sheet in Excel, simply double click on the sheet name in the lower left-hand corner (or right-click, or press Shift-F10 when the tab is selected, and select "Rename"). Try to provide a name that will give readers enough context to understand the entirety of the content on the sheet. If this is impossible, it might be appropriate to split the content into two or more different sheets.
- Review different suggestions for making charts and graphs accessible, as Excel does not automatically generate accessible charts and graphs.
- Use the built-in Accessibility Checker to verify the file against a set of rules in order to identify possible accessibility issues. Depending on how severe the issue is, the Accessibility Checker will classify each issue as an error, warning or tip. The Accessibility Checker is not 100 per cent accurate, as it cannot understand the author's intent; if a check shows no issues, it does not necessarily mean that the sheet is fully accessible.

4.4 PDF

Portable Document Format (PDF) is an open standard for electronic documents. As its use has become common, it is essential that PDF files are made accessible for use with assistive technologies. PDF documents can be created from source documents produced in Word, PowerPoint, Excel or InDesign. Scanning a printed document to make a PDF file must be avoided at all costs, as doing so produces a file with untagged images which is completely inaccessible to assistive technology users. To create an accessible PDF from a scanned document, optical character recognition software must first be used, and the document must then be tagged correctly.

The main aspects of accessibility addressed in PDF documents are oriented towards people without vision; however, it must be considered that there are other types of disabilities – such as hearing, motor, cognitive and different types of visual disabilities – which must also be considered when creating an accessible PDF document.

The recommendations for making PDF documents accessible are similar to those for making Web pages (in HyperText Markup Language (HTML) format) accessible:

- Provide alternative text for all non-textual elements.
- Provide expansions for abbreviations or acronyms the first time they appear in the document.

- Write in clear and simple language.
- Clearly specify the destination of all links.
- Do not use links that are too small to be clicked easily by individuals with motor problems.
- Use and apply styles to structural elements instead of visually modifying the text directly.
- Do not use only colour to convey information. Make sure that all colour-based information is also visible without the colour.
- Apply sufficient contrast to the document.

It is possible to improve the accessibility of an existing PDF document using Adobe Acrobat Pro; the following are some simple ways of making PDF elements accessible:

- To convert text that cannot be selected (because it is an image) into text that can be read using assistive technology, select "Tools", then "Text Recognition", then "In This File".
- To add tags to indicate heading structures, which can help in navigating long and complex documents (e.g., textbooks), select "Tools", then "Accessibility", then "Add Tags to Document".
- To add alternative text to describe the content of an image in a concise, summarized way, go to the Tools tab, select "Accessibility Tool" under "Protect & Standardize", select "Add" and then "Open". In the "Accessibility" menu, select "Set Alternative Text" and provide alternative text (or mark the image as "Decorative") for each image.
- To set the reading order in which a screen reader will read the content to the user, select "Tools", then "Accessibility", then "Touch Up Reading Order".
- To set the language, which helps screen readers switch to the correct language, select "File", then "Properties", then "Advanced" and then "Reading Options".[9]

To create an accessible PDF from a Word document, it is first important to make sure that the latest versions of Microsoft Office and Adobe Acrobat are being used. It is then critical to check that the Word document has no accessibility issues (by using the "Check Accessibility" feature under "Review" in the menu bar) regarding critical accessibility features (including heading structure, alternative text for images, markup identifying lists, tables and document language). Once all accessibility issues in the Word document have been fixed, the following steps should be used to create the PDF file:

- In Windows (Microsoft 365, Office 2021, Office 2019, Office 2016): Select "File", then "Save as Adobe PDF". Click "Options", check "Select the 'Document structure tags for accessibility' checkbox", click "OK", and then "Save".[10]
- In Mac: Click "File", then "Save As". Select "PDF" in the "File Format" drop-down menu, select "Best for electronic distribution and accessibility", then click "Export".[11]

Even if the source Word document appeared to be fully accessible, there is no guarantee that the resulting PDF will be. It is therefore important that the accessibility of the PDF is tested by experienced users of assistive technology, using screen reading software (e.g. Job Access With Speech, NonVisual Desktop Access and Window-Eyes).

[9] University of Indiana, "Make an existing PDF file accessible".
[10] Microsoft 365 Support, Create accessible PDFs
[11] Microsoft 365 Support, Create accessible PDFs

4.5 Online forms

Forms can be visually and cognitively complex and challenging to use.

It is recommendable to create simple and short forms in which users are asked to enter only what is required to complete the transaction or process. Authors should avoid requesting irrelevant information that may lead users to abandon the form. Making forms accessible through improved layout structure, instructions and feedback helps persons with various types of disabilities to understand how to complete and navigate the form.

Accessibility makes forms easy to understand, fill out and submit. Clear information must be provided about how to complete the form, which form fields are mandatory, and the format of the information to be entered. Errors must be indicated clearly and in a timely manner and should be easy to recover from.

The reading and navigation order must be logical and intuitive. The use of layout tables to create columns must be avoided. It should be possible to navigate through all form elements in a logical sequence using the tab key. It is important to ensure that forms can be understood and operated using the keyboard alone; this can be achieved by avoiding the use of JavaScript for operations such as setting focus, changing form elements or submitting forms.[12]

There are several techniques that can be used to make form controls accessible: [13]

- Labels: To create accessible online forms, it is important to make sure that all form fields are correctly labelled so that screen reading software can let users know what each form field is asking for. In general, form elements have labels that may be evident to sighted users because they are placed next or close to the field. Screen reader users cannot rely on such visual cues; labels must therefore be explicitly associated with form fields in the HTML code. Form labels must identify the kind of information required in each field and should be provided for all form fields (text fields, checkboxes, radio buttons and drop-down menus).
- Grouping controls: For groups of related fields, such as radio buttons and checkboxes, each form field must have a label as described in the previous section. The <fieldset> and <legend> elements must be used to group and describe the purpose of related form fields in order to provide necessary context.
- Form instructions: Provide instructions to help users understand how to complete the form and use individual form controls.
- Validating input: Validate input provided by the user and provide options to undo changes and confirm data entry.
- User notifications: Notify users about successful task completion and any errors, and provide instructions to help them correct mistakes.
- Multi-page forms: Divide long forms into multiple smaller forms that constitute a series of logical steps or stages, and inform users about their progress.
- Custom controls: Use stylized form elements and other progressive enhancement techniques to provide custom controls.
- Time limits: Avoid subjecting forms to a time limit in order to allow users to complete the form at their own pace. If, for security reasons, a time limit needs to be put in place, the user should be given the option to turn it off or extend it.

---

12 WebAIM, "Creating accessible forms: General form accessibility".

13 University of Washington, "Accessible technology Forms"; WebAIM, "Creating accessible forms: Accessible form controls".

It is worth mentioning that, on many websites, forms make extensive use of PDFs or other documents; these forms not only tend to have accessibility issues but may also be harder to use and could take longer to process than online HTML forms.

In general, forms in PDF and other document formats are easier to create than online HTML forms, especially as the persons creating them often are generalist users and not digital experts. However, PDF-based forms can be problematic from an accessibility standpoint, as they behave inconsistently with assistive technologies such as screen readers and magnifiers.[14] The fields in a PDF form often do not read in a logical sequence. The reading order must therefore also be tested with the tab key to make sure that it follows a logical sequence.

Finally, Completely Automated Public Turing Test to Tell Computers and Humans Apart (CAPTCHA) fields are sometimes placed in online forms to determine if the user is really a human and thus prevent algorithms from automatically submitting forms. CAPTCHA fields are often inaccessible to blind and dyslexic users, among others. Audio CAPTCHA fields are sometimes provided as an alternative for such users, but they, in turn, pose barriers for deaf-blind users. The W3C Web Accessibility Initiative provides guidance on alternatives to the use of CAPTCHA.[15]

4.6 Images

Graphic elements such as images, charts, icons and infographics on websites and digital documents can serve different purposes, for example providing and communicating information or messages, adding visual appeal or increasing interactivity. Important information conveyed via images is often missed by blind and visually impaired persons, however. It is therefore important to provide such users with alternative ways of accessing relevant information conveyed in images.

Before making an image accessible, it is important to determine whether the image is purely decorative or whether it conveys information and, in the latter case, what is the degree of complexity of the information conveyed.

For images conveying simple information, a short description concisely conveying its content and functionality, known as alternative text, can be used. Alterative text can be added by adding the following "alt" attribute to the <img> element in the HTML code, which can be read by assistive technologies such as screen readers or Braille displays:

<img src="image.png" alt="Description of the image">

Most Rich Text web content or document authoring applications include the possibility of adding alternative text to images.

Complex images (such as infographics, illustrations, charts, diagrams and graphs) that contain too much information to be described using alternative text must be described using a "long description", which is a more detailed description that provides an equivalent text version of the information contained in the image.

On a website, long descriptions can be added to images either via a separate web page or on the same page using a element with an "id" attribute. Once the long description is in

[14] United Kingdom, "Why GOV.UK content should be published in HTML and not PDF".
[15] W3C, "Inaccessibility of CAPTCHA: Alternatives to visual Turing tests on the web", W3C Group Draft Note, 16 December 2021.

place, a "longdesc" attribute pointing to the URL of the long description must be added to the <img> element. The following is an example of an attribute for a long description provided on a separate web page titled "image1-longdesc.html":

<img src="image1.png" alt="Image 1. Example of image" longdesc="image1-longdesc.html">

It is recommendable to consult expert guidance on how to describe complex images of a variety of subject matters and degrees of complexity, and to study examples of how to implement them.[16]

For purely decorative images conveying no meaning, screen readers can be instructed to ignore the image either by using Cascading Style Sheets to present the image as a background image (rather than using the HTML <img> element) or by using the HTML <img> element and adding the role="presentation" attribute.[17]

4.7 Video

Video and audio are powerful means of conveying content and engaging audiences effectively. However, they can also create barriers to many users unless accessibility is taken into account during their creation and delivery. User profiles to consider when delivering video content include the following:

- Persons who are unable to see video: All relevant visual content must be made accessible by means of the audio track, either through the script or through audio description (a separate audio track that narrates and describes important visual-only content).
- Persons who are unable to hear audio: All videos must include closed captions (text versions of the audio content synchronized to the video). Closed caption not only make videos accessible to persons who are deaf or hard of hearing but also help non-native speakers understand video content. All audio content must also be made available as text in the form of a transcript, which makes it possible to search for content within the video.
- Persons who cannot use a mouse: Video and audio content must be delivered through a multimedia player with properly labelled controls that can be operated effectively using only a keyboard or speech input software and that can be announced to users of screen reading software.

Videos should be produced and delivered in such a way as to ensure that all members of the audience can access their content. An accessible video includes captions, a transcript and audio description and is delivered through an accessible media player.[18]

---

16 United States, National Center for Accessible Media, "Effective practices for description of science content within digital talking books", December 2008.
17 University of Washington, "Accessible technology: Images".
18 University of Washington, "Accessible technology: Videos".

Annexes

Annex 1: Accessible online job application and recruitment systems in the context of the United Nations Disability Inclusion Strategy

UNDIS is a comprehensive strategy that provides the foundation for sustainable and transformative progress on disability inclusion across all the work of the United Nations system. It establishes the highest levels of commitment and accountability, in addition to a vision on disability inclusion for the United Nations system. Through UNDIS, all United Nations system entities recognize that the full and complete realization of the human rights of all persons with disabilities is an inalienable, integral and indivisible part of all human rights and fundamental freedoms.

UNDIS is the United Nation's key tool in implementing the global commitment to the CRPD and the 2030 Agenda, by mainstreaming the inclusion of persons with disabilities into all areas of United Nation action in a systematic, coherent and unified manner.

The UNDIS Entity Accountability Framework covers the main organizational functions (including hiring practices, accessibility and reasonable accommodation) and includes indicators to monitor progress on disability inclusion across United Nations entities in a clear and impactful manner.

How can accessible online job application and recruitment systems contribute to the successful achievement of UNDIS? The accessibility of ICTs (including websites) has been one of the key demands from the disability rights movement with a view to advancing disability inclusion and the implementation of UNDIS.

In the context of the recovery from the coronavirus disease (COVID-19) pandemic, digital inclusion has become even more relevant; teleworking has become widespread, having become the norm rather than the exception. In this scenario, communication platforms that have become mainstream must be made fully accessible, and employees with disabilities must be provided with the reasonable accommodations that they require to work from home.

The accessibility of ICT products and services required to contribute to the full inclusion of persons with disabilities must be implemented from the design stage by applying universal design. This is beneficial not just for persons with disabilities, but for a much larger audience.

Web accessibility is also essential as organizations are increasingly using online recruitment platforms during the talent search, interviewing and hiring processes, especially in the context of the pandemic.

Key indicators of the UNDIS Entity Accountability Framework:

For the purposes of this guide, the UNDIS Entity Accountability Framework includes two key indicators of particular interest:

Indicator 6: Accessibility

An entity is considered to:

a. approach requirements if a baseline assessment on accessibility is complete;
b. meet requirements if an accessibility policy/strategy is in place and has been implemented;
c. exceed requirements if:

    i. an accessibility policy/strategy is in place and has been implemented;
    ii. a review/assessment of the policy/strategy is undertaken at least every five years.

Indicator 13: Employment

An entity is considered to:

a. approach requirements if employment policy/strategy and other human resources-related policies/strategies include provisions to attract, recruit, retain and promote the career development of employees with disabilities;
b. meet requirements if:

    i. its employment policy/strategy and other human resources-related policies/strategies include provisions to attract, recruit, retain and promote the career development of employees with disabilities;
    ii. its employees with disabilities report satisfaction and well-being at a level similar to that of the general staff body;

c. exceed requirements if:

    i. employment policy/strategy and other human resources-related policies/strategies include provisions to attract, recruit, retain and promote the career development of employees with disabilities;
    ii. employees with disabilities report satisfaction and well-being at a level similar to that of the general staff body;
    iii. the number of persons with disabilities entering the organization through targeted or mainstream recruitment practices has increased.

Annex 2: Web accessibility policies and standards

Introduction

An accessibility policy is the set of rules and regulations that indicate what decision-makers within an organization must do to make sure that accessibility is considered and implemented across the organization's structure. The policy provides guidance to employees and governs the way in which the importance of accessibility is communicated. An accessibility policy not only provides the foundations on which to build any accessibility programmes or initiatives, but it also ensures that long-term, strategic accessibility efforts have continuity, and designates roles and responsibilities across the organization. An accessibility policy sets out the formal rules put in place by an organization to achieve its accessibility goals and outlines how an organization should operate and interact with its employees and customers. The aim of the principles and guidelines set forth in an accessibility policy is to ensure that an organization's internal and external-facing digital assets (websites in particular) comply with the provisions set out by the corresponding national accessibility law and accessibility standards. A web accessibility policy is designed to guide all internal decisions, strategies and processes pertaining to digital accessibility within an organization.

Most private-sector organizations around the world still do not have a strong and consistent digital accessibility policy, which hinders general progress in improving the extension and implementation of accessibility. While many public sector entities in certain countries and regions (such as Australia, Canada, the European Union and the United States) do have digital accessibility policies that mandate the use of specific accessibility standards and regulations, in many cases the enforcement mechanisms are not strong enough. As a result, the implementation of accessibility in public-facing websites and services, such as e-government portals or IT procured for internal or external use, remains low.

Causes of absent or weak enforcement of digital accessibility policies:

- Absence of organizational leadership and culture
- Absence of commitment by organizational leadership
- Poor incorporation of policy into key processes
- Absence of, or low, technical knowledge and awareness

While the CRPD contains defined obligations in relation to desired outcomes by application area, it does not provide specific technical guidance. It is therefore incumbent upon policy-makers, regulators, civil society and industry to identify and define solutions tailored to their individual country's needs, international standards and global economies of scale in order to lower costs and promote interoperability. Depending on each country's legal and institutional framework, different aspects of ICT policy and regulation may be the responsibility of different bodies and stakeholders, which will need a range of tools, including laws, policies, regulations, standards, self-regulatory/co-regulatory codes and guidelines, on which they can draw as a comprehensive framework for addressing ICT accessibility.

Steps for developing an accessibility policy

- Assess current policies and identify any gaps. Organizations – especially public sector organizations – are encouraged to consult persons with disabilities when developing accessibility policies and plans in order to obtain their inputs as to what the main barriers that affect them are and how to remove them and, consequently, ensure that accessibility policies and plans are correctly geared towards addressing real needs. Ways to do this include engaging employees, customers or volunteers and running brainstorming sessions to identify programmes, services, products and situations that are known or suspected to generate barriers to people with disabilities.
- Organize and write the policy; for example, "[Name of organization] will provide, on request, information in an accessible format or with communication support to persons with disabilities, in a manner that takes into account their disability."
- Publish the policy.
- Review and update the policy. Public sector organizations are encouraged to publish annual status reports (in accessible formats) to inform the general public about what has been accomplished.

The Model ICT Accessibility Policy Report

The Model ICT Accessibility Policy Report developed by ITU in collaboration with G3ict provides a framework to guide countries in developing policies. Drawing on legislation, regulations, standards and guidelines, the report addresses various facets of the ICT sector with the aim of assisting policy-makers, regulators and other stakeholders (including non-governmental organizations, organizations of persons with disabilities, and members of parliament) in building policies on public ICT access, mobile communications, television/video programming, web accessibility and public procurement. The report set out good practices for policy development and implementation across a range of ICT sub-sectors (public communications, mobile communications, television/video programming, the Internet and public procurement) on the basis of the following principles:

- Mainstreaming ICT accessibility through inclusive language, definitions and provisions in policies, laws and regulations;
- Identifying key steps to promote ICT accessibility;
- Raising awareness among key stakeholders;
- Building consensus and promoting inclusive policy-making through national debate;
- Promoting public-private partnerships;
- Setting clear targets and conducting periodic reporting to monitor implementation;
- Promoting training, capacity-building and educational programmes on disability awareness.

ITU has also developed a freely available toolkit and self-assessment for ICT accessibility implementation, which provides fundamental knowledge on the topic to facilitate and incentivize global implementation and inclusion. The self-assessment aspect is based on the CRPD and ICT-related requirements. A video guide is available with captions in Arabic, Chinese, English, French, Russian and Spanish.

What to include in a web accessibility policy

The W3C Web Accessibility Initiative provides guidance on defining and developing a policy for creating, managing and delivering accessible websites and an example of a comprehensive organizational policy.

The key components to include in a web accessibility policy are:

- **a summary statement(s)** that explicitly justifies the policy, describes the expected outcomes and sets out what the key steps are, how they should be completed and when they should be taken;
- **the date** on which the policy comes into effect;
- **the scope of the policy,** detailing which web applications fall under the policy and whether there are any exceptions;
- **the technical standard** to which the organization's web assets should conform. The most commonly used standards are:
    - WCAG 2.1;
    - the Authoring Tool Accessibility Guidelines;
    - the User Agent Accessibility Guidelines;
    - EN 301 549;
    - Section 508 of the Rehabilitation Act of 1973 (United States);
- **a provision for procurement,** stating that accessibility should be included in all requests for proposals and contracts to purchase web-based products and services;
- **the consequences if units or individuals choose non-conformance,** including a detailed description of what happens if the policy is not followed;
- **a description of the mechanism for ongoing review,** including who is responsible.[19]

A web accessibility policy must not be confused with an accessibility statement, which is a public declaration of the organization's commitment to digital or web accessibility.

European Union policies

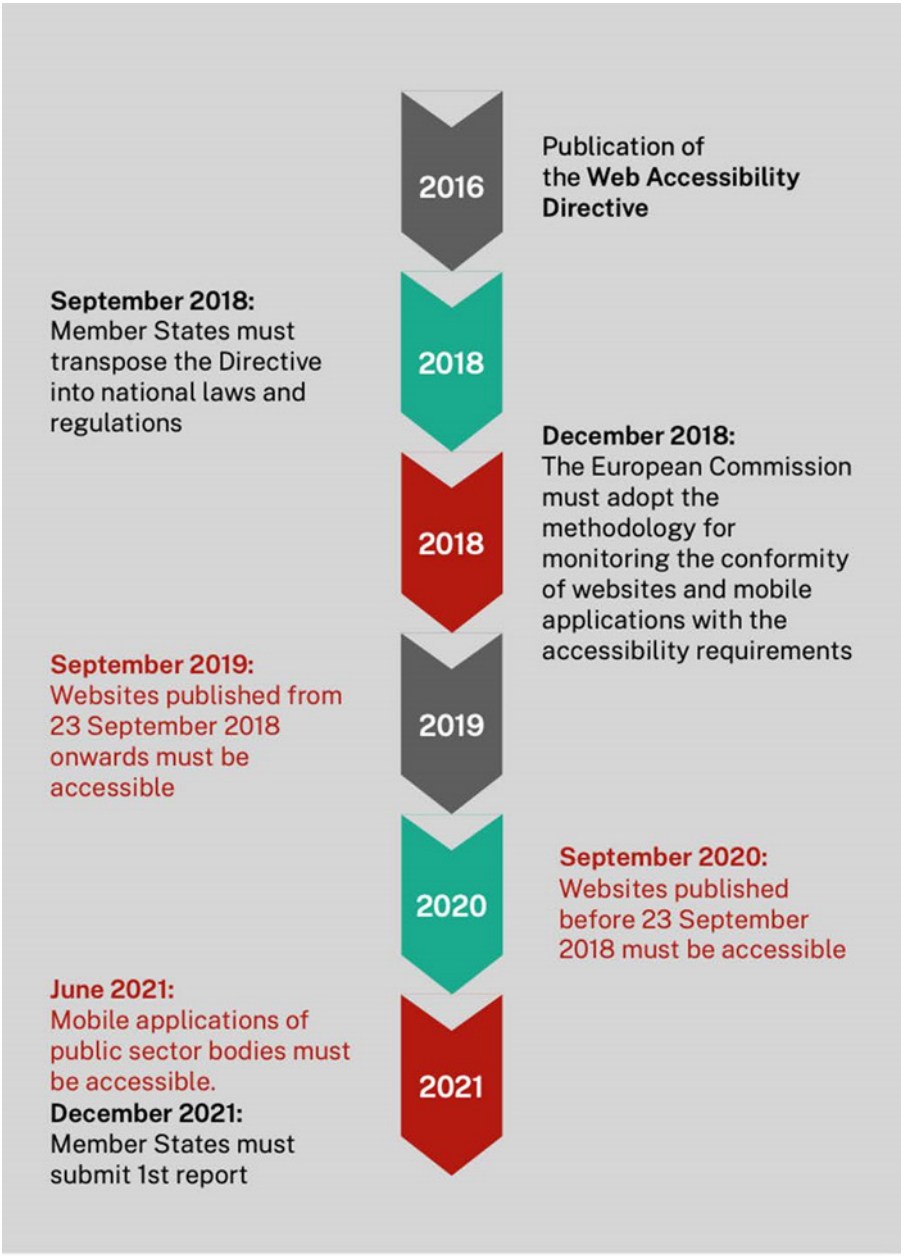
In the European Union, the Web Accessibility Directive mandates that all websites and mobile applications of public sector bodies must meet standard EN 301 549, which is aligned to WCAG 2.1. All European Union member States should already have transposed the Directive into their national laws by 23 September 2018. From September 2020, all websites must be accessible, and all mobile applications must be accessible from June 2021.[20]

---

[19] United States, National Center on Disability and Access to Education, "Writing a solid web accessibility policy: Cornell gets it right".

[20] ITU, "ICT accessibility assessment for Europe region", 2021.

Figure 1 – Timeline of the publication of the Web Accessibility Directive



Source: ITU, "ICT accessibility assessment for Europe region", 2021.

With most job-seeking activities being performed online, website accessibility should be a given. Unfortunately, the opposite is the norm, as most websites are still highly inaccessible. Research indicates that, despite global calls and the adoption of requirements such as the Web Accessibility Directive, the accessibility gap is widening as the global digital transformation process accelerates. When career websites, and, more specifically, online job application forms, contain accessibility barriers, jobseekers with a disability face challenges in finding or applying for jobs, and employers looking for qualified candidates miss out on valuable talent.

Annex 3: Executive summary of the project entitled "Accessibility of online job application and recruitment systems"

Introduction

The goal of the project entitled "Accessibility of online job application and recruitment systems" was to assess the online job application and recruitment systems and related content of the following United Nations entities:

- International Labour Organization (ILO)
- United Nations High Commissioner for Refugees (UNHCR)
- World Health Organization (WHO)
- United Nations Secretariat
- World Intellectual Property Organization (WIPO)

The British non-governmental organization Leonard Cheshire also participated in the project.

The aims of the project were to determine:

- whether the entire online job application process of each entity conformed to the success criteria for level AA of WCAG 2.1;
- whether critical steps in the online job application and recruitment system process were accessible, including by:
    - ensuring that all online recruitment forms and/or digital content was available in accessible formats;
    - ensuring that upload processes were fully accessible to applicants with disabilities who wished to present documents as part of their candidacy, such as résumés or certifications;
    - preventing accessibility and usability barriers that could lead to online application drop-off (such as consistency, flexibility and the time allowed for completion);
- whether the entire online job application process of each entity provided an overall accessible and positive experience for end users.

To this end, an accessibility audit was performed, consisting of an in-depth evaluation of a set of pages on each organization's website or web/desktop application with a view to documenting the types of accessibility issues experienced and any violations of level AA compliance with WCAG 2.1 and providing detailed recommendations on how to remedy the violations. For the accessibility audit, the evaluator used a combination of accessibility evaluation tools, screen readers and browsers. These audits not only highlighted the key violations, but also provided accessibility remediation suggestions and feedback such as user experience issues.

In addition, remote user testing sessions were performed with the involvement of persons with different types of impairments in order to determine the extent to which a given interface facilitated users' ability to complete specific tasks. Collaboration with Spanish organization Fundación ONCE and with UNHCR was instrumental for recruiting testers. Sessions took place remotely using web conferencing software platforms. During the sessions, users were asked to complete a series of tasks. The sessions were recorded and analysed to identify potential areas for improvement on each website. The purpose of these testing sessions was to assess the general usability of the site's web interface design, information flow and architecture, services and functionalities by collecting relevant data on user experiences of carrying out different tasks

on the job portal using a computer, smartphone or tablet, across various operating systems and browsers and with a variety of assistive technologies (where required). Any barriers, difficulties or commendable aspects encountered by users while performing these tasks were identified and described, in addition to the feelings and perceptions that they triggered in users.

Individual reports with findings and recommendations were issued for each organization following the completion of the accessibility audit and user testing.

This document is a general report summarizing the most common findings included in the individual reports.

Summary of accessibility audit results

The following is a list of the key findings. They primarily apply to desktop users, but some also apply to mobile users. The findings are organized by WCAG principle, issue type and their impact on persons with disabilities.

Perceivable

Information and user interface components must be presented to users in ways that they can perceive. This means that users must be able to perceive the information presented. In other words, the content cannot be invisible to all the user's senses.

Key issues found:

- Alternative text: Also known as "alt text", "alt attributes" or "alt descriptions", alternative text is used within the HTML code of a web page to provide a short-written description of the appearance and function of an image. Alternative text was found to be missing from some image elements (banners, job opportunity PDF images, social media active elements in the footers of websites, etc.) on the pages of some portals.
- Headings: Headings provide structure to web page content by breaking information down into ordered sections. A heading describes the content that will follow it, similar to a news headline. When sighted users arrive at a new page, they can use the headings to quickly find the content that they are looking for on the page. However, headings are fundamental for blind, visually impaired or dyslexic persons who use screen reading software and other assistive technologies to skip from heading to heading and navigate web pages in an agile manner. When headings are clear and descriptive, users can more easily find the information that they seek and understand the relationships between different parts of the content. Without headings, users are unable to navigate to specific sections and will likely leave the website. On several pages of the portals of the organizations assessed, headings were found to be either missing or wrongly designated as level one ("H1" in the HTML code of the website). Consequently, the headers did not describe the content or purpose of the page, the page appeared to contain more than one level one heading, and the heading level broke the hierarchical order, all of which can confuse assistive technology users.
- Use of colour to convey information: On some pages, the current step on a progress bar was indicated only visually, through colour, rather than programmatically.
- The contrast between text colour and background colours was insufficient.
- Some search fields lacked an associated form label.
- Navigation lists were not defined as ordered lists. Where lists are not defined, non-visual users have no way to know how many items are in the list and may find it harder to navigate through the items.

- Content reflow: On some pages (especially job search pages) content was presented at a width of 320 pixels, forcing users to scroll both horizontally and vertically to read content and interact with controls. Low vision users who need to enlarge text were not able to view and read the content in a single column, forcing them to scroll in the direction of reading to reveal lines that were cut off by the viewport. This requires more effort from the users' side to read the same amount of content.
- Large blocks of justified text were used, which could have a negative impact on document readability.
- Input field purpose: Input fields for collecting certain types of user information (e.g. first and last names and date of birth) lacked an autocomplete definition visible to assistive technologies. Autocomplete options make it is easier for persons with disabilities to fill out input fields where a specific data type is expected.
- Adequate semantics/tags were missing from PDF documents, including:
    - missing or inadequate titles
    - inadequate descriptive text on images
    - no additional information on complex images
    - no relationship between headings and data cells in tables.
- Videos lacked accessible names recognizable by assistive technologies.

Operable

User interface components and navigation must be operable. This means that users must be able to operate the interface using only a keyboard. In other words, the interface must not require interactions that users cannot perform.

Key issues found:

- In-page navigation: Some pages lacked a skip link to allow users to skip over a block of links or text to reach the main content area, thereby making page navigation more difficult for keyboard-only users.
- Page title: Some pages (such as job search) had an HTML title element that was either not meaningful enough or not descriptive enough. Page titles are important as they provide assistive technology users with orientation information when the page initially loads.
- Link texts:
    - Generic link text (e.g. "Click here") was used. Such text should be avoided in links, as it does not transmit clear information to assistive technology users.
    - Some empty links were given keyboard focus, which can be confusing for assistive technology users.
    - Some links were not placed far enough apart, which could cause users to click the wrong link.
- In some pages, content in tables was structured poorly.
- Visible focus:
    - Some active elements had no visible focus indicator. Mouse users were given visible cues that a page element was active, but these cues were not available to keyboard-only users.
    - Elements were located on a header before the main menu without a visible focus indicator, making them invisible to keyboard-only users.

- Keyboard access:
    - In some job search pages, there was no indication to let keyboard-only users know that they could collapse or expand a group of search filters.
    - The "Play" button on embedded video players was not accessible to keyboard-only users.
    - When filling out a user information form, the only way to select a country was by clicking on the corresponding country flag with a mouse.

Understandable

Information and the operation of the user interface must be understandable. This means that users must be able to understand both the information on the web page and how to operate the user interface. In other words, neither the content nor the method of operation should be beyond users' understanding.

Key issues found:

- Lack of a defined language.
- Lack of visible focus indicator, which makes navigation extremely difficult.
- The language selection button could not be read by screen reading software.
- Error handling in job application or new user forms:
    - In some job application forms, mandatory fields were marked visibly with an asterisk but were not marked programmatically.
    - Error messages at the top of the form were defined but lacked a heading to identify the content as errors.
    - Error messages were not as coherent and brief as possible. Long messages are difficult for screen reader users to listen to.
    - Error messages on job application pages were not announced by the screen reader on either the desktop or smartphone version of the web page.
    - In case of password-related errors, password rules that were already defined on the page were repeated at the top of the form.

Robust

Content must be robust enough so that a wide variety of user agents can interpret it reliably, including assistive technologies.

Key issues found:

- In forms:
    - No mechanism was available for screen reader users to navigate from the error messages area at the top of the form to the field containing the error.
    - Instruction texts were visually linked to form fields but not programmatically associated with them, meaning that screen reader users would miss this information.
    - Some fields were marked as "Required" with a red asterisk, but screen reader users might not know that the field was required.

- On some job application pages, the progress bar was incorrectly defined as a table, meaning that the table structure was announced by a screen reader. In such cases, the progress bar provided only a visual indication of the current step and no programmatic indication.
- PDF documents found on some pages contained accessibility issues that could prevent screen reader users from perceiving and interacting with their content.

Issues found on mobile versions of web pages:

- Some pages were not responsive, forcing users to scroll the page horizontally to read and interact with content.
- While the user menu at the top of some job search pages expanded correctly, VoiceOver users on iOS/Safari were unable to navigate the expanded menu using gestures or touch, thereby preventing them from accessing their profile and account details.
- When navigating with gestures, the name of the button and menu item were read separately by screen readers, meaning that the name was announced twice.

Summary of user testing findings

The most significant issues identified during the tests and requiring remediation were as follows:

- When navigating from a non-English version of a page to a job search page that was only in English, the page language was automatically changed to English without warning.
- In some language selection drop-down lists, the option for English was the only one that was described, while others options were not labelled in a way that indicated to which language they referred (e.g. "3 in 7", "4 in 7" or "6 in 7").
- Some buttons were not clearly labelled.
- Some images either lacked an alternative description or were not marked as decorative.
- Not all images containing links (and therefore being "clickable") clearly indicated where they would take the user.
- Poor colour contrast between text and background.
- Some pages (such as job search pages, application forms and new user forms) did not resize to the screen of a smartphone, thereby requiring users to scroll vertically and horizontally to navigate the page. As a result, filling in or editing fields was more difficult.
- The font size of some text and form elements was very small.
- Some mandatory form fields were not marked as such, and users were only informed after they had saved the form. All such fields should be clearly marked as mandatory.
- Some form fields did not provide error messages readable by screen readers whenever the user made a mistake while entering data. The user was therefore forced to wait until after saving the form to find out if there were any errors.
- The method of indicating errors on forms was frustrating, as it did not indicate exactly where each error was and forced screen reader users to navigate through the whole form again to find the error. This made the process extremely difficult, time-consuming and frustrating for screen reader users.
- Job application forms in which users are required to fill out many fields did not clearly indicate this at the top of the page (e.g. "In this form, there are 40 fields to fill out").
- Job search pages did not resize to the screen size of a smartphone. As a result, users were required to scroll vertically and horizontally to view information and fill or edit fields. This makes filling out a form from a mobile device an almost impossible task.
- Videos lacked captioning.
- The job applicant manual was too long.
- Some job descriptions were extremely long, not correctly formatted and used jargon only known to United Nations employees.

- Some pop-up windows opened unexpectedly and without notice, which could confuse users of screen readers or force them to lose their navigation focus.
- Some radio buttons used to provide Yes/No answers were not correctly aligned to the specific questions to which they corresponded owing to poor formatting.
- The meaning of the options in some drop-down form fields was confusing.
- Some calendars were exceedingly difficult to use.
- The "Language page" selection drop-down menu item was labelled as English, when it should be labelled as "Languages".
- Screen reader users could not move directly to the list of results of a job search and instead had to tab through a lengthy list of page elements before reaching the list, which was extremely frustrating and time-consuming.
- Some address form fields were laid out visually in two columns but were not semantically formatted as such. This made it confusing for screen reader users to navigate the form, as the focus would jump from a field on one column to a field in another column.
- On some pages, the focus of form controls fell on "Save and Continue" as soon as the user landed on the page; this should be the last place where the focus falls, however.
- Date form fields did not clearly indicate the format to be used and whether to include certain characters between data elements (e.g. a hyphen or forward slash between the day, month and year).
- There were issues with page language selection management.
- Some form fields required users to repeatedly select a "Does not apply" option or requested the same information more than once.
- Some form elements were wrongly labelled as buttons.
- Different font types and sizes were used, which could be confusing for users.
- Maps showing the number and geographic location of job vacancies could not be navigated via keyboard. An alternative way of displaying the information is required, such as a list of elements under the map itself.
- Some buttons were not labelled as form controls, which made navigation more complicated for users of screen readers, given that screen readers prefer to pull up the list of form controls in a page.
- The heading level order was wrong on some pages.

Recommendations

This report does not pretend to provide legal counsel of any kind. The issues uncovered in the technical and usability report should be addressed aggressively by the teams in each agency. The list of recommendations below should be seen as a call to action to address priority issues, which could significantly improve the accessibility and usability levels of the job portals analysed:

- Add alternative text to all images that convey relevant information or content.
- Use headings to structure page content into clear and descriptive ordered sections in which users can easily find the information that they are looking for.
- Do not use colour as the only means of conveying specific information.
- Make sure that the contrast ratio between the text colour and the background colours is sufficient (at least 4.5:1).
- Apply form labels to all search fields.
- Use ordered lists for navigation.
- Avoid using large blocks of justified text.
- Use autocomplete definitions for input fields so that their purpose is made clear to assistive technologies. It is easier for users of assistive technologies to fill out fields when they know the data type expected.

- Create PDF documents from accessible source documents, and make sure that adequate semantics/tagging is applied:
    - Add a proper title.
    - Add meaningful descriptive text to non-decorative images.
    - Establish relationships between table headings and data cells.
- Provide videos with accessible names that can be recognized by assistive technologies.
- Provide in-page navigation by adding a skip link to allow users to skip over a block of links or text to reach the main content area. Failure to do so makes page navigation more difficult for keyboard-only users.
- Provide meaningful HTML page titles.
- Avoid using generic link texts (e.g. "Click here") as they do not transmit clear information to assistive technology users.
- Avoid allowing empty links to receive keyboard focus.
- Place links far enough apart to prevent users from clicking on the wrong link.
- Avoid structuring page content as tables.
- Make sure active elements are given a visible focus indicator.
- Keyboard access:
    - Provide job search page filter elements to indicate to keyboard-only users whether they can collapse or expand the filter.
    - Make sure that all video player controls can receive focus and that it is possible to navigate, activate and deactivate the controls using a keyboard.
    - Avoid using expandable form field options that can only be selected by clicking on them with the pointer.
- Always define the page language.
- Where a page includes a language selection button, make sure that the button can be read by screen reading software.
- Address handling errors in job application or new user forms:
    - Do not mark required fields with a visible element only (e.g. a coloured asterisk). Required fields should also be marked programmatically so that assistive technologies can recognize that the fields are mandatory.
    - Include error messages at the top of the form under a heading that identifies the content following it as an error message.
    - Make error messages as coherent and brief as possible.
    - Make sure that error messages can be read aloud by screen reading software on computers and mobile devices.
    - Provide mechanisms for screen reading software to navigate from the error messages area at the top of the form to the field containing the error.
    - Make sure that instruction texts are linked to form fields programmatically as well as visually so that screen reading software does not miss the information.
- Provide an indication of the progress towards form completion not only visually (e.g. through a coloured progress bar) but also programmatically.
- Address issues specific to mobile devices:

- Design pages to be responsive, so that they adapt to the size of a mobile device screen and so that users are not forced to scroll the page horizontally to read and interact with content.
- Make sure that expanded menus at the top of some job search pages can be navigated using VoiceOver on Safari (iOS) and touch gestures so that users can access their profile and account details.
- Make sure that button names and menu items are correctly labelled programmatically so that they are not read separately by screen reading software when navigating through gestures.

Conclusion

All the job portals analysed presented accessibility and usability issues that would pose serious challenges for persons with disabilities interested in learning about and applying to job vacancies with the agencies to which the portals belonged.

Many of the most basic issues, such as the provision of alternative text descriptions for visual content, can be easily fixed. Many other issues are straightforward to resolve and should form part of any short-term web accessibility strategy. Other issues may require a broader and deeper understanding of accessible web development techniques and should therefore form part of a medium- to long-term strategy.

The simple truth is that many leading websites around the world are not accessible to persons with many forms of disabilities and require considerable work to attain the minimum accessibility levels as per international standards. It is imperative that each agency takes the initiative and invests effort into ensuring that their job portals can be used by a broader audience. Greater awareness and increased web accessibility education may also help ensure that persons with disabilities are able to use such portals.

Given the characteristic issues identified across all the job portals analysed, this report may provide a guide for other United Nations agencies on increasing the accessibility of their job portals.

Glossary[21]

- **Accessibility**: The degree to which a product, device, service or environment (virtual or real) is available to as many people as possible.
- **Assistive technology**: Separate hardware or software added to equipment or services to enable persons with more severe disabilities to overcome barriers faced in gaining access to information and communication. Assistive technology enables or compensates for the capabilities of users with functional, motor, sensory or intellectual impairments.
- **Assessment:** A process that includes the examination, interaction with, and observation of individuals or groups with actual or potential health conditions, impairments, activity limitations or participation restrictions. Assessment may be required for rehabilitation interventions or to gauge eligibility for educational support, social protection or other services.
- **Braille:** A system of writing for individuals who are visually impaired. It uses letters, numbers and punctuation marks comprising patterns of raised dots.
- **Disability:** Disability is an evolving concept. It results from the interaction between persons with impairments and the attitudinal and environmental barriers that hinder their full and effective participation in society on an equal basis with others, as defined in the CRPD. Under the International Classification of Functioning, Disability and Health (ICF) adopted by WHO in 2001, disability is defined as the outcome of the interaction between impairments and negative environmental impacts. WHO emphasizes that most people will experience some degree of disability at some point during their lives. Accordingly, the ICF classification focuses on a person's abilities and strengths and not just the impairments and limitations. It also grades functioning on a scale from "no impairment" to "complete impairment". By shifting the focus from cause to impact, the ICF places all health conditions on an equal footing.
- **Electronic document:** Downloadable files, which can be consulted, printed or filled in by users either offline or online.
- **EN 301 549:** A standard of the European Union, which describes functional accessibility requirements applicable to ICT products and services, in addition to setting out test procedures and an evaluation methodology for each accessibility requirement in a form that is suitable for use in public procurement in Europe.
- **Impairment:** A term used to refer to the loss or limitation of physical, mental, intellectual or sensory function on a long-term or permanent basis.
- **Information and communication technologies (ICT):** This encompasses a wide range of hardware, software, formats and systems that enable communication through electronic means. This includes devices and systems used for the storage, processing and retrieval of electronic information to the array of devices and software used to retrieve this information, in addition to devices and systems used to communicate in real time with other people.
- **International Classification of Functioning, Disability and Health (ICF):** The classification that provides a unified and standard language and framework for the description of health and health-related states. The ICF is part of the "family" of international classifications developed by WHO.
- **Persons with disabilities**: Individuals who have long-term physical, mental, intellectual or sensory impairments, which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others. Older persons with functional disabilities are also regarded as persons with disabilities (article 1, CRPD).

[21] Some of these terms and definitions are based on: ITU Telecommunication Standardization Sector, "Accessibility terms and definitions", Series F: Non-telephone telecommunication services: Multimedia services, Recommendation ITU-T F.791.

- **Public sector**: Ministries, national government departments, local government and other government or public agencies that provide e-government services and communication to the public, in addition to public education resources available via websites, email, SMS and other means of electronic communication.
- **Reasonable accommodation**: The application of necessary and appropriate modifications and adjustments, without imposing a disproportionate or undue burden, to ensure that persons with disabilities can enjoy and exercise all human rights and fundamental freedoms on an equal basis with others.
- **Universal design**: Universal design is a strategy which aims to make the design and composition of different environments, products, means of communication, information technologies and services accessible to, understandable to and usable by all persons in the most independent and natural manner possible, preferably without the need for adaptation or specialized solutions. The Seven Principles of Universal Design are meant to "guide the design of environments, products and communications":
    - Principle 1: Equitable use
    - Principle 2: Flexibility in use
    - Principle 3: Simple and intuitive use
    - Principle 4: Perceptible information
    - Principle 5: Tolerance for error
    - Principle 6: Low physical effort
    - Principle 7: Size and space for approach and use
- **User**: A person who interacts with the product, service or environment.
- **The Web Accessibility Directive (Directive (EU) 2016/2102 on the accessibility of the websites and mobile applications of public sector bodies)**: A directive of the European Parliament and of the Council of Europe in force since 22 December 2016, which obliges public sector bodies in European Union member States, with a limited number of exceptions (e.g. broadcasters and live streamers), to meet specific technical accessibility standards on their websites and mobile applications. The Directive requires: an accessibility statement for each website and mobile application; a feedback mechanism allowing users to flag accessibility problems or request information published in a non-accessible format; and regular monitoring of public sector websites and applications by member States and reporting on the results. The Directive refers to EN 301 549, V2.1.2 (2018-08) as the harmonized standard for websites and mobile applications that provides for the presumption of conformity with the Directive.
- **Website:** The entire collection of electronic files accessible through a domain name. It includes all home pages and other pages (including web applications and services and dynamically generated content) referenced from the website home page.
- **Web Content Accessibility Guidelines (WCAG) 2.1:** The web standard developed as part of the W3C Web Accessibility Initiative.

ILO resources

1. Disability in the workplace: A global perspective (online course)
2. Guide for business on the rights of persons with disabilities (also available as an easy-to-read version)
3. Austria: National Action Plan on Disability 2012-2020
4. An inclusive digital economy for people with disabilities
5. How do you lip read a robot? Recruitment AI has a disability problem (webinar)
6. Disability inclusion in company responses to COVID-19: Results of a survey among national business and disability networks and their members
7. Disability inclusion in company responses to COVID-19
8. COVID-19 and the world of work: Ensuring no one is left behind in the response and recovery
9. Persons with disabilities in the COVID-19 response
10. Key issues on promoting employment of persons with disabilities
11. Good practice guide for the employment of persons with disabilities
12. Promoting diversity and inclusion through workplace adjustments: A practical guide
13. The win-win of disability inclusion
14. EmployAbility: Tapping the potential of persons with disabilities in Asia and the Pacific – A guide for employers
15. Employment for social justice and a fair globalization: Overview of ILO programmes – Disability
16. Making the future of work inclusive of people with disabilities (also available in an easy-to-read version)
17. Inclusion of persons with disabilities in the digital and green economy
18. Promoting employment opportunities for people with disabilities: Quota schemes (vol. 1)
19. Promoting employment opportunities for people with disabilities: Quota schemes (vol. 2)
20. Labour market inclusion of people with disabilities
21. Making apprenticeships and workplace learning inclusive of persons with disabilities
22. Inclusion of people with disabilities in national employment policies

ITU resources

1. ICT accessibility: The key to inclusive communication (online course)
2. Web accessibility: The cornerstone of an inclusive digital society (online course)
3. Video-tutorials on the creation of accessible digital documents
4. "Towards building inclusive digital communities": ITU toolkit and self-assessment for ICT accessibility implementation
5. Access to telecommunication/ICT services by persons with disabilities and other persons with specific needs
6. ITU guidelines on how to ensure that digital information, services and products are accessible by all people, including persons with disabilities during COVID-19
7. Accessible Europe 2019 background paper: Artificial intelligence and information communication technology accessibility
8. ICT accessibility assessment for the Europe region
9. Toolkit for safe listening devices and systems
10. Digital signage: Glossary and definitions
11. Overview of remote captioning services
12. Accessibility terms and definitions (Recommendation ITU-T F.791)
13. Use cases for assisting persons with disabilities using mobile application
14. Guidelines for accessible meetings
15. Guidelines for supporting remote participation in meetings for all
16. ITU study on the assessment of digital accessibility policies in Serbia

Other resources

1. IBM: Designing AI applications to treat people with disabilities fairly
2. United Nations Department of Economic and Social Affairs: Disability and development: Realizing the Sustainable Development Goals by, for and with persons with disabilities
3. Institute for Ethical Artificial Intelligence: Recruitment AI has a disability problem: Questions employers should be asking to ensure fairness in recruitment
4. Michigan State University: Prioritizing web content for accessibility review and remediation
5. Global Disability Innovation Hub: Barriers to access and retain formal employment for persons with disabilities in Bangladesh and Kenya
6. Journal of Business and Psychology: The participation of people with disabilities in the workplace across the employment cycle: Employer concerns and research evidence
7. United Nations Human Rights Council: Artificial intelligence and the rights of persons with disabilities - Report of the Special Rapporteur on the rights of persons with disabilities
8. European Disability Forum: Plug and pray? A disability perspective on artificial intelligence, automated decision-making and emerging technologies
9. Bloomberg: How AI is deciding who gets hired (video)
10. United States Equal Employment Opportunity Commission: EEOC disability-related resources
11. LEAD Center: Putting WIOA policy into practice
12. Kessler Foundation: nTIDE December 2021 jobs report: Employment remains above historic levels for people with disabilities
13. PwC: Reimagining accessible employment: PwC Australia's access and inclusion plan 2020-2022
14. Mid-Atlantic ADA Center: Employers (list of resources)
15. Job Accommodation Network: Online application systems: Sample language for accommodation statements
16. Job Accommodation Network: Accommodation and compliance: Digital/web accessibility
17. Mid-Atlantic ADA Center: The interactive process: Lessons from case law
18. PEAT: Pain points for users with disabilities–and how to fix them
19. United States Department of Labor, Office of Federal Contract Compliance Programs: Disability issues related to online application systems frequently asked questions
20. Level Access: Accessibility in the hiring process
21. Accessibility.com: When career websites aren't accessible, everyone loses
22. Job Accommodation Network: Making the online application process accessible under the Americans with Disabilities Act (ADA)
23. CNBC: Why technology accessibility is key for disability inclusion at work
24. The Applicant Manager: How to ensure OFCCP compliance when job posting
25. Adobe: Adobe study: Employers making progress supporting employees with disabilities but must make it a priority to recruit and retain
26. Global Initiative for Inclusive ICTs (G3ict) and Steelcase: Blueprint for inclusive workplaces of the future: How to create inclusive, safe and compelling workplaces
27. Tenon.io: Human resources concerns: Accessibility of job sites
28. CMSWire: The UX of job applications: Less is more

29. Journal of User Experience: Investigating the accessibility and usability of job application web sites for blind users
30. Smashing Magazine: The importance of manual accessibility testing
31. Northwest ADA Center: Making web-based job application forms accessible to all users
32. United Nations: United Nations Disability Inclusion Strategy (in particular section III.C on indicators)
33. United States, National Center on Disability and Access to Education: Looking to the work of others as you create your institution's web accessibility policy
34. Disability Hub Europe: Making the future of work inclusive of people with disabilities
35. Pennsylvania State University: Accessibility: Google Forms
36. AccessibilityOz: Making CAPTCHA accessible

Office of the Director
International Telecommunication Union (ITU)
Telecommunication Development Bureau (BDT)
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: bdtdirector@itu.int
Tel.: +41 22 730 5035/5435
Fax: +41 22 730 5484

Office of Deputy Director and Regional Presence
Field Operations Coordination Department (DDR)
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: bdtdeputydir@itu.int
Tel.: +41 22 730 5131
Fax: +41 22 730 5484

Digital Networks and Society (DNS)
Email: bdt-dns@itu.int
Tel.: +41 22 730 5421
Fax: +41 22 730 5484

Digital Knowledge Hub Department (DKH)
Email: bdt-dkh@itu.int
Tel.: +41 22 730 5900
Fax: +41 22 730 5484

Partnerships for Digital Development Department (PDD)
Email: bdt-pdd@itu.int
Tel.: +41 22 730 5447
Fax: +41 22 730 5484

Africa

Ethiopia
International Telecommunication Union (ITU) Regional Office
Gambia Road
Leghar Ethio Telecom Bldg. 3rd floor
P.O. Box 60 005
Addis Ababa
Ethiopia

Email: itu-ro-africa@itu.int
Tel.: +251 11 551 4977
Tel.: +251 11 551 4855
Tel.: +251 11 551 8328
Fax: +251 11 551 7299

Cameroon
Union internationale des télécommunications (UIT)
Bureau de zone
Immeuble CAMPOST, 3e étage
Boulevard du 20 mai
Boîte postale 11017
Yaoundé
Cameroon

Email: itu-yaounde@itu.int
Tel.: + 237 22 22 9292
Tel.: + 237 22 22 9291
Fax: + 237 22 22 9297

Senegal
Union internationale des télécommunications (UIT)
Bureau de zone
8, Route des Almadies
Immeuble Rokhaya, 3e étage
Boîte postale 29471
Dakar - Yoff
Senegal

Email: itu-dakar@itu.int
Tel.: +221 33 859 7010
Tel.: +221 33 859 7021
Fax: +221 33 868 6386

Zimbabwe
International Telecommunication Union (ITU) Area Office
TelOne Centre for Learning
Corner Samora Machel and Hampton Road
P.O. Box BE 792
Belvedere Harare
Zimbabwe

Email: itu-harare@itu.int
Tel.: +263 4 77 5939
Tel.: +263 4 77 5941
Fax: +263 4 77 1257

Americas

Brazil
União Internacional de Telecomunicações (UIT)
Escritório Regional
SAUS Quadra 6 Ed. Luis Eduardo Magalhães,
Bloco "E", 10º andar, Ala Sul (Anatel)
CEP 70070-940 Brasilia - DF
Brazil

Email: itubrasilia@itu.int
Tel.: +55 61 2312 2730-1
Tel.: +55 61 2312 2733-5
Fax: +55 61 2312 2738

Barbados
International Telecommunication Union (ITU) Area Office
United Nations House
Marine Gardens
Hastings, Christ Church
P.O. Box 1047
Bridgetown
Barbados

Email: itubridgetown@itu.int
Tel.: +1 246 431 0343
Fax: +1 246 437 7403

Chile
Unión Internacional de Telecomunicaciones (UIT)
Oficina de Representación de Área
Merced 753, Piso 4
Santiago de Chile
Chile

Email: itusantiago@itu.int
Tel.: +56 2 632 6134/6147
Fax: +56 2 632 6154

Honduras
Unión Internacional de Telecomunicaciones (UIT)
Oficina de Representación de Área
Colonia Altos de Miramontes
Calle principal, Edificio No. 1583
Frente a Santos y Cía
Apartado Postal 976
Tegucigalpa
Honduras

Email: itutegucigalpa@itu.int
Tel.: +504 2235 5470
Fax: +504 2235 5471

Arab States

Egypt
International Telecommunication Union (ITU) Regional Office
Smart Village, Building B 147,
3rd floor
Km 28 Cairo
Alexandria Desert Road
Giza Governorate
Cairo
Egypt

Email: itu-ro-arabstates@itu.int
Tel.: +202 3537 1777
Fax: +202 3537 1888

Asia-Pacific

Thailand
International Telecommunication Union (ITU) Regional Office
4th floor NBTC Region 1 Building
101 Chaengwattana Road
Laksi,
Bangkok 10210,
Thailand

Mailing address:
P.O. Box 178, Laksi Post Office
Laksi, Bangkok 10210, Thailand

Email: itu-ro-asiapacific@itu.int
Tel.: +66 2 574 9326 – 8
+66 2 575 0055

Indonesia
International Telecommunication Union (ITU) Area Office
Sapta Pesona Building
13th floor
Jl. Merdan Merdeka Barat No. 17
Jakarta 10110
Indonesia

Email: itu-ro-asiapacific@itu.int
Tel.: +62 21 381 3572
Tel.: +62 21 380 2322/2324
Fax: +62 21 389 5521

CIS

Russian Federation
International Telecommunication Union (ITU) Regional Office
4, Building 1
Sergiy Radonezhsky Str.
Moscow 105120
Russian Federation

Email: itumoscow@itu.int
Tel.: +7 495 926 6070

Europe

Switzerland
International Telecommunication Union (ITU) Office for Europe
Place des Nations
CH-1211 Geneva 20
Switzerland
Email: eurregion@itu.int
Tel.: +41 22 730 5467
Fax: +41 22 730 5484

International Telecommunication Union
Telecommunication Development Bureau
Place des Nations
CH-1211 Geneva 20
Switzerland

ISBN: 978-92-61-37041-1

Published in Switzerland
Geneva, 2022