ANALIZA ODNOSA INDEKSA DIGITALNIH VEŠTINA I RAZVOJA EKONOMIJE

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Apstrakt

Prelazak iz industrijskog doba u doba znanja ili informatičko doba, podrazumeva usvajanje novih znanja i veština koje postaju glavni resurs poslovanja. Posledica konstantnih tehnoloških inovacija je potreba za novim znanjima i veštinama, kao što su digitalna pismenost i digitalne veštine, koje su postale jedan od najvažnijih resursa za razvoj industrije, a samim tim i ekonomije. Predmet istraživanja u ovom radu je analiza DSI indeksa (Digital Skill Index) za 2021.i 2023.godinu i DQL indeksa (Digital Quality of Life Index) za period od pet godina, sa ciljem da se izvrši komparacija podataka i ukaže na značaj koji posedovanje digitalnih veština i upotreba društvenih mreža ima na razvoj ekonomije. U istraživanju je korišćena kvantitativna metoda istraživanja i sprovedena je dinamička analiza DSI i DQL indeksa za Srbiju i komparativna analiza sa drugim zemljama u datom vremenskom periodu. Rezultati istraživanja DSI indeksa za 2021. i 2023. godinu za 36 zemalja Evrope pokazuju da su vodeće pozicije zauzele zemlje Severne Evrope, Holandija, Irska, Španija i Luksemburg, dok je Srbija zauzela 30. poziciju. Pojedine zemlje koje su zauzele središnje pozicije u tabeli 2019. godine, 2023. godine su nazadovale, odnosno napredovale, ali ne u značajnom nivou. Sa druge strane, analiza DQL indeksa za 50 zemalja sveta u periodu od 2019. do 2023. godine pokazuje da su evropske zemlje zauzele više od 50 odsto među najbolje rangiranim zemljama u celom vremenskom periodu, dok Srbija nije analizirana 2019. godine, ali je u naredne četiri analizirane godine dospela u prvih 50 rangiranih zemalja sveta. Takođe, u radu je prikazan značaj razvijenosti digitalnih veština i upotrebe društvenih mreža u rastu i razvoju ekonomije.

Ključne reči: *DSI indeks, DQL indeks, digitalne veštine, društvene mreže, rast i razvoj ekonomije*

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Uvod

Pojava Interneta transformisala je poslovanje i ubrzala razmenu informacija i komunikaciju kompanija sa potrošačima, ali i dobavljačima i drugim poslovnim partnerima. Mnogi poslovni procesi su postali efikasniji, zahvaljujući tehnološkim inovacijama i digitalnim veštinama. U industrijskom dobu glavni resursi su bili sredstva za rad, dok se u informatičkom dobu znanje smatra najvrednijim resursom poslovanja (Dašić, 2023, Vuković, et al., 2023). Prema Vidas-Bubanja i Bubanja (2016) „informaciono-komunikacione tehnologije su osnovna infrastruktura za inovacije u svim oblastima i ključna determinanta konkurentnosti država i kompanija u budućnosti"(Ala-Mutka, 2011).

Tehnološke mogućnosti u vidu digitalnog povezivanja sveta menjaju način poslovanja kompanija(Perović & Đukić, 2023) i kreira se novi idnustrijski ekosistem koji menja poslovno okruženje kako bi se ono adaptiralo potrebama informacione ere (Vidas-Bubanja, Bubanja, 2016).

U korak sa tehnološkim napretkom i inovacijama, kompanije su shvatile značaj posedovanja digitalnih veština, a zatim ih okarakteriale kao jedan od prioriteta za sopstveni razvoj i prosperitet(Zupur & Janjetović, 2023; Vukosavljević et al., 2023). Ovaj trend prvo su usvojile i primenile velike korporacije, da bi se vremenom i mala i srednja preduzeća prilagodile novonastalim uslovima poslovanja. Kako su velike korporacije važan makroekonomski pokazatelj razvoja nacionalne ekonomije, tako su i mala i srednja preduzeća značajna karika u analizi kretalja GDP-a.

Digitalne veštine, digitalna pismenost i kompetencije se veoma često posmatraju kao sinonimi, stoga je važno obrazložiti razlike između ova tri pojma. Digitalnu kompetenciju Ala-Mutka (2011) definiše kao „sposobnost primene znanja i veština u različitim kontekstima, kao što su posao, slobodno vreme ili učenje" (Vidas-Bubanja, Popovčić-Avrić, 2017). Prema van Deursenu and van Dajku (2011) „digitalna pismenost se odnosi na određene kompetencije i znanja, dok se digitalne veštine odnose na više tehničkih aspekata ovih kompetencija i znanja" (Van Deursen & Van Dijk, 2011). Oni su prvobitno izdvojili četiri vrste veština koje su usmerene na praksu (Van Deursen & Van Dijk, 2011):

     1.operativne veštine koje se odnose na operativnu manipulaciju softvera i hardvera,

     2.formalne veštine koje podrazumevaju sposobnost razumevanja i upotrebe formalne karakteristike računara i Interneta,

     3.informacione veštine odnosno veštine neophodne za pretraživanje, rukovanje dogitalnim medijskim sadržajima, njihov izbor i kritičku procenu,

     4.strateške veštine – kapacitet za korišćenje Interneta u svoju ličnu korist; da bi kasnije uvrstali i dodatne dve veštine, a to su:

5.veštine komunikacije

6.veštine kreiranja sadržaja (Van Deursen et al.,2014; Van Deursen & Van Dijk, 2014)

UNESCO (2018) defininiše digitalnu pismenost kao „sposobnost pristupa, upravljanja, razumevanja, integracije, komunikacije, procene i kreiranja informacija bezbedno i na odgovarajući način putem digitalnih tehnologija za zapošljavanje, pristojne poslove, i preduzetništvo. Uključuje kompetencije koje se odnose na kompjutersku pismenost, informaciono-komunikacionu tehnološku pismenost, informatičku pismenost i medijsku pismenost" (UNESCO, 2018). Autori Tinmaz, Yoo-Taek, Fanea-Ivanovici i Baber (2022) ukazuju na uticaj digitalne pismenosti na različite aspekte ljudskih života, kao što su obrazovanje, poslovanje, zdravlje, upravljanje itd., te da bi za svaku od ovih dimenzija mogle sprovesti pojedinačne studije slučaja. Oni smatraju da je važno istražiti ulogu digitalne pismenosti posebno na doživotno učenje, obrazovanje uopšte, kao i efekte digitalnog usavršavanja na fleksibilnost tržišta rada (Tinmaz, et al., 2022).

Lopez (2013) smatra da je korišćenje društvenih mreža jedna od podvarijabli digitalne pismenosti(Lopez, 2013).

Struktura ovog rada usmeriće se na DSI indeks i DQL indeks, kao i na društvene mreže, kao značajan faktor digitalnih veština i njihov uticaj na rast i razvoj ekonomije. Metodologija rada obuhvatiće komparativnu analizu indeksa digitalnog kvaliteta života u nekoliko zemalja, uključujući i Srbiju, u vremenskom periodu od pet godina, kao i komparativnu analizu indeksa digitalnih veština za 36 zemalja Evrope za 2021.i 2023.godinu. Cilj rada je da se ukaže na realno stanje i pravce kretanja ka poboljšanju ovih vrednosti.

Digitalne veštine kao neizostavan faktor održivog poslovanja i razvoja

U uvodu ovog rada, dat je kratak pregled pojmova digitalna pismenost, digitalne veštine i digitalne kompetencije. U ovom poglavlju, biće detaljnije analizirane sličnosti i razlike ovih pojmova, a akcenat će svakako biti na digitalnim veštinama.

Pored van Deursenove (2011) već spomenute obuhvatnosti digitalnih veština, mnogi autori su nadograđivali ovu podelu, i istakli svoja poimanja digitalnih veština. Međutim, klasifikacija Dženkinsa (2006) se izdavaja jer polazi od zajednice i samih učesnika. Umesto da isključivo ističe pojedinačne atribute, Dženkins uokviruje ono što naziva nova medijska pismenost kao kulturne kompetencije i društvene veštine koje su razvijene kroz saradnju i umrežavanje, a definiše jedanaest različitih novih veština:

1. Igra –sposobnost da se eksperimentiše sa okolinom kao oblik rešavanja problema,

2. Učinak – sposobnost usvajanja alternativnih identiteta u svrhu improvozacija i otkrivanja,
3. Simulacija – sposobnost tumačenja i konstruisanja dinamičkih modela realnih svetskih procesa,
4. Prisvajanje – sposobnost smislenog uzorkovanja i izmene medijskih sadržaja,
5. Multitasking – mogućnost skeniranja okoline i pomeranja fokusa kao potrebe za istaknutost detalja,
6. Distribuirana kognicija – sposobnost smislene interakcije sa alatima kako bi se proširili mentalni kapaciteti,
7. Kolektivna inteligencija – sposobnost udruživanja znanja i upoređivanje beleški sa drugima u kretanju ka istom cilju,
8. Procena – sposobnost procene kredibiliteta i pouzdanosti različitih izvora informacija,
9. Transmedijska navigacija – sposobnost praćenja tokova priča i informacija uz pomoć različitih modaliteta,
10. Umrežavanje – sposobnost traženja, sinteze i širenja informacija,
11. Pregovaranje – sposobnost putovanja kroz različite zajednice, pronicljivost i poštovanje različitih perspektiva, i shvatanje i praćenje alternativne norme (Jenkins, 2006).

Značaj digitalne pismenosti i digitalnih veština, kao i kompetencija u savremenom poslovanju, ključni su faktori za održivost konkurentnosti i razvoja ekonomije. Zbog toga se od pojave Interneta pažljivo izučavaju efekti koje digitalna era ima na mirkoekonomiju, a onda i na makroekonomiju. Digitalne veštine su jedan od osnovnog pokazatelja praćenja razvoja digitalne ekonomije, stoga se prati kretanje ovog pokazatelja u dužem vremenskom periodu i analiziraju razlozi takvog kretanja.

Digitalna pismenost i digitalne veštine su neizostavan element privatnog i poslovnog života danas, i veoma je malo industrija u kojima se ne traže ove veštine i znanja. Osim toga, znanja u digitalnoj sferi se konstantno unapređuju i inoviraju, te su posebne digitalne veštine često tražene od strane poslodavaca.

Đorđević i saradnici (2022) smatraju da su veštine neophodne u kontekstu globalizacije poslovanja: saradnja i timski rad, planiranje i organizovanje, osnovne digitalne veštine, prilagodljivost, upravljanje vremenom, pregovaranje, rešavanje konflikata, kreativno, inovativno i kritičko mišljenje, komunikacija, rešavanje problema itd. (Đorđević et al., 2022).

GSM Association (Global System for Mobile Communications) definiše mobilne digitalne veštine kao znanje i veštine neophodne za efektivnu i sigurnu upotrebu mobilnog telefona, mobilne usluge i mobilnog Interneta (2021). Pri tom, digitalne veštine nisu samo tehničke veštine koje su ljudima neophodne da koriste Internet, već obuhvataju niz kognitivnih i nekognitivnih veština kao one povezane sa

komunikacijom i medijskom pismenošću, bezbednošću i privatnošću (Jacobs, 2021).

Sa druge strane, ako posmatramo upotrebu Interneta i društvenih mreža u svrhu zabave, odnosno privatne svrhe, digitalna pismenost i digitalne veštine su važni faktori i za prevenciju sajber kriminalnih aktivnosti (Baltazarević, 2022).

Digitalna pismenost i digitalne veštine u svetu

UNESCO (2018) je proučio i analizirao oblasti kompetencija i digitalne pismenosti i referentne okvire ovih kategorija prikazao u tabeli 1, koje je kasnije istraživao u 47 zemalja u svetu, te ih razvrstao po geografskom regionu i nivou dohotka, što je prikazano u tabeli 2.

Tabela 1. DigCom 2.0 oblasti kompetencija i kompetencije (UNESCO, 2018)

Oblasti kompetencija	Kompetencije
1. Informatička pisemenost i sposobnosti obrade podataka	1.1 Pregledanje, pretraživanje i filtriranje podataka, informacija i digitalnog sadržaja 1.2 Procena podataka, informacija i digotalnog sadržaja 1.3 Upravljanje podacima, informacijama i digitalnim sadržajem
2. Komunikacija i saradnja	2.1 Interakcija putem digitalnih tehnologija 2.2 Deljenje putem digitalnih tehnologija 2.3 Angažovanje u građanstvu putem digitalnih tehnologija 2.4 Saradnja putem digitalnih tehnologija 2.5 Pravila prikladnog ponašanja 2.6 Upravljanje digitalnim identitetom
3. Kreiranje digitalnog sadržaja	3.1 Razvoj digitalnog sadržaja 3.2 Integracija i ponovna razrada digitalnog sadržaja 3.3 Autorska prava i licence 3.4 Programiranje
4. Bezbednost	4.1 Zaštita uređaja 4.2 Zaštita ličnih podataka i privatnosti 4.3 Zaštita zdravlja i blagostanja 4.4 Zaštita okoline
5. Rešavanje problema	5.1 Rešavanje tehničkih problema 5.2 Identifikovanje potreba i tehnoloških odgovora

	5.3 Kreativna upotreba digitalnih tehnologija 5.4 Identifikacija nedostataka u digitalnim kompetencijama

Tabela 2. Distribucija digitalne pismenosti i oblasti kompetencija u 47 zemalja po geografskim regionima i nivoima prihoda (UNESCO, 2018)

Geografski region	Nivo dohotka zemlje				Ukupno
	Visok	Srednje visok	Srednje nizak	Nizak	
1. Azija	1	3	7		11
2. Evropska Unija	1	1			2
3. Države sa visokim nivoom dohotka van EU	2				2
4. Latinska Amerika	1	4			5
5. Bliski Istok i Severna Afrika	4	4	4		12
6. Podsaharska Afrika		4	6	3	13
7. Ostale		1	1		2
Total	9	17	18	3	47

Tabela 2. analizira nivo dohotka zemalja po regionima i okvire digitalne pismenosti u tim zemljama. Rezultati istraživanja koje je sproveo UNESCO su pokazala da multinacionalne kompanije imaju glavnu ulogu u uticaju na digitalne kompetencije i digitalnu pismenost, koje se podučavaju i procenjuju, naročito u zemljama u razvoju. Međunarodne kompanije ponekad održavaju kurseve i ispite, a ponekad u saradnji sa nacionalnim provajderima.

DSI indeks i DQL indeks

Digitalne kompetencije se mere na osnovu već navedenih pet stavki: Informatička i data pismenost, komunikacija i saradnja, kreiranje digitalnog sadržaja, bezbednost i rešavanje problema.

Evropska komiija analizira DESI (Digital Economy and Society Index) od 2015.godine i rangira 28 zemalja, članica Evropske Unije na osnovu sledećih pokazatelja:

1. Konekcija (pokrivenost domaćinstava Internet konekcijom, procenat korisnika brzog Interneta, mobilna konekcija),
2. Ljudski kapital (korisnici Interneta, osnovne digitalne veštine, ICT specijalisti, stručnjaci iz oblati matematike, nauke i tehnologije),
3. Upotreba Interneta (vesti, muzika i zabava, video pozivi, društvene mreže, bankarstvo, kupovina),
4. Integracija digitalne tehnologije (deljenje informacija, društvene mreže, e-fakture, klaud, identifikacija putem radio frekvencije, prodaja online, međunarodna online prodaja),
5. Digitalni javni servis (korisnici elektronsog javnog servisa, unapred popunjeni formulari, završavanje usluge online, dostupnost podataka).

Tek od 2021.godine Eurostat uvodi novi koncept, DSI indeks (Indeks digitalnih veština) kojim obuhvata zemlje članice EU, zemlje kandidate za članstvo u EU, potencijalne zemlje kandidate za članstvo u EU, Island, Švajcarsku i Norvešku. Za analizu DSI indeksa, odnosno digitalnih veština građana uzrasta od 16-74 godine, Eurostat ocenjuje sledeće indikatore:

1. **Veštine informacione pismenosti i sposobnosti obrade podataka** („Formulisanje potrebe za informacijama, lociranje i preuzimanje digitalnih podataka, informacija i sadržaja, procena relevantnosti izvora i njegovog sadržaja, skladištenje, upravljanje i organizovanje digitalnih podataka, informacija i sadržaja" *),
2. **Veštine komunikacije i saradnje** („Sposobnosti pojedinaca za integraciju, komunikaciju i saradnju putem digitalnih tehnologija uz svest o kulturnim i generacijskim razlikama, socijalizacija kroz javne i privatne digitalne ustanove i participativno građanstvo, upravljanje sopstvenim digitalnim identitetom i reputacijom" *),
3. **Veštine kreiranja digitalnog sadržaja** („Kreiranje i uređivanje digitalnog sadržaja, poboljšanje i integracija informacija i sadržaja u postojeći korpus znanja uz razumevanje načina na koja se autorksa prava i licence primenjuju, znanje za davanje razumljivih uputstava za računarski sistem" *),

4. **Veštine bezbednosti** („Zaštita uređaja, sadržaja, ličnh podataka i privatnosti u digitalnom okruženju, zaštita psihičkog i fizičkog zdravlja, biti svestan uticaja digitalnih tehnologija na društveno blagostanje i socijalnu inkluziju, biti svestan uticaja digitalnih tehnologija na životnu sredinu i njihovu upotrebu" *),

5. **Veštine rešavanja problema** („Identifikacija potreba i problema i rešavanje konceptualnih problema u digitalnom okruženju, upotreba digitalnih alata za inoviranje procesa i proizvoda, biti u toku sa digitalnom evolucijom" *[79]).

Vremenski okvir koji se odnosio na upotrebu Interneta je bio 3 meseca, a svaki od ovih indikatora se ocenjuje kao osnovni nivo, nivo iznad osnovnog nivoa i bar osnovni nivo: osnovni nivo ili iznad osnovnog nivoa. Istraživanje je sprovedeno na uzorku od 75% populacije u analizirianim zemljama 2021.godine i 2023.godine.

Na osnovu ovih elemenata, Eurostat je rangirao zemlje prema nivoima digitalnih veština.

Tabela 3. Kriterijumi na osnovu kojih su određeni nivoi digitalnih veština

Nivo		
1	Pojedinci sa osnovnim ili nivoom iznad osnovnih digitalnih veština	Svih pet indikatora su ocenjeni kao osnovni nivo ili nivo iznad osnovnog nivoa dig.veština
2	Pojedinci sa nivoom iznad osnovnih digitalnih veština	Svih pet indikatora su ocenjeni kao iznad osnovnog nivoa dig. veština
3	Pojedinci sa osnovnim nivoom digitalnih veština	Svi indikatori su ocenjeni kao nivo osnovnih dig. veština ili nivo iznad osnovnih dig. veština, ali nisu svi indikatori ocenjeni kao nivo iznad osnovnih dig.veština
4	Pojedinci sa niskim nivoom digitalnih veština	4/5 indikatora su ocenjeni kao nivo osnovnih ili nivo iznad osnovnih dig.veština
5	Pojedinci sa neadekvatnim nivoom digitalnih veština	3/5 indikatora su ocenjeni kao nivo osnovnih ili nivo iznad osnovnih dig.veština
6	Pojedinci sa ograničenim nivoom digitalnih veština	2/5 idnikatora su ocenjeni kao nivo osnovnih ili nivo iznad osnovnih dig.veština
7	Pojedinci bez osnovnog nivoa digitalnih veština	Bez osnovnih dig.veština

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[79] *Definicija u okviru Digital Competence Framework 2.0

8	Nivo digitalnih veština nije mogao da se utvrdi	Pojedinci nisu koristili Internet u poslednja 3 meseca

Tabela 4. Nivo digitalnih veština pojedinaca za 2021.godinu

R.br	Država	Nivo 1 (Nivo 2 +Nivo 3) %	Nivo 2 %	Nivo 3 %	Nivo 4 %	Nivo 5 %	Nivo 6 %	Nivo 7 %	Nivo 8 %
1	Island	80.99	44.77	36.23	12.10	4.93	0.74	0.68	0.56
2	Finska	79.18	48.13	31.04	12.58	3.59	1.02	0.33	3.29
3	Holandija	78.94	51.77	27.18	11.40	3.39	0.46	0.32	5.48
4	Norveška	78.71	42.59	36.12	15.03	4.33	0.86	0.49	0.58
5	Švajcarska	77.79	40.26	37.53	12.22	4.60	2.17	1.36	1.86
6	Irska	70.49	39.69	30.80	14.17	7.60	4.83	1.85	1.07
7	Danska	68.65	37.37	31.27	20.17	8.04	1.14	0.89	1.11
8	Švedska	66.60	35.68	30.92	17.92	7.93	2.78	1.53	3.24
9	Španija	64.16	38.06	26.11	15.44	7.44	4.47	2.39	6.10
10	Luksemburg	63.79	31.81	31.98	20.41	8.32	4.70	1.44	1.34
11	Hrvatska	63.37	31.18	32.19	11.57	4.73	1.49	0.10	18.75
12	Austrija	63.33	33.28	30.05	16.95	6.82	3.38	2.05	7.47
13	Francuska	61.96	31.25	30.71	16.07	8.47	3.74	1.32	8.45
14	Malta	61.23	35.49	25.74	15.45	6.09	3.25	1.46	12.53
15	Češka	59.69	24.06	35.63	17.36	8.42	2.42	0.96	11.15
16	Estonija	56.37	27.68	28.69	19.13	9.82	3.37	2.28	9.02
17	Portugal	55.31	28.54	26.76	12.64	6.99	4.76	2.60	17.69
18	Slovačka	55.18	20.83	34.36	18.15	8.93	4.40	2.26	11.07
19	Belgija	54.23	26.34	27.89	18.59	11.71	5.24	3.01	7.21
20	Grčka	52.48	21.70	30.78	10.64	7.86	5.45	2.07	21.51
21	Letonija	50.80	23.79	27.01	20.70	12.37	5.05	2.37	8.70
22	Kipar	50.21	20.95	29.26	20.58	10.07	6.98	2.92	9.24

23	Slovenija	49.67	19.72	29.95	20.48	11.21	4.80	2.84	11.00
24	Mađarska	49.09	21.54	27.56	20.51	11.91	4.98	2.14	11.36
25	Nemačka	48.92	18.84	38.88	21.22	11.51	6.19	3.58	8.57
26	Litvanija	48.84	23.01	25.83	18.61	10.41	5.84	3.23	13.07
27	Crna Gora	47.21	9.14	30.08	25.44	7.91	1.65	0	17.78
28	Italija	45.60	22.52	23.08	16.34	9.84	6.12	3.69	18.41
29	Poljska	42.93	20.64	22.28	18.82	11.45	7.31	4.88	14.63
30	**Srbija**	**41.30**	**12.32**	**28.97**	**18.67**	**10.48**	**6.65**	**4.08**	**18.83**
31	Bosna i Hercegovina	34.65	5.35	29.29	21.53	10.17	7.17	2.16	24.32
32	Severna Makedonija	34.62	8.15	26.48	18.28	15.93	11.71	5.85	13.60
33	Bugarska	31.18	7.82	23.36	14.51	11.67	11.75	6.16	24.73
34	Turska	30.12	9.87	20.25	19.64	14.34	10.00	7.32	18.59
35	Rumunija	27.82	8.73	19.09	16.53	14.23	14.88	10.13	16.41
36	Albanija	23.80	4.01	19.79	16.80	17.39	14.42	6.96	20.63

https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21/default/table?lang=en

U tabeli je rangirano 36 država na osnovu nivoa digitalnih veština, s tim da su prvorangirane zemlje one koje imaju najviše procente nivoa 1, a koji predstavlja zbir nivoa 2 i nivoa 3, odnosno procenat pojedinaca sa nivoom iznad osnovnih digitalnih veština i procenat pojedinaca koji poseduju osnovne digitalne veštine. Analizom ostalih vrednosti, vidimo da ostali procenti pojedinaca u ostalim nivoima (nivo niskih digitalnih veština, nivo neadekvatnih digitalnih veština, nivo ograničenih digitalnih veština i nivo bez osnovnih digitalnih veština) nužno ne prate sled opadajućih vrednosti u poređenju sa vrednostima nivoa 1, odnosno zbira nivoa 2 i nivoa 3. Republika Srbija je na ovoj rang listi zauzela 30.poziciju sa sledećim vrednostima: Nivo 1 (41.30%), Nivo 2 (12.32%) i Nivo 3 (28.97%), što znači da ukupan procenat ispitanika koji poseduju nivo osnovnih digitalnih veština i nivo iznad osnovnih digitalnih veština manji od 50%, tačnije iznosi 41.30%. Kada je u pitanju Nivo 4 koji predstavlja procenat pojedinaca sa niskim nivoom osnovnih digitalnih veština, ta vrednost je 18.67%, procenat pojedinaca sa neadekvatnim nivoom digitalnih veština (nivo 5) iznosi 10.48% , a sledi 6.65% pojedinaca sa ograničenim nivoom digitalnih veština (nivo 6) i 4.08% pojedinaca bez osnovnih digitalnih veština (nivo 7). I na kraju nivo 8 sa vrednošću od 18.83% pojedinaca za koje nije bilo moguće utvrditi nivo digitalnih veština, jer nisu koristili Internet u poslednja tri meseca. Taj procenat je izuzetno veliki s obzirom da je to otprilike petina ispitanika. Negativan značaj ova vrednost dobija naročito

ako se uzme u obzir pandemija Covid-19, koja je u veoma kratkom roku transformisala učenje i rad uživo u digitalnu sferu.

abela 5. Nivo digitalnih veština pojedinaca za 2023.godinu

R.br	Država	Nivo 1 (Nivo 2 +Nivo 3) %	Nivo 2 %	Nivo 3 %	Nivo 4 %	Nivo 5 %	Nivo 6 %	Nivo 7 %	Nivo 8 %
1	Holandija	82.70	54.53	28.16	12.12	3.43	0.65	0.25	0.85
2	Finska	81.99	53.63	28.36	11.28	3.01	0.80	0.62	2.30
3	Norveška	81.09	50.71	30.38	14.66	3.24	0.29	0.39	0.32
4	Švajcarska	77.52	42.69	34.83	13.21	5.42	1.81	1.29	0.75
5	Danska	69.62	39.37	30.25	19.62	7.12	1.54	0.90	1.20
6	Češka	69.11	35.48	33.63	13.89	5.32	2.59	1.13	7.96
7	Irska	68.65	37.88	30.77	15.93	7.31	3.34	0.65	4.12
8	Švedska	66.44	36.51	29.93	19.57	8.19	2.37	1.03	2.41
9	Španija	66.18	38.65	27.52	15.25	7.15	4.36	2.51	4.55
10	Austrija	64.68	32.04	32.64	17.01	7.49	4.13	2.03	4.67
11	Malta	63.02	36.98	26.04	16.68	7.52	3.52	1.34	7.93
12	Estonija	62.61	34.84	27.76	17.40	8.06	3.23	1.89	6.80
13	Luksemburg	60.14	27.86	32.28	20.13	10.16	5.05	3.87	0.65
14	Francuska	59.67	30.62	29.06	16.73	9.30	4.65	2.48	7.17
15	Belgija	59.39	28.26	31.12	18.46	10.30	4.36	2.12	5.37
16	Hrvatska	58.95	25.00	33.94	15.93	6.27	2.16	0.09	16.60
17	Mađarska	58.89	28.13	30.76	18.60	8.54	3.89	1.53	8.55
18	Portugal	55.97	29.93	26.04	14.39	7.59	5.15	2.69	14.21
19	Litvanija	52.91	25.90	27.01	16.40	10.34	6.07	2.79	11.50
20	Grčka	52.40	20.02	32.38	14.98	8.51	6.31	2.81	14.99
21	Nemačka	52.22	19.79	32.43	20.89	11.44	5.61	2.32	7.52
22	Crna Gora	52.02	10.55	41.48	25.44	7.61	3.15	0.14	11.64
23	Slovačka	51.31	21.70	29.61	19.30	10.55	4.00	2.05	12.79
24	Kipar	49.46	24.96	24.51	23.51	9.64	6.35	2.27	8.78
25	Slovenija	46.70	18.88	27.82	20.64	12.86	6.48	3.71	9.62
26	Italija	45.75	22.21	23.54	18.23	10.70	7.15	5.09	13.08

27	Letonija	45.34	16.55	28.79	22.22	15.82	6.30	2.65	7.67
28	Poljska	44.30	20.05	24.25	20.36	11.56	6.41	3.79	13.59
29	Bugarska	35.52	7.73	27.79	15.59	13.36	10.03	5.88	19.61
30	Turska	33.11	10.61	22.51	20.91	16.60	9.05	6.29	14.03
31	**Srbija**	**32.81**	**12.17**	**20.64**	**31.33**	**11.15**	**7.27**	**2.80**	**14.64**
32	Bosna i Hercegovina	30.08	6.88	23.20	23.94	13.65	10.75	4.96	16.62
33	Rumunija	2.73	8.97	18.77	18.73	17.47	15.35	9.91	10.80
34	Island	:	:	:	:	:	:	:	:
35	Severna Makedonija	:	:	:	:	:	:	:	:
36	Albanija	:	:	:	:	:	:	:	:

Rezultati DSI indeksa za 2023.godinu su pokazali negde manje značajne, a negde značajnije razlike u odnosu na DSI indeks 2021. godine. Prvo što je važno napomenuti je da podaci 2023.godine nisu prikupljeni i analizirani za svih 36 zemalja, kao 2021.godine, odnosno nedostaju podaci za Island, Severnu Makedoniju i Albaniju. Kada su u pitanju Severna Makedonija i Albanija, one su 2021.godine zauzele niske pozicije, međutim interesantno je da je Island 2021.godine imao lidersku poziciju kada je u pitanju indeks digitalnih veština u Evropi.

S obzirom na nedostatak podataka za Island za 2023.godinu, koja je 2021.godine imala vodeću poziciju, sada je vodeću poziciju preuzela Holandija sa 82.70% populacije koja poseduje osnovni nivo digitalnih veština ili nivo iznad osnovnog. Finska je zadržala drugu poziciju sa nešto većim procentom populacije sa osnovnim nivoom digitalnih veština i nivoom iznad osnovnog, 2021.godine procenat je iznosio 79.18, a 2023.godine iznosi 81.99%. U samom vrhu, pozicije su zadržale i Norveška, Švajcarska, Irska, Švedska, Danska i Španija, dok su se u odnosu na 2021.godinu, kada se među prvih 10 rangiranih zemalja nalazio i Luksemburg, sada su se tu našle Češka i Austrija. 2021.godine Češka je bila na 15.poziciji, dok je 2023.godine vrednost njenog DSI ideksa zabeležila skok na čak 6.poziciju. Luksemburg je spao sa 10.mesta na 13.mesto, što ne predstavlja značajniju promenu. Isto tako, Austrija je 2021.godine zauzela 12.mesto, a 2023.godine je zabeležila rast na 10.mesto.

Što se ostalih značajnih promena tiče, Belgija beleži pad za 4 pozicije 2023.godine u odnosu na 2021.godinu, Hrvatska pad za 5 pozicija, isto kao i Slovačka, dok su Turska, Bugarska, Nemačka i Estonija zabeležile rast za 4

pozicije. Najveći rast zabeležile su Mađarska i Litvanija, čak za 7 pozicija, a zatim Letonija rast za 6 pozicija i Crna Gora rast za 5 pozicija.

Kada je Srbija u pitanju, ona je zabeležila pad za jednu poziciju i u odnosu na 30.poziciju koju je zauzela 2021.godine, vrednost DSI indeksa Srbije 2023.godine zauzima 31.poziciju. Ipak, zbog nedostatka podataka za Island, Albaniju i Severnu Makedoniju za 2023.godinu, ovi rezultati ne predstvaljaju u potpunosti realnu sliku. Ali, ono što se može zaključiti je da su prvih deset pozicija obe godine zabeležile većinom iste zemlje, i to zemlje Severne i Zapadne Evrope.

U nastavku rada, analizira se DQL indeks (Digital Quality of Life) na globalnom nivou za period od 2019-2023.godine te ćemo napraviti komparaciju rezultata, odnosno sličnosti i razlike sa DSI indeksom.

DQL Indeks (The Digital Quality of Life) razmatra sledeće faktore na osnovu kojih rangira 121 državu po indeksu digitalnog kvaliteta života:

1. Pristupačnost Interneta,
2. Kvalitet Interneta,
3. Elektronska infrastruktura,
4. Elektronska bezbednost,
5. Digitalizacija državnih ustanova.

Ovi kriterijumi se razmatraju od 2020.godine, dok su se 2019. godine razmatrali malo drugačiji elementi za manji broj država, tačnije 65. Ti elementi su:

1. Brzina interneta,
2. Sajber bezbednost zemlje,
3. Dostupnost usluga e-uprave,
4. Dostupnost i raznovrsnost e-zabave,
5. Prisustvo zakona o zaštiti ličnih podataka.

Među analiziranim zemljama 2019.godine nema Republike Srbije, dok je Kina uključena u izveštaj, ali kao poseban slučaj. U analizi 2020. godine, razmatrano je 85 država, među kojima se nalazi i Srbija. Za 2021.godinu broj analiziranih zemalja je povećan na 110, dok je za 2022.godinu broj analiziranih zemalja iznosio 117. 2023.godine analizirana je 121 država.

Tabela 6. DQL Index u periodu od 2019-2023. godine

R.br	Država	DQL Index 2019.	Država	DQL Index 2020.	Država	DQL Index 2021.	Država	DQL Index 2022.	Država	DQL Index 2023.
1	Australija	0.7992	Danska	0.79	Danska	0.8313	Izrael	0.7610	Francuska	0.7902
2	Francuska	0.7985	Švedska	0.79	J. Koreja	0.7608	Danska	0.7347	Finska	0.7483
3	Singapur	0.7854	Kanada	0.78	Finska	0.7562	Nemačka	0.7123	Danska	0.7377

4	Norveška	0.7607	Francuska	0.77	Izrael	0.7387	Francuska	0.7105	Nemačka	0.7357
5	Japan	0.7606	Norveška	0.75	USA	0.7360	Švedska	0.6895	Luxemburg	0.7357
6	Kanada	0.7516	Holandija	0.74	Singapur	0.7192	Holandija	0.6843	Španija	0.7232
7	Danska	0.7479	UK	0.74	Francuska	0.7128	Finska	0.6826	Estonija	0.7185
8	J. Koreja	0.7448	Izrael	0.73	Švajcarska	0.7093	Japan	0.6785	Austrija	0.7166
9	Italija	0.7361	Japan	0.72	Nemačka	0.7071	UK	0.6685	Švajcarska	0.7106
10	Švedska	0.7360	Poljska	0.72	UK	0.7065	J. Koreja	0.6660	Singapur	0.7096
11	SAD	0.7341	Finska	0.71	Holandija	0.7060	Litvanija	0.6648	Švedska	0.7079
12	Holandija	0.7331	Singapur	0.71	Japan	0.6983	USA	0.6572	Holandija	0.7063
13	Izrael	0.7269	Estonija	0.7	Švedska	0.6972	Švajcarska	0.6570	Litvanija	0.6957
14	Švajcarska	0.7223	Austrija	0.7	Norveška	0.6916	Estonija	0.6554	Rumunija	0.6944
15	Španija	0.7061	Švajcarska	0.7	Luxemburg	0.6867	Singapur	0.6547	UK	0.6296
16	Island	0.7045	Nemačka	0.69	Litvanija	0.6863	Španija	0.6533	Japan	0.6807
17	UK	0.7035	Novi Zeland	0.69	Australija	0.6835	Norveška	0.6389	Izrael	0.6660
18	Finska	0.7033	Španija	0.69	Španija	0.6744	Luksemburg	0.6347	Poljska	0.6613
19	Nemačka	0.6914	Australija	0.68	Estonija	0.6662	Italija	0.6330	SAD	0.6598
20	Novi Zeland	0.6872	Italija	0.67	Kanada	0.6635	Portugal	0.6260	J.Koreja	0.6559
21	Belgija	0.6690	Litvanija	0.67	Austrija	0.6620	Belgija	0.6235	Belgija	0.6540
22	Austrija	0.6687	SAD	0.67	Kina	0.6529	Austrija	0.6214	Kanada	0.6527
23	Litvanija	0.6553	Slovenija	0.67	Novi Zeland	0.6492	Poljska	0.6150	Irska	0.6501
24	Mađarska	0.6529	Belgija	0.66	Irska	0.6459	Irska	0.6149	Italija	0.6500
25	Portugal	0.6478	Mađarska	0.65	Belgija	0.6360	Češka	0.6123	Češka	0.6477
26	Poljska	0.6442	Bugarska	0.65	Poljska	0.6360	Kanada	0.6038	Norveška	0.6452
27	Rusija	0.6439	Letonija	0.65	Italija	0.6352	Mađarska	0.5999	Novi Zeland	0.6432
28	Estonija	0.6431	Irska	0.64	Češka	0.3267	Novi Zeland	0.5966	Letonija	0.6391
29	Slovenija	0.6302	Portugal	0.63	Slovačka	0.6210	Slovačka	0.5932	Portugal	0.6360
30	Irska	0.6242	Slovačka	0.62	Portugal	0.6176	Bugarska	0.5907	Australija	0.6324
31	UAE	0.6215	UAE	0.62	Malezija	0.6108	Hrvatska	0.5880	Kipar	0.6299
32	Indija	0.6165	Češka	0.61	Mađarska	0.6083	Slovenija	0.5867	Malta	0.6239
33	Rumunija	0.6110	Katar	0.61	Katar	0.6050	Letonija	0.5854	Slovačka	0.6215

#										
34	Katar	0.6057	Hrvatska	0.6	Rumunija	0.5975	Rumunija	0.5847	Mađarska	0.6149
35	Turska	0.6049	Kipar	0.6	Kipar	0.5951	Australija	0.5806	Slovenija	0.6148
36	Slovačka	0.5867	Urugvaj	0.59	Slovenija	0.5950	Malta	0.5747	Hrvatska	0.6057
37	Meksiko	0.5846	Grčka	0.58	Hrvatska	0.5932	Kipar	0.5683	Malezija	0.5869
38	Hrvatska	0.5832	Kina	0.58	Grčka	0.5879	Malezija	0.5580	UAE	0.5821
39	Letonija	0.5791	Rumunija	0.58	Bahrain	0.5873	Grčka	0.5561	Grčka	0.5781
40	Južna Afrika	0.5738	Azerbejdžan	0.57	Malta	0.5834	Čile	0.5481	Bugarska	0.5704
41	Malezija	0.5727	Malezija	0.57	Letonija	0.5785	Urugvaj	0.5472	Urugvaj	0.5652
42	Urugvaj	0.5702	Rusija	0.57	UAE	0.5735	Rusija	0.5325	Čile	0.5625
43	Ukrajina	0.5639	Kuvajt	0.54	Čile	0.5713	Kina	0.5261	Argentina	0.5624
44	Čile	0.5624	Turska	0.54	Tajland	0.5672	UAE	0.5130	Kina	0.5577
45	Češka	0.5598	Saudijska Arabija	0.53	Bugarska	0.5664	Argentina	0.5106	Saudijska Arabija	0.5365
46	Albanija	0.5564	Makedonija	0.52	**Srbija**	**0.5654**	Katar	0.5088	Ukrajina	0.5295
47	Kina	0.5548	Kazahstan	0.52	Ukrajina	0.5640	Jermenija	0.5052	Kazahstan	0.5280
48	Grčka	0.5534	Argentina	0.52	Filipini	0.5584	**Srbija**	**0.4976**	Katar	0.5277
49	Gruzija	0.5499	**Srbija**	**0.52**	Argentina	0.5573	Tajland	0.4904	Brazil	0.5245
50	Azerbejdžan	0.5312	Meksiko	0.52	Saudijska Arabija/ Moldavija	0.5523	Ukrajina	0.4893	**Srbija**	**0.5236**

https://surfshark.com/dql, https://surfshark.com/dql2020, https://surfshark.com/dql2021, https://surfshark.com/dql2022, https://surfshark.com/dql2023

Poredeći DQL Indekse za rangiranih 50 zemalja u periodu od 2019.godine do 2023.godine, neophodno je istaći da su kriterijumi po kojima je vršeno rangiranje 2019.godine drugačiji u odnosu na kriterijume narednih godina, zbog čega izvor, Surfshark, ističe da su indeksi od 2020.godine do 2023.godine uporedljivi. Ono što je već navedeno, ali važno za analizu, jeste da se sa godinama povećavao broj zemalja čiji DQL je analiziran, kao i da Srbija nije bila među analiziranim zemljama 2019.godine. Na ovom prikazu predstavljene su vrednosti DQL Indeksa za 50 zemalja širom sveta, kao i kretanja ovog indeksa po godinama i zemljama, na osnovu kojeg su pojedine države zauzimale višu ili nižu poziciju, dok su se neke države prvi put pojavile među prvih 50, a neke spale na poziciju ispod 50.mesta.

Analizom pokazatelja DQL za svih pet godina, evidentno je da su evropske države zauzele više od 50 % među 50 najbolje rangiranih zemalja. Naročito se ističu zemlje Skandinavije, koje su svake godine zauzele neke od prvih deset

pozicija, a interesantno je da su 2023. godine prvih devet pozicija na listi zauzele evropske zemlje.

Što se Srbije tiče, analiza DQL Indexa u Srbiji počela je od 2020.godine i vrednosti za period od 2020-2023 godine pokazuju da se Srbija nalazi među prvih 50 rangiranih zemalja, i to 2020.godine je zauzela 49.poziciju sa indeksom 0.52, zatim 2021.godine Srbija je napredovala na 46.poziciju sa indeksom 0.5654, da bi 2022.godine nazadovala do 48.pozicije sa indeksom 0.4976, i na kraju 2023.godine Srbija je zauzela 50.poziciju sa indeksom 0.5236.

Komparacija rezultata DSI indeksa i DQL indeksa pokazuje odnosno potvrđuje da se u vrhu rangiranih zemalja nalaze zemlje Severne i Zapadne Evrope, a za Srbiju je važno da iako je u rangiranju DSI indeksa (36 zemalja Evrope), u rangiranju DQL indeksa na globalnom nivou zauzela pozicije među prvih 50 zemalja, u odnosu na rangiranih 85,110,117 i 123 zemalja respektivno. To znači da je Srbija poslednjih nekoliko godina ostala konstantna kada je u pitanju ulaganje u digitalnu transformaciju i sticanje digitalnih veština.

Odnos DQL indeksa, DSI indeksa i razvoja ekonomije

Surfshark pruža i kratku analizu DQL indeksa i GDP-a po glavi stanovnika, pri čemu daje jasan zaključak da su države sa manjim DQL indeksom upravo i države sa manjom vrednošću GDP-a po glavi stanovnika. Rast vrednosti DQL indeksa od 0.0300 bi moglo potencijalno uticati na rast od 10.000,00 dolara GDP-a po glavi stanovnika zemlje. Ipak, 2019.godine, nekoliko zemalja je pokazalo iznenađujuće dobre performanse u određenim digitalnim oblastima, uprkos malim vrednostima GDP-a po glavi stanovnika. To su: Rusija, Mađarska, Portugal, Poljska, Estonija, Slovenija, Litvanija, Indija, Rumunija i Turska. Srednja vrednost DQL indeksa iznosi 0.6110/1.000, što ukazuje da je digitalni kvalitet života na osnovu ovog faktora prosečan. Ni jedna zemlja nije ostvarila vrednost preko 0.800 ukazujući da je bilo prisutno mnogo nedostataka u različitim oblastima. Od suštinskog značaja je i dobro razvijena Internet infrastruktura, a ključ je u investicijama u mobilni Internet. Kada su u pitanju zakoni o zaštiti ličnih podataka, 62 od 65 analiziranih zemalja ima zakone o zaštiti ličnih podataka, međutim u mnogim slučajevima je posvećenost zaštiti ličnih podataka nerealna.

Prema izveštaju za 2020.godinu ističe se da napredak u e-infrastrukturi korespondira sa ekonomskim bogatstvom samo do određene tačke. Države sa vrednostima GDP-a po glavi stanovnika iznad proseka ne garantuju bolje internet tehnologije ili veće upotrebe interneta(Milenković et al., 2023). Tri zemlje sa relativno visokim vrednostima GDP-a po glavi stanovnika, Kuvajt, Bahrain i Saudijska Arabija, su podbacile kada su u pitanju nivo kvaliteta Interneta i elektronske bezbednosti.

Vrednosti DQL indeksa i njihova analiza pokazuje da ulaganja u elektronsku infrastrukturu i digitalizaciju državnih ustanova imaju najveći doprinos

poboljšanju digitalnog kvaliteta života ljudi, dok se pristupačnost Interneta pokazala kao najmanje važan faktor za DQL indeks. Kada je u pitanju GDP po glavi stanovnika, izveštaj pokazuje da njegova vrednost nužno ne određuje kvalitet elktronske infrastrukture države. U odnosu na 2020.godinu, uticaj GDP-a po glavi stanovnika na elektronsku bezbednost je 2021.godine opao. Srbija je, uz još 20 zemalja, među kojima su i zemlje regiona: Hrvatska, Bugarska, Rumunija i Mađarska, su nadmašile ostale zemlje u obezbeđivanju viših nivoa elektronske bezbednosti i elektronske infrastrukture. Iako GDP po glavi stanovnika u velikoj meri korespodira sa DQL indeksom, postoje zemlje koje imaju bolji digitalni kvalitet života sa nižim GDP-om po glavi stanovnika od očekivanog, što ukazuje da postoji potencijal za podizanje nivoa kvaliteta digitalnog života i uz manje resurse i fokusiranje strateško planiranje.

Za 2022.godinu, rezultati su praktično isti kada je u pitanju korelacija GDP-a po glavi stanovnika i DQL indeksa, s tim da se te godine izdvojilo 17 zemalja koje su nadmašile očekivanja po pitanju DQL indeksa, a kada su u pitanju elekronska bezbednost, digitalizacija državnih ustanova (e-uprava) i elektronska infrastruktura. Među ovim zemljama se ponovo našla i Srbija, kao i Mađarska, Hrvatska, Bugarska i Rumunija.

I kada je u pitanju izveštaj za 2023.godinu, evropske zemlje nastavljaju da zauzimaju najviše rangirane pozicije po pitanju DQL indeksa. Zapadna Evropa je lider po pitanju DQL indeksa, ali i po pitanju ekonomskog bogatstva. Zanimljiv podatak za 2023.godinu je da iako region Severne Evrope beleži 15% manju vrednost GDP-a po glavi stanovnika u odnosu na Severnu Ameriku, vrednosti DQL indeksa u Severnoj Evropi su više u odnosu na Severnu Ameriku. Takođe, interesantan podatak je da, iako je GDP po glavi stanovnika Zapadne Azije veći u odnosu na globalni prosek za 38%, vrednost DQL indeksa Zapadne Azije pada ispod globalnog proseka. Ovi podaci ponovo potvrđuju da je korelacija između DQL indeksa i GDP-a po glavi stanovnika važna, ali GDP ne predstavlja najvažniji pokazatelj kvaliteta digitalnog života građana određene zemlje. Ponovo su se Srbija, Rumunija, Hrvatska, Bugarska i Mađarska, uz još 17 zemalja od ukupno 121 rangirane zemlje, pokazale kao zemlje koje su sa nižim vrednostima GDP-a, uspele da postignu više od očekivanih vrednosti elektronske bezbednosti, elektronske infrastrukture i e-uprave (digitalizacije državnih ustanova). Pokazalo se da zemlje koje investiraju u e-upravu, imaju veće šanse da poboljšaju vrednost DQL indeksa, s obrirom da je vrednost e-uprave faktor čija vrednost ima najveći uticaj u odnosu na ukupan DQL indeks.

Analizom rezultata DSI indeksa i DQL indeksa, a uzimajući u obzir i ostale faktore koji određuju rast i razvoj ekonomije, evidentno je da su bolje pozicije zauzele zemlje sa razvijenom ekonomijom, poput Švajcarske, Norveške, Austrije, Japana, Belgije, SAD, Australije, Singapura, Južne Koreje i mnogih drugih.

Tomše i Snoj (2016) su utvrdili da razvoj ICT sektora ima pozitivne efekte na ekonomiju, konkretno kada je u pitanju GDP po glavi stanovnika, ali negativan uticaj kada je u pitanju stopa nezaposlenosti. Autori ističu da je index razvoja ICT sektora u pozitivnoj korelaciji sa indeksom inovativnosti, te stoga preporučuju ulaganja u ICT sektor, kako bi se održala globalna konkurentska prednost (Tomše, Snoj, 2016; Tomše, Snoj, 2016; Tomše, Snoj, 2016).

Milojević i saradnici su još 2012.godine prepoznali potencijal ICT sektora u Republici Srbiji i ističu da je i pored malog tržišta, ovaj sektor učestvovao u GDP-u sa 5%, ali da su neophodna značajna ulaganja kako bi ICT tržište imalo pozitivan efekat na nivo preduzeća i nivo nacionalne privrede(Milojević, Cvijanović, Ignjatijević, 2012)

Atkinson i Stjuart (2013) su naglasili pozitivne efekte ICT sektora na ekonomiju(Atkinson, Stewart, 2013):

    a. Stvaranje visoko plaćenih poslova,
    b. 2011.godine IT industrija je doprinela 4,3% GDP-a Sjedinjenih Američkih Država,
    c. 2010.godine globalni output IT sektora je više nego dupliran na $2.8 triliona u odnosu na $1.2 triliona 1995.godine,
    d. IT sektor je zaslužan za 75% rasta produktivnosti u Sjedinjenim Američkim Državama u periodu od 1995-2002.godine i 44% u periodu od 2000-2006.godine,
    e. zbog uticaja dot.com Intrenet domena, godišnji globalni GDP Sjedinjenih Američkh Država je $1.5 triliona veći,
    f. od 2006.godine do 2010.godine, korporacije koje su investirale više u IT sektor su postigle rast produktivnosti tri puta brže u odnosu na korporacije koje su investirale manje,
    g. stvaranje visokorastućih kompanija,
    h. building high-growth companies,
    i. stvaranje novih sektora i strategija poslovanja,
    j. pokreće inovacije,
    k. ključni je izvor konkurentne prednosti.

GDP po glavi stanovnika je jedan od glavnih pokazatelja razvoja ekonomije, ali tu su i stopa nezaposlenosti, spoljnotrgovinska razmena, nacionalni dohodak i drugi. Mnogi autori ističu da je digitalizacija ili „digitalna ekonomija" strategija bez koje zemlje ne bi uspele da beleže rast i razvoj ekonomije. Digitalna transformacija podrazumeva ne samo uvođenje novih tehnologija u proces proizvodnje i poslovanja, već i u kompletnu organizacionu strukturu. Daub i Wiesinger (2015) smatraju da su ključni faktori zaposleni i znanje, odnosno u ovom slučaju digitalne veštine (Daub, Wiesinger, 2015).

Đorđević i saradnici (2022) smatraju da u vremenu koje dolazi, digitalne veštine moraju biti dostupne. Kako bi se održao korak sa tehnološkim promenama i razvojem na globalnom tržištu, neophodno je kontinuirano ulaganje u usavršavanje zaposlenih i sticanje novih veština, jer je znanje postalo izvor strateške prednosti, ekonomske moći i bogatstva(Đorđević et al., 2022).

Digitalna transformacija je obeležila 21. vek, ali ne samo u vidu razvoja i implementacije novih tehnologija, već se sve više pažnje usmerava na humani kapital i znanje, odnosno veštine koje poseduje ljudski kapital, te tako i na razvoj i usavršavanje istih. Pored toga, mnoge zemlje koje napreduju u digitalnoj transformaciji, susreću se sa manjkom stručne radne snage, odnosno ljudskog kapitala sa odgovarajućim znanjem i digitalnim veštinama.

Olszewska (2017) je analizirala digitalne performanse zemalja Centralne i Istočne Evrope u periodu od 2010-2015.godine, gde su, između ostalih faktora, analizirani: nivo digitalnih veština, obuka za ICT i dostupnost savremenih tehnologija koje zaposlenima pružaju kompanije, i nivo performansi u oblasti ponude i potražnje digitalnih veština. Analizirane zemlje su Bugarska, Hrvatska, Češka Republika, Estonija, Mađarska, Poljska, Letonija, Litvanija, Rumunija, Slovačka i Slovenija. Rezultati pokazuju da je u skoro svim zemljama pozitivan ishod preduzetničke kulture, ali niske performanse u oblasti digitalne infrastrukture i integracije digitalnih tehnologija, kao i niske nivoe digitalnih veština zaposlenih. Autorka zaključuje da postoji potencijal za digitalni rast, ali su neophodna velika ulaganja u ICT sektor i poboljšanje performansi kompanija u sektoru integrisanja digitalnih tehnologija u poslovanje. Isto tako, naglašava da je jedan od najvećih barijera za digitalni rast upravo nedostatak digitalnih veština (Olszewska, 2017).

Prema istraživanju AWS (Amazon Web Service) i Gallup – Work Place Consulting & Global Research, svet u kojem živimo i radimo postaje sve više digitalan, a informaciona tehnologija pokreće značajnu transformaciju širom sveta, na individualnom, organizacionom i makroekonomskom nivou. AWS i Gallup su sproveli jedno od najvećih međunarodnih istraživanja o digitalnim veštinama. U istraživanju je učestvovalo više od 30.000 radnika i 9.000 poslodavaca u 19 zemalja, koje čine 67% globalnog GDP-a. Metodologija ovog istraživanja je obuhvatila klasifikaciju prihoda po zemljama od strane Svetstke banke, pri čemu od ukupno analiziranih 19 zemalja, 13 zemalja imaju visoke prihode i to su: Australija, Kanada, Francuska, Nemačka, Hong Kong, Italija, Japan, Novi Zeland, Singapur, Južna Koreja, Tajvan, SAD, UK, i 6 zemalja sa srednjim nivoom prihoda: Brazil, Kina, Indija, Indonezija, Malezija i Tajland. Istraživanje je obuhvatilo period od 2020-2022.godine. Rezultati istraživanja su pokazala ekonomsku vrednost i značaj digitalnih veština za preduzeća, uticaj na rast GDP-a, na rast prihoda, inovacija, sigurnog posla i boljih plata.

Kada su u pitanju napredne digitalne veštine, one generišu procenjenih 4.2 triliona dolara godišnjeg GDP-a u analiziranih 19 zemalja i 6.3 biliona dolara globalnom nivou zvog prihoda i produktivnosti radnika sa naprednim digitalnim veštinama. Kada se naprednim digitalnim veštinama dodaju nivo osnovnih digitalnih veština i srednji nivo digitalnih veština, ukupna godišnja globalna vrednost digitalnih veština iznosi 18.5 biliona dolara, što je otprilike 12% globalnog GDP-a. U periodu od 2000-2021.godine, u SAD-u, obrada podataka, Internet izdavaštvo, i industrija informacionih usluga porasla je pet puta, a četiri sektora informacionih tehnologija doprinele su rastu GDP-a sa 2% na 8%. Takođe, Informaciono-tehnološke kompanije u Aziji i Evropi su najbržerastuće kompanije.

Lightcast je za 2021.godinu sumirao 4 velika trenda promena u veštinama na osnovu sprovedenog istraživanja u 2022.godini koje se odnosi na promene radnih veština u odnosu na 2016.godinu(Ercegovac, 2022):

1. Rast nivoa digitalnih veština nije ograničen samo u IT sektoru, već one igraju sve veću ulogu u drugim industrijama. Ove veštine uključuju digitalni marketing, digitalne veštine u proizvodnji, analizu podataka i umrežavanje.

2. Digitalni poslovi ne zahtevaju samo veštine programiranja, već i balans veština poput upravljanja vremenom, organizacije, liderstva, verbalne komunikacije, pozitivnog razmišljanja, slušanja, kritičnog razmišljanja i izgradnje efikasnih odnosa, jer su timovi zaposlenih u kompanijama sve više interaktivniji i kooperativniji.

3. Upotreba vizualizacije podataka je postala mnogo važnija kada su u pitanju sva zanimanja. Tražene veštine su: D3.js, Canva, Adobe Analytics, MS Visio, Alteryx...

4. Karijere se razvijaju prema trenutnoj aktuelnosti medija, gde je tehnologija široko dostupna, pristupačnija i fleksibilna sve vreme. Mnogi poslovi sada zahtevaju znanje i veštine upravljanja društvenim mrežama. Primeri traženih veština su Adobe InDesign, YouTube....

Evropska Unija je usvojila strategiju za digitalnu transformaciju pod nazivom „Evropa prilagođena digitalnom dobu 2020.godine. Ova stretagija nudi osnovu za jačanje konkurentske prednosti Evropske Unije u tzv."četvrtoj industrijskoj revoluciji", a od 2022.godine usvojena je najnovija regulativa obuhvaćena „Programom digitalne decenije do 2030.godine".Ovaj program usmerava digitalnu transformaciju Evrope sa konkretnim ciljevima za 2030.godinu:

1. Rast digitalno kvalifikovane populacije I visokokvalifikovanih profesionalaca sa ciljem postizanja rodne ravnoteže, gde najmanje 80%

populacije uzrasta od 16-74 poseduje najmanje osnovne dgitalne veštine I zaposlenost najmanje 20 miliona specijalista ICT sektora ,

2. Bezbedna, efikasna I odživa digitalna infrastruktura, gde će svi krajnji korisnici biti pokriveni gigabitnom mrežom do krajnje tačke mreže, a sva naseljena područja pokrivena bežičnim mrežama velike brzine sledeće generacije sa performansama koje su najmanje ekvivalentne 5G. Proizvodnja najsavremenijih poluprovodnika u EU, u skladu sa pravom EU o održivosti životne sredine iznosi najmanje 20% vrednosti svetske proizvodnje. Najmanje 10.000 klimatski neutralnih visoko bezbednih rubnih čvorova je raspoređeno u EU, tako da garantuje pristup uslugama podataka sa kašnjenjem od svega nekoliko milisekundi gde god da se preduzeća nalaze I da do 2025.godine Evropska Unija dođe do prvog računara sa kvantnim ubrzanjem, čime bi njen digitalni potencijal mogao biti na vrhuncu kvantnih mogućnosti do 2030.godine.

3. Digitalna transformacija preduzeća, gde je najmanje 75% preduzeća EU prezelo usluge računarstva u cloud-u, u skladu sa svojim poslovanjem, velike podatke ili veštačku inteligenciju. Više od 90% malih I srednjih preduzeća EU dostiže barem osnovni nivo digitalnog intenziteta. EU olakšava rast svojih inovativnih proširenja I poboljšava njihov pristup finansijama, što dovodi barem do udvostručenja broja tzv.jednoroga (unicorns).

4. Digitalizacija javnih usluga, gde su ključne javne usluge 100% onlajn dostupne I gde je moguće da građani I preduzeća uspostave onlajn interakciju sa javnom administracijom, 100% građana EU ima pristup svojim elektronskim zvdravstvenim kartonima, 100% građana EU ima pristup sredstvima bezbedne elektronske identifikacije koja su priznata širom EU, što im omogućava potpunu kontrolu nad transakcijama koje uključuju njihov identitet I nad ličnim podacima koje dele(Decision (EU) 2022/2481).

Vlada Republike Srbije prati Strategiju EU, te je 2021.godine usvojila "Strategiju razvoja informacionog društva I informacione bezbednosti za period od 2021-2026.godine", sa ciljem da se nastavi sa daljim unapređenjem digitalnih znanja I digitalnih veština svih građana, zatim da se podigne kapacitet zaposlenih i u javnom i u privatnom sektoru za korišćenje novih tehnologija, kao i da se unapredi digitalna infrastruktura u obrazovnim ustanovama ("Službeni glasnik RS", broj 86. od 3.septembra 2021.godine).

Društvene mreže kao važan deo digitalnih veština i digitalne pismenosti

Društvene mreže nastale su krajem 20. veka u svrhu uspostavljanja komunikacije ljudi iz različitih delova sveta. Iako je prvobitna uloga društvenih mreža bila socijalna, zbog eksplozivnog skoka popularnosti među korisnicima širom sveta, i industrija je prepoznala potencijalne koristi uvrštavanja društvenih mreža u

portfolio svog poslovanja, te su se efekti ove strategije veoma brzo pokazale i te kako profitabilnim. Ipak, za razliku od korisnika društvenih mreža, industrija je nešto kasnije prepoznala potencijalne benefite ovog fenomena, što se naročito razlikovalo u razvijenim zemljama i zemljama u razvoju.

Prema Global Web Index-u, društvene mreže su u potpunosti promenile koncept marketinga, a njihova popularnost i dalje raste pokazuju statistički podaci za 2023. godinu. U prilog tome govore podaci da društvene mreže koristi 60% populacije širom sveta, dok je prosečno vreme upotrebe društvenih mreža dnevno 2 sata i 24 minuta. Koje društvene mreže su najzastupljenije među korisnicima zavisi od njihovog životnog doba, kao i od zemlje u kojoj žive. Zbog životnih navika ljudi i činjenice da su društvene mreže postale sastavni deo života više od 60 % populacije, neminovno je bilo da industrija prepozna fenomen društvenih mreža kao izvor prihoda, posredno ili neposredno. Bilo da se društvene mreže koriste kao jedini instrument marketinga ili u kombinaciji sa drugim instrumentima, prisustvo na društvenim mrežama u 21. veku je neizostavan faktor. Sama svrha prisutnosti na društvenim mrežama može biti oglašavanje, informisanje potrošača, izgradnja i održavanje brenda i mnogi drugi, ali je komunikacija sa potrošačima putem društvenih mreža je najvredniji marketinški alat svake kompanije.

Značaj upotrebe društvenih mreža u komercijalne svrhe je višestruk. Pored ostvarivanja brze i dvosmerne komunikacije sa potrošačima, promovisanja proizvoda i/ili usluga, prevođenja potrošača iz stanja kupca i konzumenta u stanje „promotera", kada potrošači preporučuju proizvod i/ili uslugu referentnim grupama (Rakić, Rakić, 2008). Zbog toga što se socijalne mreže smatraju prenosnicima informacija koje kupci ocenjuju kao kredibilne, Levy (2010) ističe da organizacije teže stvaranju pozitivnog imidža na toj osnovi(Levy, 2010). Banković i Gijić (2010) ukazuju da je još jedan razlog sve veće komercijalne upotrebe Internet društvenih mreža, konstantan eksponencijalni rast broja korisnika društvenih mreža, ali i njihove aktivnosti na mreži (Banković, D., Gijić. N. (2010).

Sa ovim viđenjem slažu se i Kotler i saradnici (2017) i kažu da tržište postaje inkluzivno, a društvene mreže smanjuju barijere u kominkaciji između preduzeća i potrošača, pri čemu potrošači prenose savete i preporuke od preduzeća i od potrošača i prelaze iz stanja svesnosti (ja znam o proizvodu), ka delovanju (ja kupujem proizvod) do zastupanja (ja preporučujem proizvod) (Kotler, et al., 2017).

Među pravcima unapređenja poslovanja u domaćim preduzećima, a u cilju održavanja konkurentstke prednosti, Bešić i saradnici (2022), između ostalog navode i primenu savremenih dostignuća u oblasti informacionih i komunikacionih tehnologija (Bešić et al., 2022).

Neosporno je da je poslovanje mnogih industrijskih branši prešlo i na poslovanje putem društvenih mreža, čak su mnoge kompanije prešle isključivo na poslovanje putem društvenih mreža. Uz razvoj ICT sektora i digitalne transformacije, potražnja za ljudskim kapitalom koji poseduje digitalne veštine iz godine u godine raste. Društvene mreže su omogućile globalizaciju, odnosno priliku kompanijama da se usmere sa lokalnog, nacionalnog, regionalnog ili međunarodnog tržišta na globalno tržište. U prilog tome govore i rast elektronske trgovine, kao i rast digitalnog opismenjavanja populacije, naročito starijih građana, korisnika društvenih mreža, i mlađe populacije koja za potrebe zapošljavanja usavršava digitalne veštine.

Gardašević (2021) ističe da su društvene mreže u potpunosti promenile način na koji korisici koriste Internet, što je dovelo do neophodnih adaptacija u poslovanju kako velikih kompanija, tako i malih i srednjih preduzeća(Gardašević, 2020). Osim toga, Gardašević, Ćirić i Carić (2018) ističu važnost razumevanja motiva upotrebe društvenih mreža od strane potrošača(Gardašević et al., 2018), kako bi kompanije na adekvatan način mogle da reaguju i svoju marketing i poslovnu strategiju usmere ka ostvarivanju krajnjih ciljeva (Obradović, 2022).

Zaključak

Informatičko doba ili doba znanja bazira se na znanju, odnosno na ljudskom kapitalu. Od pojave prvih računara, Interneta i mobilnih telefona, način poslovanja i način života menjao se iz korena, da bi danas život bez ovih uređaja i bez svetske globalne mreže, u civilizovanom svetu bio nezamisliv.

Uz sva tehnološka dostignuća i promene, koje se odavno ne dešavaju na nivou decenije, već na godišnjem, pa čak i kvartalnom nivou, stanovništvo u svetu, kao i industrija, prilagođavaju se tim sve učestalijim promenama koje ubrzavaju proces poslovanja i čine ga značajno efikasnijim. Sa druge strane, te promene iziskuju nove veštine i znanja kako bi se tehnološke inovacije implementirale u poslovanje na adekvatan način.

Sam proces digitalne transformacije podrazumeva savladavanje digitalnih veština, odnosno konstantno usavršavanje i dokvalifikacije radne snage u ICT sektoru. Značaj ulaganja u digitalnu transformaciju za rast i razvoj kompanija i njihove konkurentnosti, a onda i za rast i razvoj ekonomije, prepoznale su kompanije i sa vremenom izdvajaju i plasiraju sve veće iznose kapitala u tehnološke inovacije i usavršavanja digitalnih znanja i veština radne snage (Dašić, G. 2023).

Značaj ulaganja u digitalne veštine i znanja prepoznale su i vodeće ekonomske sile, a njih prate i zemlje u razvoju usvajanjem Nacionalnih strategija koje se odnose na plan razvoja digitalnih performansi i ubrzavanja digitalnog procesa transformacije.

Digitalne veštine i znanja ponajviše se odnose na umeće upravljanja društvenim mrežama, koje su postale sastavni deo poslovanja, odnosno komunikacije kompanija sa potrošačima, promocije proizvoda, kao i trgovine putem interneta, ne samo na lokalnom i nacionalnom, već i na regionalnom i globalnom nivou.

Literatura

1. Ala-Mutka, K. (2011). *Mapping Digital Competence: Towards a Conceptual Understanding.* European Commission, Seville, Spain, DOI:10.13140/RG.2.2.18046.00322, Report number: JRC67075, pp. 18.
2. Atkinson, R. D., and Stewart, L. A. (2013). Just the Facts: The Economic Benefits of Information and Communications Technology. (I. T. Fundation, Edit.), pp.3-4.
3. Baltazarević, R. M. (2022), *Digitalna pismenost kao sredstvo prevencije protiv sajber kriminala,* Baština, Institut za srpsku kulturu Priština, Leposavić, br.57, DOI: https://doi.org/10.5937/bastina32-38103, str.131-139.
4. Banković, D., Gijić. N. (2010). *Application of WEB 2.0 Technology in Business*, In Application of New Techologies in Management/2nd International Conference ANTiM2010, Tara: Faculty for Education of the Executives of the University of business Academy, 2010, pp.390-395.
5. Bešić, C., Bešić Vukašinović, D.C., Bešić, S. (2022). Izazovi globalne ekonomije i unapređenje poslovanja domaćih cpreduzeća, Zbornik radova sa konferencija JUSK, Beograd, Srbija, str. 8-13.
6. Dašić, G. (2023). Digital transformation in the sports industry. In: Dašić, D (ed.) *SPORTICOPEDIA - SMB*, *1*(1), 309-318. https://doi.org/10.58984/smbic2301309d
7. Dašić, D. (2023) Application of delphi method in sports. *Sports, media and business*, *9*(1), 59-71. https://doi.org/10.58984/smb2301059d
8. Daub, M., Wiesinger, A. (2015). *Acquiring the Capabilities, You Need to Go Digital*. McKinsey Digital. Retrieved from http://www.mckinsey.com/insights/business_technology/acquiring_the_capabilities_you_need_to_go_digital, dostupno 23.01.2024.
9. Đorđević, D., Ćoćkalo, D., Bogetić, S., Bešić, C. (2022). *Analiza osnovnih apstekata poslovanja u novom tržišnom okruženju*, Zbornik radova sa konferencija JUSK, Beograd, Srbija, str. 36-44.
10. Đorđević, D., Ćoćkalo, D., Bešić, C., Bogetić, S., Bakator, M. (2022). *Značaj novih znanja i veština za postizanje održivosti u novoj paradigmi poslovanja*, Zbornik radova sa konferencija JUSK, Beograd, Srbija, str. 60-68.
11. Decision (EU) 2022/2481 of the European Parliament and of the Council of the 14 December 2022, establishing the Digital Decade Policy Programme

2030, Article 4: Digital targets, https://eur-lex.europa.eu/eli/dec/2022/2481/oj, dostupno 04.02.2024.

12. Gardašević, J. (2020). *Enterpreneurship and Facebook: Analyzing the Network usage on a daily and weekly basis among Serbian and American Respondents,* Journal of Enterpreneurship and Business Resilience, Faculty of Economics and Engineering Management, University Business Academy in Novi Sad, Vol 3, No 1, pp. 5-65.

13. Gardašević, J., Ćirić, M., Carić, M. (2018). *Razumevanje motiva koršćenja društvenih mreža u funkciji unapređenja komunikacije sa potrošačima,* Časopis Marketing, Srpsko udruženje za marketing SeMA, Ekonomski fakultet u Beogradu, vol. 49, br. 4, str. 311-320.

14. Ercegovac, I. (2022). Televizijski formati kao sadržaj koji generišu korisnici - Jutjub kao mas-medijski kanal influensera. *Društveni horizonti*, *2*(3), 59-73. https://doi.org/10.5937/drushor2203059E

15. https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts, dostupno 24.01.2024.

16. https://ec.europa.eu/eurostat/cache/metadata/en/isoc_sk_dskl_i21_esmsip2.htm, dostupno 30.01.2024.

17. https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21/default/table?lang=en, dostupno 24.01.2024.

18. https://surfshark.com/dql2023/methodology, dostupno 24.01.2024.

19. https://surfshark.com/dql2020, dostupno 24.01.2024.

20. https://surfshark.com/dql2021, dostupno 24.01.2024.

21. https://surfshark.com/dql2022, dostupno 24.01.2024.

22. https://surfshark.com/dql, dostupno 24.01.2024.

23. https://assets.aboutamazon.com/dd/e4/12d668964f58a1f83efb7ead4794/aws-gallup-global-digital-skills-study-report.pdf, dostupno 01.02.20234.

24. https://4906807.fs1.hubspotusercontent-na1.net/hubfs/4906807/Shifting%20Skills_Executive%20Summary%20(1).pdf, dostupno 01.02.2024.

25. https://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/ preuzeto 01.01.2024.

26. Jacobs, L. (2021), *Developing mobile digital skills in low and middle-income countries*, GSMA, pp.4, https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2021/11/Developing-mobile-digital-skills-in-low-and-middle-income-countries.pdf, dostupno 28.01.2024.

27. Jenkins, H. (2006). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*, Building the Field of Digital Media and Learning, The MacArthur Foundation, Chicago, Illinois, pp. 4.

28. Kotler, P., Kartajaya, H., Setiawan, I. (2017). *Marketing 4.0*, John Wiley and Sons Inc, Hoboken, New Jersey, https://www.drnishikantjha.com/booksCollection/Marketing%204.0_%20Mov

ing%20from%20Traditional%20to%20Digital%20(%20PDFDrive%20).pdf, dostupno 02.02.2024.

29. Levy, J.R. (2010). *Facebook Marketing: Design your next Marketing Campaign*, 2nd ed., Indianapolis: Pearson education, pp.125.

30. Lopez 2013: Islas Lopez. "Digital literacy and academic success in online education for underprivi-leged communities : the prep@net case." Ph.D. Dissertation, University of Texas, Austin

31. Milenković, N., Radosavljević, M., & Vladisavljević, V. (2023). Korišćenje aplikacija sa otvorenom licencom u razvoju programa poslovnog preduzeća. *Održivi razvoj*, *5*(2), 35-49. https://doi.org/10.5937/OdrRaz2302035M

32. Milojević, I., Cvijanović, D., Ignjatijević, S. (2012). *Makroekonomski okvir konkurentnosti srpske privrede i ICT sektora*, Međunarodni naučno-stručni časopis za ekonomiju i politiku tranzicije „Tranzicija", Ekonomski institut Tuzla, JCEA Zagreb, IEP Beograda, feam Bukurest, Vol.14 No. 30, str. 93-98.

33. Obradović, D. (2022). Operacije uticaja na drušvenim mrežama kao hibridna pretnja. *Društveni horizonti*, *2*(4), 217-233. https://doi.org/10.5937/drushor2204217O

34. Olszewska, K. (2017). The Digital Economy in Central and Eastern European Countries (CEECS) – The Case of Poland, International Scientific Conference on Economics and Management EMAN, Ljubljana, Slovenija, str. 363-370.

35. Perović, A. & Đukić, S. (2023). Značaj komunikacije u sportu. *Menadžment u sportu*, 14(1), 103-118.

36. Rakić, B, Rakić. M. (2008) *Marketing i inovacije u funkciji ra-zvoja organizacija i privrede*, Međunarodni naučni skup razvojne strategije preduzeća i privrede, Beograd: Mega-trend univerzitet, pp. 255-259.

37. Strategija razvoja informacionog društva I informacione bezbednosti u Republici Srbiji za period od 2021. do 2026.godine, "Službeni glasnik RS", broj 86. od 3.septembra 2021.godine, https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2021/86/1/reg, dostupno 04.02.2024.

38. Tinmaz, H., Lee, YT., Fanea-Ivanovici, M., Baber, H. (2022). A systematic review on digital literacy. *Smart Learn. Environ.* **9**, 21 (2022). https://doi.org/10.1186/s40561-022-00204-y

39. Tomše, D., Snoj, B. (2016). *The impact of Information and Communications Technologies on Unemployment rate on OECD Countries*. Integrated Politics of Research and Innovations. International Scientific Conference, Limen, pp.605-610.

40. Tomše, D., Snoj, B. (2016). *The impact of Information and Communications Technologies on GDP per Capita*. Knowledge Based Suistanable Economic Development. International Scientific Conference, Eraz, pp. 119-120.

41. Tomše, D., Snoj, B. (2016). *The impact of Information and Communications Technologies on Innovations*. International Scientific Conference on Economics and Management EMAN, Ljubljana, Slovenija, str. 556-561.

42. Trifunović, D., Bogdanović Bulut I., Tankosić, M., Lalić, G. & Nestorović, M. (2023). Research in the use of social networks in business operations. *Akcionarstvo,* 29(1), 39-62

43. UNESCO (2018). "Global framework of reference on digital literacy skills for indicator 4.4.2: Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skill (Draft Report)." Paris: UNESCO. https://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf, dostupno 10.01.2024.

44. Vidas-Bubanja, M., Bubanja, I. (2016). *The High Quolity and Sustainability as Characteristics of Doing Business in Digital Connected World*, International Journal of Advanced Quolity, JUSK, UDC 658.5, ISSN 2217-8155, no 2, vol 44, pp. 7-12.

45. Vidas-Bubanja, M, Popovčić-Avrić, S. (2017). *Izazovi globalnog poslovanja kompanija u savremenom digitalnom okruženju*, International Scientific Conference on Economics and Management EMAN 2017, Ljubljana, Slovenija, str.544.

46. Van Deursen, A.J.A.M. & Van Dijk, J.A.G.M., (2011). Internet skills, and the digital divide. New media & society. DOI:10.1177/1461444810386774, pp. 893-911.

47. Van Deursen, A.J.A.M., Helsper, E.J., & Einon, R. (2014). *Measuring Digital skills: From Digital Skills to Tangible Outcomes project report,* University of Twente / London School of Economics / Oxford University, DOI:10.13140/2.1.2741.5044, pp. 9-10.

48. Van Deursen, A.J.A.M. & Van Dijk, J.A.G.M. (2014). The digital divide shifts to gaps of usage. New media & Society, 16(3), pp. 507-526.

49. Vukosavljević, D., Vukosavljević, D., Miletić, V. (2023). Analysis of multidimensional globalization index on the example of the Republic of Serbia and the surrounding countries. *Akcionarstvo*, 29(1), 9-38

50. Vuković, M., Urošević, S., Dašić, D. (2023) Threats to objectivity in the social science research. *Sports, media and business*, 9(2), 143-158. https://doi.org/10.58984/smb2302143v

51. Zupur, M., & Janjetović, M. (2023). Održivost marketinga lične prodaje na savremenom tržištu. *Održivi razvoj*, 5(2), 7-19. https://doi.org/10.5937/OdrRaz2302007Z

ANALYSIS OF THE RELATIONSHIP INDEX OF DIGITAL SKILLS AND ECONOMIC DEVELOPMENT

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Abstract

The transition from the industrial age to the age of knowledge or information age implies the adoption of new knowledge and skills that become the main resource of business. The consequence of constant technological innovations is the need for new knowledge and skills, such as digital literacy and digital skills, which have become one of the most important resources for the development of industry, and therefore the economy. The subject of research in this paper is the analysis of the DSI index (Digital Skill Index) for the years 2021 and 2023 and the DQL index (Digital Quality of Life Index) for a period of five years, with the aim of comparing the data and pointing out the importance of having digital skills and the use of social networks have on the development of the economy. Quantitative research method was used in the research and was implemented dynamic analysis of DSI and DQL indices for Serbia and comparative analysis with other countries in a given time period. The results of the DSI index research for 2021 and 2023 for 36 European countries show that the leading positions were taken by the countries of Northern Europe, the Netherlands, Ireland, Spain and Luxembourg, while Serbia took the 30th position. Certain countries that occupied the central positions in the table in 2019, in 2023 have regressed, that is, progressed, but not to a significant level. On the other hand, the analysis of the DQL index for 50 countries of the world in the period from 2019 to 2023 shows that European countries occupied more than 50 percent among the best-ranked countries in the entire time period, while Serbia was not analyzed in 2019, but in in the next four analyzed years, it reached the top 50 ranked countries in the world. Also, the paper shows the importance of the development of digital skills and the use of social networks in the growth and development of the economy.

Keywords: DSI index, DQL index, digital skills, social networks, economic growth and development

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Introduction

The emergence of the Internet transformed business and accelerated the exchange of information and communication between companies and consumers, as well as suppliers and other business partners. Many business processes have become more efficient, thanks to technological innovations and digital skills. In the industrial age, the main resources were means of work, while in the information age, knowledge is considered the most valuable business resource (Dašić, 2023, Vuković, et al., 2023). According to Vidas-Bubanja and Bubanja (2016) "information and communication technologies are the basic infrastructure for innovation in all areas and a key determinant of the competitiveness of states and companies in the future"(Ala-Mutka, 2011).

Technological possibilities in the form of digital connection of the world are changing the way companies do business(Perović & Đukić, 2023) and a new industrial ecosystem is being created that changes the business environment in order to adapt it to the needs of the information age (Vidas-Bubanja, Bubanja, 2016).

In step with technological progress and innovation, companies have realized the importance of having digital skills, and then characterized them as one of the priorities for their own development and prosperity(Zupur & Janjetović, 2023; Vukosavljević et al., 2023). This trend was first adopted and implemented by large corporations, so that over time, small and medium-sized enterprises also adapted to the new business conditions. As large corporations are an important macroeconomic indicator of the development of the national economy, small and medium-sized enterprises are also an important link in the analysis of GDP trends.

Digital skills, digital literacy and competencies are very often seen as synonyms, so it is important to explain the differences between these three terms. Digital competence is defined by Ala-Mutka (2011) as "the ability to apply knowledge and skills in different contexts, such as work, leisure or learning"(Vidas-Bubanja, Popovčić-Avrić, 2017). According to van Deursen and van Dijk (2011) "digital literacy refers to certain competencies and knowledge, while digital skills refer to more technical aspects of these competencies and knowledge"(Van Deursen & Van Dijk, 2011). They initially singled out four types of practice-oriented skills (Van Deursen & Van Dijk, 2011):

     1. operational skills related to the operational manipulation of software and hardware,

     2. formal skills, which include the ability to understand and use the formal characteristics of computers and the Internet,

     3. information skills, i.e. skills necessary for searching, handling digital media content, their selection and critical assessment,

4. strategic skills - the capacity to use the Internet for your personal benefit;

to later include two additional skills, namely:

5. communication skills

6. content creation skills (Van Deursen et al.,2014; Van Deursen & Van Dijk, 2014).

UNESCO (2018) defines digital literacy as "the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent work, and entrepreneurship. It includes competencies related to computer literacy, information and communication technology literacy, information literacy and media literacy" (UNESCO, 2018). The authors Tinmaz, Yoo-Taek, Fanea-Ivanovici and Baber (2022) indicate the impact of digital literacy on various aspects of human life, such as education, business, health, management, etc., and that for each of these dimensions, they could carry out individual case studies. They believe that it is important to investigate the role of digital literacy in particular on lifelong learning, education in general, as well as the effects of digital training on the flexibility of the labor market(Tinmaz, et al., 2022).

Lopez (2013) considers that the use of social networks is one of the sub-variables of digital literacy(Lopez, 2013).

The structure of this paper will focus on the DSI index and the DQL index, as well as on social networks, as a significant factor of digital skills and their impact on the growth and development of the economy. The work methodology will include a comparative analysis of the digital quality of life index in several countries, including Serbia, over a period of five years, as well as a comparative analysis of the digital skills index for 36 European countries for 2021 and 2023. The aim of the work is to point out the real situation and directions of movement towards the improvement of these values.

Digital skills as an indispensable factor of sustainable business and development

In the introduction of this paper, a brief overview of the terms digital literacy, digital skills and digital competences is given. In this chapter, the similarities and differences of these concepts will be analyzed in more detail, and the emphasis will definitely be on digital skills.

In addition to van Deursen's (2011) already mentioned comprehensiveness of digital skills, many authors have built on this division, and highlighted their notions of digital skills. However, the classification of Jenkins (2006) stands out because it starts from the community and the participants themselves. Rather than exclusively highlighting individual attributes, Jenkins frames what he calls new

media literacy as cultural competencies and social skills developed through collaboration and networking, and he defines eleven different new skills:

1. Play – the ability to experiment with the environment as a form of problem solving,
2. Performance - the ability to adopt alternative identities for the purpose of improvisation and discovery,
3. Simulation - the ability to interpret and construct dynamic models of real world processes,
4. Appropriation – the ability to meaningfully sample and modify media content,
5. Multitasking - the ability to scan the environment and shift the focus as needed to highlight details,
6. Distributed Cognition – the ability to meaningfully interact with tools to extend mental capacities,
7. Collective intelligence – the ability to combine knowledge and compare notes with others in moving towards the same goal,
8. Assessment - the ability to assess the credibility and reliability of various sources of information,
9. Transmedia navigation – the ability to follow the flow of stories and information with the help of different modalities,
10. Networking - the ability to search, synthesize and disseminate information,
12. Negotiation – the ability to travel through different communities, insight and respect for different perspectives, and understanding and following an alternative norm(Jenkins, 2006).

The importance of digital literacy and digital skills, as well as competence in modern business, are key factors for the sustainability of competitiveness and economic development. That is why, since the advent of the Internet, the effects that the digital era has on the micro-economy, and then on the macro-economy, have been carefully studied. Digital skills are one of the basic indicators for monitoring the development of the digital economy, therefore the movement of this indicator is monitored over a longer period of time and the reasons for such movement are analysed.

Digital literacy and digital skills are an indispensable element of private and business life today, and there are very few industries where these skills and knowledge are not in demand. In addition, knowledge in the digital sphere is constantly being improved and innovated, and special digital skills are often sought after by employers.

Đorđević et al. (2022) believe that skills are necessary in the context of business globalization: cooperation and teamwork, planning and organizing, basic digital skills, adaptability, time management, negotiation, conflict resolution, creative,

innovative and critical thinking, communication, problem solving etc. (Đorđević et al., 2022).

The GSM Association (Global System for Mobile Communications) defines mobile digital skills as the knowledge and skills necessary for the effective and safe use of a mobile phone, mobile service and mobile Internet (2021). At the same time, digital skills are not only technical skills that people need to use the Internet, but include a range of cognitive and non-cognitive skills such as those related to communication and media literacy, security and privacy (Jacobs, 2021).

On the other hand, if we look at the use of the Internet and social networks for the purpose of entertainment, that is, for private purposes, digital literacy and digital skills are important factors for the prevention of cybercriminal activities (Baltazarević, 2022).

Digital literacy and digital skills in the world

UNESCO (2018) studied and analyzed the areas of competence and digital literacy and presented the reference frames of these categories in Table 1, which he later researched in 47 countries in the world, and classified them by geographic region and income level, which is shown in Table 2.

Table 1. DigCom 2.0 Competence and Competence Areas (UNESCO, 2018)

Areas of competence	Competencies
1. Computer literacy and data processing skills	1.1 Browsing, searching and filtering data, information and digital content 1.2 Evaluation of data, information and digital content 1.3 Management of data, information and digital content
2. Communication and cooperation	2.1 Interaction through digital technologies 2.2 Sharing through digital technologies 2.3 Civic engagement through digital technologies 2.4 Collaboration through digital technologies 2.5 Rules of appropriate behavior 2.6 Digital identity management
3. Creation of digital content	3.1 Development of digital content 3.2 Integration and reworking of digital content 3.3 Copyright and licenses 3.4 Programming
4. Security	4.1 Device protection 4.2 Protection of personal data and privacy 4.3 Protection of health and well-being 4.4 Environmental protection
5. Troubleshooting	5.1 Solving technical problems

	5.2 Identifying needs and technological responses
	5.3 Creative use of digital technologies
	5.4 Identification of gaps in digital competences

Table 2. Distribution of digital literacy and competence areas in 47 countries by geographic region and income level (UNESCO, 2018)

Geographical region	**The country's income level**				**In total**
	Tall	Medium tall	Medium low	Low	
1. Asia	1	3	7		11
2. European Union	1	1			2
3. High-income countries outside the EU	2				2
4. Latin America	1	4			5
5. Middle East and North Africa	4	4	4		12
6. Sub-Saharan Africa		4	6	3	13
7. The rest		1	1		2
Total	9	17	18	3	47

Table 2 analyzes the income level of countries by region and the frameworks of digital literacy in those countries. The results of research carried out by UNESCO have shown that multinational companies have a major role in influencing digital competences and digital literacy, which are taught and assessed, especially in developing countries. International companies sometimes hold courses and exams, and sometimes in collaboration with national providers.

DSI index and DQL index

Digital competences are measured on the basis of the five items already mentioned: IT and data literacy, communication and cooperation, creation of digital content, security and problem solving.

The European Commission analyzes the DESI (Digital Economy and Society Index) since 2015 and ranks 28 countries, members of the European Union, based on the following indicators:

1. Connection (coverage of households with Internet connection, percentage of fast Internet users, mobile connection),
2. Human capital (Internet users, basic digital skills, ICT specialists, experts in mathematics, science and technology),
3. Use of the Internet (news, music and entertainment, video calls, social networks, banking, shopping),
4. Integration of digital technology (information sharing, social networks, e-invoices, cloud, radio frequency identification, online sales, international online sales),
5. Digital public service (users of electronic public service, pre-filled forms, completing the service online, availability of data).

Only from 2021, Eurostat introduces a new concept, the DSI index (Digital Skills Index), which includes EU member countries, EU candidate countries, potential EU candidate countries, Iceland, Switzerland and Norway. For the analysis of the DSI index, i.e. the digital skills of citizens aged 16-74, Eurostat evaluates the following indicators:

1. **Information literacy skills and data processing skills** ("Formulating the need for information, locating and downloading digital data, information and content, evaluating the relevance of sources and their content, storing, managing and organizing digital data, information and content" *),
2. **Communication and cooperation skills** ("Abilities of individuals for integration, communication and cooperation through digital technologies with awareness of cultural and generational differences, socialization through public and private digital institutions and participatory citizenship, management of own digital identity and reputation" *),
3. **Digital content creation skills** ("Creating and editing digital content, improving and integrating information and content into an existing body of knowledge while understanding how copyright and licenses apply, knowledge to provide understandable instructions for a computer system" *),
4. **Security skills** ("Protection of devices, content, personal data and privacy in the digital environment, protection of mental and physical health, being aware of the impact of digital technologies on social well-being and social inclusion, being aware of the impact of digital technologies on the environment and their use" *),

5. **Problem solving skills** ("Identifying needs and problems and solving conceptual problems in a digital environment, using digital tools to innovate processes and products, keeping up with digital evolution" * [83]).

The time frame related to Internet use was 3 months, and each of these indicators is rated as basic level, above basic level and at least basic level: basic level or above basic level. The research was conducted on a sample of 75% of the population in the analyzed countries in 2021 and 2023.

Based on these elements, Eurostat ranked countries according to the levels of digital skills.

Table 3. Criteria on the basis of which the levels of digital skills were determined

Level		
1	Individuals with basic or above basic digital skills	All five indicators were rated as basic level or above basic level of digital skills
2	Individuals with above basic digital skills	All five indicators were assessed as above the basic level of dig. skill
3	Individuals with a basic level of digital skills	All indicators are rated as the level of basic dig. skill or level above basic dig. skills, but not all indicators are rated as a level above basic dig.skills
4	Individuals with low levels of digital skills	4/5 indicators were rated as basic or above basic digital skills
5	Individuals with inadequate levels of digital skills	3/5 indicators were rated as basic or above basic digital skills
6	Individuals with limited digital skills	2/5 of the IDs were rated as basic or above basic digital skills
7	Individuals without a basic level of digital skills	Without basic dig.skills
8	The level of digital skills could not be determined	Individuals have not used the Internet in the last 3 months

https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21/default/table?lang=en

Table 4. Level of digital skills of individuals for 2021

R.	Country	**Level 1** (Level 2 +	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	level 8

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[83] * Definition within the Digital Competence Framework 2.0

no		Level 3) %	%	%	%	%	%	%	%
1	Iceland	80.99	44.77	36.23	12.10	4.93	0.74	0.68	0.56
2	Finland	79.18	48.13	31.04	12.58	3.59	1.02	0.33	3.29
3	Netherlands	78.94	51.77	27.18	11.40	3.39	0.46	0.32	5.48
4	Norway	78.71	42.59	36.12	15.03	4.33	0.86	0.49	0.58
5	Switzerland	77.79	40.26	37.53	12.22	4.60	2.17	1.36	1.86
6	Ireland	70.49	39.69	30.80	14.17	7.60	4.83	1.85	1.07
7	Denmark	68.65	37.37	31.27	20.17	8.04	1.14	0.89	1.11
8	Sweden	66.60	35.68	30.92	17.92	7.93	2.78	1.53	3.24
9	Spain	64.16	38.06	26.11	15.44	7.44	4.47	2.39	6.10
10	Luxembourg	63.79	31.81	31.98	20.41	8.32	4.70	1.44	1.34
11	Croatia	63.37	31.18	32.19	11.57	4.73	1.49	0.10	18.75
12	Austria	63.33	33.28	30.05	16.95	6.82	3.38	2.05	7.47
13	France	61.96	31.25	30.71	16.07	8.47	3.74	1.32	8.45
14	Malta	61.23	35.49	25.74	15.45	6.09	3.25	1.46	12.53
15	Czech Republic	59.69	24.06	35.63	17.36	8.42	2.42	0.96	11.15
16	Estonia	56.37	27.68	28.69	19.13	9.82	3.37	2.28	9.02
17	Portugal	55.31	28.54	26.76	12.64	6.99	4.76	2.60	17.69
18	Slovakia	55.18	20.83	34.36	18.15	8.93	4.40	2.26	11.07
19	Belgium	54.23	26.34	27.89	18.59	11.71	5.24	3.01	7.21
20	Greece	52.48	21.70	30.78	10.64	7.86	5.45	2.07	21.51
21	Latvia	50.80	23.79	27.01	20.70	12.37	5.05	2.37	8.70
22	Cyprus	50.21	20.95	29.26	20.58	10.07	6.98	2.92	9.24
23	Slovenia	49.67	19.72	29.95	20.48	11.21	4.80	2.84	11.00
24	Hungary	49.09	21.54	27.56	20.51	11.91	4.98	2.14	11.36
25	Germany	48.92	18.84	38.88	21.22	11.51	6.19	3.58	8.57
26	Lithuania	48.84	23.01	25.83	18.61	10.41	5.84	3.23	13.07
27	Montenegro	47.21	9.14	30.08	25.44	7.91	1.65	0	17.78
28	Italy	45.60	22.52	23.08	16.34	9.84	6.12	3.69	18.41
29	Poland	42.93	20.64	22.28	18.82	11.45	7.31	4.88	14.63

30	**Serbia**	**41.30**	**12.32**	**28.97**	**18.67**	**10.48**	**6.65**	**4.08**	**18.83**
31	Bosnia and Herzegovina	34.65	5.35	29.29	21.53	10.17	7.17	2.16	24.32
32	North Macedonia	34.62	8.15	26.48	18.28	15.93	11.71	5.85	13.60
33	Bulgaria	31.18	7.82	23.36	14.51	11.67	11.75	6.16	24.73
34	Turkey	30.12	9.87	20.25	19.64	14.34	10.00	7.32	18.59
35	Romania	27.82	8.73	19.09	16.53	14.23	14.88	10.13	16.41
36	Albania	23.80	4.01	19.79	16.80	17.39	14.42	6.96	20.63

https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21/default/table?lang=en

The table ranks 36 countries based on the level of digital skills, with the first-ranked countries being those with the highest percentage of level 1, which represents the sum of level 2 and level 3, i.e. the percentage of individuals with a level above basic digital skills and the percentage of individuals who possess basic digital skills. Analyzing the other values, we see that the other percentages of individuals in the other levels (level of low digital skills, level of inadequate digital skills, level of limited digital skills and level without basic digital skills) do not necessarily follow a sequence of decreasing values compared to the values of level 1, i.e. the sum of levels 2 and level 3. In this ranking, the Republic of Serbia took the 30th position with the following values: Level 1 (41.30%), Level 2 (12.32%) and Level 3 (28.97%), which means that the total percentage of respondents who have the level of basic digital skills and the level above basic digital skills is less than 50%, more precisely it is 41.30%. When it comes to Level 4, which represents the percentage of individuals with a low level of basic digital skills, that value is 18.67%, the percentage of individuals with an inadequate level of digital skills (level 5) is 10.48%, followed by 6.65% of individuals with a limited level of digital skills (level 6) and 4.08% of individuals without basic digital skills (level 7). And finally, level 8 with a value of 18.83% of individuals for whom it was not possible to determine the level of digital skills, because they did not use the Internet in the last three months. That percentage is extremely high considering that it is about a fifth of the respondents. This value acquires a negative significance, especially if one takes into account the Covid-19 pandemic, which in a very short period of time transformed learning and live work into the digital sphere.

Table 5. Level of digital skills of individuals in 2023

R.	Country	Level 1 (Level 2 +	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	level 8

no		Level 3) %	%	%	%	%	%	%	%
1	Netherlands	82.70	54.53	28.16	12.12	3.43	0.65	0.25	0.85
2	Finland	81.99	53.63	28.36	11.28	3.01	0.80	0.62	2.30
3	Norway	81.09	50.71	30.38	14.66	3.24	0.29	0.39	0.32
4	Switzerland	77.52	42.69	34.83	13.21	5.42	1.81	1.29	0.75
5	Denmark	69.62	39.37	30.25	19.62	7.12	1.54	0.90	1.20
6	Czech Republic	69.11	35.48	33.63	13.89	5.32	2.59	1.13	7.96
7	Ireland	68.65	37.88	30.77	15.93	7.31	3.34	0.65	4.12
8	Sweden	66.44	36.51	29.93	19.57	8.19	2.37	1.03	2.41
9	Spain	66.18	38.65	27.52	15.25	7.15	4.36	2.51	4.55
10	Austria	64.68	32.04	32.64	17.01	7.49	4.13	2.03	4.67
11	Malta	63.02	36.98	26.04	16.68	7.52	3.52	1.34	7.93
12	Estonia	62.61	34.84	27.76	17.40	8.06	3.23	1.89	6.80
13	Luxembourg	60.14	27.86	32.28	20.13	10.16	5.05	3.87	0.65
14	France	59.67	30.62	29.06	16.73	9.30	4.65	2.48	7.17
15	Belgium	59.39	28.26	31.12	18.46	10.30	4.36	2.12	5.37
16	Croatia	58.95	25.00	33.94	15.93	6.27	2.16	0.09	16.60
17	Hungary	58.89	28.13	30.76	18.60	8.54	3.89	1.53	8.55
18	Portugal	55.97	29.93	26.04	14.39	7.59	5.15	2.69	14.21
19	Lithuania	52.91	25.90	27.01	16.40	10.34	6.07	2.79	11.50
20	Greece	52.40	20.02	32.38	14.98	8.51	6.31	2.81	14.99
21	Germany	52.22	19.79	32.43	20.89	11.44	5.61	2.32	7.52
22	Montenegro	52.02	10.55	41.48	25.44	7.61	3.15	0.14	11.64
23	Slovakia	51.31	21.70	29.61	19.30	10.55	4.00	2.05	12.79
24	Cyprus	49.46	24.96	24.51	23.51	9.64	6.35	2.27	8.78
25	Slovenia	46.70	18.88	27.82	20.64	12.86	6.48	3.71	9.62
26	Italy	45.75	22.21	23.54	18.23	10.70	7.15	5.09	13.08
27	Latvia	45.34	16.55	28.79	22.22	15.82	6.30	2.65	7.67
28	Poland	44.30	20.05	24.25	20.36	11.56	6.41	3.79	13.59
29	Bulgaria	35.52	7.73	27.79	15.59	13.36	10.03	5.88	19.61

30	Turkey	33.11	10.61	22.51	20.91	16.60	9.05	6.29	14.03
31	**Serbia**	**32.81**	**12.17**	**20.64**	**31.33**	**11.15**	**7.27**	**2.80**	**14.64**
32	Bosnia and Herzegovina	30.08	6.88	23.20	23.94	13.65	10.75	4.96	16.62
33	Romania	2.73	8.97	18.77	18.73	17.47	15.35	9.91	10.80
34	Iceland	:	:	:	:	:	:	:	:
35	North Macedonia	:	:	:	:	:	:	:	:
36	Albania	:	:	:	:	:	:	:	:

https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21/default/table?lang=en

The results of the DSI index for the year 2023 showed some less significant, and some more significant differences compared to the DSI index of 2021. The first thing that is important to note is that the data for 2023 were not collected and analyzed for all 36 countries, as in 2021, that is, data for Iceland, North Macedonia and Albania are missing. When it comes to North Macedonia and Albania, they occupied low positions in 2021, but it is interesting that Iceland had a leading position in 2021 when it comes to the index of digital skills in Europe.

Considering the lack of data for 2023 for Iceland, which had the leading position in 2021, the leading position has now been taken over by the Netherlands with 82.70% of the population possessing a basic level of digital skills or a level above basic. Finland maintained the second position with a slightly higher percentage of the population with a basic level of digital skills and a level above basic, in 2021 the percentage was 79.18, and in 2023 it was 81.99%. At the very top, Norway, Switzerland, Ireland, Sweden, Denmark and Spain retained their positions, while compared to 2021, when Luxembourg was among the first 10 ranked countries, the Czech Republic and Austria are now there. In 2021, the Czech Republic was in the 15th position, while in 2023, the value of its DSI index jumped to even the 6th position. Luxembourg fell from 10th place to 13th place, which does not represent a significant change. Likewise, in 2021, Austria took 12th place, and in 2023, it recorded growth to 10th place.

As for other significant changes, Belgium recorded a decrease of 4 positions in 2023 compared to 2021, Croatia decreased by 5 positions, as did Slovakia, while Turkey, Bulgaria, Germany and Estonia recorded growth of 4 positions. The biggest growth was recorded by Hungary and Lithuania, by as many as 7 positions, followed by Latvia, which grew by 6 positions, and Montenegro, which grew by 5 positions.

When it comes to Serbia, it recorded a drop by one position and compared to the 30th position it occupied in 2021, the value of the DSI index of Serbia in 2023

occupies the 31st position. However, due to the lack of data for Iceland, Albania and North Macedonia for the year 2023, these results do not fully represent a realistic picture. But what can be concluded is that the top ten positions were recorded by the same countries in both years, namely the countries of Northern and Western Europe.

In the continuation of the work, the DQL index (Digital Quality of Life) is analyzed at the global level for the period from 2019-2023, and we will compare the results, that is, the similarities and differences with the DSI index.

The DQL Index (The Digital Quality of Life) considers the following factors on the basis of which it ranks 121 countries according to the digital quality of life index:

1. Internet accessibility,
2. Internet quality,
3. Electronic infrastructure,
4. electronic security,
5. Digitization of state institutions.

These criteria have been considered since 2020, while in 2019 slightly different elements were considered for a smaller number of countries, 65 to be exact. These elements are:

1. internet speed,
2. Cyber security of the country,
3. Availability of e-government services,
4. Availability and variety of e-entertainment,
5. The presence of the law on the protection of personal data.

Among the countries analyzed in 2019, there is no Republic of Serbia, while China is included in the report, but as a special case. In the 2020 analysis, 85 countries were considered, including Serbia. For 2021, the number of analyzed countries has increased to 110, while for 2022, the number of analyzed countries was 117. In 2023, 121 countries were analyzed.

Table 6. DQL Index in the period from 2019-2023. years

R. no	Country	DQL Index 2019.	Country	DQL Index 2020.	Country	DQL Index 2021.	Country	DQL Index 2022.	Country	DQL Index 2023.
1	Australia	0.7992	Denmark	0.79	Denmark	0.8313	Israel	0.7610	France	0.7902
2	France	0.7985	Sweden	0.79	J. Korea	0.7608	Denmark	0.7347	Finland	0.7483
3	Singapore	0.7854	Canada	0.78	Finland	0.7562	Germany	0.7123	Denmark	0.7377
4	Norway	0.7607	France	0.77	Israel	0.7387	France	0.7105	Germany	0.7357

5	Japan	0.7606	Norway	0.75	IN WITH	0.7360	Sweden	0.6895	Luxemburg	0.7357
6	Canada	0.7516	Netherlands	0.74	Singapore	0.7192	Netherlands	0.6843	Spain	0.7232
7	Denmark	0.7479	UK	0.74	France	0.7128	Finland	0.6826	Estonia	0.7185
8	J. Korea	0.7448	Israel	0.73	Switzerland	0.7093	Japan	0.6785	Austria	0.7166
9	Italy	0.7361	Japan	0.72	Germany	0.7071	UK	0.6685	Switzerland	0.7106
10	Sweden	0.7360	Poland	0.72	UK	0.7065	J. Korea	0.6660	Singapore	0.7096
11	USA	0.7341	Finland	0.71	Netherlands	0.7060	Lithuania	0.6648	Sweden	0.7079
12	Netherlands	0.7331	Singapore	0.71	Japan	0.6983	IN WITH	0.6572	Netherlands	0.7063
13	Israel	0.7269	Estonia	0.7	Sweden	0.6972	Switzerland	0.6570	Lithuania	0.6957
14	Switzerland	0.7223	Austria	0.7	Norway	0.6916	Estonia	0.6554	Romania	0.6944
15	Spain	0.7061	Switzerland	0.7	Luxemburg	0.6867	Singapore	0.6547	UK	0.6296
16	Iceland	0.7045	Germany	0.69	Lithuania	0.6863	Spain	0.6533	Japan	0.6807
17	UK	0.7035	New Zealand	0.69	Australia	0.6835	Norway	0.6389	Israel	0.6660
18	Finland	0.7033	Spain	0.69	Spain	0.6744	Luxembourg	0.6347	Poland	0.6613
19	Germany	0.6914	Australia	0.68	Estonia	0.6662	Italy	0.6330	USA	0.6598
20	New Zealand	0.6872	Italy	0.67	Canada	0.6635	Portugal	0.6260	J. Korea	0.6559
21	Belgium	0.6690	Lithuania	0.67	Austria	0.6620	Belgium	0.6235	Belgium	0.6540
22	Austria	0.6687	USA	0.67	China	0.6529	Austria	0.6214	Canada	0.6527
23	Lithuania	0.6553	Slovenia	0.67	New Zealand	0.6492	Poland	0.6150	Ireland	0.6501
24	Hungary	0.6529	Belgium	0.66	Ireland	0.6459	Ireland	0.6149	Italy	0.6500
25	Portugal	0.6478	Hungary	0.65	Belgium	0.6360	Czech Republic	0.6123	Czech Republic	0.6477
26	Poland	0.6442	Bulgaria	0.65	Poland	0.6360	Canada	0.6038	Norway	0.6452
27	Russia	0.6439	Latvia	0.65	Italy	0.6352	Hungary	0.5999	New Zealand	0.6432
28	Estonia	0.6431	Ireland	0.64	Czech Republic	0.3267	New Zealand	0.5966	Latvia	0.6391
29	Slovenia	0.6302	Portugal	0.63	Slovakia	0.6210	Slovakia	0.5932	Portugal	0.6360
30	Ireland	0.6242	Slovakia	0.62	Portugal	0.6176	Bulgaria	0.5907	Australia	0.6324
31	UAE	0.6215	UAE	0.62	Malaysia	0.6108	Croatia	0.5880	Cyprus	0.6299

32	India	0.6165	Czech Republic	0.61	Hungary	0.6083	Slovenia	0.5867	Malta	0.6239
33	Romania	0.6110	Qatar	0.61	Qatar	0.6050	Latvia	0.5854	Slovakia	0.6215
34	Qatar	0.6057	Croatia	0.6	Romania	0.5975	Romania	0.5847	Hungary	0.6149
35	Turkey	0.6049	Cyprus	0.6	Cyprus	0.5951	Australia	0.5806	Slovenia	0.6148
36	Slovakia	0.5867	Uruguay	0.59	Slovenia	0.5950	Malta	0.5747	Croatia	0.6057
37	Mexico	0.5846	Greece	0.58	Croatia	0.5932	Cyprus	0.5683	Malaysia	0.5869
38	Croatia	0.5832	China	0.58	Greece	0.5879	Malaysia	0.5580	UAE	0.5821
39	Latvia	0.5791	Romania	0.58	Bahrain	0.5873	Greece	0.5561	Greece	0.5781
40	South Africa	0.5738	Azerbaijan	0.57	Malta	0.5834	Chile	0.5481	Bulgaria	0.5704
41	Malaysia	0.5727	Malaysia	0.57	Latvia	0.5785	Uruguay	0.5472	Uruguay	0.5652
42	Uruguay	0.5702	Russia	0.57	UAE	0.5735	Russia	0.5325	Chile	0.5625
43	Ukraine	0.5639	Kuwait	0.54	Chile	0.5713	China	0.5261	Argentina	0.5624
44	Chile	0.5624	Turkey	0.54	Thailand	0.5672	UAE	0.5130	China	0.5577
45	Czech Republic	0.5598	Saudi Arabia	0.53	Bulgaria	0.5664	Argentina	0.5106	Saudi Arabia	0.5365
46	Albania	0.5564	Macedonia	0.52	**Serbia**	**0.5654**	Qatar	0.5088	Ukraine	0.5295
47	China	0.5548	Kazakhstan	0.52	Ukraine	0.5640	Armenia	0.5052	Kazakhstan	0.5280
48	Greece	0.5534	Argentina	0.52	Philippines	0.5584	**Serbia**	**0.4976**	Qatar	0.5277
49	Georgia	0.5499	**Serbia**	**0.52**	Argentina	0.5573	Thailand	0.4904	Brazil	0.5245
50	Azerbaijan	0.5312	Mexico	0.52	Saudi Arabia/ Moldova	0.5523	Ukraine	0.4893	**Serbia**	**0.5236**

https://surfshark.com/dql , https://surfshark.com/dql2020 , https://surfshark.com/dql2021 , https://surfshark.com/dql2022 , https://surfshark.com/dql2023

Comparing the DQL Indices for the ranked 50 countries in the period from 2019 to 2023, it is necessary to point out that the criteria used for the ranking in 2019 are different compared to the criteria of the following years, which is why the source, Surfshark, points out that the indices from 2020 to 2023 are comparable. What has already been stated, but is important for the analysis, is that the number of countries whose DQL was analyzed increased over the years, as well as that Serbia was not among the countries analyzed in 2019. This display presents the values of the DQL Index for 50 countries around the world, as well as the movements of this index by year and country, based on which certain countries occupied a higher or lower position, while some countries appeared for the first time among the top 50, and some fell to a position below 50th place.

By analyzing the DQL indicators for all five years, it is evident that European countries occupied more than 50% of the top 50 ranked countries. The countries of Scandinavia stand out in particular, occupying some of the first ten positions every year, and it is interesting that in 2023, the first nine positions on the list were occupied by European countries.

As far as Serbia is concerned, the analysis of the DQL Index in Serbia began in 2020 and the values for the period from 2020-2023 show that Serbia is among the first 50 ranked countries, and in 2020 it took the 49th position with an index of 0.52. then in 2021, Serbia advanced to the 46th position with an index of 0.5654, and in 2022 it fell back to the 48th position with an index of 0.4976, and at the end of 2023, Serbia occupied the 50th position with an index of 0.5236.

The comparison of the results of the DSI index and the DQL index shows that it confirms that the top ranked countries are the countries of Northern and Western Europe, and it is important for Serbia that although it is in the ranking of the DSI index (36 European countries), it has taken positions in the ranking of the DQL index at the global level among the top 50 countries, compared to the ranked 85,110,117 and 123 countries respectively. This means that Serbia has remained constant over the last few years when it comes to investing in digital transformation and acquiring digital skills.

Relationship between DQL index, DSI index and economic development

Surfshark also provides a brief analysis of the DQL index and GDP per capita, with a clear conclusion that countries with a lower DQL index are also countries with a lower value of GDP per capita. A rise in the value of the DQL index of 0.0300 could potentially affect a rise of $10,000.00 in GDP per capita of the country. However, in 2019, several countries showed surprisingly good performance in certain digital areas, despite low GDP per capita values. These are: Russia, Hungary, Portugal, Poland, Estonia, Slovenia, Lithuania, India, Romania and Turkey. The mean value of the DQL index is 0.6110/1.000, which indicates that the digital quality of life based on this factor is average. No country achieved a value above 0.800 indicating that many deficiencies were present in various areas. A well-developed Internet infrastructure is also essential, and the key lies in investments in mobile Internet. When it comes to personal data protection laws, 62 of the 65 analyzed countries have laws on personal data protection, however in many cases the commitment to personal data protection is unrealistic.

According to the report for 2020, it is emphasized that progress in e-infrastructure corresponds with economic wealth only up to a certain point. Countries with above-average GDP per capita values do not guarantee better Internet technologies or greater Internet usage. Three countries with relatively high values

of GDP per capita, Kuwait, Bahrain and Saudi Arabia, failed when it comes to the level of Internet quality and electronic security.

The values of the DQL index and their analysis show that investments in electronic infrastructure and digitization of state institutions have the greatest contribution to improving the digital quality of people's lives, while Internet accessibility has proven to be the least important factor for the DQL index. When it comes to GDP per capita, the report shows that its value does not necessarily determine the quality of a country's electronic infrastructure. Compared to 2020, the impact of GDP per capita on electronic security has decreased in 2021. Serbia, along with 20 other countries, including the countries of the region: Croatia, Bulgaria, Romania and Hungary, surpassed other countries in providing higher levels of electronic security and electronic infrastructure. Although GDP per capita largely corresponds to the DQL index, there are countries that have a better digital quality of life with a lower GDP per capita than expected, indicating that there is potential to raise the level of digital quality of life even with fewer resources and a more focused strategic planning.

For the year 2022, the results are practically the same when it comes to the correlation of GDP per capita and the DQL index, with the fact that in that year 17 countries were singled out that exceeded expectations in terms of the DQL index, and when it comes to electronic security, digitization of state institutions (e-administration) and electronic infrastructure. Serbia was once again among these countries, as well as Hungary, Croatia, Bulgaria and Romania.

And when it comes to the report for 2023, European countries continue to occupy the highest ranked positions in terms of the DQL index. Western Europe is the leader in terms of the DQL index, but also in terms of economic wealth. An interesting fact for 2023 is that although the region of Northern Europe records a 15% lower value of GDP per capita compared to North America, the values of the DQL index in Northern Europe are higher compared to North America. Also, an interesting fact is that, although the GDP per capita of West Asia is higher than the global average by 38%, the value of the DQL index of West Asia falls below the global average. These data confirm again that the correlation between the DQL index and GDP per capita is important, but GDP is not the most important indicator of the quality of digital life of the citizens of a certain country. Once again, Serbia, Romania, Croatia, Bulgaria and Hungary, along with 17 other countries out of a total of 121 ranked countries, proved to be countries with lower GDP values that managed to achieve more than the expected values of electronic security, electronic infrastructure and e- administration (digitalization of state institutions). It has been shown that countries that invest in e-government have a greater chance of improving the value of the DQL index, with the conclusion that the value of e-government is the factor whose value has the greatest impact in relation to the overall DQL index.

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By analyzing the results of the DSI index and the DQL index, and taking into account other factors that determine the growth and development of the economy, it is evident that better positions were taken by countries with developed economies, such as Switzerland, Norway, Austria, Japan, Belgium, the USA, Australia, Singapore , South Korea and many others.

Tomše and Snoj (2016) determined that the development of the ICT sector has positive effects on the economy, specifically when it comes to GDP per capita, but a negative impact when it comes to the unemployment rate. The authors point out that the ICT sector development index is positively correlated with the innovation index, and therefore recommend investments in the ICT sector in order to maintain a global competitive advantage prednost (Tomše, Snoj, 2016; Tomše, Snoj, 2016; Tomše, Snoj, 2016).

In 2012, Milojević and colleagues recognized the potential of the ICT sector in the Republic of Serbia and pointed out that despite the small market, this sector contributed 5% to the GDP, but that significant investments are necessary in order for the ICT market to have a positive effect on the level companies and the level of the national economy (Milojević, Cvijanović, Ignjatijević, 2012)

Atkinson and Stewart (2013) emphasized the positive effects of the ICT sector on the economy(Atkinson, Stewart, 2013):

a. Creating high-paying jobs,
b. In 2011, the IT industry contributed 4.3% of the GDP of the United States of America,
c. In 2010, the global output of the IT sector more than doubled to $2.8 trillion compared to $1.2 trillion in 1995.
d. The IT sector is responsible for 75% of productivity growth in the United States in the period from 1995-2002 and 44% in the period from 2000-2006.
e. due to the influence of the dot.com Internet domain, the annual global GDP of the United States of America is $1.5 trillion higher,
f. from 2006 to 2010, corporations that invested more in the IT sector achieved productivity growth three times faster than corporations that invested less,
g. creating high-growth companies,
h. building high-growth companies,
i. creation of new sectors and business strategies,
j. drives innovation,
k. is a key source of competitive advantage.

GDP per capita is one of the main indicators of economic development, but there are also unemployment rates, foreign trade, national income and others. Many authors point out that digitization or "digital economy" is a strategy without which

countries would not be able to record economic growth and development. Digital transformation implies not only the introduction of new technologies into the production and business process, but also into the complete organizational structure. Daub and Wiesinger (2015) consider that the key factors are employees and knowledge, or in this case digital skills (Daub, Wiesinger, 2015).

Đorđević et al. (2022) believe that in the time to come, digital skills must be available. In order to keep pace with technological changes and developments in the global market, it is necessary to continuously invest in the training of employees and the acquisition of new skills, because knowledge has become a source of strategic advantage, economic power and wealth (Đorđević et al., 2022).

Digital transformation has marked the 21st century , but not only in the form of development and implementation of new technologies, but more and more attention is being directed to human capital and knowledge, that is, the skills possessed by human capital, and thus also to their development and improvement. In addition, many countries that are progressing in the digital transformation face a shortage of skilled labor, i.e. human capital with appropriate knowledge and digital skills.

Olszewska (2017) analyzed the digital performance of the countries of Central and Eastern Europe in the period from 2010-2015, where, among other factors, were analyzed: the level of digital skills, training for ICT and the availability of modern technologies provided by companies to employees, and the level of performance in the area of supply and demand of digital skills. The analyzed countries are Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Poland, Latvia, Lithuania, Romania, Slovakia and Slovenia. The results show that in almost all countries there is a positive outcome of entrepreneurial culture, but low performance in the field of digital infrastructure and integration of digital technologies, as well as low levels of digital skills of employees. The author concludes that there is potential for digital growth, but large investments in the ICT sector and improvement of the performance of companies in the sector of integrating digital technologies into business are necessary. It also emphasizes that one of the biggest barriers to digital growth is precisely the lack of digital skills (Olszewska, 2017).

According to research by AWS (Amazon Web Service) and Gallup - Work Place Consulting & Global Research, the world in which we live and work is becoming increasingly digital, and information technology is driving a significant transformation worldwide, at the individual, organizational and macroeconomic levels. AWS and Gallup conducted one of the largest international surveys on digital skills. More than 30,000 workers and 9,000 employers in 19 countries, which make up 67% of global GDP, participated in the research. The methodology of this research included the classification of income by country by the World Bank, whereby out of a total of 19 countries analyzed, 13 countries have high incomes, namely: Australia, Canada, France, Germany, Hong Kong,

Italy, Japan, New Zealand, Singapore , South Korea, Taiwan, USA, UK, and 6 middle-income countries: Brazil, China, India, Indonesia, Malaysia, and Thailand. The research covered the period from 2020-2022. The research results showed the economic value and importance of digital skills for companies, the impact on GDP growth, income growth, innovation, secure work and better wages [30].

When it comes to advanced digital skills, they generate an estimated $4.2 trillion in annual GDP in the 19 countries analyzed and $6.3 trillion globally in income and productivity of workers with advanced digital skills. When basic digital skills and intermediate digital skills are added to advanced digital skills, the total annual global value of digital skills is $18.5 trillion, roughly 12% of global GDP. In the period from 2000-2021, in the USA, the data processing, Internet publishing, and information services industry grew fivefold, and the four information technology sectors contributed to GDP growth from 2% to 8%. Also, Information Technology companies in Asia and Europe are the fastest growing companies [30].

For the year 2021, Lightcast has summarized 4 major trends of changes in skills based on the research conducted in 2022, which refers to changes in work skills compared to the year 2016(Ercegovac, 2022):

1. The growth of digital skill levels is not only limited to the IT sector, but they are playing an increasing role in other industries. These skills include digital marketing, digital manufacturing skills, data analysis and networking.
2. Digital jobs require not only programming skills, but also a balance of skills such as time management, organization, leadership, verbal communication, positive thinking, listening, critical thinking and building effective relationships, as employee teams in companies are increasingly interactive and cooperative.
3. The use of data visualization has become much more important when it comes to all professions. Required skills are: D3.js, Canva, Adobe Analytics, MS Visio, Alteryx...
4. Careers are evolving according to the current state of media, where technology is widely available, more accessible and flexible all the time. Many jobs now require knowledge and skills in social media management. Examples of skills in demand are Adobe InDesign, YouTube...

The European Union has adopted a strategy for digital transformation called "Europe adapted to the digital age in 2020." This strategy offers a basis for strengthening the European Union's competitive advantage in the so-called "fourth industrial revolution", and from 2022 the latest regulation included in the

"Program of the Digital Decade until 2030" was adopted. This program directs the digital transformation of Europe with specific goals for 2030. .year:

1. Growth digitally qualified population and highly qualified professionals with goal achieving relatives equilibrium , where at least 80% of the population aged 16-74 owns least basic digital skills and employment at least 20 million ICT sector specialist ,

2. Safe , efficient and sustainable digital infrastructure , where will all of ultimate users to be covered gigabit network to the end points networks , and all populated areas covered wireless networks big ones speed the following generations with performance who is are least equivalent to 5G. Production the most modern of semiconductors in the EU, in accordance with EU law on sustainability vital environment amounts at least 20% of the value world production . At least 10,000 climatic neutral high safe marginal of nodes is distributed in the EU, so it guarantees access services data with delay from the everything a few milliseconds where whatever the company they find that by 2025 the European Union get to the first one computer with quantum acceleration , which would make her digital potential Could to be on the peak quantum possibilities until 2030.

3. Digital transformation companies , where at least 75% of EU companies took over services computing in the cloud, in accordance with his own business , big data or artificial intelligence . More than 90% of small and medium-sized EU companies reach at least basic level digital intensity . The EU makes it easier growth of their own innovative extensions and improves their own access finances , what brings at least until doubled number so-called unicorns.

4. Digitization public service , where are key public services 100% online available and where possible for citizens and businesses established online interaction with public administration , 100% of EU citizens have access his own electronic healthy cards , 100% of EU citizens have access means safe electronic identification which are recognized throughout the EU, which and M allows complete control over the transactions who is include their own identity I super personal data which share (Decision (EU) 2022/2481).

Government of the Republic Serbia follows EU Strategy , and in 2021 it adopted the " Strategy development informational society and information of security for the period from 2021-2026", with with the goal of continuing with further promotion digital knowledge and digital skill of all of citizens , then to rise to

capacity employees and in public and in private sector for use new ones technology , like and to improve digital infrastructure in education institutions ("Službeni glasnik RS", broj 86. od 3.septembra 2021.godine).

Social networks as an important part of digital skills and digital literacy

Social networks were created at the end of the 20th century for the purpose of establishing communication between people from different parts of the world. Although the original role of social networks was social, due to the explosive jump in popularity among users around the world, the industry also recognized the potential benefits of including social networks in the portfolio of its business, and the effects of this strategy were very quickly shown to be profitable. However, unlike the users of social networks, the industry recognized the potential benefits of this phenomenon somewhat later, which was particularly different in developed and developing countries.

According to the Global Web Index, social networks have completely changed the concept of marketing, and their popularity continues to grow, according to statistical data for the year 2023. In support of this, the data shows that social networks are used by 60% of the population worldwide, while the average time spent using social networks is 2 hours and 24 minutes per day. Which social networks are most popular among users depends on their age, as well as on the country in which they live. Due to people's living habits and the fact that social networks have become an integral part of the lives of more than 60% of the population, it was inevitable that the industry recognized the phenomenon of social networks as a source of income, directly or indirectly. Whether social media is used as the sole marketing tool or in combination with other tools, a social media presence in the 21st century is an indispensable factor. The very purpose of presence on social networks can be advertising, informing consumers, building and maintaining a brand and many others, but communication with consumers through social networks is the most valuable marketing tool of any company.

The importance of using social networks for commercial purposes is manifold. In addition to achieving fast and two-way communication with consumers, the promotion dreams of products and/or services, translating consumers from the state of buyer and consumer to the state of "promoter", when consumers recommend the product and/or service to reference groups (Rakić, Rakić, 2008). Because social networks are considered to be transmitters of information that customers evaluate as credible, Levy (2010) points out that organizations strive to create a positive image on that basis (Levy, 2010). Banković and Gijić (2010) indicate that another reason for the increasing commercial use of Internet social

networks is the constant exponential growth of the number of users of social networks, as well as their online activities (Banković, Gijić, 2010).

Kotler et al. (2017) also agree with this view and say that the market is becoming inclusive, and social networks reduce barriers in communication between businesses and consumers, whereby consumers transfer advice and recommendations from businesses and consumers and move from a state of awareness (I I know about the product), to action (I buy the product) to representation (I recommend the product) (Kotler, et al., 2017).

Among the ways to improve operations in domestic companies, and with the aim of maintaining a competitive advantage, Bešić et al. (2022), among other things, mention the application of modern achievements in the field of information and communication technologies (Bešić et al., 2022).

It is indisputable that the business of many industrial branches has moved to business through social networks, even many companies have moved exclusively to business through social networks. With the development of the ICT sector and digital transformation, the demand for human capital with digital skills is growing year by year. Social networks have enabled globalization, that is, the opportunity for companies to move from the local, national, regional or international market to the global market. This is supported by the growth of e-commerce, as well as the growth of the digital literacy of the population, especially older citizens, users of social networks, and the younger population that improves digital skills for employment purposes.

Gardašević (2021) points out that social networks have completely changed the way users use the Internet, which has led to necessary adaptations in the business of both large companies and small and medium-sized enterprises (Gardašević, 2020). In addition, Gardašević, Ćirić and Carić (2018) point out the importance of understanding the motives behind the use of social networks by consumers, so that companies can respond adequately and direct their marketing and business strategy towards achieving the ultimate goals (Obradović, 2022).

Conclusion

The information age or the age of knowledge is based on knowledge, that is, on human capital. Since the appearance of the first computers, the Internet and mobile phones, the way of doing business and the way of life have changed radically, so that today life without these devices and without the world's global network would be unimaginable in the civilized world.

With all the technological achievements and changes, which have long been happening not on a decade level, but on an annual and even quarterly level, the population of the world, as well as the industry, adapt to those increasingly frequent changes that speed up the business process and make it significantly

more efficient. On the other hand, these changes require new skills and knowledge in order to implement technological innovations in business in an adequate way.

Itself implies the mastering of digital skills, i.e. constant improvement and retraining of the workforce in the ICT sector. The importance of investing in digital transformation for the growth and development of companies and their competitiveness, and then also for the growth and development of the economy, has been recognized by companies and over time they allocate and place increasing amounts of capital in technological innovations and improvement of digital knowledge and skills of the workforce (Dašić, G. 2023).

The importance of investing in digital skills and knowledge has been recognized by leading economic powers, and developing countries are following them by adopting National Strategies related to the plan for developing digital performance and accelerating the digital transformation process.

Digital skills and knowledge mostly refer to the art of managing social networks, which have become an integral part of business, i.e. communication between companies and consumers, product promotion, as well as online trade, not only at the local and national level, but also at the regional and global level.

Literature

3. Ala-Mutka, K. (2011). *Mapping Digital Competence: Towards a Conceptual Understanding*. European Commission, Seville, Spain, DOI:10.13140/RG.2.2.18046.00322, Report number: JRC67075, pp. 18.
4. Atkinson, R. D., and Stewart, L. A. (2013). Just the Facts: The Economic Benefits of Information and Communications Technology. (I. T. Fundation, Edit.), pp.3-4.
5. Baltazarević, R. M. (2022), *Digitalna pismenost kao sredstvo prevencije protiv sajber kriminala,* Baština, Institut za srpsku kulturu Priština, Leposavić, br.57, DOI: https://doi.org/10.5937/bastina32-38103, str.131-139.
6. Banković, D., Gijić. N. (2010). *Application of WEB 2.0 Technology in Business*, In Application of New Techologies in Management/2nd International Conference ANTiM2010, Tara: Faculty for Education of the Executives of the University of business Academy, 2010, pp.390-395.
7. Bešić, C., Bešić Vukašinović, D.C., Bešić, S. (2022). Izazovi globalne ekonomije i unapređenje poslovanja domaćih cpreduzeća, Zbornik radova sa konferencija JUSK, Beograd, Srbija, str. 8-13.
8. Daub, M., Wiesinger, A. (2015). *Acquiring the Capabilities, You Need to Go Digital*. McKinsey Digital. Retrieved from http://www.mckinsey.com/insights/business_technology/acquiring_the_capabilities_you_need_to_go_digital, dostupno 23.01.2024.

9. Dašić, G. (2023). Digital transformation in the sports industry. In: Dašić, D (ed.) *SPORTICOPEDIA - SMB*, *1*(1), 309-318. https://doi.org/10.58984/smbic2301309d

10. Dašić, D. (2023) Application of delphi method in sports. *Sports, media and business*, *9*(1), 59-71. https://doi.org/10.58984/smb2301059d

11. Đorđević, D., Ćoćkalo, D., Bogetić, S., Bešić, C. (2022). *Analiza osnovnih apstekata poslovanja u novom tržišnom okruženju*, Zbornik radova sa konferencija JUSK, Beograd, Srbija, str. 36-44.

12. Đorđević, D., Ćoćkalo, D., Bešić, C., Bogetić, S., Bakator, M. (2022). *Značaj novih znanja i veština za postizanje održivosti u novoj paradigmi poslovanja*, Zbornik radova sa konferencija JUSK, Beograd, Srbija, str. 60-68.

13. Decision (EU) 2022/2481 of the European Parliament and of the Council of the 14 December 2022, establishing the Digital Decade Policy Programme 2030, Article 4: Digital targets, https://eur-lex.europa.eu/eli/dec/2022/2481/oj, dostupno 04.02.2024.

14. Gardašević, J. (2020). *Enterpreneurship and Facebook: Analyzing the Network usage on a daily and weekly basis among Serbian and American Respondents,* Journal of Enterpreneurship and Business Resilience, Faculty of Economics and Engineering Management, University Business Academy in Novi Sad, Vol 3, No 1, pp. 5-65.

15. Gardašević, J., Ćirić, M., Carić, M. (2018). *Razumevanje motiva koršćenja društvenih mreža u funkciji unapređenja komunikacije sa potrošačima,* Časopis Marketing, Srpsko udruženje za marketing SeMA, Ekonomski fakultet u Beogradu, vol. 49, br. 4, str. 311-320.

16. Ercegovac, I. (2022). Televizijski formati kao sadržaj koji generišu korisnici - Jutjub kao mas-medijski kanal influensera. *Društveni horizonti*, *2*(3), 59-73. https://doi.org/10.5937/drushor2203059E

17. https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts, dostupno 24.01.2024.

18. https://ec.europa.eu/eurostat/cache/metadata/en/isoc_sk_dskl_i21_esmsip2.htm, dostupno 30.01.2024.

19. https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21/default/table?lang=en, dostupno 24.01.2024.

20. https://surfshark.com/dql2023/methodology, dostupno 24.01.2024.

21. https://surfshark.com/dql2020, dostupno 24.01.2024.

22. https://surfshark.com/dql2021, dostupno 24.01.2024.

23. https://surfshark.com/dql2022, dostupno 24.01.2024.

24. https://surfshark.com/dql, dostupno 24.01.2024.

25. https://assets.aboutamazon.com/dd/e4/12d668964f58a1f83efb7ead4794/aws-gallup-global-digital-skills-study-report.pdf, dostupno 01.02.20234.

26. https://4906807.fs1.hubspotusercontent-na1.net/hubfs/4906807/Shifting%20Skills_Executive%20Summary%20(1).pdf, dostupno 01.02.2024.

27. https://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/ preuzeto 01.01.2024.

28. Jacobs, L. (2021), *Developing mobile digital skills in low and middle-income countries*, GSMA, pp.4, https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2021/11/Developing-mobile-digital-skills-in-low-and-middle-income-countries.pdf, dostupno 28.01.2024.

29. Jenkins, H. (2006). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*, Building the Field of Digital Media and Learning, The MacArthur Foundation, Chicago, Illinois, pp. 4.

30. Kotler, P., Kartajaya, H., Setiawan, I. (2017). *Marketing 4.0*, John Wiley and Sons Inc, Hoboken, New Jersey, https://www.drnishikantjha.com/booksCollection/Marketing%204.0_%20Moving%20from%20Traditional%20to%20Digital%20(%20PDFDrive%20).pdf, dostupno 02.02.2024.

31. Levy, J.R. (2010). *Facebook Marketing: Design your next Marketing Campaign*, 2nd ed., Indianapolis: Pearson education, pp.125.

32. Lopez 2013: Islas Lopez. "Digital literacy and academic success in online education for underprivi-leged communities : the prep@net case." Ph.D. Dissertation, University of Texas, Austin

33. Milenković, N., Radosavljević, M., & Vladisavljević, V. (2023). Korišćenje aplikacija sa otvorenom licencom u razvoju programa poslovnog preduzeća. *Održivi razvoj*, *5*(2), 35-49. https://doi.org/10.5937/OdrRaz2302035M

34. Milojević, I., Cvijanović, D., Ignjatijević, S. (2012). *Makroekonomski okvir konkurentnosti srpske privrede i ICT sektora*, Međunarodni naučno-stručni časopis za ekonomiju i politiku tranzicije „Tranzicija", Ekonomski institut Tuzla, JCEA Zagreb, IEP Beograda, feam Bukurest, Vol.14 No. 30, str. 93-98.

35. Obradović, D. (2022). Operacije uticaja na drušvenim mrežama kao hibridna pretnja. *Društveni horizonti*, *2*(4), 217-233. https://doi.org/10.5937/drushor2204217O

36. Olszewska, K. (2017). The Digital Economy in Central and Eastern European Countries (CEECS) – The Case of Poland, International Scientific Conference on Economics and Management EMAN, Ljubljana, Slovenija, str. 363-370.

37. Perović, A. & Đukić, S. (2023). Značaj komunikacije u sportu. *Menadžment u sportu*, 14(1), 103-118.

38. Rakić, B, Rakić. M. (2008) *Marketing i inovacije u funkciji ra-zvoja organizacija i privrede*, Međunarodni naučni skup razvojne strategije preduzeća i privrede, Beograd: Mega-trend univerzitet, pp. 255-259.

39. Strategija razvoja informacionog društva I informacione bezbednosti u Republici Srbiji za period od 2021. do 2026.godine, "Službeni glasnik RS", broj 86. od 3.septembra 2021.godine, https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2021/86/1/reg, dostupno 04.02.2024.

40. Tinmaz, H., Lee, YT., Fanea-Ivanovici, M., Baber, H. (2022). A systematic review on digital literacy. *Smart Learn. Environ.* **9**, 21 (2022). https://doi.org/10.1186/s40561-022-00204-y

41. Tomše, D., Snoj, B. (2016). *The impact of Information and Communications Technologies on Unemployment rate on OECD Countries*. Integrated Politics of Research and Innovations. International Scientific Conference, Limen, pp.605-610.

42. Tomše, D., Snoj, B. (2016). *The impact of Information and Communications Technologies on GDP per Capita*. Knowledge Based Suistanable Economic Development. International Scientific Conference, Eraz, pp. 119-120.

43. Tomše, D., Snoj, B. (2016). *The impact of Information and Communications Technologies on Innovations*. International Scientific Conference on Economics and Management EMAN, Ljubljana, Slovenija, str. 556-561.

44. Trifunović, D., Bogdanović Bulut I., Tankosić, M., Lalić, G. & Nestorović, M. (2023). Research in the use of social networks in business operations. *Akcionarstvo,* 29(1), 39-62

45. UNESCO (2018). "Global framework of reference on digital literacy skills for indicator 4.4.2: Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skill (Draft Report)." Paris: UNESCO. https://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf, dostupno 10.01.2024.

46. Vidas-Bubanja, M., Bubanja, I. (2016). *The High Quolity and Sustainability as Characteristics of Doing Business in Digital Connected World*, International Journal of Advanced Quolity, JUSK, UDC 658.5, ISSN 2217-8155, no 2, vol 44, pp. 7-12.

47. Vidas-Bubanja, M, Popovčić-Avrić, S. (2017). *Izazovi globalnog poslovanja kompanija u savremenom digitalnom okruženju*, International Scientific Conference on Economics and Management EMAN 2017, Ljubljana, Slovenija, str.544.

48. Van Deursen, A.J.A.M. & Van Dijk, J.A.G.M., (2011). Internet skills, and the digital divide. New media & society. DOI:10.1177/1461444810386774, pp. 893-911.
49. Van Deursen, A.J.A.M., Helsper, E.J., & Einon, R. (2014). *Measuring Digital skills: From Digital Skills to Tangible Outcomes project report,* University of Twente / London School of Economics / Oxford University, DOI:10.13140/2.1.2741.5044, pp. 9-10.
50. Van Deursen, A.J.A.M. & Van Dijk, J.A.G.M. (2014). The digital divide shifts to gaps of usage. New media & Society, 16(3), pp. 507-526.
51. Vukosavljević, D., Vukosavljević, D., Miletić, V. (2023). Analysis of multidimensional globalization index on the example of the Republic of Serbia and the surrounding countries. *Akcionarstvo*, 29(1), 9-38
52. Vuković, M., Urošević, S., Dašić, D. (2023) Threats to objectivity in the social science research. *Sports, media and business*, 9(2), 143-158. https://doi.org/10.58984/smb2302143v
53. Zupur, M., & Janjetović, M. (2023). Održivost marketinga lične prodaje na savremenom tržištu. *Održivi razvoj*, 5(2), 7-19. https://doi.org/10.5937/OdrRaz2302007Z