Abstract

Digital literacy is important in many areas of life, such as remote working, using public services on the Internet, communication, buying goods and services, education, participation in political and cultural events, entertainment and leisure. Digital literacy enhances employability of young people in the global labour market. It can reduce financial insecurity and increase access to information, finding advice and support. Digital literacy is also important for the elderly, persons with disabilities and other vulnerable groups because it enables equal participation in society, independent living, working, and reduces the risk of social isolation. Some of the goals of the Digital Literacy Development Network and the key goal of the working group for Digital Citizenship are digital inclusion of individuals from all age groups, improved quality of life and empowerment through digital technologies. In this paper, initial chapters...
describe the benefits of digital technologies and the Internet for vulnerable groups. The paper continues with a presentation of the basic idea, implementation and work of the Digital Literacy Development Network as part of the Digitalna.hr project. In this paper, the emphasis is on the description and implementation of the activities of the working group for Digital Citizenship, which deals with public opinion polls and the needs of digital inclusion of vulnerable groups and areas. The paper ends with recommendations for creating guidelines for national, regional and local decision makers. Once created, these guidelines can be used in future strategic documents with the purpose of actively including a particular population group in the digital society.

**Key words:** digital literacy, project, digital inclusion, vulnerable groups

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**Introduction**

Nowadays, many countries face digital transformation in public and social life, and Croatia is no exception. Public and private organizations provide a growing number of digital services for citizens. The Internet has changed the way we communicate, do business, educate ourselves and spend free time. More importantly, our general behaviour is different because the Internet has erased the boundaries of time and space. The access and use of digital technologies and the Internet are constantly increasing, both for daily, private activities and business. According to the Croatian Bureau of Statistics data for 2021, 77% of individuals own a personal computer, while 86% have Internet access. Computers are mainly used by the 16 - 35 age group (more than 80%), with the number of users decreasing proportionally with increasing age. For example, only 25% of individuals aged 65 – 74 use computers. The Internet is mostly used by the youngest population, aged 16 – 34, with 100% of individuals, followed by 97% aged 35 - 44, while only 38% of the 65 – 74 age group use it. Most people (90%) use the Internet to send messages (e.g., Skype, Messenger, WhatsApp, Viber), gather information about products and services, and read newspapers and magazines, 80% use the Internet for sending electronic mail, and over 70% use it for telephone calls or video conferences (e.g., Skype, Facetime, WhatsApp, Viber, and so on), social networks and health-related information. Regarding use of e-services, e-banking services are used the most (68%), followed by e-Government (55%). Only 30% of individuals use the possibility of submitting official requests/forms to public bodies. The Internet is rarely used for online voting or political and social dialogue, in only 10% of cases (Croatian Bureau of Statistics, 2022).

Digital transformation, stimulated by the continuous progress of information and communication technology (ICT) on the one hand and digitalization on the other, is
changing society every day. "Digital citizens" are constantly connected to digital content and have a high level of digital literacy. However, regardless of all the efforts, certain population groups cannot equally benefit from all the advantages of digital transformation, which causes digital exclusion, and, nowadays, partly social exclusion (Helsper, Galácz, 2009) leading to the digital divide. Currently, it is not only a matter of non-access to modern digital technologies and the Internet, but also socio-political, economic and cultural factors that affect access to digital technologies and the Internet or citizens' ability to use them effectively (Van Dijk, 2020, Reisdorf and Grosejl, 2017). In the Republic of Croatia, 14% of the households surveyed in 2021 do not have an Internet connection. The most common reasons for not having Internet access are the lack of need to use the Internet (83%) and insufficient knowledge for its use (55%). A worrisome result is that more than 30% of individuals mention affordability as the reason for not having an Internet connection, i.e., service and necessary equipment are too expensive. (Croatian Bureau of Statistics, 2022). Digital exclusion puts such population groups, most often the so-called "vulnerable groups", in a disadvantageous position. These "vulnerable groups" usually face various difficulties and are most likely the poorest and oldest citizens, living in rural and remote areas. They could become even more vulnerable as service digitization continues to grow. This growing trend is in accordance with the ambitious goals of the European Commission stating that by 2030 all key public services must be fully accessible on the Internet, 100% of citizens must have access to their medical records, and 80% should use digital means of identification (European Commission, 2021). According to the European Commission data, "65% of European citizens possess basic digital skills, and the goal is to reach 80% by 2030. Including and supporting the remaining 20% (about 90 million inhabitants) is important for reducing poverty and exclusion" (European Commission, 2020).

As described in the first chapters, this paper aims to demonstrate how vulnerable population groups can benefit from accessing and actively using digital technologies and the Internet. The goals and activities of Digitalna.hr project are described in more detail in the following chapters, especially the most significant results of project implementation - the activities of the working group for Digital Citizenship and the Digital Literacy Development Network. The paper ends with a conclusion and recommendations for achieving successful digital inclusion of vulnerable population groups.
The benefits of using digital technologies and the Internet for rural and island-based LAGs

New technologies should be available, affordable and accessible, to positively affect all citizens and benefit society. It is necessary to "ensure appropriate mechanisms for combating digital exclusion, including rural areas, in the process of technological progress and digitalization" (European Economic and Social Committee-EESC, 2021). The European Union and the member states should "increase investment in rural areas which would, in turn, enable people to also gain access to broadband Internet or resolve issues of Internet quality and cost, and the lack of devices with Internet access" (EESC, 2021). To promote the economic and social development of rural areas, Croatia has recently introduced rural relocation grants for residents moving from large urban areas to rural ones. Appropriate infrastructure is crucial for achieving this goal, especially in telecommunications and transport. The problem of limited digital skills is no less important than the problem of inadequate connectivity. “It is therefore important to encourage digital skills training and develop capacities which we know will facilitate a qualitative leap in the standard of living of rural dwellers” (European Court of Auditors, 2021).

In Catalonia, Spain, dozen local action groups (LAGs) worked together to design the COWOCAT project (COWOrking CATaluña) that created the so-called collaborative spaces in rural areas. These helped establish networks to attract experts and develop and improve digital skills of local entrepreneurs (Paneva et al., 2018). The empowering collaboration spaces focus on technical assistance in rural areas to improve expertise. They also include consulting on legal issues, easier selection of collaborators, creating a promotion website and advertising events important to the community.

By observing communication channels between LAGs and citizens, a wide-ranging Spanish survey indicates that full potential has not been reached yet. Social networks are the main channels of connection and communication (e.g., Facebook, Twitter) and a fundamental tool for the exchange of knowledge, experience, and opinions on LAGs' transformation. Social networks enabled collaboration in virtual communities and the spread of LAGs' influence and interactions beyond their borders (Galindo-Pérez-de-Azpilaga and Foronda-Robles, 2018).

The business sector and civil society should participate and cooperate with the EU and national, regional, and local authorities to tackle the problem of using technological and digital resources. The availability of new technological resources and their incorporation into agriculture and the food value chain pose major challenges in rural areas. Infrastructural barriers, high cost of access to technology and limited digital literacy of the population slow down digital development. The current COVID-19 crisis

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1 Local Action Groups are EU bodies for the support and development of rural areas, gathering representatives of the public, economic and civil sector who work together in order to achieve development of their own regions.
has highlighted the need for progress in this area which would stimulate development, reduce the digital divide in rural areas and attract young people (Long-term Vision for EU Rural Areas, 2021).

Revitalization of rural areas can be achieved by using ICT and encouraging the development of digital skills in areas afflicted with human capital flight (brain drain) (Paneva et al., 2018). Increased use of the Internet and digital technologies in LAGs, i.e., EU funded projects, has several advantages for the inhabitants of rural and island areas including increased access to information and digital services, easier implementation of rural development strategies and making key decisions, and, very importantly, training users to utilize new technologies (Galindo-Pérez-de-Azpillega and Foronda-Robles, 2018). In addition to access to information and digital technologies, ICT policies and strategies help individuals in local communities to develop and implement the Internet of Things (IoT) concept in rural areas and establish action plans for broadband Internet access. In general, digital transformation is the basis for bridging the rural-urban gap in rural areas and creating the concept of smart villages (Stojanova et al., 2021).

Another example of good practice comes from Sweden where IMPROVE e-project technology provides focused and more cost-effective home care for the population in remote rural areas, especially the elderly. The project outcome is a network of established collaborators and a digital online platform for sharing information and more efficient treatment of high-risk medical conditions. The project emphasizes the digital inclusion of residents of remote rural areas and the efficient use of technologies to improve the quality of life of the elderly, who are often socially and digitally excluded. (Paneva et al., 2018).

The benefits of using digital technologies and the Internet for persons with visual disabilities

According to the World Health Organization (2021), nearly 2.2 billion people have distance or near-vision impairment.

On estimate, more than 30 million Europeans are blind and partially sighted; on average, 1 in 30 Europeans experience sight loss. There are four times as many partially sighted persons as blind persons. The average unemployment rate of blind and partially sighted persons of working age is over 75 percent, with more unemployed women than men. Women are also more at risk of becoming blind or partially sighted than men. Sight loss is closely related to old age, so one 1 in 3 persons over 65 has sight loss. In more detail, 90 percent of visually impaired persons are over 65 years of age (EBU, no date).

According to the data from the 2021 Report on persons with disabilities in the Republic of Croatia, there are 19,132 visually impaired persons, as seen in the Overview of types of impairments that cause disability or contribute to the degree of a person's functional impairment as comorbid diagnoses (Table 3.a.).
Ensuring conditions, equal opportunities and social inclusion of persons with disabilities is a joint responsibility of individuals, the community, society, and especially public administration bodies.

The National Plan for the Promotion of Equal Opportunities for Persons with Disabilities 2021 - 2027 (2021) recognizes the following public policy priorities in the Republic of Croatia:

1. Inclusive upbringing, education, and employment of persons with disabilities,
2. Availability, affordability and accessibility of health and social services for persons with disabilities, and
3. Ensuring the accessibility of basic social infrastructure and amenities.

Priority 3 states that accessibility “is a prerequisite for the inclusion of persons with disabilities in the life of the community equal to other citizens, implying accessibility of the physical environment, transportation, information and communications, including information and communication technologies and systems, and other contents and services open or intended for the public” (Ministry of Labour, Pension System, Family and Social Policy, 2021).

It is difficult to imagine contemporary life without digital technologies so priority 3 recognizes the need to reduce the digital gap (unequal opportunities for use of digital technologies and content), by ensuring (digital) accessibility of (digital) information and communications, technology, and content and services. Thus, the Law on Accessibility of Websites and Software Solutions for Mobile Devices of Public Sector Bodies entered into force in 2019 (Croatian Parliament, 2019).

Digital inclusion and digital accessibility are crucial in the education of not only persons with disabilities but others in a less favourable position (for example, the elderly whose abilities decrease with age, people with limited access to information and communication (digital) technology - devices and Internet connection). The use of digital technologies is one of the contemporary prerequisites for education, employment and daily life. To improve general inclusion, we need to ensure the accessibility of digital technology and digital content.

Typhlotechnics and digital technologies - devices and software, are (can be) assistive technologies for the blind, visually impaired and persons with other visual difficulties. Some examples include magnifying glasses, text-to-speech (screen readers) and vice versa (speech recognition software), and Braille notebook. These technologies enable availability, i.e., accessibility of locally stored digital content, on a computer or another device, or online (on the web/Internet). Digital technologies and the Internet enable and facilitate communication and social participation of blind and visually impaired persons. They can also utilize and realize their potential (education, employment) and access services (online banking, shopping, etc.) more easily online than in a physical environment, and the COVID-19 pandemic emphasizes this even more.
Digital technology has yet another important role - raising awareness of the different needs, in this case, of the blind and visually impaired persons, and the importance of inclusion and accessibility. Computers and other digital devices/technologies can simulate various visual impairments. This is especially important for digital content creators who should be aware of the diverse needs of prospective users. The users should be provided with the easiest possible content access. Digital content creators should also be familiar with the guidelines for ensuring the accessibility of web/digital content according to the standard ISO/IEC 40500:2012 Information Technology — W3C Web Content Accessibility Guidelines (WCAG) 2.0 (ISO/IEC, 2012). The accessibility guidelines are based on four principles stated in Article 6 of the Law on the Accessibility of Websites and Software Solutions for Mobile Devices of Public Sector Bodies (Croatian Parliament, 2019). The Law stipulates necessary measures for a public sector body to enhance accessibility of its websites and software solutions for mobile devices, which include:

- "observability, meaning that content and user interface components must be presentable in ways users can perceive,
- operability, meaning that user interface components and navigation must be operable,
- comprehensibility, meaning that the information and user interface functions must be comprehensible, and
- stability, meaning that the content must be stable enough to be interpreted reliably by different user programmes, including assistive technologies used by persons with disabilities, so that users can always access the content."

In the Republic of Croatia, there are several associations of blind and visually impaired persons. The most important one is the Croatian Association of the Blind, a national association, a member of the European Association of the Blind (EBU), and the World Association of the Blind (WBU). It includes 26 member associations of the blind on the local, county, and city levels in the Republic of Croatia. Only a few of these associations educate their members in the use of digital technologies, as can be seen in their programmes. For this paper, we would like to highlight the experiences of the Education, Research and Application Center, UP2DATE, (https://up2date.hr), the only association in the Republic of Croatia that deals with the development and application of ICT in the daily life of persons with disabilities, especially the blind and visually impaired. They have publicly established themselves as one of the important factors in the field of information and counselling, organizing and conducting IT education, providing technical support services to users of new technologies and the services of seeing companions and sign language interpreters. The Center has 700 members, most of whom active users of IT technologies. Last year they celebrated 30 years of existence and engage in a wide range of activities:

- digitization of textbooks for high-school and faculty students in Braille,
- checking the accessibility of digital content,
- designing new content for blind and visually impaired people,
• organizing workshops for learning Braille and more,
• participating in EU projects,
• providing seeing companion services,
• providing sign language interpreter services for the deaf-blind.

The Center collaborates on national projects with the Faculty of Electrical Engineering and Computing at the University of Zagreb (FER), CARNET and the Croatian Informatics Association. Furthermore, they participated in the Conference on Digital Inclusion in February 2022 and the implementation of the Law on Accessibility of Websites and Software Solutions for Mobile Devices of Public Sector Bodies. According to their statement, "The Law is implemented by institutional goodwill. Although institutions at the national administrative level are responsible for its implementation, there are no sanctions for those who do not implement the Law, so there is no obligation to do so. It is unknown which other associations test websites for accessibility. The UP2DATE Center worked with FER, CARNet, AMPEU (Agency for Mobility and EU Programmes) and many others to test website accessibility. "When testing websites for accessibility, it is incorrect to use online tools to check for irrelevant accessibility and exclude end users expertise in assistive technology. They can identify website accessibility and suggest changes which should be made." The Center refers to the Law persistently and notifies competent authorities of deficiencies in website accessibility, but often does not receive a response. Therefore, the Central State Office for the Development of the Digital Society should cooperate with the National School of Public Administration, the Information Commissioner, and the umbrella national organization of persons with disabilities to organize and implement training programmes for public sector employees and other relevant stakeholders for creating, managing and maintaining website content and software solutions for mobile devices under the Law.

The benefits of using digital technologies and the Internet for the elderly

The continuous development of digital technologies and digital services has offered numerous opportunities but also caused digital divides (digital gap) which mostly occur between younger and older generations (Friemel, 2016, Olphert, Damodaran, 2013). In the beginning, digital divides were reflected in access to digital technologies and the Internet, but today they are evident in the aspect of use. The affordability of digital technologies and the Internet is no longer a problem. The challenges lie in motivation for using technology and the competencies required for use. The key to reducing the digital divide is empowering the elderly and enhancing their digital inclusion (Gil, 2019). Digital inclusion aims to bridge the digital divide of disadvantaged groups such as the elderly, ensure access to social resources for people in need and reduce inequality between disadvantaged groups and the rest of society, which is necessary for sustainable development (United Nations Social Development Network, 2019).

There are numerous advantages for the elderly population stemming from digital technologies and the Internet. In contemporary times of the COVID 19-pandemic and limited possibilities of physical contact with the environment, the elderly people who
use digital technologies and the Internet can expand their social circles, improve social interactions and access to social resources. For example, the use of social networks and new media provides them with easier access to information, communication with relatives, friends... (Bianchi, 2021, Rodríguez et al., 2009). Furthermore, the elderly can be empowered through digital technologies and the Internet by exercising their rights in a digital society and participating in social dialogues via public electronic services (e.g., e-Consultation), participating in online discussions on social networks, online viewing of parliamentary sessions, etc. They can also use electronic public services, saving time and money, and in case of a mobility limitation they are able to exercise some of their rights or access a certain public service (Wong et al., 2014, Damant et al. 2013).

Digital technologies can motivate the elderly to actively participate in all spheres of social and political life in a new way. In addition, digital technologies and the Internet can also help them improve and maintain better health, cognitive and motor skills, and lead an independent life, which is an important way of promoting active aging and improving the quality of life of the elderly (Hatamnezhad, Ghafari Ashtiyani, Seyedi, 2021, Duplaga, 2021, Nikou, et al., 2020, Hussain, Ross, Bednar, 2018, Haight, Quan-Haase, Corbett 2014). In the report on active aging policy, the World Health Organization (WHO) explicitly states that the elderly should use new technologies actively, including new media and electronic services, just as young people do (WHO, 2020). Many studies have shown that the use of new media, such as social networks and digital communication and networking technologies, can help reduce loneliness of the elderly population, improve their social participation and interaction, increase life satisfaction, prevent cognitive decline and reduce depression and senile diseases, thus improving and maintaining the quality of life in general (Llorente-Barroso, Kolotouchkina, Mañas-Viniegra, 2021, Chen, 2020, Pekkarinen, Melkas, Hyypiä, 2019, Dinitto 2013, Sum, et al. 2008). Therefore, public policies and strategies should contain a digital inclusion component to be implemented in various projects and activities. It is very important to motivate and inform the elderly of the benefits that digital technologies and the Internet can provide them with, awake their vitality and digital enthusiasm and give them the simple know-how of digital technologies and enjoying digital life without too much effort (Zhang, Guo, Vogel, 2022). To achieve these goals, all stakeholders should work actively to participate in the costs of acquiring digital technologies and Internet access, if necessary. Society needs to design and implement various trainings/educational programmes for the elderly to obtain the necessary digital competencies through free courses and help centers working on the digital inclusion of the elderly (e.g., public libraries, pensioners' associations, retirement homes, educational institutions...) (Sales, 2009, Blažič, Blažič, 2020). This includes accessibility and easier use of digital public services, which should be suitable for everyone, including the elderly. It is also essential to educate the elderly about the importance of personal data protection against various types of fraud and risks that all users, including the elderly, can be exposed to when using digital technologies and the Internet. Most often, the elderly lack the necessary knowledge about Internet fraud (Martínez-Alcalá, et al., 2021). Numerous modern digital platforms offer various
benefits "for free" or provide opportunities for "easy" earnings, most often leading to personal data theft or financial loss. When combined with economic losses, such events can harm the physical and mental health of the elderly (Tao, Shuijing, 2016). Large amount of information and the extensive content provided by digital technologies and the Internet can initially satisfy the curiosity of the elderly and thus fill their excess free time. However, all users, including the elderly, are in danger of long-term and excessive use of digital technologies which can cause addiction. Excess use of entertainment content such as games and videos can lead to serious addiction and cause health problems. Also, the large amount of information that can be accessed through digital technologies and the Internet can easily cause information overload, increasing the psychological pressure to access and use information, which can ultimately result in undesirable consequences for the elderly, such as anxiety (Ordonez, Yassuda, Cachioni, 2010). It is necessary to continuously raise awareness and educate everyone, including the elderly, about the advantages and disadvantages of digital technologies and the Internet.

**Digitalna.hr project**

Digitalna.hr is a three-year project for the development of a network of partners from the civil, public and private sectors whose goal is the development of digital literacy of citizens. Project implementation period is October 29, 2020 – October 28, 2023. Total project value is 3,598,871.35 HRK. The project is divided into 5 separate working groups cooperating in particular activities. The first three working groups – Digital citizenship, Digital education, work and new occupations, and Digital talents and innovations, conduct scientific research and social needs assessments in the first half of the project. Then, they create guidelines for national, regional and local decision-makers, with the intention of including the guidelines in 2021 – 2030 strategic documents and operational plans. In the second half of the project, new R&D projects in human resources are planned in cooperation with partners from European national associations for digital skills and jobs, members of the All Digital network and other international partners. Technological development will dictate the continuous development of new projects, enabling the Network's financial sustainability. The fourth working group, Research and Development, is involved in joint activities of building internal capacities for scientific research implementation and integrating applied R&D of institutes, universities and other scientific institutions into the economy, raising the R&D capacity of civil society organizations and SMEs, the role of public and local administration in the development of strategic e-infrastructure necessary to attract investments, collecting and using open public data and building the capacity of network stakeholders for international cooperation on digital projects. The horizontal working group Digital Branding of Croatia is partly responsible for increasing the visibility of the Digitalna.hr network and partly deals with the promotion of Croatian digital projects, smart digital solutions, and digital literacy, as a strategic priority of positioning Croatia as a digitally mature society and the promotion of sustainable use of digital technologies in Croatian society.
One of the project goals is to build additional capacities for participation in European projects of research and development of the digital society and brand Croatian examples of good practice in the country and abroad. Digitalna.hr project addresses the need of coordinating educational programmes with policies and operational plans for the development of an inclusive digital society on the one hand and the needs of the economy on the other. The need to develop digital competencies as one of the key competencies of all citizens is an important social need. There is also the need for the e-inclusion of vulnerable groups and advanced support programmes for digital talents as future initiators and implementors of the digital economy development. Digitalna.hr project aim is to network stakeholders in the development of digital literacy in Croatia. Digitalna.hr target groups are associations and scientific institutions, local and regional self-government, other civil society organizations or cultural and educational institutions that will join the network during the project. Target users from the civil sector are associations that deal with the development of digital literacy of children, young people, adults and e-inclusion of vulnerable social groups. Target users among local and regional self-administration are counties, cities and municipalities, which support or plan to support digital society development in their strategic and operational plans. Target users from education and culture are primary and secondary schools, faculties, adult education institutions, cultural centres and libraries. The end users of the guidelines for digital literacy development are ministries, agencies and offices of the Government of the Republic of Croatia, as well as Croatian citizens for whom developed digital literacy is a prerequisite for active inclusion in the digital society. Digitalna.hr project will build an action model based on a democratic, responsible, inclusive and public way of co-managing Network activities and processes. The aim is to implement expert and scientific analyses of social needs and develop evidence-based guidelines, which will more effectively advocate for the improvement of public policies for digital literacy development.

**Digital Literacy Development Network**

The Digital Literacy Network was created as part of the Digitalna.hr project, co-funded by the European Social Fund. The Network was formed with the general goal of strengthening cooperation and building the capacity of stakeholders across the civil, public and private sectors for research and development of the digital society in Croatia. The network conducts scientific research and, based on their results, develops guidelines for the development of public policies in the field of digital inclusion, digital education and digital transformation of work and non-IT professions. The network currently has 25 members, of which 15 civil society organizations, 7 scientific and educational institutions, and 3 regional and local governments. The Network operates through 5 working groups dealing with the issues of digital citizenship development, digital education, digital transformation of non-IT professions, digital talents and innovations, and digital research and development.

Network activities are planned and coordinated via Microsoft Teams online platform, with 55 coordination meetings organized in the first half of the project. An R&D Lab was equipped for experimenting with multimedia production and video transmission.
of educational content. According to their own interests, Network members are involved in planning workshops for new EU funded project proposals. Network membership simplifies the formation of project consortia, while Network research helps in analysing needs and defining specific goals of new projects. Trends in the digital transformation of Croatian and European societies are presented in round table discussion and thematic Network conferences. These hybrid events can be attended live or via online video streaming. At thematic conferences, the best examples from European practice, Network results and the projects of the members are presented, ideas are exchanged and cooperation with new national or international partners is agreed upon. The first round table discussion was about computer games in school classes, while the first conference was organized on the topic of digital inclusion.

International cooperation with the European All Digital network enabled participation in the development of the new version of the Digital Competence Framework for Citizens DigComp 2.2, which will be used in the development of guidelines for the development of digital literacy in Croatia. The cooperation also offered insight into examples of good European practice in the development of digital literacy of different age and social groups. In preparation of the guidelines, the Strategy for Shaping Europe’s Digital Future was analysed along with the EU Digital Education Action Plan and the 2030 Digital Compass, with planned success indicators of the European strategic goals implementation by the end of the decade.

**The working group for Digital Citizenship**

The most important goals of the working group for Digital Citizenship are: create guidelines for the development of digital literacy and information literacy as well as safe, ethical, creative, inclusive and responsible use of digital media, solve the problem of inadequate digital literacy which hinders the full potential of a competent high-school or faculty student, a professional and efficient employee, and an active citizen, develop digital literacy as a prerequisite for creating public digital services for citizens and employers at the local and national level, e-inclusion, smart cities, islands and homes, digital democracy, the position of women in digital technologies, e-Citizen, digital culture and personal data protection.

In order to achieve these goals, the working group for Digital Citizenship conducts scientific research to identify the needs of digital inclusion of vulnerable groups. The aim of this research is to examine the digital inclusion needs of vulnerable target groups from the aspects of access, use, impact on quality of life, empowerment and user experience. During coordination meetings and research preparation, the members of the working group for Digital Citizenship defined vulnerable groups at the greatest risk of digital exclusion. The selected target groups in this research are persons with disabilities, retired people, residents of islands and rural areas. The research is conducted in the City of Zagreb and Zagreb County, Varaždin County and Primorje-Gorski Kotar County. After the research ends, the obtained results and relevant literature related to the digital inclusion of vulnerable groups will be analysed. National and international experts will help in gathering examples of best practices.
from other countries. Lastly, the working group for Digital Citizenship will create guidelines for:

- developing digital literacy and information literacy, as well as safe, ethical, creative, inclusive and responsible use of digital media,
- solving the problem of inadequate digital literacy which hinders the full potential of a competent high-school or faculty student, a professional and efficient employee, and an active citizen,
- developing digital literacy as a prerequisite for creating public digital services for citizens and employers at the local and national level, e-inclusion, smart cities, islands and homes, digital democracy, the position of women in digital technologies, e-Citizen and e-Health services, digital culture and personal data protection.

**Activities of the working group for Digital Citizenship**

The activities of the working group for Digital Citizenship began with scientific research. In the first phase, the research problem was defined. At the beginning of the research, a search of the relevant literature on digital inclusion followed, and research problems were defined based on the references.

Research problems:

- national policy makers’ lack of promoting, enabling access and using digital technologies among "vulnerable groups", as well as developing digital and information literacy and safe, ethical, responsible and creative use of digital technologies,
- insufficient representation of the digital inclusion of "vulnerable groups" in creating strategies, action and implementation plans, reports on implementation, connecting planned activities with budget items of national, local and regional bodies,
- despite all efforts, economic, geographical and other limiting factors create a digital divide for many individuals, especially "vulnerable groups", preventing equal benefits offered by modern digital technology,
- the "digital gap" which, in the circumstances of the COVID-19 pandemic and the consequences of natural disasters (earthquake), increases social exclusion and worsens the position of digitally excluded individuals from "vulnerable groups",
- insufficient research on the quality of public e-services in the Republic of Croatia, especially the accessibility of public e-services to "vulnerable groups",
- the lack of research implementation at the national and local level in the Republic of Croatia on the topic of digital inclusion of "vulnerable groups" and insufficient engagement in defining the "Policy Program for Realizing Digital Society" within the 2015 Digital Single Market Strategy for Europe, improving access to e-Government, e-Health services and digital skills related to the aforementioned groups.

The research continued by defining target groups. Target groups belonging to "vulnerable groups" were agreed upon after an extensive search of relevant literature
and gathering experiences of the members of the working group for Digital Citizenship. The groups most affected by digital exclusion are:

- retired people (retirement homes, pensioners' associations),
- persons with disabilities (associations of blind and visually impaired persons, associations of persons with disabilities),
- residents of rural areas and local action groups (LAGs),
- residents of islands.

The research questions were formed after the research problem and target groups had been defined:

1. Do vulnerable groups use the Internet?
2. What types of Internet access do vulnerable groups use?
3. What barriers do individuals from vulnerable groups face when using digital technologies and the Internet?
4. How often do vulnerable groups use digital technologies for communication?
5. How much do individuals have and/or want to acquire the necessary competencies?
6. How much are e-Citizen services used?
7. Is there motivation/interest for using the Internet and digital technologies for communication and e-Citizen services?
8. What is the user experience of e-Citizen services?
9. What is the level of media literacy of individuals from vulnerable groups?

The main goal and the sub-goals of the research were based on set research questions. The goals and sub-goals of the research define the research aim. The main goal of the research was to ultimately and comprehensively determine the research direction, while the sub-goals were intended to define specific aspects of the topic within the framework of the research itself.

The main goal of scientific research:

Examine digital inclusion needs of vulnerable target groups in terms of access, use, impact on quality of life, empowerment (use of public services) and media literacy, and create guidelines for decision makers.

The sub-goals of the research are based on the main goal:

Sub-goal_1: Creating a measuring instrument to examine the need for digital inclusion of vulnerable target groups from the aspects of access, use, impact on quality of life, empowerment and digital accessibility.

Sub-goal_2: Using the created measuring instrument to conduct empirical research on a sample of respondents from vulnerable target groups.
Sub-goal 3: Creating guidelines for the development of strategies and action plans for digital inclusion of vulnerable target groups based on empirical research and relevant literature. These guidelines will be presented to national and local decision makers in the Republic of Croatia.

The main categories of the measuring instrument for examining the need for digital inclusion of vulnerable target groups were based on the research questions.

Main categories and subcategories of measuring instrument:

1) Digital inclusion of vulnerable groups
   a. reasons for using digital technologies and the Internet
   b. accessibility of digital technologies and the Internet (networks and devices)
   c. means of acquiring skills to use digital technologies and the Internet
   d. barriers to the use of digital technologies and the Internet
   e. frequency of using digital technologies and the Internet
   f. motivation for using digital technologies and the Internet
   g. support/assistance in the use of digital technologies and the Internet
   h. assessment of knowledge and skills in using digital technologies and the Internet
   i. interest in acquiring new knowledge and skills in using digital technologies and the Internet

2) Reasons for using digital public services (e-Citizen)
   a. reasons for using
   b. reasons for not using
   c. type of digital public services used
   d. frequency of using digital public services
   e. experience in using digital public services

3) Media literacy

After the main categories had been defined, the development of the measuring instrument followed. The measuring instrument was developed in cooperation with the members of working group for Digital Citizenship, academics and practitioners, and target users. A qualitative assessment of the content validity was performed by distinguished experts in application of digital technologies and digital inclusion practitioners, who have knowledge and experience in scientific research. A quantitative evaluation of the relevance of the identified initial set of claims/questions was performed only on expert data by calculating the empirical indicator of content validity. The focus group method with an expert panel was added for the purpose of content validity to achieve group interaction of academics and practitioners. In order to determine whether the end users understand the questionnaire and the
claims/questions are clear, a pilot study was conducted by interviewing the end users' representatives. Based on the results of this procedure, the measuring instrument was finalized.

After the measuring instrument was developed, the empirical part of the research was conducted from September to December 2021, with 450 participants in the City of Zagreb and Zagreb County, Varaždin County and Primorje-Gorski Kotar County. After data collection and analysis, the results will be used for creating guidelines. The activities of the working group for Digital Citizenship go beyond the implementation of scientific research and the creation of guidelines. To achieve the final goal, the key activities of the working group for Digital Citizenship include:

1. Strengthening the partnerships of civil society organizations, involving new members of the thematic network by contacting representatives of associations and institutions of vulnerable groups, representatives of creators of e-government services and representatives of the scientific community,

2. Assessing the social impact of the working group for Digital Citizenship based on field information and social impact analysis methods of the Institute for Public Finance as well as conducting structured interviews with stakeholders of the working group for Digital Citizenship,

3. Organizing a conference and a structured dialogue with associations' representatives to present Network activities, analysing the results of public opinion polls and scientific research, and presenting Croatian and EU examples of good practice in the development of digital competences.

The development of strategic guidelines and action plans for the digital inclusion of vulnerable target groups is underway and will be presented to national and local decision makers in the Republic of Croatia. Through these guidelines, decision makers will be introduced to the needs, problems and necessary measures and activities to be included in public policies to increase the digital inclusion of vulnerable groups.

**Conclusion and recommendations**

Public policy makers should be responsible and able to recognize the negative consequences of the digital divide. They should also be aware that nowadays it is necessary to work both on the development of the digital society and digital inclusion, especially of vulnerable groups. If governments only encourage the development of digital public services without simultaneously implementing digital inclusion, they create a so-called "computerized" state, not a digital society. By non-implementing digital inclusion of the most vulnerable groups and neglecting their well-being, governmental activities only enhance the existing empowerment of the already empowered individuals. In this way, the groups who need help the most and could benefit from digital transformation gain minimal or no benefits. Human resources can be stimulated, and their potential can be used to the fullest through digital inclusion.
and involving stakeholders from different areas and levels into joint and supportive action through various coordinated activities. This is the way to bridge the digital gap affecting the most vulnerable groups. Governments should constantly work on policies of innovative management of the digital divide by improving and implementing relevant laws and other regulations, and thus supporting the tendencies of reducing the digital divide. Furthermore, it is important to encourage and invest in life-long learning about digital technology and acquiring digital skills. This is especially important for vulnerable groups to improve their ability to use modern digital technologies, which can greatly enhance their quality of life and integration into digital society. Vulnerable groups should also be continuously educated on the potential dangers and frauds when using digital technologies and the Internet, as well as negative economic and other losses due to improper or careless use. We should ensure equal benefits from all the advantages of digital technologies for vulnerable groups and ensure their carefree, safe and unbiased integration into the digital society.

The scientific research carried out within the working group for Digital Citizenship is focused on identifying the needs of digital inclusion of vulnerable groups in terms of access, use, impact on quality of life, empowerment, user experience and media literacy. A measuring instrument was created to examine these needs. Academics and practitioners participated in content validation, and the representatives of the end users participated in validating clarity and adaptability to the target groups.

The interviewed representatives of vulnerable groups stated that digital services, especially public ones, should be easy to use and practical so that users, especially from vulnerable groups, could use them actively. Therefore, developers of digital public services should adapt to the particular needs of vulnerable groups (e.g., larger font, speech-to-text or simplified use) while creating and designing these services.

Children and young people need to be made more aware of vulnerable groups and their needs. The new generations of the so-called "digital natives" could also contribute to reducing the digital gap, since they grow up with digital technologies, and easily overcome and accept the challenges of continuously developing digital technologies. Children and young people should be encouraged to assist the members of vulnerable groups, such as elderly family members, in using digital technologies and the Internet. In addition, international examples of good practice of the digital inclusion of vulnerable groups should be promoted. The governments could then adapt these practices and apply them accordingly. Digitally excluded groups and individuals should be empowered, motivated and integrated into the digital society to benefit from digital inclusion. The authors will define future activities while constructing and expanding the Digital Literacy Network, focusing on meeting the digital needs of the most vulnerable social groups.
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