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STRATEGIC FRAMEWORK FOR INCLUSION OF PERSONS WITH DISABILITIES IN ONLINE (PLATFORM) WORK

Abstract: The COVID-19 crisis has accelerated digital transformation and expanded the usage of advanced ICT solutions globally. Moreover, the expansion of remote work platforms and the tendency of modern businesses to outsource part of their business operations to individuals in remote locations creates significant potential for finding employment. According to available data sources, it is estimated that about 700,000 persons in Serbia face some form of disability. Of that number, only about 13% are employed. As a consequence of facing discrimination, persons with disabilities have a greater tendency towards long-term unemployment and complete withdrawal from the labor market. The Internet and advanced digital technologies provide equal opportunities for persons with disabilities to get involved in the digital labor market and increase their chances to find employment and generate income. This paper aims to discuss the potential of digital labor platforms for lowering the long-term unemployment of persons with disabilities in Serbia. Accordingly, the paper provides data on the level of digital competencies of persons with disabilities, since they are fundamental for obtaining employment on digital labor platforms. For that purpose, the standard desk-research method and secondary data analysis of relevant literature, strategic documents and public policies have been performed. The research results provide a deeper insight into the current level of digital competencies of persons with disabilities and suggest a potential solution for improving their chances of obtaining employment and generating income.
Keywords: digital labor platforms, persons with disabilities, digital competencies, self-employment.

1. INTRODUCTION

Digital transformation has led to the entrance of digital technologies in all aspects of society with a noticeable trend of increasing services provided by ICT (Domazet et al., 2018), especially in the labor market (Banović & Pavlović, 2021). The ongoing health crisis has further accelerated the trend (Lazić et al., 2021). The expansion of remote work platforms and the tendency of modern businesses to outsource part of their business operations to individuals in remote locations creates significant potential for finding employment. Online outsourcing websites have proved to be valuable partners to companies in search of a "specific set of skills for a limited period" (Green et al., 2018), while platform affiliation provides access to insurance, credit, and cash transfers for freelancers (Cieslik et al., 2021).

According to available data, about 15% of the total world population faces some form of disability (World Health Organization, 2011). In Serbia, that number is estimated to be around 700,000 of which only 13% are employed (Mamula Nikolić et al., 2019). Due to a specific type of discrimination, persons with disabilities have a greater propensity to long-term unemployment or a complete withdrawal from the labor market, especially in developing countries. Consequently, persons with disabilities in Serbia face various social and psychological barriers, which reduce the possibility of their active participation in key spheres of social life, leaving numerous adverse consequences, both on the quality of their lives and the lives of their family members.

Online platform work provides multiple benefits to persons with disabilities, such as working from home, adjusting the pace and scope of work to the personal capacity, creating a flexible working model, and the possibility of using adaptive technologies for every single form of disability. Nevertheless, the question of how many persons with disabilities in Serbia are capable of getting involved in work on online platforms naturally arises.

Considering the above mentioned, this paper aims to discuss the potential of digital labor platforms for lowering the long-term unemployment of persons with disabilities in Serbia. Accordingly, the paper provides data on the level of digital competencies of persons with disabilities in Serbia, considering their importance for obtaining employment on digital labor platforms. For that purpose, the standard desk-research method and secondary data analysis of relevant literature, strategic documents and public policies have been performed. The key findings indicate the lack of advanced digital competencies of persons with disabilities in Serbia and the necessity of their digital inclusion through training and retraining programs.

The remainder of the paper is organized as follows. After the introductory remarks, Section 2 briefly describes the current position of persons with disabilities in the domestic labor market and the potential of online platform work. Section 3 analyses the level of digital competencies of persons with disabilities in Serbia based on the available data and publications. Section 4 is devoted to the discussion of the insights obtained, while Section 5 concludes the paper.

2. THE POTENTIAL OF DIGITAL (ONLINE) PLATFORM WORK

According to the latest available data, there are approximately 700,000 persons with disabilities in Serbia (Mamula Nikolić et al., 2019). It is estimated that the employment rate of persons with disabilities is 13%, compared to the 42.5% employment rate in the total population in Serbia (Mamula Nikolić et al., 2019). High and tenacious unemployment rates among persons with disabilities imply that this population segment has an unequal position in the labor market. Literature suggests that persons with disabilities face numerous obstacles in the search for employment, which vary from the difficulties in using public transportation or approaching office spaces to assessing working ability and revealing their disability status (Zyskowski et al., 2015). It is also believed that they often face workplace bias and discrimination (Davis & Chansiri, 2019). Accordingly, work from remote locations using digital technology is commonly seen as a way in which persons with disabilities can participate in the labor market and generate income. Persons with temporary or permanent physical disabilities find the ability to work from home as an advantage due to limited mobility. In contrast, persons with certain limitations in cognitive functioning find the absence of social interaction a relief, as they feel that their limited social skills would affect their ability to complete work tasks successfully (ILO, 2018).

Davis and Chansiri (2019) provide evidence on the use of second life avatars by persons with physical disabilities and work in virtual societies, such as "starting an online gift shop, maintaining a virtual island, investing in real estate, or working as a weekend disc jockey". This might imply that performing tasks on virtual job platforms where workers are judged principally on the quality and amount of work done could be a manner towards achieving employment and earning a wage for persons with disabilities. Work on virtual platforms is performed as crowdwork and is mainly divided into microwork and online freelancing (Margaryan, 2019). Microwork is used to describe a crowdwork practice which implies that larger projects are divided into smaller work tasks, i.e. micro-tasks, which are posted on digital labor platforms in order to be performed for pay. These tasks most commonly do not require advanced digital competencies and are completed in shorter periods of time. A taxonomy of micro-tasks was provided by Gadiraju et al. (2014), and a more detailed taxonomy was developed by ILO (2018). The following table presents micro-task categories performed on crowdwork platforms (Table 1).

Table 1: Taxonomy of micro-tasks on crowdwork platforms

Task	Illustration/examples
Data collection	Collecting metadata (searching for contact data and "mobile crowdsourcing")
Categorization	Classification of entities into groups (tagging, bookmarking, pinning)
Content access	Product promotion, SEO, app testing (watching videos, liking, retweeting to increase traffic and improve rating)
Verification and validation	Verification and "cleaning" existing data or classifications
Content moderation	Screening user-generated content (reviewing text, images and video content according to guidelines)
Market research and reviews	Reviewing or rating a product, service or location ("mystery shopping", reviewing and testing apps, judging statements, images or videos)
Artificial intelligence and machine learning	Collection of material for machine learning or artificial intelligence (tasks related to programming and coding or to mathematical or logical problem-solving)
Transcription	Transcription of information from different types of media (audio, text, photos, videos) into written form
Content creation and editing	Creating new content, proofreading, editing or translating existing materials, graphic design
Surveys and experiments	Completing academic and market research questionnaires

Source: Adapted to ILO (2018)

According to Schmidt (2017), tasks on microwork platforms are usually supervised by algorithms, whereas workers are mostly anonymous. Some of the microwork platforms are Clickworker and Mechanical Turk. On the other hand, online freelancing requires advanced digital and professional skills as work tasks are much more complex and take longer to complete. Unlike microwork platforms, clients supervise the quality of work on online freelancing platforms, and workers have to display their profile pictures and name. Some of the online freelancing platforms include Freelancer, Upwork and Fiverr. Analyzing the Upwork online job platform, Anderson (2017) provided a taxonomy of job skills needed to perform tasks in the online freelance labor market. The following table presents macro-task categories performed on online freelancing platforms (Table 2).

Table 2: Taxonomy of macro-task categories performed on online freelancing platforms

Task	Examples
Administration	Data entry, virtual assistant, customer service, accounting, bookkeeping, internet research, market research, project management
Art/Design	Graphic design, photo & video editing, 3d & 2d-design, UI design, animation, video production
Writing	Content writing, copywriting, creative-writing, technical-writing, business-proposal-writing, e-book writing, copy-editing
Translation	Transcription, translation, proofreading
Marketing	Social media marketing, internet marketing, email marketing, SEO, SEM, Google analytics, Google AdWords, link-building, on & off page optimization, PPC advertising
Programming	WordPress, HTML, PHP, Joomla, Javascript, MySQL, Web design
IT administration	Amazon web services, eBay listing writing, Linux system administration
Mobile Development	Game design, game development, iPhone & Android app development, ios development, iPhone UI design
Statistics	Data mining, data scraping, web scraping

Source: Adapted to Anderson (2017)

Even though research on the topic of persons with disabilities and crowdwork is scarce, Zyskowski et al. (2015) provide evidence on the opportunities that micro-work tasks offer for this population segment, stating that they allow for flexible work hours and avoiding spatial obstacles. The authors suggest that further investigation is needed regarding their participation in higher-skilled platforms such as Freelancer. A study on the improvement of the employability of long-term unemployed persons with disabilities in Serbia highlights the importance of possessing IT skills and conducting training and retraining programs in this area. These skills include using Microsoft Office packages and programs to work with databases, working in design and photo manipulation programs, web design and web marketing, knowledge of software languages and work on software development and testing (Mamula Nikolić et al. 2019). Despite the fact that this study does not consider the possibility of applying these digital skills in the context of self-employment through online platforms, but in the function of traditional employment, this opportunity should be highlighted among persons with disabilities.

3. DIGITAL COMPETENCIES OF PERSONS WITH DISABILITIES IN SERBIA

Considering the above mentioned, it is clear that measuring the level of digital competencies is vital to determine which tasks in the online labor market persons with disabilities can get involved in - micro-tasks, such as data collection, editing materials or proofreading, which require basic digital competencies, or online freelancing jobs, such as data mining, programming or web design, that require advanced digital skills. On the other hand, measuring digital competencies is important in order to reduce digital exclusion, which causes social exclusion. For example, it is estimated that in the UK, about 10% of the population will never be able to acquire basic digital skills due to age, poor literacy skills or disabilities, which directly puts them at risk of complete digital exclusion (Ipsos, 2015). Also, insights into the level of digital competencies that persons with disabilities possess would give the opportunity to improve them, through training or courses. Increasing the level of digital competencies of persons with disabilities reduces the possibility of their unemployment. At the same time, an individual would have the opportunity to be more competitive in the online labor market and generate a higher income.

First, we should make a few technical remarks. There is a distinction between digital skills and digital competencies. Digital skills refer to the possession of appropriate knowledge and behaviors following the needs of individuals and society in the time of rapid development of ICT (ITU, 2020). Digital competencies refer to the creative usage of ICT for achieving goals related to employment, learning, or participation in society (Ferrari, A, 2012). To better identify the level of digital competencies of citizens and consequently develop strategies for their improvements, the European Commission introduced the European Digital Competence Framework for Citizens, known as DigComp (Simović & Domazet, 2021). The instrument consists of 21 competencies, classified into five areas of digital technology usage: (1) information and data literacy, (2) communication and collaboration in the digital environment, (3) creating digital content, (4) security and (5) problem-solving. Information and data literacy includes the ability to search and filter

information, filter data and digital content, as well as data assessment and management. Communication and collaboration involve interaction and the possibility to share content through digital technologies and use various digital services for more effortless functioning in the digital community. Creating digital content involves development and programming, while security includes personal data and privacy protection, health protection, environment, safety, and well-being. Problem-solving includes identifying and solving technical problems and the possibility for creative usage of digital technologies.

Nevertheless, Cvejić and Stefanović (2018) stated that although Eurostat monitors digital literacy annually, according to the different characteristics of the EU population (age, gender, employment status), there is no measurement of digital literacy where one of the indicators is a disability. In other words, a systematic assessment of the digital competencies of persons with disabilities in the European Union is lacking (Cvejić & Stefanović, 2018). The situation is a bit more favorable in Serbia. Study *Improving the employability of long-term unemployed persons with disabilities* (2019) points out that persons with disabilities in Serbia most often performed the following tasks – 17% of them worked in sales, and IT jobs were performed by only 2% of respondents. When it comes to possessing specific knowledge and skills, 78% of respondents stated that they possess excellent knowledge in MS Office (Word, Excel, PowerPoint), and 15% of them said they have adequate knowledge of advanced computer programs. These numbers may indicate that most persons with disabilities possess basic, and only 15% advanced digital competencies. The study also states that persons with disabilities over the age of 55 have weaker knowledge and skills for working in MS Office, and 71% of them believe that training programs and courses would help them to be more competitive in the labor market.

In a study that measured digital competencies of persons with disabilities, *Digital literacy and youth activism of youth with disability*, the DigComp framework at the level of self-evaluation was used. The answers were divided into three categories: do not use digital technology, basic user, and independent user. The study was performed on 298 persons aged 15-30 years. About 48% of respondents were male, and 52% were female. Skills were divided into five areas and two levels of competence. If we take into consideration data management, 88% of respondents were able to find information online, and 81% stated that they are aware that not all information on the Internet is reliable. Exact 66% of respondents indicated that they were capable of comparing different sources of information to assess their reliability.

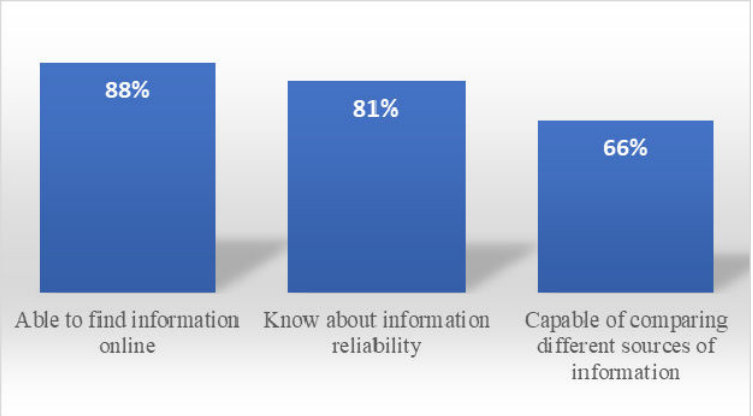

Figure 1: Data management
Source: Cvejić & Stefanović, 2018.

When it comes to creating digital content, 66% of respondents were able to create simple digital content in at least one format, and 44% said that they could create complex digital content using different tools and devices. With regard to protecting devices using security passwords and antiviruses, 72% of respondents said that they understand basic steps in the protection of devices, and 62% have installed security programs on devices (antivirus, firewall) at least once. If a technical problem occurs, 77% of respondents are able to find support to fix the problem with the program or application, and 45% of them can solve the problem that may arise while using digital technologies on their own.

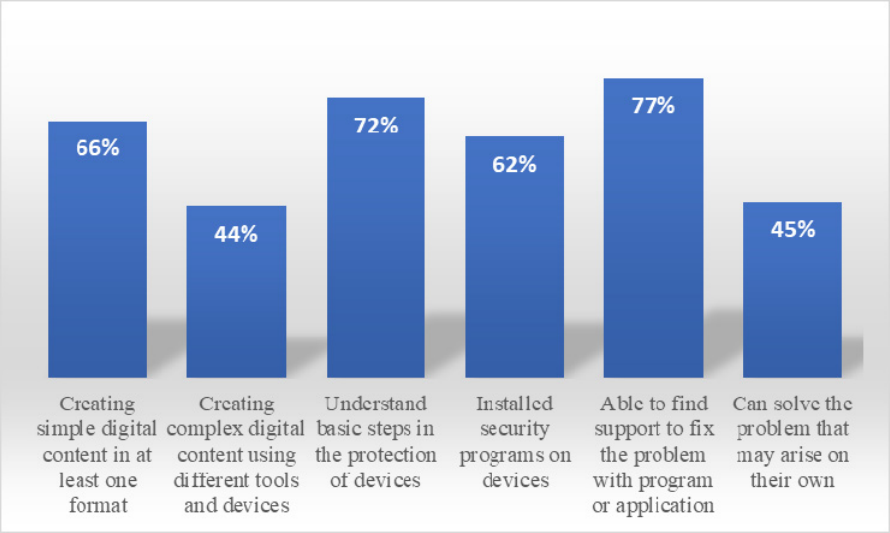

Figure 2: Creating digital content, safety and problem-solving in digital environment
Source: Cvejić & Stefanović, 2018.

This study shows that as the complexity of competencies grows, the number of individuals who can master them is declining (Cvejić & Stefanović, 2018). This leads to the fact that these persons may not be able to use technologies that would enable them simpler everyday life, better education and potential employment. As digital technologies become an important tool for accessing the labor market, it is crucial for persons with disabilities to use them for doing business or business communication. Consequently, the main challenge in the forthcoming period would be to find a way to assist this vulnerable group of people in gaining equal chances in the labor market, especially in the online labor market, which is becoming more prevalent in the digital age.

4. DISCUSSION

There are numerous regulations and conventions on equalizing persons with disabilities with other participants in the labor market. Nevertheless, many middle- and low-income countries are unable to follow this trend. Research conducted so far on the position of persons with disabilities in Serbia indicates a certain, significant degree of their presence in organizations (companies) and online environment. However, authors Mamula Nikolić et al. (2019) indicate that although persons with disabilities in Serbia find some understanding of employers regarding working conditions and adjustment of working space, there is still ample space for improvements. In addition, for most persons with disabilities in Serbia, the financial situation is pretty much challenging. It is estimated that about 50% of persons with disabilities do not have a regular monthly income, while every fifth person manages to earn money through part-time jobs (Mamula-Nikolić et al., 2019). The inadequacy of public space for the needs of persons with disabilities, sense of social discomfort and material deprivation make this vulnerable category less represented in public life, which has significant repercussions on the quality of their life and sense of self-worth.

In that regard, self-employment and work from home represent a significant, underutilized and inadequately promoted channel for the inclusion of vulnerable categories, such as persons with disabilities, in the labor market. This fact is further emphasized by the ongoing epidemiological situation, which increasingly forces the transition to work in the online environment (Vukmirović et al., 2021). Nevertheless, available data indicate lower levels of digital competencies of persons with disabilities in Serbia even though the situation is a bit more encouraging among the younger segment of this population group.

The scarcity of data on digital competencies of persons with disabilities in Serbia and their intention to engage in the online labor market calls for further investigation of this topic for two main reasons. First, it would indicate if the level of their digital competencies is adequate to perform work tasks on the digital labor platforms. Second, it would provide valuable insights into the capacity and readiness of persons with disabilities to conduct self-employment activities in the online labor market. Accordingly, better fitted training and retraining programs could be created for persons with disabilities based on their level of digital competencies, i.e. their technical skills, but also skills related to obtaining work on platforms. Even though initiatives for IT retraining of persons with disabilities already exist in Serbia, they require prior computer knowledge and are focused on obtaining traditional employment (itobuke.rs).

Another significant point of discussion is related to matching the skills developed through training initiatives with the actual skill requirements in the online work platforms' job listings. By studying listed job posts, a taxonomy of the most commonly required skills can be provided. Accordingly, these insights can be valuable for creating training programs that would better fit the most demanded work skills of employers in the digital labor market.

Recognizing the potential of the online platform work for reducing the long-term unemployment and digital exclusion of persons with disabilities in Serbia, on one hand, and the scarcity of data on digital competencies of the working-age segment of this population group, on the other, the authors of this paper are currently performing pilot research within

the project *Digital Competences of Persons with Disabilities in the Republic of Serbia and Involvement in Working on Online Platforms - DigCompOSI* (ien.bg.ac.rs). The aim of the project is to identify and evaluate the gap between the current level of digital competencies of persons with disabilities aged 15 - 64 years and the competencies required to participate in digital labor platforms and undertake digital entrepreneurial ventures. The research comprises three main parts.

The first part involves primary research which will assess the level of digital competencies of the working-age segment of persons with disabilities in Serbia with a minimum of completed primary school (as a prerequisite for understanding the questions in the questionnaire). The questionnaire was divided into four complementary segments - a standard socio-economic group of questions, overall digital competencies (adapted to DigComp framework), digital entrepreneurial competencies (adapted to DigComp framework) and online platform work. The questionnaire was distributed through two of our partner institutions - National Organization of Persons with Disabilities in Serbia (noois.rs) and Sports Association of Persons with Disabilities of Belgrade (sosib.rs). This part of the research will end by April 15.

The second part involves the secondary analysis of scientific papers and studies on work practices on the most popular digital labor platforms Freelancer, Upwork and Fiverr to gather information on the required level and type of competencies needed to engage in the online labor market. Additionally, the primary research of the job requirements in the *marketing&sales* work segment of the Upwork platform will be performed according to the identified level of digital competencies of the targeted segment of the population (entry, intermediate or advanced level).

The third part is devoted to matching the taxonomy obtained through the second part of the research and the level of digital competencies identified through the first part of the research. The idea is to provide recommendations for training initiatives that will help persons with disabilities in Serbia to get involved in the online labor market. This is in accordance with the fact that non-formal educational programs are experiencing growing popularity worldwide (Domazet & Simović, 2019). Furthermore, it is our opinion that persons with disabilities are not fully aware of the potential of digital labor platforms and digital entrepreneurship for self-employment. Compared to traditional training programs, our initiative would be devoted to training persons with disabilities to apply for jobs independently or start digital entrepreneurial initiatives.

5. CONCLUSION

The Internet creates equal opportunities for different categories of persons with disabilities (physical, sensory, intellectual) to get involved and increase their employment chances and income generation. Furthermore, digital platform work provides multiple benefits to persons with disabilities compared to traditional job assignments in terms of flexibility and adaptability to their specific needs. This is in accordance with the UN Convention on the Rights of Persons with Disabilities (United Nations, 2006), which emphasizes that persons with disabilities should be guaranteed the right to work with equal chances and to the same extent as all other citizens.

At the time of crisis caused by the COVID-19 pandemic that has intensified the process of digital transformation, the issue of digital inclusion of vulnerable categories such as persons with disabilities represents one of the policy priorities. Considering the gap identified in the literature as well as insufficient recognition of the potential that digital technologies provide in reducing the long-term unemployment of persons with disabilities in Serbia, the authors of this paper suggest the following:

- Conducting comprehensive research to identify the level of digital competencies of persons with disabilities (age 15 – 64) in Serbia. To ensure the international comparability of the data obtained, we propose the usage of the DigComp framework.
- Further examination of the job requirements in the online labor market. For that purpose, the analysis of the requirements of jobs advertised on the most popular online platforms such as Freelancer, Upwork and Fiverr should be performed.
- Identifying the gap in the level of digital competencies of persons with disabilities in Serbia and the requirements of the online labor market.
- Designing (online) training and retraining courses based on the identified requirements of the online labor market (tailor-made).
- Designing courses and training programs for employers regarding the needs and requirements for advancing persons with disabilities.

To reduce the long-term unemployment of persons with disabilities in Serbia, we emphasize the necessity of organizing public discussions and round tables where relevant stakeholders (Associations of persons with disabilities, National Employment Service, Employer Union, policymakers etc.) will have room to address current challenges and constraints and introduce new possibilities and opportunities. Moreover, it is our opinion that the potential of digital technologies and online platform work should be more visible and incorporated into national strategies focused on the position of persons with disabilities in Serbia.

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