Digitalisation and digital transformation in Serbia

Implications for persons with disabilities

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1 Executive summary

The main digitalisation strategy is the Digital Skills Development Strategy in the Republic of Serbia for the period 2020 to 2024. The overall goal of the Strategy is to improve the digital knowledge and skills of all citizens, including members of vulnerable social groups (e.g. persons with disabilities, older persons, persons living in poverty, rural population, etc.), monitoring the development of information communication technologies in all areas and ensuring the needs of the economy and the labour market. Having in mind the recognised huge digital gap, i.e., persons with disabilities, Roma population and rural population have significantly lower access to digital technologies, several measures and activities are aimed at decreasing the existing digital gap.

The Strategy was adopted without an Action plan for its realization. It is stated that the Action plan will be adopted in 90 days. However, it has not been adopted yet, more than a year after the adoption of the Strategy, and therefore it is not yet known how funds would be provided. According to the Strategy, the funds will be provided in the Budget of the Republic of Serbia in accordance with the budget capabilities and based on the needs, while additional funds will be provided from donations, projects, international assistance, as well as from other sources. Having in mind that the Action plan has not been adopted yet, it is not clear at the moment how much financial resources will be provided for the implementation of the Strategy.

The Strategy for the development of the information society in the Republic of Serbia expired in 2020. The overall goal of the Strategy was that the Republic of Serbia reaches the EU average compared to information society development indicators by 2020. One of the main planned improvements is the transition from analogue to digital broadcasting of radio and television programs, which should enable, among other things, new services for persons with disabilities, as stated in the Strategy. In addition, it was planned that all citizens will be able to make all contacts with administrative bodies, holders of public authority, courts and the health care system, electronically by 2020, except for those contacts that by their nature require physical presence.

From the disability perspective, planned priority areas and some measures are very important, but unfortunately, since the evaluation of the Strategy is not available, effects of those measures to persons with disabilities are still unknown.

Another important strategic document is the E-government Development Program in the Republic of Serbia for the period from 2020 to 2022 with the Action Plan for its implementation. Based on previously mentioned strategy, Serbia switched to e-government as of 1 June 2017. In the new strategic document, it is stated that the inclusiveness and accessibility of electronic services must be ensured at the design stage, and services must be accessible, safe and usable by everyone without discrimination and with appropriate support if needed.

The vision and the main goals of the Program are aligned with the European Union Action Plan for e-Government for the period 2016-2020,[1] and they refer, among other things, to digitalisation as a standard, inclusiveness and accessibility, openness and transparency, interoperability, reliability and security as well as user orientation.

[1] E.g. General Data Protection Regulation (GDPR) and European Regulations in the field of e-Government.

In March 2020, the Republic of Serbia adopted the Strategy for improving the position of persons with disabilities for the period from 2020 to 2024, while the Action plan for the implementation of the Strategy has been adopted in April 2021. The overall goal of the Strategy is to equalize the opportunities of persons with disabilities to enjoy all civil, political, economic, social and cultural rights, with full respect for their dignity and individual autonomy, ensuring independence, freedom of choice and full and effective participation in all areas of society, including the right to live in the community.

Although this Strategy is very new, the term digitalisation is not mentioned at all. The Strategy contains several measures regarding accessibility, but potential advantages and benefits of digitalisation for persons with disabilities have not been recognized nor included in the Strategy. According to the Strategy, main improvements were achieved in the area of physical accessibility, while information and communication accessibility needs to be significantly improved, and it is necessary to support the development of information and communication technologies - ICT tools that enable persons with disabilities to have easier access to the use of new technologies - including assistive technology. Also, the Strategy plans that persons with disabilities should be provided, among other things, with accessible content, information and communications.

Unfortunately, there is no evidence of experiences (positive or negative) of persons with disabilities with respect to digitalisation and digital transformation.

Official data on persons with disabilities are very scarce. The latest available official data at the national level date back to the 2011 Population Census. According to the Census data, more than 90% of persons with disabilities do not use computers and the internet, while computer-literate persons with disabilities make up only 5%. Newer data on how persons with disabilities use computers, the internet and new technologies are not available.

Despite of evident digital divide, persons with disabilities and their organisations are not included nor consulted in processes of adoption of strategic and legal documents on digitalisation, so their needs are not properly recognized and addressed. In order to bridge the digital divide, it is necessary to conduct needs assessment of persons with disabilities in the field of digitalisation, and based on the needs assessment results, the state should plan measures and activities specifically aimed at persons with disabilities in relation to the digitalisation.

Good practices

An example of good practice is found in the provision of the Law on Electronic Communications, stating that the basic Universal Service includes special measures to provide equal opportunities to persons with disabilities and vulnerable groups (i.e. ensuring access to publicly available telephone services, including free calls to emergency services and access to information services and public telephone directories).

Furthermore, the Law on Electronic Administration and bylaws for its implementation regulate the area of accessibility of websites of public administration bodies, state bodies and local self-government units in the Republic of Serbia, and are mostly aligned to international ICT accessibility standards. Some websites of public bodies are improved with a text to speech software and eye reader software.

Finally, example of good practice is the provision of the Law of Textbooks, ensuring the adaptation of textbooks to primary and secondary education students who need adaptation of textbooks, as well as providing for the digitalisation of teaching content (e.g., preparation and publication of digital textbooks, streamlined solutions and specified time frames for the submission and approval of textbooks).

Recommendations

Having in mind that persons with disabilities and their organisations are not consulted in the process of adoption of majority of strategic and legal documents on digitalisation, state should ensure their meaningful participation in those processes at all levels (national, provincial and local).

In order to bridge the digital divide, it is necessary to conduct needs assessment of persons with disabilities in the field of digitalisation, including development of digital skills. Needs assessment should be conducted at national level on representative sample of persons with disabilities. Based on the needs assessment results, state should plan measures and activities specifically aimed at persons with disabilities in relation to the digitalisation. In addition, data on digital skills and digital literacy of persons with disabilities is not collected, so it is necessary to ensure that disaggregated data is collected (minimum on sex, disability and age) in annual surveys conducted by the Statistical Office of the Republic of Serbia on usage of ICT, as well as in other research and surveys.

It is necessary to continue investing in infrastructural projects and intensify efforts by state institutions and civil society organisations to increase social inclusion of persons with disabilities through the use of ICT. This includes but it’s not limited to improvement of all e-government services to make it more accessible to persons with disabilities, as well as other available e-services (e-health, e-tax).

Finally, it is of the utmost importance to ensure proper funding for all measures and activities planned in strategic and legal documents regarding digital inclusion of persons with disabilities, including proper funding for training.

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

The main digitalisation strategy is the Digital Skills Development Strategy in the Republic of Serbia for the period 2020 to 2024.[2]

The overall goal of the Strategy is to improve the digital knowledge and skills of all citizens, including members of vulnerable social groups, monitoring the development of information communication technologies in all areas and ensuring the needs of the economy and the labour market, while special goals are:

1. improving digital competences in the education system;
2. improving basic and advanced digital skills for all citizens;
3. development of digital skills in relation to the needs of the labour market;
4. lifelong teaching of ICT experts.

The Strategy was adopted without an Action plan for its realization. It is stated that the Action plan will be adopted in 90 days. However, the Action plan has not been adopted yet,[3] more than a year after the adoption of the Strategy. In the Draft Action Plan for the period 2021-2022[4] it is stated that two action plans to achieve planned results will be adopted, the first one for the period from 2021 to 2022 and the second for the period 2023 to 2024. Hence, more than one year of implementation (from March 2020) is already lost.

As for the funding, according to the Strategy: *The funds necessary to implement the measures and activities planned by this strategy, which will contribute to achieving defined strategic goals, will be provided in the Budget of the Republic of Serbia in accordance with the budget capabilities, and based on the needs, additional funds will be provided from donations, projects, international assistance, as well as from other sources.* Having in mind that the Action plan has not been adopted yet, it is not clear at the moment how much financial resources will be provided for the implementation of the Strategy.

There is no evidence that persons with disabilities or their organisation were involved in the work on the Strategy. However, it is stated that organisations of persons with disabilities, among other civil society organisations, should monitor the implementation of the Strategy and ensure that needs of persons with disabilities are met timely and adequately.

Data from 2016, cited in the Strategy, show that 64 % of the population in Serbia has access to the internet. However, the digital gap is huge, so persons with disabilities,

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2 Official Gazette of the Republic of Serbia, No. 6/2020, available in Serbian only at: https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2020/21/2/reg.

3 May 2021.

4 Available in Serbian only at: https://mtt.gov.rs/download/Akcioni%20plan%20za%20sprovodjenje%20Strategije%20digitalnih%20vestina%20za%202021-2022.pdf.

Roma population and rural population have significantly lower access to digital technologies. More than 90 % of persons with disabilities do not use computer and internet.[5] Having that in mind, some measures are aimed at decreasing the existing digital gap.

Under the special goal 2: Improving basic and advanced digital skills for all citizens, there are several measures highlighting existing challenges, and as a consequence, the necessity of improving digital skills for persons with disabilities. Planned measures, aimed at increasing digital skills for all citizens through education and trainings, are as follows:

2.1 providing conditions for the development of different levels of digital skills for citizens;
2.2 accreditation of training programs for the development of digital skills of citizens, including the development of models of increased access for citizens belonging to vulnerable categories, such as the elderly, persons with disabilities, poor citizens or rural population, as well as reducing gender disparities and inequalities in digital skills development;
2.3 raising citizens' awareness of the need to acquire digital skills;
2.4 improving digital skills for citizens at the local government level.

Under the measure 2.1 Providing conditions for the development of different levels of digital skills for all citizens, it has been recognized that communication infrastructure should be provided/enhanced in Serbia, as well as it is necessary to define different levels of digital skills for citizens (e.g., basic, intermediate, advanced). In addition, persons with disabilities are recognized as a category of persons that need digital education and training. It is emphasized that educational programs and trainings should be provided free of charge or at subsidized price for persons belonging to marginalized groups, including persons with disabilities.

Gender, age and other differences have led to less involvement in ICT of women, persons with disabilities, the elderly and other marginalized groups. Therefore, as stated in the Strategy, it is necessary to pay special attention to measures to create more inclusive and equitable opportunities for groups that have less opportunities to use digital technologies and to develop basic digital skills for many reasons, such as age, social norms and expectations, physical ability, awareness, geographical area, level of education, price or other reasons. Also, it is recognized that training of marginalized groups reduces socio-economic disparities and builds a more inclusive society. Otherwise, existing differences will continue to widen, further exacerbating socio-economic inequalities, such as lower incomes and even higher unemployment. In this area, it is necessary to focus especially on women and girls, persons with disabilities, poor and elderly citizens, as well as citizens from rural areas. In this regard, it is necessary to adjust training plans and methods depending on the specifics of particular groups in order to make training more attractive and accessible, which should be taken into account when determining the conditions for accreditation of training programs. Achieving these goals requires that lecturers/trainers in certain

[5] Cited in the Strategy: SHARE Foundation (2017), *SHARE@WORK 2016 – Monitoring of digital rights and freedoms in Serbia (Мониторинг дигиталних права и слобода у Србији),* May 2017, available in Serbian at: https://labs.rs/Documents/Monitoring_digitalnih_prava_i_sloboda_izvestajza_2016_srb.pdf.

cases undergo prior training and acquire new skills (e.g., training for persons with disabilities, youth or elderly).

Under this Strategy's goals, a part titled Persons with disabilities is included. It states that:

> Affordable technology and skills development programs can enable persons with disabilities to become entrepreneurs, get jobs in conventional sectors and find jobs in the technology sector. However, persons with disabilities are often excluded from digital technologies and the opportunities they offer. Although some progress has been made in removing barriers to the use of technology by persons with disabilities, in particular the development of accessible hardware and software, there is still a need for innovative solutions to support the inclusion of persons with disabilities. Even with the growing range of useful technologies produced for persons with disabilities, the question of their accessibility and affordability remains. More advanced training can also support the employment of persons with disabilities in areas such as design, content development and site accessibility verification. Complementary training focused on developing soft skills and finding a job can also be helpful. For persons with disabilities, it is necessary to identify available ICT solutions and provide training for the use of assistive technologies in an accessible space. Also, there is a need for training programs on creating accessible websites, mobile applications and devices.

It is worth of noting that under the measure 2.4 Improving digital skills for citizens at the local government level, the importance of the local self-governments is emphasised in regard to improvement of citizens' digital skills. It includes needs assessment, revision of existing services and programs and creation of new ones, as well as provision of financial support in cooperation with civil society organisations, employers, etc. In addition, local self-government units should also conduct trainings for the development of digital skills of its employees, as well as create as many e-services as possible, while at the same time promoting available e-services and educating citizens for their use.

Furthermore, under the specific goal 3: Development of digital skills in relation to the needs of the labour market, two measures explicitly mention persons with disabilities: 3.1 Meeting labour market needs for digital skills at all levels and promoting opportunities in the ICT sector and 3.2 Creating and implementing active employment policy measures in relation to the effects and needs in the ICT sector. In the explanation of those measures, some data from 2017 and 2018 from the work of the National Employment Agency were presented. The data show that not a single person with disabilities was included in advanced (specialized) IT trainings. The Catalogue of training for unemployed persons with disabilities offers basic IT training for blind and sight impaired, basic IT training for deaf and hear impaired, basic IT training, WEB workshops, and basic IT training by ECDL standard. Therefore, planned activities include intermediate and advanced IT trainings for persons with disabilities, alone or combined with trainings on 'soft' skills development necessary for entrepreneurship and business sector.

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

Strategy for the development of the information society in the Republic of Serbia until 2020[6] has expired in 2020. The overall goal of the Strategy is that the Republic of Serbia reaches the EU average compared to information society development indicators by 2020. However, the evaluation of this important strategy is not available yet.

As stated in the Strategy, in order to develop the Information Society, measures and activities should be focused on priorities within the following areas:

1. Electronic communications
2. E-government, e-health and e-justice
3. ICT in education, science and culture
4. Electronic commerce (e-commerce)
5. ICT business sector
6. Information security

One of the main planned improvements under the measure 1.2 Digital television and radio broadcasting and digital dividend is the transition from analogue to digital broadcasting of radio and television programs in the Republic of Serbia, which should enable better sound and image quality, more diverse content, more radio and television programs, new services for persons with disabilities and the elderly, improved additional services, portable and mobile program reception as well as service convergence. Also, it is very important that under the priority area 2: e-government, e-health and e-justice it was planned that all citizens will be able to make all contacts with administrative bodies, holders of public authority, courts and the health care system, electronically by 2020, except for those contacts that by their nature require physical presence.

From the disability perspective, planned priority areas and some measures are very important, but unfortunately, since the evaluation of the Strategy is not available, effects of those measures to persons with disabilities are still unknown.

The next important strategic document is the E-government Development Program in the Republic of Serbia for the period from 2020 to 2022 with the Action Plan for its implementation.[7] Based on the previously mentioned strategy, Serbia switched to e-government as of 1 June 2017, which was presented as a good practice example at the World Economic Forum 2021.[8]

In the new strategic document, further harmonisation with EU *acquis* is planned, including respect for the principle of inclusiveness and accessibility, which means that

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6 *Official Gazette of the Republic of Serbia*, No. 51/2010, available in Serbian only at: https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2010/51/2/reg.

7 *Official Gazette of the Republic of Serbia*, No. 85/2020, available in Serbian only at: https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/drugiakt/2020/85/1/reg.

8 Video available at: https://es.weforum.org/videos/this-smart-move-helped-serbia-save-180-million-sheets-of-paper?fbclid=IwAR0yuGsgZgjnkES60oDZKYV3QguPvil3tXmm6fhpLMmQWM2VaYiZuO6huXw.

the inclusiveness and accessibility of electronic services must be ensured at the design stage. In addition, one of the principles is accessibility, security, availability, and usability, which means that services are accessible, safe and can be used by everyone without discrimination with appropriate support if needed. This principle also includes the implementation of the principle of universal design. It is explicitly stated that implementation of the Program requires harmonization with, inter alia, Directive 2016/2102/EU of the European Parliament and the Council of 26 October 2016 on the accessibility of websites and mobile applications of public sector institutions. In addition, the vision and the main goals of the Program are aligned with the European Union Action Plan for e-Government for the period 2016-2020, and they refer, among other things, to digitalisation as a standard, inclusiveness and accessibility, openness and transparency, interoperability, reliability and security as well as user orientation. Finally, the digital transformation of public administration in the Republic of Serbia should enable improvements in all segments of public administration, by enabling efficient, transparent, consistent, economical and responsible exercise of public authority.

It is important to notice that the Law on Electronic Administration[9] was passed in 2018, which stipulates that state bodies are obliged to respect accessibility standards regarding the content of websites and electronic government, and the Decree on detailed conditions for the development and maintenance of websites was passed, which contains part on accessibility.[10] Also, the Law on Public Information and Media[11] proclaims the principle of the right of persons with disabilities to access information, stating that 'the Republic of Serbia, the Autonomous Province, and local government units shall take measures to enable unhindered access to public information by persons with disabilities, in a suitable format through the use of appropriate technology, and provide part of the funding or other conditions for the activity of media outlets that publish information in the sign language, or in Braille, or that enable these persons to exercise the right to public information in other ways'. It is very important that access of persons with disabilities to public information is listed as one of the elements that define the public interest in public information services.

9 *Official Gazette of the Republic of Serbia*, No. 27/18.
10 *Official Gazette of the Republic of Serbia*, No. 104/18.
11 *Official Gazette of the Republic of Serbia*, Nos. 83/2014, 58/2015 and 12/2016 – authentic interpretation.

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

In March 2020, the Republic of Serbia adopted the Strategy for improving the position of persons with disabilities for the period from 2020 to 2024.[12] However, the Action plan for the implementation of the Strategy, which was due for adoption in 90 days, has been adopted in April 2021, so more than one year of implementation is already lost.

During the preparation of the Strategy, consultations were conducted with representatives of state bodies and public services, civil society organisations and other relevant social actors. First, consultations were held with organisations of persons with disabilities and civil society organisations dealing with human rights, non-discrimination and the rights of persons with disabilities. They consisted of two segments; the first was dedicated to presenting the evaluation of the previous Strategy and the draft of the new Strategy, while the second consultation segment was on the content and priorities of the new Strategy.

It is planned that the financing of measures and activities will be done from the budget of the Republic of Serbia, the budget of territorial autonomy and the budget of local self-government units, depending on the specific activities, as well as from donations, legacies, loans and other sources. The financial framework for the implementation of the planned measures and activities is given in cases when it is a matter of precisely determined activities and when they do not have a permanent or continuous character, as well as in cases when the budget of the Republic of Serbia provides allocation for certain purposes in the future.

The overall goal of the Strategy is to equalize the opportunities of persons with disabilities to enjoy all civil, political, economic, social and cultural rights, with full respect for their dignity and individual autonomy, ensuring independence, freedom of choice and full and effective participation in all areas of society, including the right to live in the community. Strategy has three special goals:

1. increase social inclusion of persons with disabilities;
2. ensure the enjoyment of the right of persons with disabilities to legal capacity and family life on an equal basis with others and effective protection against discrimination, violence and abuse and
3. systematic introduction of the disability perspective in the adoption, implementation and monitoring of public policies.

Although this Strategy is very new, the term digitalisation is not mentioned at all. The Strategy contains several measures regarding accessibility, but potential advantages and benefits of digitalisation for persons with disabilities have not been recognized nor included in the Strategy.

[12] *Official Gazette of the Republic of Serbia*, No. 44/2020, available in Serbian only at: http://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2020/44/1/reg.

In the problem analysis, under the title Information accessibility, it has been stated that legal framework in Serbia is improved in the last decade, but some challenges remained. The main recognized improvements are in the area of physical accessibility, while information and communication accessibility needs to be significantly improved. According to the Strategy, it is necessary to support the development of information and communication technologies - ICT tools that enable persons with disabilities to have easier access to the use of new technologies. Also, subsidies are needed for equipment that serves as assistive technology (e.g., custom tax exemption, reduced VAT), as well as the introduction of incentives for the domestic ICT industry to create these tools. Emergencies are recognized as a special segment in terms of information accessibility, including accessible protocols and information services, in accordance with the various needs of persons with disabilities, especially in cases of need for evacuation - warnings, SOS telephones, Braille manuals in Serbian language, audio description and the like, as well as the availability of information on available and accessible services in the local community in various accessible formats. Although some activities were implemented (e.g., manual for emergency situations in accessible format), there is still a need for significant improvements in this segment.

Finally, despite the existence of a solid legal framework, persons with sensory disabilities continue to have difficulty accessing information and communication, the print media are generally inaccessible to the persons with visual impairments, while radio and television are largely inaccessible to persons with hearing impairments. However, digitalisation is not mentioned in the context of improvement of the said situation. On the other hand, it is planned in the Strategy that persons with disabilities should be provided, among other things, with accessible information and communications, hence potential of digitalisation might be included under this strategic goal.

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

In Serbia, there is only the above detailed (general) disability strategy, adopted in March 2020. Unfortunately, specific disability-related strategies do not exist.

At the moment, a Draft Deinstitutionalization Strategy for the period 2021 – 2026 is open for public hearing and comments, but digitalisation and digital transformation are not mentioned in the draft text.[13]

[13] Available in Serbian only at: https://www.komorasz.rs/strategija-deinstitucionalizacije-za-period-od-2021-2026-godine-pocetak-javne-rasprave/.

4 Promoting disability inclusion through funding, education and training

4.1 How funding promotes disability-inclusive digitalisation and digital transformation

According to available data,[14] 69 projects were supported under the framework of information society support programmes implemented by the Ministry of Trade, Tourism and Telecommunications in the period from 2015 to 2018, and a total of RSD 60 084 498 (approx. EUR 510 000) was disbursed for their implementation.

Funds were allocated for eight projects in the field of social inclusion of persons with disabilities using ICT under the public call for programmes in the field of information society development in 2016. In 2017, the Ministry of Trade, Tourism and Telecommunications implemented two public invitations/calls for projects in support of 26 projects in the field of digital inclusion, none of which directly targeted persons with disabilities. For example, nine supported projects aimed at increasing the inclusion of women in IT sector (reskilling and upskilling programs), while other 17 approved projects were for the development of digital competences, digital literacy and skills of the elderly and pensioners through the use of ICT.[15]

Projects approved in 2018 under the framework of the information society development programme in the Republic of Serbia, funded from the national budget, are mainly engaged in raising the level of digital literacy and digital competencies of women from rural areas, the safe use of the Internet by children, as well as organizing conferences to exchange experiences in increasing general digital literacy and digital competencies. Similarly, as in 2017, programmes were not targeted at persons with disabilities.

As for 2019 and 2020, there are no publicly available data on support programmes under the framework of information society.

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

There is no available data on disability and accessibility matters inclusion in the education and/or training of digital professionals. Websites of schools offering education and trainings for digital professionals do not explicitly state that accessibility matters are included in curricula.[16]

According to the Report on Digital Inclusion in the Republic of Serbia for the Period 2014–2018, during 2018 a competition was organized with the aim of improving teaching and innovating courses at the faculties, following the needs of the digital society, which attracted the participation of 166 teams of professors, of whom 66

[14] Information on supported programmes taken from Social Inclusion and Poverty Reduction Unit Government of Serbia (2019), *Report on Digital Inclusion in the Republic of Serbia for the Period 2014–2018,* Belgrade, June 2019.

[15] Social Inclusion and Poverty Reduction Unit Government of Serbia (2019), *Report on Digital Inclusion in the Republic of Serbia for the Period 2014–2018,* Belgrade, June 2019, pp. 52-53

[16] See, for example: IT Academy, available at: https://www.it-akademija.com/web-design-program-obrazovanja; Higher ICT school, available at: https://webdizajn.ict.edu.rs/; Oxford Academy, available at: https://www.akademijaoxford.com/skola_racunara_kurs_za_web_dizajn.php; Krojac school, available at: https://www.krojacevaskola.com/kursevi/online/web-dizajn/obuka#pitanja.

received funding (amounts of RSD 250 000 to RSD 1 million, approx. EUR 2 100 to EUR 8 500). Support was provided to projects aimed to increase the use of information technologies in teaching and learning, to monitor the needs of the labour market and develop entrepreneurial skills of students and cooperation of higher education institutions with the economy and other stakeholders in the local community. Those projects were not specifically aimed at disability inclusion, however, improved teaching and development of innovative courses in regard to the needs of the digital society are beneficial for all students, including students with disabilities.

In addition, the 21st Century Schools Project, implemented by the British Council and the Ministry of Education, Science and Technological Development, includes teacher training for the implementation of teaching that encourages the development of critical thinking skills of students, problem-solving and the development of digital literacy. The pilot phase of the project included 25 teachers from Serbia. Each of the schools received 30 micro:bit devices (programmable digital devices suitable for project teaching, accelerating functionalization of students' knowledge and significant changes in the dynamics of the teaching process) and training for their programming. The plan is to form an online network of primary schools after the completion of all trainings, to exchange good practices and solve any dilemmas and issues through cooperation. As with previously mentioned projects, those projects were not specifically disability inclusive (e.g., not aimed specifically at disability inclusion), but teachers with improved skills would provide better teaching for all pupils, including pupils with disabilities.

Finally, the Smart and Safe Platform for the Development of Information Society was launched in 2016 by the Ministry of Trade, Tourism and Telecommunications,[17] with the main goal to educate and raise awareness about the necessity of fast, correct and targeted involvement of citizens, the education system and the economy in contemporary digital trends. The platform consists of educational and promotional projects and activities that should contribute to the development of digital literacy, digital competencies and digital security culture in the entire population. Special attention is paid to projects aimed at young people, children, women, and persons with disabilities.

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

As stated previously, in the Digital Skills Development Strategy in the Republic of Serbia for the period 2020-2024, obstacles and challenges regarding the digital divide have been recognised, especially for certain multiply marginalised groups, such as persons with disabilities among other groups. It is stated that special attention should be given to measures that create more inclusive and equitable opportunities for groups that have less opportunities to use digital technologies and to develop basic digital skills.

One of the planned measures is adjusting training plans and working methods to the needs of different groups in order to make training more accessible and useful. Training adjustments and increased accessibility should be taken into account for training/programmes accreditation. In addition, it has been recognized that

[17] More information available at the official project website at: https://pametnoibezbedno.gov.rs/.

lecturers/trainers in certain cases have to undergo prior training and acquire new skills in order to become better equipped with knowledge and skills to work with persons with disabilities. Such additional training refers to (digital) accessibility, too.

Also, there is an obligation for local self-government units to organize trainings for the development of digital skills of its employees, to create as many e-services as possible, as well as to promote available e-services and educate citizens for their use.

However, there is no publicly available data on the realisation of planned activities in this Strategy. Finally, there is no publicly available data on whether and how digital inclusion and accessibility is addressed during the education and ongoing professional development of accessibility and inclusion professionals

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

In the Digital Skills Development Strategy in the Republic of Serbia for the period 2020-2024, persons with disabilities are recognized as a category of persons that need education and training on development of digital skills at all levels (basic, intermediate, advanced). Those educational programmes and trainings should be provided free of charge or at subsidized price in order to improve their availability and affordability for persons with disabilities. In addition, it has been recognized that affordable technology and skills development programs can enable persons with disabilities to become entrepreneurs, get jobs in conventional sectors and find jobs in the technology sector.

Furthermore, having in mind very low level of activity and employment rate of persons with disabilities, it is planned to include more persons with disabilities in trainings on digital skills at all levels, to enhance their employability in digital age. Planned activities include intermediate and advanced IT trainings for persons with disabilities, alone or combined with trainings on “soft” skills development necessary for entrepreneurship and business sector.

As it was already mentioned, report on the implemented activities is not publicly available. Analysis of the Annual Report on work of the National Employment Service for 2020[18] showed that activities for persons with disabilities were the same as in previous years. The report contains data on different activities the National Employment Service conducted in regard to unemployed persons with disabilities. However, those activities did not include any training/education programme on development or improvement of digital skills. It should be mentioned that entrepreneurship skills development training included 271 unemployed persons with disability, out of which 131 women, but there is no data if this training included digital skills development.

[18] National Employment Service, Belgrade (2021), *Annual Report on the Work of the National Employment Service for 2020*, available at: http://www.nsz.gov.rs/live/digitalAssets/15/15758_izvestaj_o_radu_nsz_za_2020._godinu.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

There are several significant opportunities presented by digitalisation and digital transformation for persons with disabilities in Serbia. According to the Law on Electronic Communications,[19] the basic Universal Service is a set of basic electronic communication services of a certain scope and quality, which are available to everyone in the territory of the Republic of Serbia at affordable prices. Basic Universal Service includes special measures to provide equal opportunities to persons with disabilities and vulnerable groups like ensuring access to publicly available telephone services, including free calls to emergency services and access to information services and public telephone directories.

Additionally, in the field of web accessibility, the Law on Electronic Administration[20] (2018) states that additional efforts are needed by all public administration bodies (national and local) to make their websites meet accessibility requirements. Bylaw titled Regulation on detailed conditions for the development and maintenance of websites of state bodies and organisations, provincial bodies and organisations, local government bodies and organisations, institutions, public enterprises, special agencies[21] regulates the area of accessibility of websites of public administration bodies, state bodies and local self-government units in the Republic of Serbia. The regulation is largely aligned to international ICT Accessibility standards like the W3C WCAG 2.0. while the List of Interoperability Standards v.2.1[22] prescribes the e-accessibility standards.

Furthermore, digitalisation of e-Government services enabled easier access to persons with disabilities. There have been some improvements in official state institutions' websites - the Government of the Republic of Serbia new website has an aid for persons with sight impairments, a text to speech software that makes use of state-of-the-art neural networks, while the new website of the Office for Information Technology and e-government, with the help of eye reader software, enables people with disabilities to control computer with the movement of the eye.

Digitalisation created numerous opportunities in education of children with disabilities. If a child needs any ICT or Assistive Technology, the line ministry will provide it, and the catalogue of available assistive technology is at the Ministry's website.[23] According to the Law of Textbooks,[24] the Ministry will provide the adaptation of textbooks to primary and secondary education students who need it. Also, the Law provides for the digitalisation of teaching content (e.g., preparation and publication of digital textbooks,

[19] *Official Gazette of the Republic of Serbia*, Nos. 44/2010, 60/2013 – Decision of the CC, 62/2014 and 95/2018 – other law.
[20] *Official Gazette of the Republic of Serbia*, No. 27/2018.
[21] *Official Gazette of the Republic of Serbia*, No. 104/2018.
[22] Available in Serbian at: https://www.ite.gov.rs/extfile/sr/2003/LISTA_STANDARDA_Tehnicke_Interoperabilnosti%20v%202.1.pdf.
[23] Available in Serbian at: http://www.mpn.gov.rs/predstavljen-katalog-asistivne-tehnologije/.
[24] *Official Gazette of the Republic of Serbia*, No. 27/2018.

streamlined solutions and specified time frames for the submission and approval of textbooks).

In that regard, it is very important to mention that the Republic of Serbia joined the Marrakesh Treaty on 24 February 2020, which entered into force on 24 May 2020.[25]

Finally, digitalisation brought improvements in television broadcasting, that is to say, it made it more accessible. Now, certain contents (e.g., daily news, educational contents) are subtitled or have sign language interpretation.

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

The main aim of digital inclusion is bridging the digital divide between people who have ready access to and ease of use of information and communications technologies and the social groups (i.e. persons with disabilities), whose full participation in the digital environment is hampered by barriers that grow over time.[26] However, bridging the digital divide will not be feasible nor successful without an overall improvement of digital literacy, equal access to information and communication technologies, the Internet and all public services.

According to the survey on the Usage of Information and Communications Technologies in the Republic of Serbia in 2020, conducted by the Statistical Office of the Republic of Serbia,[27] 74.3 % of households in Serbia own a computer, which is an increase of 1.2 % compared to 2019, and 2.2 % compared to 2018. There are significant regional differences (Belgrade - 91.5 %, Southern and Eastern Serbia – 71.2 %, Vojvodina - 66.8 %), as well as in urban and other parts of Serbia (81.6 % and 61.8 %, respectively). Compared to 2019, this gap between urban and rural parts of Serbia has slightly increased.

The gap between households with computers can be significant, depending on the households' monthly income. Most of the households with a monthly income exceeding EUR 600 own a computer (95.7 %), while among the households with an income of up to EUR 300 the share of households that own a computer is 48 %.

In Serbia, 81 % of households have internet connection, which is an increase of 0.9 % compared to 2019, and 8.1 % compared to 2018. The share of households with internet connections is the highest in Belgrade and amounts to 94.1 %, while in other parts of Serbia it is lower (approx. 75 %). Similarly, to owning computers, there is a large gap between higher-income and lower-income households: most households with a monthly income exceeding EUR 600 have internet connection (97.8 %), while the share of households with internet connection among the households with an income of up to EUR 300 is 59 %.

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[25] Information available at: https://wipolex.wipo.int/en/treaties/ShowResults?start_year=ANY&end_year=ANY&search_what=C&code=ALL&treaty_id=843.

[26] Social Inclusion and Poverty Reduction Unit Government of Serbia (2019), *Report on Digital Inclusion in the Republic of Serbia for the Period 2014–2018,* Belgrade, June 2019.

[27] Statistical Office of the Republic of Serbia (2020), *Usage of Information and Communications Technologies in the Republic of Serbia 2020*, Belgrade, available at: https://publikacije.stat.gov.rs/G2020/Pdf/G202016015.pdf.

Almost 20 % of Serbia's population reported they have never used the computer, while 72.4 % reported they have used computer in the last three months. The number of computer users increased by 2 % compared to 2019, by 3.1 % compared to 2018, and by 6.4 % compared to 2017. Among computer users, 54.3 % have secondary education, 14.8 % lower than secondary education, and 30.9 % higher education. Also, there is a gender gap when it comes to use of computer - 78.7 % of males and 67.9 % of females used a computer in the last three months.

Finally, the survey shows that 37 % of the internet population uses internet services instead of making personal contacts or visiting public institutions or administrative bodies (e-government).

It should be highlighted that the digital gap is huge not only in relation to urban/rural areas, and incomes of the household, but also in relation to belonging to social groups that have significantly lower access to digital technologies (persons with disabilities, Roma population, etc.).

Unfortunately, new data on how persons with disabilities use computers, the internet and new technologies are not available, and the latest available data at the national level date back to the 2011 Population Census.[28] According to the Census data, there were 571 780 citizens with disabilities in Serbia, accounting for 8 % of the total population. Out of this number, there were 25 437 computer-literate persons with disabilities, with a greater share of men (14 380) than women (11 057).[29] Also, 44 481 persons with disabilities have used the internet, with a higher share of men (25 078) than women (19 403). Data from 2015 show that of the total population with disabilities in Serbia, computer-literate people make up only 5 %, while the Internet is used by slightly less than 9 %.[30]

The experience of civil society organisations shows that service providers mainly deal with the aspect of physical accessibility, while other dimensions of accessibility have not been taken into account.[31] The majority of representatives of civil society organisations (96 %) believe that service providers are not well trained to communicate with persons with disabilities, which includes not only administrative services, but also medical and social protection services, while e-channels of service provision are perceived as mostly inaccessible to persons with disabilities (58 %).[32]

On the other hand, public officials consider that major challenges to promote digital inclusion and ICT accessibility in Serbia are at the local government level (insufficient awareness about the importance of ICT accessibility and disability inclusion, lack of

[28] Social Inclusion and Poverty Reduction Unit Government of Serbia (2019), *Report on Digital Inclusion in the Republic of Serbia for the Period 2014–2018,* Belgrade, June 2019.

[29] *R* Social Inclusion and Poverty Reduction Unit Government of Serbia (2019), *Report on Digital Inclusion in the Republic of Serbia for the Period 2014–2018,* Belgrade, June 2019.

[30] Social Inclusion and Poverty Reduction Unit Government of Serbia (2015), *Report on Digital Inclusion in the Republic of Serbia for the Period 2011–2014,* Belgrade.

[31] Miloš Djindjić and Dragana Bajić, *National PAR monitor: Serbia*, Centar za evropske politike, Belgrade, 2018, available in Serbian at: https://cep.org.rs/wp-content/uploads/2018/11/nacionalni_par_monitor_srbija.pdf.
Miloš Djindjić and Dragana Bajić, *National PAR monitor: Serbia*, Centar za evropske politike, Belgrade, 2018, available in Serbian at: https://cep.org.rs/wp-content/uploads/2018/11/nacionalni_par_monitor_srbija.pdf.

capacities of persons in charge of municipal digital services, and lack of trained experts in the field of digital inclusion and ICT accessibility).[33]

There are numerous remaining challenges related to digitalisation and persons with disabilities. For example, it is necessary to make it easy and simple for persons with disabilities to access the internet and use electronic services, as well as to provide access to internet for all persons with disabilities, including the ones in remote or rural areas. Also, educational programmes/training on digital literacy and development of digital skills are needed for persons with disabilities, since persons with disabilities are recognized as a category of persons that need digital education and training in the Digital Skills Development Strategy. In addition, educational programs and trainings should be provided free of charge or at subsidized price for persons belonging to marginalized groups, including persons with disabilities. Although affordable technology and skills development programs can improve employability of persons with disabilities, they are often excluded from digital technologies and the opportunities they offer. Thus, it is necessary to identify available ICT solutions and provide training for the use of assistive technologies, creating accessible websites, mobile applications and devices in an accessible space.[34]

Training and education are also needed for different professionals working for/with persons with disabilities. For example, there are no laws or policies that foresee mandatory training for educational professionals on how to create accessible materials. Also, there is no specific policy or general strategy stating that Vocational study schools and academies must follow ICT accessibility standards in their digital education offerings.

Finally, challenges exist in e-health services, e-government services, as well as in emergency situations, access to information, etc. For example, an analysis of accessibility of compliance levels of websites of state bodies carried out in 2020 showed that the average fulfilment of the eAccessibility criteria is as follows: 47.47 % of state administration bodies; 35.58 % of local self-government units, and 45.9 % bodies of territorial autonomy.[35] Although there have been some improvements in accessibility of health care services, it is necessary to ensure that all digital information, communications, and online services provided by the public healthcare system must be in accessible formats so that they can be accessed, received, and understood by all users, including those with disabilities and older persons. Also, legal framework on emergency communications and services should be revised in order to be inclusive and accessible for persons with disabilities, as well to include measures how to deal with emergency communications and services to ensure that the needs of persons with disabilities are considered.

[33] Social Inclusion and Poverty Reduction Unit Government of Serbia (2021), *ITU Study on the Assessment of Digital Accessibility Policies in Serbia*, Belgrade, June 2021.

[34] As stated in the Digital Skills Development Strategy in the Republic of Serbia for the period 2020 to 2024.

[35] Social Inclusion and Poverty Reduction Unit Government of Serbia (2021), *ITU Study on the Assessment of Digital Accessibility Policies in Serbia*, Belgrade, June 2021.

6 Conclusions and recommendations

6.1 Conclusions

It could be concluded that the Republic of Serbia has achieved the most significant results in the process of developing legal framework regarding digital inclusion and ICT accessibility. Besides the Constitution and general antidiscrimination law, it is important that the Law on Suppression of Discrimination of Persons with disabilities was adopted in 2006 (amended in 2016), as well as the Law on the Use of Sign Language, which was adopted in 2015, recognising the right to use sign language in procedures before public authorities, in education, etc. In addition, several strategic and legal documents on digitalisation were enacted, including provisions on digital inclusion and ICT accessibility. The most important pieces of legislation are: the Digital Skills Development Strategy, containing several measures aimed at persons with disabilities, the Law on Electronic Communications includes provisions protecting the digital rights of persons with disabilities, the Law on Electronic Administration states that all e-government service users are equal in exercising the right to access to electronic data and documents, and that e-government service provides access to persons with disabilities without technical, audio-visual, semantic and linguistic restrictions. Having in mind that Serbia is in the process of the EU accession, all new laws are influenced by the EU laws.

Moreover, Serbia has invested significant resources in digitalisation during the last years and the process of digitalisation is very successfully ongoing. The annual surveys conducted by the Statistical Office of the Republic of Serbia show constant improvement, i.e., steady increase in the number of computer users, in households with broadband internet connection, in number of internet users, as well as in number of users of e-Government services.

On the other hand, those surveys do not include data on persons with disabilities and other vulnerable social groups, although in the Digital Skills Development Strategy as well as in reports on digital inclusion, significant digital divide has been recognized. Unfortunately, the only available data on digital literacy and digital skills of persons with disabilities date back to the 2011 Census, hence the data is very old.

According to the new ITU Study on the Assessment of Digital Accessibility Policies in Serbia,[36] public officials consider that major challenges to promote digital inclusion and ICT accessibility in Serbia are: integration of accessibility standards at local government level, as there is insufficient awareness about the importance of ICT accessibility and disability inclusion, as well as the lack of capacities of persons in charge of municipal digital services, and also limited availability of trained experts with knowledge in the field of digital inclusion and ICT accessibility. In addition, most of recent accessibility and disability inclusion-related initiatives in the country have focused on physical or architectural accessibility, while very few focused on digital accessibility.

Therefore, it is very important to bridge the digital divide in Serbia, i.e. to improve digital literacy of persons with disabilities, and to provide for equal access to information and communication technologies, the internet and all e-services.

[36] Social Inclusion and Poverty Reduction Unit Government of Serbia (2021), *ITU Study on the Assessment of Digital Accessibility Policies in Serbia*, Belgrade, June 2021.

6.2 Recommendations

1. State should ensure meaningful participation of persons with disabilities and organisations of persons with disabilities in the process of adopting public policies related to digitalisation at all levels (national, provincial and local).

2. In order to bridge the digital divide, it is necessary to conduct needs assessment of persons with disabilities in the field of digitalisation, including development of digital skills. Needs assessment should be conducted at national level on representative sample of persons with disabilities. Based on the needs assessment results, state should plan measures and activities specifically aimed at persons with disabilities in relation to the digitalisation.

3. Ensure that disaggregated data is collected (minimum on sex, disability and age) in annual surveys conducted by the Statistical Office of the Republic of Serbia on usage of ICT.

4. Continue investing in infrastructural projects and intensify efforts by state institutions and civil society organisations to increase social inclusion of persons with disabilities through the use of ICT. For example, improvement of all e-government services to make it more accessible to persons with disabilities not only in terms of content accessibility but also with new services of relevance for the persons with disabilities that could be provided electronically. In addition, efforts should be intensified to make ICT reskilling programs accessible and affordable to persons with disabilities.

5. Ensure proper funding for all measures and activities planned in strategic and legal documents. For example, public authorities inviting applications for public funding should ensure that among the criteria for the granting of public funds should be digital accessibility for persons with disabilities (*e.g.* for media: produced media content should be accommodated to and thematically designed for persons with disabilities). In addition, proper funding is needed for training of both persons with disabilities and different professionals that need training on the needs of persons with disabilities related to accessibility, ICT, etc.

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