



Digitalisation and digital transformation in Croatia

Implications for persons with disabilities

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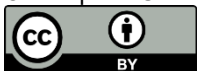
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Table of contents

1	Executive summary	6
2	Are government strategies and plans on digitalisation and digital transformation disability-inclusive?	9
	2.1 Disability inclusion in generic strategies on digitalisation and digital transformation.....	9
	2.2 Disability inclusion in focused or sector-specific strategies on digitalisation and digital transformation	10
3	Do disability strategies address the potential of and challenges pertaining to digitalisation and digital transformation?	14
	3.1 How digitalisation and digital transformation are addressed in the national disability strategy	14
	3.2 How digitalisation and digital transformation are addressed in specific disability-related strategies	16
4	Promoting disability inclusion through funding, education and training	22
	4.1 How funding promotes disability-inclusive digitalisation and digital transformation.....	22
	4.2 How disability inclusion is promoted through the education and training of digital professionals	24
	4.3 How digital inclusion and accessibility is addressed in the education and training of accessibility and inclusion professionals.....	25
	4.4 How digital inclusion is addressed via the training of people with disabilities	26
5	The opportunities and challenges presented by digitalisation and digital transformation to the rights of persons with disabilities	28
	5.1 The most significant opportunities presented by digitalisation and digital transformation for persons with disabilities	28
	5.2 The most significant challenges faced by persons with disabilities in relation to digitalisation and digital transformation	28
6	Conclusions and recommendations	31
	6.1 Conclusions	31
	6.2 Recommendations.....	32

1 Executive summary

The key national digital strategies concerning digitisation and digital transformation are e-Croatia 2020 Strategy¹ and Action Plan for the implementation of the e-Croatia 2020 Strategy.² The strategy is based on the Digital Agenda for Europe and the e-Government Action Plan 2016-2020. The key national development strategy that includes digital transformation is the National Development Strategy of the Republic of Croatia until 2030 that was adopted in February 2021.³ The green and digital transition is one of four key development areas. In the digital transition, the key goals are the digital transition of the economy, digitalisation of public administration and judiciary, development of broadband electronic communication networks, development of digital competencies and digital jobs. In the National Recovery and Resilience Plan 2021-2026⁴ one of the key parts is the digital transition of society and the economy. In the National Recovery and Resilience Strategy, the key objectives are related to the development of standards and harmonised mechanisms for coordination, monitoring and evaluation of the digitisation process. It is intended to build a central system of interoperability, which is a prerequisite for secure data exchange and connection of services of public administration bodies and the economy. One of the goals is to provide the preconditions for digitisation and modernization of existing key digital public services used by citizens and businesses. Persons with disabilities (PWDs) are specifically mentioned in the goals related to the digitalisation of public services, new employment opportunities and improvement of mobility. Adequate broadband coverage is also needed.

In 2019, the Law on Accessibility of Websites and Software Solutions for Mobile Devices of Public Sector Bodies - a transposition of Directive (EU) 2016/2102 of the European Parliament and of the Council of 26 October 2016 on the accessibility of the websites and mobile applications of public sector bodies) - was adopted.⁵ In education, digitalisation is implemented by the programme e-Schools: Complete informatisation of school business processes and teaching processes in order to create digitally mature schools for the 21st century⁶ led by the Croatian Academic and Research

¹ Ministry of Public Administration (2017), e-Croatia 2020 Strategy (*Strategija e-Hrvatska 2020*), https://rdd.gov.hr/UserDocsImages//MURH_migracija%20s%20weba//e-Croatia%202020%20Strategy%20-final.pdf.

subsequent mentions: Ministry of Public Administration (2017).

² Ministry of Public Administration (2017), e-Croatia 2020 Strategy. Annex 4 Action Plan for the implementation of the e-Croatia 2020 Strategy (*Strategija e.Hrvatska, Aneks 4 Akcijski plan implementacije strategije*), https://rdd.gov.hr/UserDocsImages//MURH_migracija%20s%20weba//Action%20Plan%20e-Croatia%202020%20Strategy%20-novo.pdf.

subsequent mentions: Ministry of Public Administration (2017) Annex.

³ Croatian Parliament (2021), National Development Strategy the Republic of Croatia until 2030 (*Nacionalna razvojna strategija Republike Hrvatske do 2030. godine*). Narodne novine 13/2021. https://narodne-novine.nn.hr/clanci/sluzbeni/2021_02_13_230.html.

subsequent mentions: Croatian Parliament (2021).

⁴ Vlada RH (2021), The Croatian National Recovery and Resilience Plan (*Nacionalni plan oporavka i otpornosti*). https://ec.europa.eu/info/files/recovery-and-resilience-plan-croatia_en

subsequent mentions: Croatian Government (2021), Recovery and Resilience Plan 2021-2026

⁵ Law on Accessibility of Websites and Software Solutions for Mobile Devices of Public Sector Bodies (*Zakon o pristupačnosti mrežnih stranica i programskih rješenja za pokretne uređaje tijela javnog sektora*), 8 February 2019. Narodne novine 17/2019 https://narodne-novine.nn.hr/clanci/sluzbeni/2019_02_17_358.html.

subsequent mentions: Law on Accessibility of Websites and Software Solutions, 2019.

⁶ e-Schools Programme, 2018 (*Program e-škole 2018.*), <https://www.e-skole.hr/program-e-skole/>.

subsequent mentions: e-School Programme, (2018).

Network - CARNET. In Health, the digital transformation is based on the Strategic Plan for Health Development in the Republic of Croatia - SPeZ from 2014.⁷

Requirements regarding digital accessibility are stated in both national operational programmes on the basis of which EU funds are implemented and enforced. Operational programme Competitiveness and cohesion builds on the EU's Digital Agenda for Europe targets.⁸ Operational Programme "Efficient Human Resources 2014-2020 envisages numerous activities in digitalisation of activities and strengthening of competencies for the use of digital tools and processes.⁹

All strategies have built inclusiveness into their content or into the document that elaborates their implementation. However, in two strategic documents (e-Croatia, and National Development Plan), persons with disabilities (PWD) are not mentioned or are mentioned only incidentally. PWDs can rely on the key principles of inclusiveness, accessibility, accessibility, equity. In sector specific strategies, the position of PWD and digitalisation is most clearly visible in educational strategies, by-laws and instructions arising from this strategy. In the National Recovery and Resilience Plan 2021-2026 people with disabilities are mentioned in almost all parts of the plan, and the digital dimension is visible in the introduction of smart working (hybrid access to the workplace), in ensuring better accessibility of digital solutions in traffic for people with disabilities, in easier exercise of rights using the national identification and authentication system and in education to strengthen digital literacy of PWDs.¹⁰

The National Strategy for Equalization of Opportunities for Persons with Disabilities clearly addresses the challenges of digitalisation and digital transformation. For the most part, it focuses on availability of information and tools that enable communication and participation in social life. Digital transformation opens up new opportunities for using technology to increase the independence and quality of life of PWD.

National strategies have only partially dealt with the potential of the great benefits that digital transformation provides for persons with disabilities. It is good that persons with disabilities have found themselves in these strategies, but there is a lack of more precise tasks with indicators, more and wider inclusion of assistive technologies in all areas. It is also important for further activities that digitalisation is not reduced to the availability of information, websites and data exchange.

Good practices

⁷ Ministry of Health and Croatian Institute for Health Insurance (2014), Strategic Plan for e-Health Development in the Republic of Croatia (*Strateški plan razvoja e-zdravlja u Republici Hrvatskoj SPeZ*)

https://zdravlje.gov.hr/UserDocsImages/dokumenti/Programi,%20projekti%20i%20strategije/Strate%C5%A1ki-plan_razvoja_eZdravlja.pdf.

subsequent mentions: Ministry of Health and Croatian Institute for Health Insurance (2014).

⁸ Operational Programme Competitiveness and Cohesion 2014 - 2020 2014HR16M1OP001 - 1.2 (*Operativni program Konkurentnost i kohezija 2014. – 2020.*).

https://strukturnifondovi.hr/wp-content/uploads/2017/03/OPKK_eng-1.pdf.

subsequent mentions: Operational Programme Competitiveness and Cohesion 2014 - 2020.

⁹ Operational Programme Efficient Human Resources 2014 – 2020. 2014HR05M9OP001 - 1.3 (*Operativni program Učinkoviti ljudski potencijali 2014. – 2020.*)

http://www.esf.hr/wordpress/wp-content/uploads/2020/04/Programme_2014HR05M9OP001_5_0_en.pdf.

subsequent mentions: Operational Programme Efficient Human Resources 2014 – 2020.

¹⁰ Croatian Government (2021), Recovery and Resilience Plan 2021-2026

1. e-schools, accessibility and adaptation of educational content.
2. The possibility of participation in the law-making process (e-consultation).
3. The digitalisation of books and their availability through the system of public libraries (Strategy to encourage reading).

Recommendations

1. Link the implementation of digital transformation more strongly with faster and more efficient implementation of the principle of reasonable accommodation.
2. In the digital transformation, the areas of action should be expanded, so as not to be reduced to communication, administrative processes, collecting and processing of data on persons with disabilities.
3. It is necessary to encourage new forms of assistive technology, use domestic intellectual potential.
4. It is crucial to involve PWD associations more directly in the preparation of sectoral strategies. These organisations have the capacity and capability for these activities. Institutional opening for their greater participation is crucial.

2 Are government strategies and plans on digitalisation and digital transformation disability-inclusive?

2.1 Disability inclusion in generic strategies on digitalisation and digital transformation

In Croatia, the Ministry of Public Administration in May 2017 adopted e-Croatia 2020 Strategy¹¹ and Action Plan for the implementation of the e-Croatia 2020 Strategy.¹² The strategy is based on the Digital Agenda for Europe and the e-Government Action Plan 2016-2020. These are fundamental national strategies concerning digitalisation and digital transformation.

In the e-Croatia 2020 Strategy, persons with disabilities and disability are mentioned only incidentally and only in principle. For example:

“Inclusion means allowing everyone to take full advantage of the opportunities offered by new technologies to overcome social and economic disadvantages. This means that it is ensured that people with disabilities and the elderly can use public services with the same service levels as all other citizens.” (p. 49)

The Action Plan for the implementation of the strategy includes the development of the integrated information system for expertise, professional rehabilitation and employment of persons with disabilities. The main goal is more efficient administration, better database connectivity and data visibility. Easier accessibility of users for the processes of expertise, rehabilitation and expertise is also mentioned, but there is no more detailed description or indicators for increasing the accessibility of PWDs.

In 2021, the Strategy for the development of broadband access in the Republic of Croatia in the period from 2021 to 2027¹³ was adopted. It does not mention PWDs.

The key actor in the development of the e-Croatia 2020 strategy was the Ministry of Public Administration. The Ministry of Public Administration is in charge of coordinating the development and monitoring of the implementation of the e-Croatia strategy in the Government. The Decree on the Internal Organisation of the Ministry of Public Administration¹⁴ established a special Directorate for e-Croatia for the implementation of the strategy and all activities. The e-Croatia 2020 Strategy was developed as part of the development of strategic documents that are a prerequisite for the use of EU structural funds for the period 2014-2020. The e-Croatia 2020 strategy presents an overview of the development of informatisation and e-services in the public sector and the goals for further development. It was prepared in accordance with the Digital Agenda for Europe (DAE) and in cooperation with all relevant public sector bodies and representatives of the academic community, ICT industry, and citizens also

¹¹ Ministry of Public Administration (2017).

¹² Ministry of Public Administration (2017), Annex.

¹³ Croatian Government (2021), Strategy for the development of broadband access in the Republic of Croatia in the period from 2021 to 2027 (*Nacionalni plan razvoja širokopolasnog pristupa u Republici Hrvatskoj u razdoblju od 2021. do 2027. godine*), https://mmpi.gov.hr/UserDocsImages/dokumenti/PROMET/Promet%203_21/MMPI-NPR-BB2021-2027-VRH%2015-3_21.pdf.

subsequent mentions: Croatian Government (2021) Strategy for the development of broadband access.

¹⁴ Croatian Government (2019), The Decree on the Internal Organisation of the Ministry of Public Administration (*Uredba o unutarnjem ustrojstvu Ministarstva uprave*), https://narodne-novine.nn.hr/clanci/sluzbeni/2019_12_128_2589.html.

participated through a survey on satisfaction with public sector e-services. High accessibility of public services is the main form of implementation of European documents within national documents. There is no information on the participation of PWDs in the drafting or creating of proposal of these documents.¹⁵

Regarding the accessibility of websites, in 2019 the Law on Accessibility of Websites and Software Solutions for Mobile Devices of Public Sector Bodies was adopted.¹⁶ This Act transposes into Croatian legislation Directive (EU) 2016/2102 of the European Parliament and of the Council of 26 October 2016 on the accessibility of websites and mobile applications of public sector bodies (Text with EEA relevance) (OJ L 327, 2.12.2016). This Law seeks to ensure the accessibility of websites and software solutions for mobile devices of public sector bodies to users, especially persons with disabilities.

Central State Office for Digital Society Development in 2018 adopted the Strategic plan of the Central State Office for Digital Society Development for the period 2019-2021.¹⁷ It does not mention persons with disabilities or other disadvantaged groups but only the general goal of balanced and inclusive development of digital society for citizens and the economy. PWD can benefit as much as other citizens. For them, the planned strengthening of digital literacy, which should enable the use of digital services, is especially important. It is also important to connect and harmonise normative databases. This would enable a better insight into the regulations related to PWD in different sectors and a better orientation in exercising rights.

2.2 Disability inclusion in focused or sector-specific strategies on digitalisation and digital transformation

Education

Priorities concerning digitalisation and digital transformation in the school system are determined by the E-school programme. This programme is related to the implementation of the Strategy of Education, Science and Technology from 2014. The programme "e-Schools: Complete informatisation of school business processes and teaching processes in order to create digitally mature schools for the 21st century"¹⁸ began in 2015 with a pilot project. The programme has been run by CARNET since the beginning of its implementation. CARNET is a public entity operating within the Ministry of Science and Education in the field of information and communication technology and its application in education. Based on the pilot results the Croatian Academic and Research Network – CARNET began in 2018 the second phases of the programme - e-Schools: Development of a system of digitally mature schools (Phase II). By the end of 2022, the teaching and business processes in all schools in the Republic of Croatia financed from the state budget will be digitally transformed. Out of a total of 1 511 school locations, local computer networks have been developed at 1 413 locations by April 2021. A passive network has been built at 1 227 locations, and

¹⁵ Central State Office for the Development of the Digital Society (2016), The activities will be implemented in accordance with the Action Plan for the implementation of the Strategy (*Aktivnosti će se provesti sukladno Akcijskom planu za provedbu Strategije*), <https://rdd.gov.hr/strategija-e-hrvatska-2020/1577>.

¹⁶ Law on Accessibility of Websites and Software Solutions (2019).

¹⁷ Central State Office for the Development of the Digital Society (2019), Strategic plan of the Central State Office for the Development of the Digital Society for the period 2020-2022 (*Strateški plan Središnjeg državnog ureda za razvoj digitalnog društva za razdoblje 2020. - 2022. godine*), <https://rdd.gov.hr/pristup-informacijama/strategije-planovi-i-izvjesca/strateski-plan/103>.

¹⁸ e-Schools Programme (2018).

active network equipment has been installed in 403 schools. They now have a functional wireless network. In order to enable people with disabilities equal and efficient use of all these services and equal quality access to their functionalities and information, CARNET began testing the digital accessibility of 21 network sites, software solutions and digital content created in the e-School programme in 2021.¹⁹ As part of the e-School programme, digitally mature schools are schools with a high degree of ICT integration into the life and work of the school.

"In digitally mature schools, the approach to the use of ICT in school planning and management, as well as in teaching and business processes, is systematized. Such a school operates in a supportive environment, with adequate resources, which include not only financial resources but also adequately equipped classrooms, classrooms, staff and students with ICT equipment. Digitally mature schools systematically approach the development of digital competencies of educators and students, and educators use ICT to improve teaching methods that focus on students, develop digital educational content and evaluate student achievement, in accordance with learning outcomes and educational goals. Collaboration between staff and students and collaboration between the school and other stakeholders using online communication tools and e-services has been developed, which includes the school's participation in ICT-related projects."²⁰

As part of this project, a manual Digital Technology for Support of Special Educational Needs was developed (2018). All basic types of impairments in students are listed: visual impairments, hearing impairments, speech-language-voice communication disorders and specific learning difficulties, communication difficulties, specific difficulties learning, dyslexia, dysgraphia, dyscalculia, impairment of organs and organ systems, intellectual difficulties, behavioural disorders and mental health disorders, existence of several types of difficulties in psychomotor development, speech disorders, communication difficulties and Autism spectrum disorder. This document describes in great detail the assistive technology that can be used in the educational process as an aid in working with students who have the described disabilities.²¹ It is a manual that describes the different possibilities of using assistive technologies. Implementation depends on choosing the appropriate way and form of adjustment, it is important to work with the school's professional team as well as with parents. This handbook is used to introduce teachers and other school staff to the different types and methods of assistive technologies.

The manual states which devices are funded by the Croatian Health Insurance Institute (e.g., Braille typewriter, Electronic Magnifier Student, etc.) and which are not funded by the Croatian Health Insurance Institute (Braille printer is a device that prints content in Braille, used by parents to prepare materials for school),

¹⁹ e-Schools (2021), Information on the progress of the second phase of the e-School program (Informacije o napretku druge faze programa e-Škole)

<https://www.e-skole.hr/informacije-o-napretku-druge-faze-programa-e-skole-2/>.

²⁰ e-Schools (2018), Digital maturity of schools (*Digitalna zrelost škola*) <https://pilot.e-skole.hr/hr/rezultati/digitalna-zrelost-skola/>.

²¹ CARNET (2018), Digital Technology to Support Special Educational Needs (*Digitalna tehnologija za potporu posebnim odgojnoobrazovnim potrebama*), https://pilot.e-skole.hr/wp-content/uploads/2018/03/Prirucnik_Digitalna-tehnologija-za-potporu-posebnim-odgojno-obrazovnim-potrebama.pdf.

subsequent mentions: CARNET (2018).

There is no additional information on accessibility of mainstream developments beyond AT or special education mentioned above.

Health

The Strategic Plan for Health Development in the Republic of Croatia - SPeZ²² from 2014 is crucial for the digital transformation in healthcare. It mentions only the principles of fairness of services, accessibility, availability, sustainability, cooperation between different sectors and community participation. The needs and activities related to persons with disabilities are not mentioned. PWDs are mentioned only in relation to introduction of unique codebooks:

"In order to ensure the semantic interoperability of the system, it is necessary to introduce the following unambiguous codebooks / registers: register of persons with disabilities, drug codebook, material codebook, procedure codebook." (p. 47)

E-Health systems should enable the automatic production of standardized reports (e.g., number of people with disabilities), real-time reporting and alarming, the provision of data for statistical analysis, and provide support for the independent production of reports by different users. It is important for PWDs to automatically fill in health and other registers of public health interest (e.g., the current epidemiological situation of persons with disabilities).

E-consultation

The process of introducing e-Consultation is important for the inclusion of persons with disabilities in public life and the opportunity for them to participate in discussion and decision-making processes. The normative framework for the implementation of consultation with the interested public in the Republic of Croatia is determined by the Law on the Right to Information Access,²³ the Code of Consultation with the Interested Public in Procedures for Adopting Laws, Other Regulations and Amendments²⁴ and the Amendments to the Law on the Right to Information Access.²⁵ The main purpose of consultation and involving all participants is to gather information about their interests, views, proposals and interests related to a particular public policy.

Amendments to the Law on Information Access state that public consultation of state administration bodies is carried out via Internet portals or websites by publishing draft regulations, general acts or other documents. It is envisaged that consultation materials (when the consultation is expected to involve specific target groups) should be prepared in an accessible format, for example, in Braille, large print or audio formats.²⁶ (p. 20) This means that in an acceptable format they can write and send

²² Ministry of Health and Croatian Institute for Health Insurance (2014).

²³ Act on the Right of Access to Information (*Zakonom o pravu na pristup informacijama*), 15 February 2013, Narodne novine 25/13, https://narodne-novine.nn.hr/clanci/sluzbeni/2013_02_25_403.html.

²⁴ Croatian Government (2009), Code of consultation with the interested public in the procedures of enacting laws, other regulations and acts (*Kodeks savjetovanja sa zainteresiranom javnošću u postupcima donošenja zakona, drugih propisa i akata*), Narodne novine 140/09, https://narodne-novine.nn.hr/clanci/sluzbeni/2009_11_140_3402.html.

²⁵ Act on Amendments to the Act on the Right of Access to Information (*Zakon o izmjenama i dopunama Zakona o pravu na pristup informacijama*), 15 July 2015, Narodne novine 85/2015, https://narodne-novine.nn.hr/clanci/sluzbeni/2015_08_85_1649.html.

²⁶ Croatian Government - Office for Non-Governmental Organisations (2010), Guidelines for the Application of the Code of Consultation with the Interested Public in the Procedures of Adopting Laws, Other Regulations and Acts (*Smjernice za primjenu Kodeksa savjetovanja sa*

their comments and suggestions, read the comments of other participants and the answers of the proponents of the law in the public debate.

3 Do disability strategies address the potential of and challenges pertaining to digitalisation and digital transformation?

3.1 How digitalisation and digital transformation are addressed in the national disability strategy

The fundamental national strategy for persons with disabilities is the National Strategy for Equalization of Opportunities for Persons with Disabilities 2017 - 2020.²⁷ This strategy was adopted in April 2017. The strategy is still being implemented, until a new one is adopted. Digitalisation is especially emphasized in the chapters Informing, communication and awareness raising and Participation in public and political life. Due to the earthquake in Croatia in 2020, the goals related to High-risk situations also appeared in the centre of interest.

Most measures and activities related to digitalisation are in Chapter 9 Informing, communication and awareness raising:

“A major role in communication is also held by the development of technology which enables people with disabilities to have easier access to different information but also to facilitate communication, and it is therefore very important to encourage the development, production and distribution of new technological achievements. It is also a duty of all, both public authorities and the private sector, to take into account the fact that the information should be accessible to all citizens, that is to say that they are compatible with accessibility standards.” (p. 111)

Measure 2 is a crucial measure - Use new ICT technology to increase the independence and quality of life of people with disabilities. Three activities are included in this measure. First, make communication systems, e-services and information content of public authorities more accessible to persons with disabilities assisted by new technologies. For example, adaptation of the website of the central state portal www.gov.hr to the Guidelines on the availability of WCAG 2.0 web content.

The second activity - encourage public services to use a greater number of e-services through the *e-Građani* (e-Citizens) project and through public bodies dealing with information and communication with citizens in the form acceptable to persons with disabilities. The greater number of services provided means that, for example, the visually impaired will be able to better adapt the content of their websites at <https://www.gov.hr/>. It is important to strengthen the competencies of public administration employees for appropriate communication with PWDs.

Third activity- Continually sensitize employees in ICT systems of public institutions for the purpose of understanding the needs of and providing better quality services to persons with disabilities. (pp. 113,114)

Chapter 11 Participation in public and political life incorporates the goals by which digital technology aids political participation. Measure 1 provides technical support in

²⁷ Croatian Parliament (2017), National Strategy for Equalization of Opportunities for Persons with Disabilities 2017 – 2020 (*Nacionalna strategija za izjednačavanje mogućnosti osoba s invaliditetom 2017.-2020.*), https://www.un.org/development/desa/disabilities/wp-content/uploads/sites/15/2019/10/Croatia_National-Strategy-of-Equalization-of-Opportunities-for-Persons-with-Disabilities.pdf.
subsequent mentions: Croatian Parliament (2017).

order to provide people with disabilities with access to basic relevant documents for political participation. An analysis of the availability of documents for all people with disabilities and equipment available at all levels of political activity (scanners, Braille printers, etc.) is planned. The intention is to achieve the availability of documents of different formats according to the needs of people with disabilities and provide the necessary equipment (scanners, Braille printers, etc.). (pp. 126, 137)

Due to two major earthquakes in 2020, the chapter High-risk situations and humanitarian crisis states gained special importance.

“Define appropriate supplementary ways of alerting people with disabilities, different from standard ways which are used for public alert purposes, especially introducing the use of new technologies and introducing new operational communication procedures, focusing on adapting the transfer of information to appropriate categories of disability.” (p. 148)

The COVID pandemic has been taken into account, although this part of the Strategy is more focused on future crises and natural disasters (earthquakes, floods, fires, etc.). Implementation depends on municipal and regional authorities.

The Report on the Implementation of the Strategy (last available for 2019)²⁸ deals mainly with the adjustment of communication. Several examples of the adjustment of services include the availability of services and library materials. In 2019, a new online service of the City of Zagreb was developed, called Affordable Zagreb, which provides information on accessibility to various facilities from the public, private and civil sectors. In the reporting period, the interface for electronic voting at the sessions of the City Assembly of the City of Zagreb was improved according to the needs of city representatives with disabilities. The report does not contain a comprehensive analysis of situation regarding digital accessibility, but several such examples of good practice are described. It states that the task of using new digital technologies in order to increase the independence and quality of life of PWD has been only partially achieved.

In the Report for year 2020,²⁹ the Ombudsperson for Persons with Disabilities analyses the implementation of the Strategy for Equalization of Opportunities for Persons with Disabilities 2017-2020 and the preparations for the development of a new strategy. One of the proposals is to add a new goal: Ensuring digital accessibility and ensuring the accessibility of information and communication services of public bodies. The Ombudsperson believes that this goal needs to be developed through activities that will further ensure the actual implementation and compliance with the provisions of the Law on Accessibility of Websites and Software Solutions for Mobile Devices of Public Sector Bodies which in September 2019 came into force.³⁰ The proposal to add a new target is based on the Ombudsman's complaints about digital accessibility and the

²⁸ Ministry of Labour, Pension System, Family and Social Policy (2020), Report on the implementation in 2019 of the National strategy for equalization of opportunities for persons with disabilities from 2017 to 2020 (*Izvešće o provedbi nacionalne strategije izjednačavanja mogućnosti za osobe s invaliditetom od 2017. do 2020. godine za 2019. godinu*), <https://mrosp.gov.hr/UserDocImages/dokumenti/Socijalna%20politika/Izvj%C5%A1%C4%87e%20o%20provedbi%20mjera%20Nacionalne%20strategije%20za%202019.%20godinu.pdf>.

²⁹ Ombudsman for Persons with Disabilities (2021), Report of the Ombudsman for 2020 (*Izvešće o radu Pravobraniteljice za osobe s invaliditetom za 2020. godinu*), <https://posi.hr/wp-content/uploads/2021/04/Izvjescje-o-radu-Pravobranitelja-za-osobe-s-invaliditetom-za-2020.-godinu.pdf>.

subsequent mentions: Ombudsman for Persons with Disabilities (2021).

³⁰ Law on Accessibility of Websites and Software Solutions (2019).

concerns of the UN Committee on the Rights of Persons with Disabilities that accessibility is still narrowly interpreted in terms of physical environment and transport, while information and communication services are neglected. According to the Ombudsperson, these problems have become especially important due to the COVID pandemic from 2020. The Ombudsperson notes that it is not known whether these proposals have been included in the proposals of the new National Strategy. (p. 172)

3.2 How digitalisation and digital transformation are addressed in specific disability-related strategies

The key national development strategy that includes digital transformation is the National Development Strategy of the Republic of Croatia until 2030 which was adopted in February 2021. The strategy is focused on four development areas (sustainable economy and society, strengthening their resilience to crises, green and digital transition, and balanced regional development). The link between persons with disabilities and digitalisation is mentioned in Horizontal priorities: promoting equality and equal opportunities. The Strategy states that persons with disabilities deserve the same opportunities as other citizens:

"In the implementation of all public policies, Croatia will also take into account the specific characteristics of persons with disabilities, with special emphasis on ensuring equal access to education, employment and all public services. In the digitalisation of public services, special attention will be paid to the incorporation of the principle of accessibility in all digital content for all citizens."³¹

Education

The 2014 Education, Science and Technology Strategy³² is the most important strategy in the field of education. Digitalisation is perceived as an important opportunity in the education system that can help learners with special needs.

"Furthermore, information and communication technologies (ICT) provide modern opportunities of adjustment to personal learning styles, collaborative learning and acquiring skills for project work and teamwork, as well as providing access to a wider range of learners (learners with special needs, learners in remote locations, foreign learners, etc.). (p. 36)

Emphasis is placed on creating digital materials that are tailored to students with learning disabilities.

"Therefore, additional content, tools and methods for the use of information and communication technologies (ICT) in teaching and learning must be developed and teachers must be trained in order to develop digital competences." (p. 72)

Assistive technology is explicitly mentioned in higher education in measure 6.4.4: Ensure assistive technology and teaching assistants for students with disabilities

³¹ Croatian Parliament (2021).

³² Ministry of Science, Education and Sports (2014), Strategy for Education, Science and Technology. New colours of knowledge (*Stratefija obrazovanja, znanosti i tehnologije. Nove boje znanja*) <https://mzo.gov.hr/UserDocsImages/dokumenti/Obrazovanje/Strategija%20obrazovanja,%20znanosti%20i%20tehnologije.pdf>.
subsequent mentions: Ministry of Science, Education and Sports (2014).

(p. 177). Institution responsible for implementation are Rectors Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions.

More information about the importance of digitalisation for students with disabilities in higher education can be found in the National Plan for Improving the Social Dimension of Higher Education in the Republic of Croatia 2019-2021 and the Guidelines for Improving the Support System for Students with Disabilities in Higher Education in the Republic of Croatia,³³ which are part of this National Plan. These documents can be interpreted as implementation documents of the Strategy.

These documents include support for students, prospective students, teachers, administrative and professional staff at universities as a form of support at universities. Information, lectures, workshops, consultations and education are planned in order to ensure individualized adjustments in teaching and exams, adaptation of teaching materials, production and adaptation of audio recordings of lectures, video recording and subtitling of lectures, digitalisation of literature, launching e-courses accessible to persons with disabilities (p. 8). Special attention was paid to copyright. Pursuant to Article 86 of the Copyright and Other Related Rights Act,³⁴ digitalised teaching literature or other acceptable formats of literature are provided to students with visual impairments and students who have difficulty reading.

In the preparation and implementation of the Strategy, some challenges relating to higher education were highlighted. Experts from the Study of Social Work in Zagreb stated that students with disabilities recognize that the people make the system and that it is not enough to rely on technological advances that make it easier to follow lectures, but it is necessary to educate teaching and non-teaching staff further systematically.³⁵

A survey conducted by the Office of the Ombudsman for Persons with Disabilities provided some information on the implementation of the Strategy and the Plan.³⁶ The survey was conducted in preparation for the professional conference Challenges of Studying with Disabilities. When asked about assistive technology, the most common answers were either that there is no need for assistive technology, or it is not available. Thus, it is rarely used. The available tools are most often computers / laptops or mobile phones with a built-in speech unit and screen reader, electric magnifier, audio reader, voice recorder and player. (p. 134)

³³ Glavaš Kiš, L. (ed.) (2016), Guidelines for Improving the Support System for Students with Disabilities in Higher Education in the Republic of Croatia (*Smjernice za unapređenje sustava potpore studentima s invaliditetom u visokom obrazovanju u Republici Hrvatskoj*). Ministry of science and education, <https://mzo.gov.hr/UserDocImages/dokumenti/Obrazovanje/VisokoObrazovanje/RazvojVisokogObrazovanja/Smjernice%20za%20unapre%C4%91enje%20sustava%20potpore%20studentima%20s%20invaliditetom%20u%20visokom%20obrazovanju%20u%20Republici%20Hrvatskoj.pdf>.

³⁴ Copyright and Related Rights Act (*Zakon o autorskim i srodnim pravima*), 8 November 2018, <https://www.zakon.hr/z/106/Zakon-o-autorskom-pravu-i-srodnim-pravima>.

³⁵ Urbanc, K., Laklija, M., Milić Babić, M., Branica, V. (2014), Multidimensional analysis of social inclusion of students with disabilities in higher education - qualitative research (*Multidimenzionalna analiza socijalne uključenosti studenata s invaliditetom u visokoškolskom obrazovanju – kvalitativno istraživanje*), In: Uzun, T. (ed.): Multidimensional analysis of social inclusion of children with disabilities and students with disabilities in the educational process, Research report (*Multidimenzionalna analiza socijalne uključenosti djece s teškoćama u razvoju i studenata s invaliditetom u obrazovnom procesu, Izvješće o istraživanju*), Hrvatski savez gluhoslijepih osoba Dodir, pp. 21-35.

³⁶ Ombudsman for Persons with Disabilities (2021).

In the implementation of the National Curriculum for Primary and Secondary School Students, the Framework for Encouraging and Adapting Learning Experiences and Evaluating the Achievements of Children and Students with Disabilities of 2017,³⁷ is important for the issue of digitalisation. The use of digital technologies is important in adapting the environment. The introduction of assisted communication and the adaptation of materials have been specially elaborated. All types of assistive technology are listed. Medium-tech aids include calculators, audio calculators, sound recorders, audiobooks, inductive loop, sound systems for deaf and hard of hearing students, Braille typewriter. High-tech aids include specialised software solutions (software solutions that convert text to speech, i.e., speech to text, software solutions for reading, specialised communication devices, specialised access to computers, etc.). The use of assistive technology in this document implies a wide range of technological approaches.

Elements of this framework have been incorporated into the Distance Learning Action Plan³⁸ (as a document for the operational implementation of curriculum reform) adopted in 2020. A special part of the Distance Learning Action Plan concerns children with learning difficulties. The Plan also states the results so far. In December 2019, the centres and schools where students with disabilities are educated received an additional HRK 4 million for the purchase of equipment (specialised assistive technology for students with disabilities). With the purchase of this equipment, infrastructurally prepared centres and schools with students with disabilities have been prepared for the implementation of distance learning. Also, the Ministry enabled the centres to independently make decisions on the distribution of equipment (assistive technology) to students to work from home, given that they are most aware of the needs of students, which made it easier for institutions to establish systems and communication. A systematic evaluation of this document has not yet been carried out.

In 2017, the Ombudsman for Persons with Disabilities collected data on number of children who used assistive technologies in centres for the education of children with disabilities, information on who is responsible for conducting assessments for the required type of equipment, where the funds for their procurement come from and whether they have funds to purchase new ones, how evaluation is conducted and what they believe should be done for better use. It can be seen from the answers that the centres understand the importance of the application of assistive technology, but they pointed out that additional education about new technologies would be useful. The centres stated that they apply technology on a daily basis in the teaching process and that it is individualised. The problem is that everyone faces a lack of financial resources for the purchase of assistive devices, there is a need for more frequent and timely education, but also the presentation of new and modern technical achievements.³⁹

³⁷ Ministry of Science, Education and Sports (2017), A framework for encouraging and adapting learning experiences and evaluating the achievements of children and students with disabilities. Final proposal (*Okvir za poticanje i prilagodbu iskustava učenja te vrednovanje postignuća djece i učenika s teškoćama. Konačni prijedlog*), <http://www.kurikulum.hr/wp-content/uploads/2016/02/Okvir-djeca-i-ucenici-s-teskocama.pdf>.

³⁸ Ministry of science and education (2020), Distance Learning Action Plan (*Akcijski plan za provedbu nastave na daljinu*), <https://mzo.gov.hr/UserDocsImages//dokumenti/Obrazovanje/NastavaNaDaljinu//Akcijski%20plan%20za%20provedbu%20nastave%20na%20daljinu%20-%20Model%20nastave%20na%20daljinu.pdf>.

³⁹ Ombudsman for Persons with Disabilities (2018), Report of the Ombudsman for 2017 (*Izvešće o radu Pravobraniteljice za osobe s invaliditetom za 2017. godinu*), <http://posi.hr/wp-content/uploads/2018/04/Izvj%C5%A1%C4%87e-o-radu-Pravobranitelja-za-osobe-s-invaliditetom-2017..pdf>.

In Croatia, several other projects have been implemented that are not directly related to the implementation of national strategies. The projects Competence network based on information and communication technologies for innovative services for people with complex communication needs (ICT-AAC) and Reconciliation of parenting and business life through multidisciplinary social services (MULTI-SKLAD) were implemented in cooperation with four faculties from Zagreb (Faculty of Electrical Engineering and Computing, Faculty of Education and Rehabilitation Sciences, Faculty of Graphic Arts and Faculty of Philosophy). This is followed by the cooperation between the UNICEF Office for Croatia and the Faculty of Education and Rehabilitation Sciences and the Faculty of Electrical Engineering and Computing, University of Zagreb. From 2016 to 2018, they implemented the project Building national capacities for the application of assisted communication (AS) as a method of early intervention for children aged 0-8 with developmental disabilities / difficulties.⁴⁰

With the support of UNICEF in 2019 and 2020, experts from the Faculty of Electrical Engineering and Computing, Faculty of Education and Rehabilitation conducted a project Communication for every child - Application of 21st century technology to promote communication, education and social inclusion of young children with --delays and developmental difficulties.⁴¹ Assistive technology, computer equipment and one hundred tablets worth almost HRK 600 000 have been provided for the institutions included in the programme. 310 experts from 106 institutions were trained, including health care institutions, institutions from the social welfare system, kindergartens and civil society organisations, and 19 private institutions from Croatia. More than 600 children were included in the programme. The open-source mobile application Cboard, which converts text into speech and facilitates communication with the help of symbols, has been translated and adapted to the Croatian language. UNICEF has supported updating 23 existing applications that help children with complex communication needs.

Health

In the Recovery and Resilience Plan 2021-2021⁴² important attention is paid to the digital transformation in healthcare. It is planned to accelerate the digitalisation and application of new methods and technologies in healthcare, including telemedicine and medical robotics. The fight against the COVID-19 pandemic has accelerated these processes.

The key strategic document for the development of health care in Croatia is the National Health Strategy 2012-2020.⁴³ The parts Informatisation and eHealth (p. 322) and Health of Persons with Disabilities (p. 101) are especially important for this

⁴⁰ UNICEF, Faculty of Electrical Engineering and Computing, Faculty of Education and Rehabilitation Sciences (2018), Building national capacities for the application of assisted communication (AS) as a method of early intervention for children aged 0-8 with developmental disabilities / difficulties (*Izgradnja nacionalnih kapaciteta za primjenu potpomognute komunikacije kao metode rane intervencije za djecu od 0-8 godina s razvojnim odstupanjima/teškoćama*) <http://rain.ict-aac.hr/2018/08/29/isaac-konferencija-2018/>.

⁴¹ UNICEF (2020), UNICEF has invested HRK 15 million to support children with disabilities (*UNICEF uložio 15 milijuna kuna za podršku djeci s teškoćama*) <https://www.unicef.org/croatia/mediji/unicef-ulozio-15-milijuna-kuna-za-podrsku-djeci-s-teskocama>.

⁴² Croatian Government (2021), Recovery and Resilience Plan 2021-2026.

⁴³ Ministry of Health (2012), National Health Care Strategy 2012 – 2020 (*Nacionalna strategija razvoja zdravstva 2012-2020.*), <https://zdravlje.gov.hr/UserDocsImages/dokumenti/Programi,%20projekti%20i%20strategije/Nacionalna%20strategija%20zdravstva%20-%20za%20web.pdf>.

analysis. There is no explicit link between digital transformation and persons with disabilities in these parts. The Central Health Information System of Croatia (CEZIH) and Telemedicine are also mentioned, but without a specific indication of the benefits for persons with disabilities (except for ordering health services) (p. 327). Persons with disabilities are most represented in the chapter Accessibility of medicines and orthopaedic and other aids. In this part, the Strategy deals almost exclusively with the prices of medicines, aids and material possibilities of society and the state.

Adoption of the Ordinance on Amendments to the Ordinance on Orthopaedic and Other Aids and the Ordinance on Amendments to the Ordinance on the Procedure for Placing Orthopaedic and Other Aids on the Basic and Additional List of Orthopaedic and Other Aids⁴⁴ and Pricing of Orthopaedic and Other Aids enables the placement of modern aids which apply modern technologies, on the lists of aids of the Croatian Health Insurance Fund, and at the same time a greater possibility of choice and availability of aids to insured person. Modern devices of the new generation include aids for the urogenital system, breathing aids, digital canal hearing aids, etc.

The Ombudsperson for Persons with Disabilities warns in the 2020 Report⁴⁵ that it is necessary to establish procedures and protocols for the procurement of assistive devices that will be applicable and useful to the persons for whom they are prescribed. In its response to the Ombudsperson, the Croatian Health Insurance Fund emphasized that it continuously provides additional funds within realistic limits. Thus, the financing of the procurement of aids is emphasized as the main problem. Croatian Health Insurance Fund undertakes to strive to provide insured persons with the right to modern technologies and modern aids with the aim of equal participation of persons with disabilities in society and everyday life. (p. 106) The Ombudsman warns that there are criteria that are sometimes too rigid. For example, a person is entitled to a new wheelchair, but is not entitled to spare parts for an old wheelchair that he would like to continue using.

However, there is no explicit link between eHealth and the issues of persons with disabilities or accessibility in the documents described above.

Reading

The National Strategy for Encouraging Reading from 2017⁴⁶ is interesting. This strategy is planned to be implemented in coordination with the implementation of the measures of the National Strategy for Equalization of Opportunities for Persons with Disabilities from 2017 to 2020. One of the basic tasks is to ensure the availability of books and other reading materials by increasing the production and availability of reading materials for people with reading difficulties. The strategy plans to increase publication and ensure the availability of reading materials for people with reading difficulties (p. 54) with clear indicators (number of published materials adapted for

⁴⁴ Croatian Health Insurance Institute (2020), Instructions on basic and additional list of orthopedic and other aids (*Naputak o osnovnoj i dodatnoj listi ortopedskih i drugih pomagala*), https://hzzo.hr/sites/default/files/inline-files/Naputak%20o%20listama%20pomagala%201-12-2020_0.pdf.

⁴⁵ Ombudsman for Persons with Disabilities (2021).

⁴⁶ Croatian Government (2017), National Strategy for Encouraging Reading 2017-2022 (*Nacionalna strategija poticanja čitanja 2017.-2022*). In: Ministry of Culture (2017) Let's read so that we don't get speechless (*Čitajmo da ne ostanemo bez riječi*). https://min-kulture.gov.hr/UserDocsImages/dokumenti/Nacionalna%20strategija%20poticanja%20%C4%8Ditanja_tekst.pdf.

people with disabilities) and funding from the state budget and European Social Fund funds. (p. 55)

This part of the Strategy which relates to people with disabilities is implemented through the tender Through reading to inclusive society, which was open from December 2020 to February 2021. The tender refers to the National Strategy for Encouraging Reading, and one of the target groups is persons with disabilities (together with Roma people, older than 54, unemployed, younger than 25). The tender also includes the procurement of the necessary equipment to increase reading accessibility.

Public funds significantly increase the availability of digitalised books. There is a specialised library for the blind in Zagreb. The Croatian Library for the Blind, among other things, produces and borrows audio books.⁴⁷ The Library also has three studios for recording audio books. A number of public libraries have special departments with materials for the blind and visually impaired, which are not only in large cities but also in several smaller ones (e.g., Poreč, Đurđevac).

The network of public libraries exists in all parts of Croatia and these two processes (accessibility for PWDs and digitisation) create new opportunities for PWDs. Experts from libraries in Koprivnica describe it in the following words:

"Digital inclusion or bridging the digital divide between those who have and those who do not have access to information and communication technology is ensured by libraries with access to computer equipment and the Internet, then by providing free library instruction to users in information, information and library literacy, mostly children and adults. There are also robotics workshops, as well as a training programme on how to use the Government e-Citizen service."⁴⁸

⁴⁷ Croatian library for the blind persons (*Hrvatska knjižnica za slijepce*) <https://www.hkzasl.hr/>.

⁴⁸ Sabolović-Krajina, D. (2019), Inclusive library services on the examples of Reykyavik City Library and "Fran Galović" Library and Reading Room Koprivnica (*Inkluzivne knjižnične usluge na primjerima Gradske knjižnice Reykyavik i knjižnice i čitaonice „Fran Galović“ Koprivnica*) <https://epale.ec.europa.eu/hr/blog/inkluzivne-knjiznicne-usluge-na-primjerima-gradske-knjiznice-rejkyavik-i-knjiznice-i-citaonice>.

4 Promoting disability inclusion through funding, education and training

4.1 How funding promotes disability-inclusive digitalisation and digital transformation

Digital accessibility requirements are set out in both key documents regulating funding through the European Structural and Investment Funds in Croatia.⁴⁹ All activities within the Operational Programme 'Competitiveness and Cohesion'⁵⁰ must take into account gender equality, non-discrimination and sustainable development as horizontal principles of the programme.⁵¹ The application of these principles depends on the nature and scope of the project and its activities and on the conditions of a particular tender. The contribution to all horizontal principles is not mandatory for each individual project but is applied in accordance with the activities and scope of the project, as well as the information contained in the Guidelines for Applicants. Within the area related to accessibility for persons with disabilities, one special area relates to information and communication accessibility.

Forms of information and communication accessibility differ depending on the type of impairment. Examples of its application are:

- Braille for the blind;
- sign language for deaf people;
- trained translators and intervenors for deafblind people who know all forms of communication used by deafblind people (tactile sign language, palm writing, etc.) or
- texts which are easy to read and understand for people with intellectual disabilities.

While there were many projects funded through this Operational Programme which focused on digital transformation, digital accessibility was there not a primary objective, but the principle which project beneficiaries should follow while pursuing the main project objective. For example, within a category 'Generic investment in production in SMEs' funds were awarded to a company Vidi-to.⁵² The goal of the project was to improve company web pages, and increasing accessibility was one of the principles which underlined that activity.

When designing web pages, one should take into account their optimal functionality for people with different functional abilities, i.e., one should ensure the availability of content through more than one sense, i.e. in accordance with the Web Content Accessibility Guidelines developed by the Web Accessibility Initiative - WAI. Website

⁴⁹ Two operational programmes described here (Competitiveness and Cohesion and Efficient Human Resources) are the most important sources of funding through ESIF in Croatia. There is no information about other programmes or sources of funding being directly linked to digital accessibility.

⁵⁰ Operational Programme Competitiveness and Cohesion 2014 – 2020.

⁵¹ Ministry of regional development and EU funds (2016), Guidelines for applicants and beneficiaries of the Operational Programme Competitiveness and Cohesion on the implementation of horizontal principles (*Upute za prijavitelje i korisnike operativnog programa Konkurentnost i kohezija o provedbi horizontalnih načela*), <https://strukturnifondovi.hr/wp-content/uploads/2017/03/Upute-za-prijavitelje-horizontalna.pdf>.

⁵² Ministry of regional development and EU funds (2020), List of operation (*Popis operacija*), https://strukturnifondovi.hr/wp-content/uploads/2020/12/Popis-operacija-OPKK-2014-2020_30112020.xlsx.

designers and developers should use these guidelines to increase network accessibility.

Applicants may also refer to the Accessibility Requirements for Public Procurement of Information and Communication Technology (ICT) Products and Services in Europe. Functional accessibility requirements can be used as technical specifications for the procurement of standardized ICT products. The user can choose one of the prepared "packages" of requirements that are the most common subject of procurement. If prepared application "packages" are not available or appropriate, relevant requirements in terms of functional accessibility are also available. Although accessibility requirements related to ICTs are not legally required⁵³, applicants should consider their inclusion in line with the scope of their project and the intended target groups. The specific tender dossier may set out minimum eligibility conditions or selection criteria.

Operational Programme Efficient Human Resources 2014-2020 also envisages the implementation of activities that promote equal opportunities and combat discrimination or disadvantage based on race or ethnicity or skin colour, gender, language, religion, political or other beliefs, national or social origin, wealth, trade union membership, education, social status, marital or family status, age, health status, disability, genetic inheritance, gender identity, expression or sexual orientation.⁵⁴ The promotion of equal opportunities is carried out during the preparation, development and implementation of the Operational Programme, and in particular with regard to access to funding, taking into account the needs of different target groups at risk of discrimination, in particular requirements to ensure access for persons with disabilities. Equal opportunities and non-discrimination are fundamental principles of this operational programme. Therefore, a clear and direct link to these principles should be demonstrated in all activities or operations. In Guidelines for applicants⁵⁵ for the projects submitted in the field of education digital accessibility is stated as one of the ways in which relevant projects can demonstrate adherence to these principles, especially principle of equal opportunities and non-discrimination.

In those Guidelines applicants are referred to comprehensive guidelines on the needs of students with disabilities and on the principles of inclusive education Guidelines for the application of ICT in working with students with special educational needs⁵⁶ where they can find instructions on motivation and teaching, the use of assistive technology, cooperation with parents and the local community to raise awareness of diversity and the principle of non-discrimination.

⁵³ The Guidelines for applicants and beneficiaries of the Operational Programme Competitiveness and Cohesion on the implementation of horizontal principles state (p. 30): "Although accessibility requirements related to information and communication technologies are not legally mandatory, applicants should consider their involvement in line with the scope of their project and intended target groups." Therefore, accessibility is highly recommended, but not compulsory.

⁵⁴ Operational Programme Efficient Human Resources 2014 – 2020.

⁵⁵ Ministry of Labour and Pension System (2019), Guidelines for applicants and beneficiaries of the Operational Programme Efficient Human Resources for the period 2014-2020 on the implementation of horizontal principles (*Upute za prijavitelje i korisnike Operativnog programa Učinkoviti ljudski potencijali za razdoblje 2014. – 2020. o provedbi horizontalnih načela*), <http://www.esf.hr/wordpress/wp-content/uploads/2019/04/Upute-HT-final-2012..pdf>.

⁵⁶ Croatian Academic and Research Network – CARNET (2018), Guidelines for the application of ICT in working with students with special educational needs (*Smjernice za primjenu informacijsko-komunikacijskih tehnologija u radu s učenicima s posebnim odgojno-obrazovnim potrebama*), https://www.e-skole.hr/wp-content/uploads/2018/10/Smjernice_za-primjenu_IKT-a_u_radu_s_ucenicima_s-osebno_odgojno-obrazovnim_potrebama.docx.

Croatian Academic and Research Network - CARNET defines mandatory requirements for ensuring digital accessibility in public procurement procedures of websites and software solutions that it implements, which bidders and contractors are obliged to meet, as well as additional recommendations whose application is not mandatory but desirable, in order to provide equal quality access to information and functionality of digital content and applications to all users.⁵⁷

For all persons with any form of disability (visual, hearing, speech, motor, cognitive and neurological impairments), some of whom use assistive technology, it is necessary to provide at least one additional mode that allows the use of digital content and applications in same manner as for people without disabilities and people who do not need to use assistive technology. When ensuring accessibility, digital content should be prepared for screen readers on all platforms for which they are developed (Windows 10, Mac OS, iOS, Linux, Android), according to the guidelines for accessibility of content of each platform, and the requirements specified in Digital Accessibility Guidelines must be met.⁵⁸ This is the document developed by the Croatian Academic and Research Network - CARNET in cooperation with the Centre for Research, Education and Application of New Knowledge UP2DATE with the review and supplement of the Association of Persons with Disabilities of Croatia - SOIH and the Croatian Association of the Blind.

4.2 How disability inclusion is promoted through the education and training of digital professionals

As part of the undergraduate study at the Faculty of Electrical Engineering and Computing a course Adaptability and accessibility of mobile and web applications is implemented.⁵⁹ The aim of the course is to develop mobile and web applications, user interface development, user-oriented design, ergonomics, usability and usability evaluation, accessibility and design of accessible user interfaces, assisted communication and applications. After successfully completing the course, students can: 1. Recognize the importance of standards and legal solutions in the field of ergonomics 2. Explain the basic principles of building user interfaces 3. Distinguish ergonomic factors when working with computers 4. Customize user interfaces to increase the usability of software solutions 5. Analyse the possible health risks in the workplace with computers 6. Recognize the importance and necessity of universal design and the diversity of users of ICT systems 7. Analyse the needs of users with disabilities and identify appropriate assistive technology to interact with the computer 8. Analyse the accessibility of web hosts 9. Design accessible user interfaces. While the fact that Faculty of Electrical Engineering and Computing is offering this course represents a positive development, there is no information about the actual implementation of this course or its impact.

This faculty, in cooperation with the Croatian Network Regulatory Agency (HAKOM), has organised a series of annual conferences Persons with Disabilities in the Digital

⁵⁷ Croatian Academic and Research Network – CARNET (2019), Digital Accessibility Guidelines (*Smjernice za osiguravanje digitalne pristupačnosti*), <https://www.carnet.hr/wp-content/uploads/2019/11/Smjernice-digitalne-pristupac%CC%8Cnosti-ver.-1.1.pdf>.

subsequent mentions: CARNET (2019).

⁵⁸ CARNET (2019).

⁵⁹ Faculty of Electrical Engineering and Computing (2018), ECTS information package for the academic year 2018/2019 (*Informacijski paket ECTS-a za akademsku godinu 2018./2019.*), https://www.fer.unizg.hr/download/repository/2018_FER3-HR-Informacijski_Paket_ECTS-a-Red_Predavanja-Preddiplomski.pdf.

Society with the aim of raising public awareness of the challenges faced by persons with disabilities in the digital society.⁶⁰

4.3 How digital inclusion and accessibility is addressed in the education and training of accessibility and inclusion professionals

The State School of Public Administration conducts the course Digital Accessibility. This course was jointly designed by representatives of the Central Office for the development of the digital society and the Office of the Commissioner for Information, in cooperation with the Association of organisations of persons with disabilities and the Croatian Association of the Blind and the National School of Public Administration, relating to the implementation of the Law on the accessibility of web pages and software solutions for mobile devices of public sector bodies.⁶¹ The online course is conducted through the MoD e-learning system developed by the Sreće University Computing Centre. Each participant receives a digital badge and a certificate from the State School of Public Administration for the completed course.

The course presents the relevant international and national legislative framework relating to obligations of public sector bodies to ensure the accessibility of the digital content of their websites. Participants are introduced to the barriers that people with various disabilities face in accessing digital content, the principles of digital accessibility, criteria and elements of digital accessibility, and they also acquire knowledge about the implementation of initial accessibility assessment, disproportionate load assessment and accessibility statement. Online courses are held in order to provide as many public sector bodies as possible with basic knowledge about the implementation of the Act and to raise awareness of the importance of accessibility of digital content and e-services for all citizens.⁶²

There is no special course dealing with the topic of digital accessibility in the narrow sense at the most important higher education institution that educates professionals who work with people with special needs, Faculty of Education and Rehabilitation Sciences. There is a graduate course Assistive and Rehabilitation Technology, which aims to acquaint students with theoretical and practical knowledge and skills for the use and application of assistive and rehabilitation technology and software in education and rehabilitation, and the design, implementation, evaluation and modification of individual plan in the application of assistive and technology rehabilitation.⁶³ The course is focused on the following issues:

- classification of assistive and rehabilitation technology;
- the role of assistive technologies to improve the quality of life of people with disabilities;
- categories of software and hardware used for people with disabilities (with special emphasis on people with physical disabilities and chronic diseases);

⁶⁰ Ombudsman for Persons with Disabilities (2020), Persons with Disabilities in the Digital Society (*Osobe s invaliditetom u digitalnom društvu*). <https://posi.hr/osobe-s-invaliditetom-u-digitalnom-drustvu/>.

⁶¹ Law on Accessibility of Websites and Software Solutions (2019).

⁶² Central State Office for Digital Society Development (2020), The first online course Digital Accessibility was held (Održan prvi online *tečaj Digitalna pristupačnost*), <https://rdd.gov.hr/vijesti/odrzan-prvi-online-tecaj-digitalna-pristupacnost/1450>.

⁶³ Faculty of Education and Rehabilitation Sciences (2018), ECTS information package for the academic year 2018/2019 (*Informacijski paket ECTS-a za akademsku godinu 2018./2019.*), https://www.erf.unizg.hr/docs/ERFUNIZG_informacijski_paket_2018-2019_diplomski_HR.pdf.

- successful implementation of assistive technology (initial needs estimate, monitoring and evaluation);
- good and bad implementation of assistive technology;
- assistive technology in the process of education and rehabilitation;
- creation, implementation, assessment and modification of individual plans using assistive technology;
- interdisciplinary cooperation in the process of creating and applying assistive and rehabilitation technology;
- analysis and interpretation of contemporary research in this field.

4.4 How digital inclusion is addressed via the training of people with disabilities

There are no regular structured education programmes for persons with disabilities related to these topics. Occasionally, some organisations conduct workshops or trainings aimed at providing support to persons with disabilities in order to facilitate their inclusion into the digital society, and most of these activities are carried out within projects. Below are a few examples.

The Croatian Association of Organisations of Persons with Intellectual Disabilities is implementing the project Information Workshops for Persons with Intellectual Disabilities.⁶⁴ The aim of the project is to include people with intellectual disabilities in all activities of modern society through the acquisition of basic skills and knowledge in the use of computers, in order to master new knowledge that will help them in employment in the open labour market. The programme focuses on using basic tools for leisure entertainment (drawing, listening to music) and mastering the skills to use in a business environment, sending and receiving e-mail, searching websites, writing in MS Word). The workshop is attended by members of the Association for the Support of Persons with Intellectual Disabilities of the City of Zagreb and users of the Rehabilitation Centre Zagreb.

The project InPULS - IT workshops for the increase of competitiveness of people with cerebral palsy and polio in the labour market was implemented from 2014 to 2016 by the Croatian Cerebral Palsy Association. The workshops were held in cooperation with local associations of persons with disabilities. Cities throughout Croatia (10 counties) were included. 170 people with disabilities participated in the courses.⁶⁵ The workshops were held in the premises of the Association, where mobile IT classroom was set up. As part of the workshops, a course for ECDL operators was organised.

Association of Persons with Physical Disabilities of the City of Sinj is conducting IT workshops in the association's premises within the project 'Educated-Included'.⁶⁶ All interested members can get involved in this project with the purpose of acquiring new knowledge of working on a computer and socializing with other members.

⁶⁴ Croatian Association of Organisations of Persons with Intellectual Disabilities (2019), IT Workshops for Persons with Intellectual Disabilities (*Informatičke radionice za osobe s intelektualnim teškoćama*), <http://www.savezosit.hr/informaticke-radionice-za-osobe-s-intelektualnim-teskocama/>.

⁶⁵ Croatian Cerebral Palsy Association (2017), InPuls closing conference (*InPuls završna konferencija*), <https://www.hsucdp.hr/inpuls-zavrsna-konferencija/>.

⁶⁶ Association of Persons with Physical Disabilities of the City of Sinj (2011), IT workshops in the association's premises (*Informatičke radionice u prostorijama udruge*), <http://utis.hr/2011/09/12/informaticke-radionice-u-prostorijama-udruge/>.

An interesting example is URIHO (Institution for professional rehabilitation and employment) from Zagreb. From 2009 to 2016, this institution implemented various projects in a virtual workshop.⁶⁷

"In the Virtual Workshop, with advanced IT equipment, with appropriate software support and specially trained trainers real work situations are simulated from financial and accounting departments, procurement, sales, marketing, storage of raw materials and finished products, administrative and similar jobs."(p. 2)

⁶⁷ URIHO (2016), URIHO Virtual Workshop 2009-2016 From idea to standard of vocational rehabilitation services (*URIHO-va Virtualna radionica 2009-2016 Od ideje do standarda usluga profesionalne rehabilitacije*), [http://www.vr-radimoucimo.hr/file/files/Priru%C4%8Dnik%20virtualna%20\(final\).pdf](http://www.vr-radimoucimo.hr/file/files/Priru%C4%8Dnik%20virtualna%20(final).pdf).

5 The opportunities and challenges presented by digitalisation and digital transformation to the rights of persons with disabilities

5.1 The most significant opportunities presented by digitalisation and digital transformation for persons with disabilities

Accelerated digitisation, especially in the context of a global pandemic has created a number of opportunities for persons with disabilities, as well as a number of challenges. The Ombudsman for Persons with Disabilities thus points out that in the past period, digital accessibility has become a more common practice. Regular adjustments are made to websites, mobile applications and digital documents so that all users can access, use and understand their content regardless of visual, hearing, motor and / or cognitive difficulties (whether temporary or permanent). In the context of the COVID-19 epidemic, although the main goal was to enable employees to work from home, the conditions and circumstances resulted in lots of content being rapidly digitised and available online. And part of the work of the Ombudsman for Persons with Disabilities was even more digitally accessible during 2020. Meetings of the Expert Council of the Ombudsperson were held in a virtual environment, as well as the Expert Conference Challenges of studying with disabilities, where with live virtual transmission, Croatian sign language translator and chat option content was made as accessible as possible to everyone in digital environment.⁶⁸

The Croatian Association of Youth and Students with Disabilities, for example, points out that the increased focus on the online sphere last year has brought a number of benefits for students with disabilities: easily accessible teaching materials, online consultations without waiting in line and lectures that can be listened from home have helped students with disabilities a lot, as well as other students.⁶⁹

Representatives of non-governmental organisations (as part of the round table discussion on 22 September 2020) pointed out that the inaccessibility of the websites of public bodies presents a discrimination, because users in all such cases cannot get certain information or access a certain service. Therefore, as good examples of accessible websites, the representatives of non-governmental organisations pointed out the Central State Portal - Become an e-Citizen and the website of the Croatian Parliament.⁷⁰

5.2 The most significant challenges faced by persons with disabilities in relation to digitalisation and digital transformation

Transformation of a whole range of activities into an online form, a process that has been particularly intensified in the circumstances of the COVID-19 pandemic, has created a number of problems and challenges for persons with disabilities, in addition to a number of opportunities. The main problems that have emerged relate to the required level of IT competencies, the lack of which can make certain content inaccessible to people with disabilities. There are also a number of problems of a technical nature, from the unavailability of the necessary technology, including due to

⁶⁸ Ombudsman for Persons with Disabilities (2021).

⁶⁹ Croatian Association of Youth and Students with Disabilities (2020), Corona and students with disabilities (*Korona i studenti s invaliditetom*), <https://www.savezsumsi.hr/index.php/novosti/91-istrazili/311-korona-i-studenti-s-invaliditetom>.

⁷⁰ Ombudsman for Persons with Disabilities (2020), Round table Digital accessibility from law to practice (*Okrugli stol Digitalna pristupačnost od zakona do prakse*). <https://posi.hr/okrugli-stol-digitalna-pristupacnost-od-zakona-do-prakse/>.

its high cost, to the issue of general infrastructure - for example, the unavailability of broadband access in some rural areas.

Ombudsman for persons with disabilities⁷¹ has noted several cases where lack of general infrastructure, most often the unavailability of high-quality internet connection produced difficulties for persons with disabilities. Most of the recent cases were related to education, since due to COVID-19 pandemic significant parts of education on all levels were conducted, partially or completely, on-line. Students who did not have adequate internet connection, mostly those in smaller places or rural areas, could not participate in education in the same way as the other students, but were constantly facing technical problems. Other example which Ombudsman states as a problem is submission of project proposals solely through on-line platforms. Here, the organisation for persons with disabilities in areas where the internet connection is inadequate experienced technical difficulties in submission of certain project proposals, which put them in disadvantage to other applicants. This is an especially big problem because it is exactly those organisations, in rural areas, which are most underfunded, and which would most benefit from awarded funds.

In the Alternative Report submitted to the UN Committee on the Rights of Persons with Disabilities, the Croatian Association of Organisations of Persons with Disabilities of Croatia points out the lack of information in a customised digital format as one of the problems.⁷² (p. 15) It emphasises in particular that the digital accessibility of existing statistics on persons with disabilities needs to be improved. (p. 29)

At the virtual round table held Digital accessibility from law to practice, organised by the Central State Office for Digital Society, the Commissioner for Information and the State School of Public Administration, which was attended by representatives of associations of persons with Disabilities, CARNET, the University Computing Centre (SRCE) and the State Geodetic Administration main problems related to digital accessibility from the position of associations of persons with disabilities were emphasized. At the round table data was presented which shows that out of 100 websites of leading companies and larger local governments in which about 50 % of the population lives, 90 % of pages do not have a font readable by people with dyslexia and reading difficulties, 88 % of pages are not adapted to readers used by people with visual impairments, 55 % of pages don't have prescribed colour contrasts for easier reading for the visually impaired, colour blind and people with reading difficulties, 45 % of the pages do not have support for the keyboard as support for people with motor impairments. The representative of the Association of Organisations of Persons with Disabilities of Croatia especially pointed out that the problems faced by people with motor disorders include too large a font, small areas for typing, inadequate management of the system through auxiliary devices.⁷³

The example of students with disabilities shows that in addition to the above-mentioned advantages, a number of difficulties emerged as a result of the implementation of online education. According to the Office for Students with Disabilities, in this situation difficulties are encountered by all students who do not have adequate working

⁷¹ Ombudsman for Persons with Disabilities (2021).

⁷² Croatian Association of Organisations of Persons with Disabilities of Croatia (2020), Alternative report submitted to the UN Committee on the Rights of Persons with Disabilities (*Alternativno izvješće podneseno Odboru UN-a za prava osoba s invaliditetom*), http://www.soih.hr/pdf/knowledge_bases/soih-alternativno_izvjesce_2020_hrv.pdf.

⁷³ In Portal (2020), Digital accessibility of websites in Croatia (*Digitalna pristupačnost web stranica u Hrvatskoj*), <https://www.in-portal.hr/in-portal-news/vijesti/21809/istraivanje-digitalna-pristupacnost-web-stranica-u-hrvatskoj>.

conditions in their homes (quiet place to work, high speed internet connection and appropriate technology) and adequate prior knowledge to use modern technology. In addition, some students with hearing and vision impairment experience additional difficulties in these circumstances. Namely, it is sometimes difficult for students with hearing impairments to follow classes if several persons join at the same time or if there is a lot of accompanying noise, and students with visual impairments who are not used to using technology in cases when web pages and applications are not accessible without proper support experience significant difficulties in accessing online education.⁷⁴

⁷⁴ Studentski.hr (2020), We learned how much distance learning is adapted to students with disabilities (*Saznali smo koliko je nastava na daljinu prilagođena studentima s invaliditetom*), <https://studentski.hr/studenti/vijesti/saznali-smo-koliko-je-nastava-na-daljinu-prilagodena-studentima-s-invaliditetom>.

6 Conclusions and recommendations

6.1 Conclusions

Digital transformation plays an important role in all key development strategies. In the National Development Strategy of the Republic of Croatia until 2030 the green and digital transition is one of four key development areas. In the Recovery and Resilience Plan 2021-2026⁷⁵ one of the key parts is the digital transition of society and the economy. People with disabilities are important end users in a large number of programme areas in this Plan. They are especially mentioned in the introduction of smart working (hybrid access to the workplace), in ensuring better accessibility of digital solutions in traffic for people with disabilities (use of new autonomous electric vehicles), in easier exercise of rights using the national identification and authentication system and in education to strengthen digital literacy of PWDs.

Digital transformation has an important place in all sectoral strategies. This is especially evident in public administration reform, e-School programme and e-health strategy. In 2019, the Law on Accessibility of Websites and Software Solutions for Mobile Devices of Public Sector Bodies - a transposition of Directive (EU) 2016/2102 of the European Parliament and of the Council of 26 October 2016 on the accessibility of the websites and mobile applications of public sector bodies - was adopted.⁷⁶ This law prescribes the necessity of using the European standard EN 301 549 when creating web pages and software solutions for mobile devices of public sector bodies, their appearance, manner of navigation through content, search and structure. The problem is that almost all of these documents do not elaborate specific areas of digital transformation for people with disabilities (assistive technology in health or employment). Schools and support for children with disabilities is the area where the most was achieved.

The key points in the parts related to PWDs relate to communications, availability and accessibility of information, websites, data collection and exchange. An important issue is securing the necessary funding for digital transformation (especially modern digital assistive technology). Therefore, it is important to expand the area of digital transformation to all dimensions of independent living (where it is now poorly present), prevention of institutionalization and deinstitutionalization, to continue digital support for inclusion in the processes of discussion and decision-making. In addition, it is important to incorporate continuous learning about the possibilities of digital technology in ensuring equal opportunities for PWDs. This is important for all professions, not just teachers or civil servants who are currently most involved. And the implementation of some seemingly less important strategies (such as the Reading Encouragement Strategy) can have important consequences for the quality of life of PWDs.

The fact that the key national strategy for people with disabilities has recognized the importance of digital transformation and that it follows it at all levels of the UN Convention is a positive aspect. The Ombudsperson for Persons with Disabilities also clearly emphasizes the importance and possibilities of digital transformation, monitors how certain activities are carried out and identifies the main problems. The COVID epidemic and the earthquakes in Croatia in 2020 opened a window of opportunity for faster digital transformation in schools, action in emergencies, in the workplace, participation in social life.

⁷⁵ Vlada RH (2021), Recovery and Resilience Plan 2021-2026.

⁷⁶ Law on Accessibility of Websites and Software Solutions (2019).

There are high expectations from EU funds (European Social Fund and the entire Recovery and Resilience Programme). For better preparation and monitoring of the use of these funds, it would be useful to include representatives of the PWD organisations.

6.2 Recommendations

1. Link the implementation of digital transformation more strongly with faster and more efficient implementation of the principle of reasonable accommodation (at work, at school, at home, in public). It is useful to continue to implement the concept of reasonable accommodation in a broader sense that is not limited to the workplace.
2. In the digital transformation, the areas of action should be expanded, so as not to be reduced to communication, administrative processes, collecting and processing of data on persons with disabilities.
3. It is necessary to encourage new forms of assistive technology, use domestic intellectual potential and encourage current initiatives dealing with digital technology, especially assistive technology. This is a major role for future EU-funded projects.
4. It is crucial to involve PWD associations more directly in the preparation of sectoral strategies and to take into account the proposals concerning the prerequisites for the introduction and use of new digital technologies for PWDs.

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