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MULTIDIMENSIONAL AND MULTIPERSPECTIVE APPROACH FOR MONITORING E-INCLUSION

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Varaždin, 2015.

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Research supervisors: Full Professor Vesna Dušak, PhD
a.o.Univ.Prof. Alexander Prosser, PhD

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MULTIDIMENZIONALAN I MULTIPERSPEKTIVAN PRISTUP PRAĆENJA E-UKLJUČENOSTI

DOKTORSKA DISERTACIJA

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”I was born at dawn today,

Spent my childhood in one morning,

With my adolescence starting around midday.

I am not frightened

That time is passing by so quickly.

I worry only about one single thought:

That perhaps tomorrow

I will be too old

To do the things I couldn't do before.“

Jorge Bucay

This doctor's thesis is dedicated to my beloved mother, Danica.

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ABSTRACT

Information and communication technologies (ICT) play an important role in the development of knowledge societies which, on the whole, constitute priority for governments worldwide. For a long time, measurement of unequal access to exploiting the potential of ICT used to be based on the digital divide concept. However, due to a strong relationship between ICT use and social inclusion/exclusion confirmed in current research, this concept has lately become inadequate. Such a complex issue also requires a much more complex approach, which explains why the concept of e-inclusion is more adequate. Insufficient operationalisation of the e-inclusion concept, which implies an insufficient number of identified indicators as well as the quantity of collected data, represents a major problem in the existing research on e-inclusion. A multiperspective, multimethodological and multidimensional approach is therefore proposed to overcome this problem.

Keywords: e-inclusion, multiperspective, multidimensional, multimethodological ICT

SAŽETAK

Globalizacija proizvodnje, ubrzani razvoj i transfer novih tehnologija, interakcija bez obzira na geografski položaj ili vremensku zonu putem ICT-a i Interneta, ubrzano i kontinuirano širenje digitalnog tržišta i mobilnih komunikacija potiču stvaranje novih i učinkovitijih modela organizacijskih i ostalih društvenih struktura. Navedeni primjeri jasno ukazuju da su informacijske i komunikacijske tehnologije (ICT) postale jedan od najvažnijih pokretača rasta i razvoja kao i napretka društva u cjelini. U današnje vrijeme velikih socijalnih i ekonomskih kriza Vlade zemalja moraju se značajno angažirati da bi se takve krize u što kraćem roku prevladale. Jedna od glavnih uloga Vlada svih nacionalnih ekonomija trebao bi biti stalni rad provedbe takvih strategija koje će korištenje ICT-a i Interneta u svim sferama kako gospodarskim tako i društvenim biti prioritetni zadatak.

Posljednjih godina uviđa se da Vladine i nevladine institucije nacionalnih ekonomija tako i Hrvatske poduzimaju značajne korake kako bi pružile mogućnost građanima da mogu iskoristiti mnogobrojne prednosti koje omogućuje korištenje ICT-a i Interneta. No uz sve napore koji se poduzimaju, istraživanja su pokazala da se svaka osoba ne može jednako okoristiti svim prednostima koje nudi ICT i Internet zbog ekonomskih, geografskih i ostalih ograničavajućih faktora. Stoga je za nositelje ekonomske politike u zemlji kao i one koji su zaduženi za kreiranje strategija u području ICT-a i Interneta, praćenje kretanja širenja i korištenja kao i identificiranje ciljanih skupina koje su obespravljene i prema kojima bi ciljevi tih strategija trebali biti definirani i provedeni, postalo od velike važnosti.

Samo istraživanje vezano uz izradu ovog doktorskog rada počelo je prikupljanjem relevantne literature vezane uz praćenje kretanja ICT-a i Interneta koristeći relevantne i dostupne baze podataka kao što su Emerald Insight, Science Direct, Springer Link, Google Scholar, Web of Science. Detaljnim pregledom i analizom dostupnih znanstvenih i stručnih istraživanja utvrdilo se da su ranije faze praćenje ekspanzije ICT-a i Interneta bile usredotočene isključivo na utvrđivanje tzv. *digitalnog jaza* odnosno jaza između onih skupina ljudi koji imaju pristup

najsuvremenijoj informacijskoj i komunikacijskoj tehnologiji i onih koji to nemaju, što je detaljnije opisano u poglavlju 9.1. doktorskog rada. Daljnja istraživanja bila su usmjerena prema utvrđivanju spremnosti privatnih poslovnih organizacija kao i vladinih i nevladinih institucija u implementaciji ICT-a i Interneta kreiranjem niza indikatora i modela iz čega je proizašao pojam *e-spremnosti*. Zbog sve veće kompleksnosti ovakvi koncepti, tzv. *binarni modeli digitalnog jaza* i *e-spremnosti,* koji proučavaju ovaj fenomen samo sa dva aspekta ne ignoriraju samo ostale modele nego i ignoriraju sve ostale razlike koje postoje, a nisu utvrđene. Također s obzirom da su kroz vrijeme brojna istraživanja potvrdila veliku povezanost između korištenja ICT-a i Interneta i socijalne uključenosti/isključenosti (više o tome opisano je u poglavlju 11.2.) takav kompleksni fenomen zahtijeva i višeaspektni pristup stoga se daljnjim istraživanjem prikladnijim pokazao pojam e-uključenosti.

E-uključenost prema Europskoj komisiji odnosi se na uključivo informacijsko društvo, odnosno *informacijsko društvo za sve*. Europska savjetodavna skupina navodi da e-uključenost u suštini predstavlja socijalno uključivanje pojedinaca u informacijsko društvo iz čega slijedi da razina pristupa kao i korištenja ICT-a predstavlja važan preduvjet za jačanje individualne sposobnosti pojedinaca za sudjelovanje u najrazličitijim sferama društvenih i poslovnih područja. Europska komisija u zadnjih desetak godina pridavala je veliku važnost razvoja i provedbi strategija e-uključivanja za sve članice Europske unije što je i Hrvatska postala od 01.07.2013., dokaz je tome niz deklaracija i strategija vezanih uz ovaj proces na razini Europske Unije koje su detaljnije opisane u poglavlju 11.1. doktorskoga rada. Sve više informacija koje su bitne za život svakog pojedinca u današnje vrijeme dostupne su u digitalnom obliku preko ICT-a i Interneta, stoga se postavlja pitanje što je s pojedincima koji zbog bilo kojeg razloga nemaju pristupa ICT-u i Internetu. Ukoliko je takvih pojedinaca velika većina, stvara se tzv. *informatizirana država*, ali ne i informacijsko društvo. Stoga se došlo do zaključka da bi bilo od velike koristi istražiti kakvo je trenutno stanje e-uključenosti po županijama/regijama u Republici Hrvatskoj s obzirom da takvo istraživanje još nije provedeno. Nužnost provedbe ovakvog istraživanja ogledala se i iz činjenice da Hrvatska nema izrađenu nacionalnu strategiju e-uključenosti te da je 2010. godine uz Makedoniju, Lihtenštajn i Island bila jedna od članica pristupnica koja nije predala izvještaj o e-uključenosti.

Proučavanjem relevantne i dostupne literature iz područja e-uključenosti uočilo se niz nedostataka, najvažniji od njih su: nedovoljna operacionalizacija ovog pojma iz čega proizlazi problem nedovoljnog broja identificiranih pokazatelja kao i prikupljenih podataka, dok postojeći razvijeni modeli i konceptualni okviri ne obuhvaćaju sve aspekte e-uključenosti većina njih kao i kod prethodno spomenutih modela digitalnog jaza i e-spremnosti, usredotočuju se isključivo na mjerenje pristupa i korištenja ICT-a što je nedovoljno za praćenje tako kompleksnog fenomena. Rezultat toga je da se kretanja i promjene kao i učinkovitost provedenih politika vezanih uz ovaj fenomen koji je u stalnom razvoju mogu samo djelomično objasniti i pratiti. Kako bi se otklonio ovaj nedostatak došlo se na ideju da se izradi multiperspektivan, multimetodološki i višedimenzonalni pristup u praćenju e-uključenosti razvojem općeg generalnog modela e-uključenosti koji će sadržavati sve relevantne kategorije, atribute i indikatore koji će omogućiti prikupljanje podataka sa svrhom utvrđivanja trenutnog stanja.

Multiperspektivni pristup omogućuje prikupljanje podataka koji se odnose na faktore koji utječu na e-uključenost (ekonomski, demografski, socijalni i kulturni), multimetodološki pristup koji zahtjeva korištenje niza kvalitativnih i kvantitativnih tehnika i alata doprinjeo bi kreiranju banke podataka koja bi također odražavala sve eventualne promjene i mogućnost izrade nužnih analiza za praćenje postojećeg stanja kao i identificiranje potencijalnih ciljanih skupina. Definiranje višedimenzionalnog modela e-uključenosti pruža korisne podatke kreatorima nacionalne strategije i politike vezane uz e-uključenost te daje točnu procjenu kretanja razvoja informacijskog društva. U nastojanju da se kreira mjerni instrument uz pomoć kojeg će se prikupiti svi relevantni podaci krenulo se u identifikaciju ponajprije relevantnih kategorija, zatim atributa, a onda i indikatora i čestica vezanih uz pojam e-uključenosti.

Kao najvažnije kategorije koje se vežu uz pojam e-uključenosti ubrajaju se *pristup ICT-u i Interneta*, *korištenje ICT-a i Interneta* te *utjecaj na kvalitetu života* i *osnaživanje*. Identificirani atributi koji čine komponentu p*ristupa* su: *materijalni pristup i mreža*, *priuštivost* i *mjesto pristupa*. Kategorija *korištenja* obuhvaća atribute: *intenzitet korištenja*, *vještine*, *motivaciju i stavove*, *društvena potpora/prisila* i *digitalni angažman*. Atributi *e-obrazovanje*, *e-zdravstvo*, *e-uprava*, *digitalna ekonomija* (e-posao e-trgovina, e-bankarstvo), e-kultura i komunikacija i *e-zabava* sačinjavaju kategoriju *utjecaja ICT-a i Interneta na kvalitetu života*. Za posljednju kategoriju identificirani su sljedeći koncepti: *e-demokracija* i *e-participacija* i *socijalno računalstvo* koje uključuje *kreiranje korisničkih sadržaja* i *umrežavanje*. Definiranje svih relevantnih kategorija i atributa omogućilo je identificiranje svih relevantnih indikatora i čestica za što su baza bila prethodna istraživanja, a s obzirom da se za neke kategorije, posebice kategoriju osnaživanja nisu nalazili indikatori autorica je samostalno i uz preporuku mentora kreirala indikatore praćenja. Nakon detaljne konceptualizacije pojma e-uključenosti moguće je bilo kreirati inicijalni teoretski konceptualni opći model e-uključenosti. Definiranjem modela uspostavljene su veze između glavnih kategorija i atributa i time izrađen strukturni i mjerni dio modela koji je prikazan u poglavlju 12.2. slika 9.

Kategorija *pristupa* definirana je kao formativna latentna varijabla, dok su sve ostale kategorije (*korištenje*, *utjecaj ICT-a na kvalitetu života* i *osnaživanje*) definirane kao reflektivne latentne varijable. Pretpostavljene veze između latentnih varijabli u generalnom konceptualnom modelu e-uključenosti su da je latentna varijabla *pristup* nužan preduvjet koji pozitivno utječe na latentnu varijablu *korištenje,* zatim da latentna varijabla *korištenje* je nužan preduvjet i pozitivno utječe na latentne varijable *osnaživanje* i *utjecaj ICT-a i Interneta na kvalitetu života*. Između ostalog u sklopu validacije ovako postavljenog teoretsko-konceptualnog sklopa željelo se ispitati postoji li veza između latentne varijable *osnaživanje* i latentne varijable *utjecaja ICT-a i Interneta na kvalitetu života*, stoga je pretpostavljena pozitivna veza od latentne varijable *osnaživanja* prema latentnoj varijabli *utjecaja ICT-a i Interneta na kvalitetu života*. Nakon teoretske identifikacije svih glavnih kategorija i atributa e-uključenosti i definiranja inicijalnog teoretskog konceptualnog modela dana je definicija e-uključenosti za potrebe ovog istraživanja. *E-uključenost možemo definirati kao uključivanje pojedinaca/grupa/zajednica u informacijsko društvo na način da svatko ima jednake mogućnosti pristupa i korištenja ICT-a i Interneta u svrhu poboljšanja kvalitete života i aktivne participacije u kreiranju novih društvenih i tehnoloških sustava.*

Za potrebe validacije definiranog teoretskog konceptualnog modela e-uključenosti i potvrđivanja definiranih postavljenih veza između latentnih varijabli u daljnjem koraku kreiran je mjerni instrument (upitnik). Inicijalno kreirani mjerni instrument sastojao se od dva dijela. Prvi dio sadržavao je indikatore vezane uz demografske, ekonomske, socijalne i kulturološke varijable za koje se nakon pregleda relevantne dostupne literature utvrdilo da utječu na e-uključenost i sadržavao je 19 pitanja. Drugi dio upitnika sastojao se od indikatora i čestica koje predstavljaju manifestne varijable koje su razvrstane prema identificiranim kategorijama i atributima koji će poslužiti za praćenje e-uključenosti i u svojoj inicijalnoj verziji sadržavao je 184 pitanja. Mjerni je instrument sadržavao pitanja zatvorenog tipa s ponuđenim odgovorima nabrajanja i ponuđenim odgovorima intenziteta i za svako pitanje postojao je uvjet odabira samo jednog od ponuđenih odgovora. Inicijalna verzija mjernog instrumenta zatim je bila sadržajno validirana od strane pomno biranih eksperata iz područja e-uključenosti. U sadržajnoj validaciji sudjelovalo je ukupno 12 eksperata. Prema svim preporukama eksperata izvršilo se kvalitativno poboljšanje indikatora i čestica u smislu izmjene u rečeničnim konstrukcijama, gramatike, spajanja jednog ili više indikatora u jedan, razdvajanje određenih indikatora itd., ukupno je preformulirano trideset i dvije manifestne varijable.

Kvantitativnom analizom sadržajne valjanosti uz pomoć dva empirijska indikatora, pokazatelja sadržajne valjanosti (CVR) i prosječne vrijednosti relativne važnosti, broj indikatora smanjen je na 117, dok je broj atributa smanjen za jedan. Atribut priuštivost kao i indikatore vezane uz njega eksperti nisu smatrali utjecajnima i važnima za opis i mjerenje latentne kategorije pristupa. Sadržajna valjanost bila je preduvjet za kreiranje mjernog instrumenta za pilot istraživanje. Pilot istraživanje provedeno je na prigodnom uzorku ispitanika dobnih skupina 18 i više (prijatelji, rodbina, članovi obitelji, studenti, radni kolege). Prikupljanje podataka u pilot istraživanju trajalo je od sredine šestog do sredine devetog mjeseca 2014. godine. Za potrebe pilot istraživanja kreiran je online-upitnik koji je putem društvenih mreža, elektroničke pošte i sustava e-učenja Fakulteta organizacije i informatike Varaždin odaslan ispitanicima. Svi ispitanici su bili uljudno zamoljeni da ispune upitnik, ali i da prema vlastitoj zainteresiranosti isti dalje proslijede drugim potencijalnim ispitanicima dobnih skupina 18 i više. U pilot istraživanju sudjelovalo je ukupno 331 ispitanik no od ukupnog broja samo je 197 ispitanika upitnik ispunilo u potpunosti i bez greške, stoga se taj broj upitnika uzeo u obzir kod daljnje obrade podataka.

Kako bi se dodatno reducirao broj manifestnih varijabli, identificirale i izuzele one varijable koje su bile redundantne i kako bi se inicijalno empirijski odredile latentne varijable prve i druge razine korištena je multivarijatna metoda faktorske analize. Nakon provođenja faktorske analize broj manifestnih varijabli reduciran je za 26. Prije konačne izrade mjernog instrumenta (upitnika) i provođenja glavnog dijela istraživanja mjerena je pouzdanost mjernog instrumenta na temelju interne konzistentnosti Cronbach-ovim α koeficijentom, za svaku inicijalno identificiranu latentnu kategoriju druge razine. Svi Cronbach α koeficijenti bili su zadovoljavajući (Cronbach α >0,70) što osigurava pouzdanost mjernog instrumenta, odnosno da se primjenom istog mjernog instrumenta u ponovljenim mjerenjima mogu očekivati isti odnosno slični mjerni pokazatelji.

Provedba glavnog dijela istraživanja izvršena je na reprezentativnom uzorku punoljetnih građana Hrvatske u Međimurskoj i Varaždinskoj županiji u prosincu 2014. i u siječnju 2015. godine. Za kreiranje uzorka angažiran je Državni statistički zavod Republike Hrvatske istraživanje je financirano sredstvima potpore Sveučilišta u Zagrebu pod vodstvom doc.dr.sc. Renate Mekovec i suradnika prof.dr.sc. Gorana Bubaša i a.o.Univ.Prof. Dr. Alexander Prossera. U anketiranju je bilo angažirano 11 osposobljenih anketarki i anketara. U istraživanju je dobrovoljno sudjelovalo 427 ispitanika.

Nakon prikupljanja i unosa i dodatne provjere unesenih podataka krenulo se sa analizom podataka. Prvotno sa deskriptivnom analizom podataka, zatim analizom signifikantnih razlika između podgrupa ispitanika po identificiranim demografskim, socijalnim, ekonomskim i kulturnim varijablama uz pomoć metode analize varijance (ANOVA) i post hoc komparacijskih analiza. Analiza je završila validacijom mjernog i strukturnog modela i testiranjem postavljenih hipoteza uz pomoć metode strukturalnog modeliranja na temelju parcijalnih najmanjih kvadrata čime je potvrđena prva hipoteza. Kod validacije mjernog dijela modela validacija je provedena posebno za formativno definirani konstrukt *pristupa* i posebno za reflektivno definirane konstrukte *korištenja, utjecaja ICT-a i Interneta na kvalitetu života* i *osnaživanja*. Nakon što se potvrdila konvergentna valjanost, ispitala kolinearnost između indikatora i signifikantnost veza formativnog konstrukta *pristupa*, te potvrdila kompozitna pouzdanost, pouzdanost indikatora, konvergentna i diskriminantna valjanost reflektivnih konstrukata krenulo se u validaciju strukturnog dijela modela. Validacijom strukturnog dijela modela potvrđena je signifikantnost svih postavljenih veza u modelu, pozitivna veza između kategorije *pristupa* i kategorije *korištenja*, pri tome se utvrdilo da latentna kategorija *pristupa* objašnjava 80,09% varijance latentne kategorije *korištenja*. Potvrđena je pozitivna veza između latentne kategorije *korištenja* i *osnaživanja* te da kategorija *korištenja* objašnjava 55,20% varijance kategorije *osnaživanja*. Također je potvrđena pozitivna veza latentne kategorije *korištenja* kao i latentne kategorije *osnaživanja* sa latentnom kategorijom *utjecaja ICT-a i Interneta na kvalitetu života* sa objašnjenom varijancom od 78,70%. Dokazivanjem postojanja pozitivne povezanosti između latentne kategorije *osnaživanja* i latentne kategorije *utjecaja ICT-a i Interneta na kvalitetu života* kako metodom strukturalnog modeliranja na temelju parcijalnih najmanjih kvadrata tako i dodatno provedenom korelacijskom analizom rezultiralo je potvrdom treće postavljene hipoteze.

Nakon empirijske validacije mjernog i strukturnog dijela modela i potvrđivanja značajnosti svih teoretski pretpostavljenih veza između glavnih kategorija i atributa u modelu, konačni model e-uključenosti sastoji se od 4 latentne varijable na drugoj razini (kategorije), 20 latentnih varijabli na prvoj razini (atributi) te 84 manifestne varijable koje direktno mjere latentne varijable prve razine (atribute). Identificirane latentne varijable prve razine multidimenzionalnog modela e-uključenosti (kategorije) su: *pristup, korištenje, osnaživanje* i *utjecaj ICT-a i Interneta na kvalitetu života*. Latentna varijabla druge razine *pristup* mjerena je latentnim varijablama prve razine: *materijalnim pristupom i mrežom, zadovoljstvo sa mrežom* i *mjestom pristupa*. Latentna varijabla druge razine *korištenje* mjerena je atributima: *intenzitet korištenja, vještinama, motivacija/stavovi, društvena potpora/prisila* te *digitalnim angažmanom*. Latentna varijabla *utjecaj ICT-a i Interneta na kvalitetu života* mjerna je

atributima *e-obrazovanje, e-zapošljavanje, digitalna ekonomija, e-zdravstvo-učestalost, e-zdravstvo-percepcija, e-uprava* i *e-kultura*. Konačno latentna varijabla *osnaživanja* mjerena je latentnim varijablama prve razine *e-demokracija, e-participacija* i *kreiranje korisničkih sadržaja* i *umrežavanje*.

Iz analize rezultata glavnog dijela istraživanja moguće je bilo izvesti temeljne zaključke i odgovoriti na istraživačka pitanja postavljena na početku ovog rada vezana uz pristup i korištenje ICT-a i Interneta, utjecaja ICT-a i Interneta na kvalitetu života kao i uloga ICT-a i Interneta u osnaživanju pojedinaca/grupa/zajednica te identificirati ciljane skupine kojima bi se trebala posvetiti posebna pozornost kod kreiranja daljnjih strategija vezani uz razvoj informacijskog društva.

Rezultati vezani uz kategoriju *pristupa* ukazuju na zadovoljavajuću strukturu pristupa ICT-a i Internetske mreže. Tako se 50% ispitanika izjasnilo da kod kuće posjeduje stolno računalo, 51,29% posjeduje prijenosno računalo, a najviše od njih čak 353 od ukupnog broja (N=427) posjeduje neke od mobilnih uređaja s mogućnošću pristupa Internetu. Fiksnu Internetsku mrežu kod kuće ima 70,02% ispitanika, a mobilnu najčešće koristi njih 179 odnosno 41,92%. No bez obzira što im je omogućen pristup samo nešto više od 30% ispitanika se izjasnilo da te uređaje koristi kako bi pristupali digitalnim sadržajima, dok se od ukupnog broja ispitanika (N=427) njih više od 55,00%, da te uređaje uopće ne koristi ili koristi vrlo rijetko za pristup digitalnim sadržajima. Percepcija zadovoljstva kvalitetom Internetske mreže kao i dostupnošću internetske mreže ispitanika pokazala se kao osrednja s obzirom da se manje od 50,00% ispitanika izjasnilo da je zadovoljno. Učestalost pristupa prema mjestu pristupa ukazuje na dominantnost pristupa od kuće, svega nešto više od 25,00% ispitanika *često* odnosno *vrlo često* pristupa ICT-u i Internetu na radnom mjestu dok je najmanji pristup iz javnih institucija u kojima je pristup besplatan. Značajne razlike između podgrupa ispitanika unutar kategorije *pristup* identificirane su prema *demografskim varijablama* prema *godinama, strukturi kućanstva* te *bračnom statusu*. Jedino prema varijabli *spola* u kategoriji *pristup* empirijski nije potvrđena značajna razlika. Prema ekonomskim faktorima za kategoriju *pristupa* empirijski su potvrđene značajne razlike prema *zaposlenosti, razini dohotka* i *imovinskog stanja obitelji*. Prema kulturnim pokazateljima značajna razlika u kategoriji *pristupa* empirijski je potvrđena prema *članstvu u religioznim organizacijama* i *znanju engleskog jezika*. Kod *kulturnih varijabli* u kategoriji *pristup* nije potvrđena signifikantna razlika prema *članstvu u političkim organizacijama* i *članstvu u jednoj/više neprofitnih organizacija*. Prema *socijalnim faktorima* za kategoriju *pristup,* signifikantna je razlika empirijski dokazana kod *razine obrazovanja* i *invaliditeta,* dok se *mjesto stanovanja* (ruralno, urbano) nije pokazalo kao signifikantno. Kako bi povećale pristup ICT-u i Internetu od kuće mnoge europske zemlje poput Poljske, Rumunjske, Belgije, Slovačke, Portugala, Velika Britanija, Grčka, Italija, Njemačka nudile su posebne pogodnosti kupnje za kućanstva niskog imovinskog statusa, ljude sa invaliditetom, umirovljenike, studente (vidi prilog 3).

U kategoriji *korištenja* prema *učestalosti korištenja* analiza podataka pokazuje da je najveća učestalost korištenja od kuće dok je kao i kod kategorije *pristupa* najmanja u javnim institucijama gdje je pristup i korištenje besplatan. Razlog je tome što u Hrvatskoj kako u urbanim tako i u ruralnim područjima takva mjesta u javnim institucijama ne postoje. Za razliku

od drugih Europskih zemalja kao što su Španjolska, Latvija, Belgija, Cipar, Bugarska, Mađarska, Poljska, Litva, Portugal, Njemačka, Austrija.. otvoreno je u urbanim kao i ruralnim područjima niz javnih mjesta gdje je građanima omogućen besplatan pristup ICT-u I Internetu (vidi prilog 3). Po pitanju *vještina* prema vlastitoj procijeni ispitanika uočena je slaba razina poznavanja rada na računalu što je povezano i sa jednako tako slabim *digitalnim angažmanom* odnosno učestalošću korištenja ICT-a i Interneta za različite kako poslovne tako i privatne aktivnosti. Dok je iznenađujući podatak da se više od 25% ispitanika njih 108 od ukupnog broja (N=427) izjasnilo da nema potrebne vještine za korištenje ICT-a i Interneta. Razlog tome leži u obrazovnom sustavu u Republici Hrvatskoj gdje još uvijek primjerice u osnovnim školama predmet Informatika ne spada pod obavezne već izborne predmete, kao i izostanak besplatnih tečajeva koji bi omogućili svim građanima koji to žele da steknu vještine korištenja ICT-a i Interneta. Primjeri drugih zemalja Europska Unije također pokazuju suprotno, tako su se u zemljama kao što su Estonija, Irska, Litva, Austrija, Češka, Poljska, Latvija, Italija… (vidi prilog… str…) organizirali besplatni tečajevi za usvajanje digitalnih vještina u koje su bile uključene različite ciljane skupine. Percepcija ispitanika vezana uz korisnost ICT-a i Interneta pokazala se kao pozitivna s obzirom da se sa tom tvrdnjom složilo više od 75,00% ispitanika. Po pitanju potpore i pomoći u korištenju ICT-a i Interneta najviše se ispitanika izjasnilo da ima potporu od članova obitelji i rodbine. U kategoriji *korištenja* vezano uz *demografske faktore* koji su identificirani kao značajni za e-uključenost empirijski su potvrđene signifikantne razlike prema *spolu, bračnom statusu, dobnoj strukturi* te *strukturi kućanstva*. Vezano uz ekonomske pokazatelje u kategoriji *korištenja* empirijski su potvrđene razlike prema faktorima: *zaposlenosti, razini dohotka* i *imovinskog stanja obitelji*. U kategoriji *korištenja* vezano uz kulturne faktore koji utječu na e-uključenost samo varijabla *poznavanje engleskog jezika u govoru i pismu* pokazala se signifikantnom, dok kod varijabli *pripadnosti ispitanika pojedinim političkim, religioznim ili neprofitnim organizacijama* nisu se pokazale značajnima. Za socijalni faktor *mjesto stanovanja* u kategoriji *korištenja* kao i kod prethodne kategorije *pristupa* nije potvrđena signifikantna razlika između urbanih i ruralnih područja, ali je dokazana kod varijabli vezanih uz *razinu obrazovanja* i varijablu *invaliditeta*.

Za kategoriju *utjecaja ICT-a i Interneta na kvalitetu života* identificirani su atributi vezani uz korištenje e-usluga. Iz analize rezultata vezanih uz atribut *e-učenje, e-posao, e-zdravstvo* i *e-kultura* uočava se da ispitanici koji su sudjelovali u istraživanju u vrlo maloj mjeri koriste ICT i Internet za navedene svrhe to možemo povezati s nedostatkom vještina koje su nužne za korištenje ICT-a i Interneta. Za atribut *digitalne ekonomije* u koju je uvrštena *e-trgovina, e-bankarstvo, e-komunikacija* i *e-zabava* ICT i Internet najveću učestalost korištenja ispitanici su izrazili za tvrdnju koja se odnosi na traženje informacija o željenim proizvodima i uslugama. Iz rezultata po pitanju kupnje proizvoda i usluga putem Internet trgovine vidljivo je da ispitanici to ne preferiraju obzirom da se 78,00% ispitanika izjasnilo da to *uopće ne radi* odnosno radi *rijetko*, rezultati istraživanja se gotovo u potpunosti slažu sa podacima EUROST-a za 2014. godinu koji su prikazani u osmom poglavlju ovog rada. Po pitanju korištenja e-bankarstva može se uočiti neznatna razlika u odnosu na podatke iz EUROSTAT baze gdje se 19% ispitanika za 2014 godinu izjasnilo da koristi internet bankarstvo dok se u ovom istraživanju 4,45% izjasnilo da koristi *vrlo rijetko,* 5,85% koristi *rijetko,* 16,63% *često* i 14,32% *vrlo često,* a da *uopće ne koristi* izjasnilo se 58,78% od ukupnog broja ispitanika. U zabavne svrhe uočava se osrednja

učestalost korištenja (slušanje/preuzimanje glazbe *često* ili *vrlo često* ICT i Internet koristi 34,66% ispitanika, za gledanje/preuzimanje filmova 28,57%, dok za i slušanje radijskih postaja kao i gledanje televizijskih emisija manje od 15,00% od ukupnog broja ispitanika). Komunikacija putem ICT-a i Internet-a također nije izražena kod većine ispitanika, to potvrđuju i rezultati analize tako primjerice, komunikaciju putem e-maila *uopće ne koristi* odnosno *koristi vrlo rijetko* 54,10% ispitanika dok socijalne mreže (npr. Facebook, Twitter…), njih čak 60,66%. Najmanje od svih ponuđenih aktivnosti ICT i Internet ispitanici koriste za kupnju odnosno rezervaciju ulaznica za primjerice koncerte ili predstave jer se samo 7,50% se izjasnilo da to radi *često* ili *vrlo često*. Što se tiče percepcije o korisnosti e-zdravstva rezultati ukazuju da po svim ponuđenim tvrdnjama gotovo više od 50,00% ispitanika nema niti pozitivno niti negativno mišljenje, odnosno nema stav, a to se može objasniti zbog prethodno spomenute slabe učestalosti korištenja. Ispitivanje stavova vezanih uz atribut *e-uprave* o potrebama za kreiranjem novih e-usluga od strane vladinih institucija pokazalo se kod većine ispitanika pozitivnim, iz čega se može zaključiti da su ispitanici uglavnom zainteresirani za kreiranje novih vladinih e-usluga što je prema informacijama objavljenim na centralnom e-portalu dugoročni plan odjela za e-Hrvatsku koje djeluje u sklopu Ministarstva uprave. U kategoriji *utjecaj ICT-a i Interneta na kvalitetu života* značajne razlike prema *demografskim pokazateljima* uočene su prema *dobnoj strukturi*, *strukturi kućanstva* te *bračnom status*, dok za varijablu *spola* u ovoj kategoriji kao i u kategoriji *pristupa* empirijski nije potvrđena značajna razlika. Prema *ekonomskim faktorima* za kategoriju *utjecaj ICT-a i Interneta na kvalitetu života* empirijski su potvrđene značajne razlike prema *zaposlenosti* kao i za *razinu dohotka* dok za varijablu *imovinsko stanje obitelji* empirijski nije potvrđena signifikantna razlika. Prema *kulturnim pokazateljima* značajna razlika u kategoriji *utjecaj ICT-a i Interneta na kvalitetu života* empirijski je potvrđena prema *poznavanju engleskog jezika u govoru i pismu* (vidi prilog 2). Kod *kulturnih faktora* nije potvrđena signifikantna razlika prema varijablama koja se odnose na *članstva u pojedinim političkim, religioznim ili neprofitnim organizacijama*. Prema *socijalnim faktorima* za kategoriju *utjecaj ICT-a i Interneta na kvalitetu života* za koje su kao značajni identificirani: razina obrazovanja, invaliditet te mjesto stanovanja, signifikantna je razlika empirijski dokazana kod *razine obrazovanja i invaliditeta* (vidi prilog 2) Dok se varijabla *mjesto stanovanja* (urbano, ruralno) za ovu kategoriju nije pokazala signifikantnom.

U kategoriji *osnaživanje* atributom *e-participacije* pokušala se ispitati frekvencija korištenja ICT-a i Interneta u svrhu aktivnog uključivanja građana u različite procese javnog i političkog djelovanja, komunikacije građana sa javnim vlastima, te aktivno uključivanje građana u procese donošenja odluka. Rezultati dobiveni istraživanjem ukazuju na veoma nisku razinu korištenja ICT-a i Interneta u prethodno navedene svrhe što je sukladno i sa rezultatima indeksa e-participacije prema kojem je Hrvatska u periodu od 2012 do 2014 sa 53 pozicije pala na 97 između 193 zemlje[11]. Rezultati provedenog istraživanja vezani uz atribut *e-demokracije* koji je strukturiran od čestica koje mjere preferencije ispitanika u praćenju aktivnosti vlade i participacije u procesima donošenja odluka kao i dostupnost relevantnih dokumenata i informacija putem ICT-a i Interneta, pokazuju da građani po određenim tvrdnjama ne izražavaju ni pozitivan ni negativan stav dok po drugima imaju uglavnom pozitivan stav u vezi

[1] http://unpan3.un.org/egovkb/en-us/Data/Country-Information/id/42-Croatia

korištenja ICT-a I Interneta u takve svrhe. To se može objasniti i činjenicom da određene e-usluge u Hrvatskoj nisu još ni zaživjele, kao što je primjerice mogućnost glasovanja na izborima i referendumima elektroničkim putem. Primjerice tvrdnju da bi svako zasjedanje sabora odnosno javnih vlasti trebalo biti popraćeno videokonferencijom podržava manje od 50,00% ispitanika, dok 37,23% o tome nema stav. Zainteresiranost više od 55,00% ispitanika ogleda se u komunikaciji lokalnih vlasti sa građanima putem Internet stranica i socijalnih mreža. Iz rezultata vezanih uz tvrdnje koje se odnose na dostupnost informacija u digitalnom obliku na Internet stranicama vidljiv je jasno pozitivan stav ispitanika. Da pronalazi sve dokumente i informacije vezane uz donošenje zakona i regulativa *slaže se* više od 70,00% ispitanika kao i vezano uz tvrdnju „*Mišljenja sam da bi prilikom izbora za predsjednika/parlament/ tijela lokalne i regionalne razine popis kandidata trebao biti dostupan na internet stranicama s kontakt informacijama svakog kandidata.*“ Ispitanici su također zainteresirani i za dobivanje informacija o različitim društvenim organizacijama i njihovim inicijativama putem ICT-a I Interneta, s obzirom da se 69,31% od ukupnog broja ispitanika izjasnilo da se *slaže* odnosno *u potpunosti se slaže* sa tvrdnjom da dobiva na taj način sve željene informacije. Vezano uz atribute *umrežavanja* i *kreiranja korisničkih sadržaja* rezultati pokazuju da bez obzira na rastući trend korištenja društvenih mreža, foruma, portala u svijetu, u Hrvatskoj rezultati pokazuju suprotno, više od 60,00% od ukupnog broja ispitanika izjasnilo da nije kreiralo i da ne uređuje svoj profil na društvenim mrežama, prijenos svojih digitalno kreiranih sadržaja *često* odnosno *vrlo često* radi samo 12,18% ispitanika, dok se više od 65,00% izjasnilo da to uopće ne radi. Korištenje foruma kao i portala za komunikaciju i traženje i dijeljenje informacija također nije zastupljeno kod velikog broja ispitanika s obzirom da se na obje tvrdnje više od 75,00% ispitanika izjasnilo da to ne koristi odnosno koristi rijetko. Po pitanju kreiranja blogova, web stranica za sebe ili za druge rezultati pokazuju gotovo da takve aktivnosti ispitanici gotovo da i ne poduzimaju jer se od ukupnog broja ispitanika samo 2,35% izjasnilo da *često* odnosno *vrlo često* kreira i uređuje vlastiti online blog odnosno časopis, da je kreiralo i uređuje svoju Internet stranicu *često* odnosno *vrlo često* izjasnilo se svega 4,45%, odnosno da to radi i za prijatelje, rodbinu njih 3,74%.

U kategoriji *osnaživanja* značajne razlike prema *demografskim pokazateljima* uočene su prema *strukturi kućanstva*, *dobnoj strukturi*, prema *spolu*, te *bračnom statusu*. Prema ekonomskim faktorima za kategoriju *osnaživanja* empirijski su potvrđene značajne razlike prema varijablama *zaposlenost, razina dohotka* kao i za varijablu *imovinsko stanje obitelji*. Prema *kulturnim pokazateljima* značajna razlika u kategoriji *osnaživanja* empirijski je potvrđena prema varijablama *poznavanje engleskog jezika u govoru i pismu, članstva u religioznim organizacijama* kao i kod varijable *članstva u jednoj/više neprofitnih organizacija*, dok za varijablu *članstva u političkim organizacijama* nije potvrđena signifikantna razlika. Prema socijalnim faktorima za kategoriju *osnaživanja* za koje su kao značajni identificirane varijable: *razina obrazovanja, invaliditet te mjesto stanovanja*, signifikantna je razlika empirijski dokazana kod svih navedenih varijabli. Iz sažetog opisa rezultata analize glavnog dijela istraživanja uočene su značajne razlike u komponentama e-uključenosti između podgrupa ispitanika prema *demografskim, socijalnim, ekonomskim i kulturnim varijablama* empirijski dokazane čime je i empirijski potvrđena druga hipoteza. Shodno tome može se zaključiti da rezultati provedenih analiza potvrđuju važnost identificiranih demografskih, ekonomskih,

kulturnih i socijalnih faktora na prihvaćanje i korištenje kao i percepciju i stavove vezane uz ICT i Internet, korištenje e-usluga i aktivne participacije pojedinaca/grupa/zajednica u svim aspektima informacijskog društva. Kao ciljane skupine na koje bi se trebalo staviti naglasak u strategijama vezanim uz e-uključenost prema empirijski dokazanim značajnim razlikama identificirane su za demografske faktore dobne skupine ispitanika (građana) iznad 55 godina starosti, prema *strukturi kućanstva* kao ciljane skupine identificirana su *jednočlana kućanstva* kao i *kućanstva bez uzdržavane djece*, dok prema *bračnom statusu* posebice se izdvaja skupina ispitanika koja se izjasnila kao *udovice/udovci*. Prema *ekonomskim faktorima* za varijablu *zaposlenost* skupine ispitanika (građana) koji su se izjasnili kao *umirovljenici*. Prema razini dohotka oni građani koji su se izjasnili da im je u *posljednje tri godine dohodak ostao isti odnosno da se smanjio*, te za varijablu *imovinsko stanje obitelji* one skupine koje su se izjasnile da im je *imovinsko stanje lošije od većine*. Prema *kulturnim pokazateljima* po svim komponentama uočena je značajna razlika između ispitanika prema varijabli *znanje engleskog jezika u govoru i pismu*, ciljane skupine su one osobe koje *ne poznaju odnosno vrlo slabo poznaju engleski jezik u govoru i pismu*. Prema *socijalnim faktorima* ciljanje skupine su *osobe sa invaliditetom* dok za varijablu *razina obrazovanja* su skupine građana *bez potpuno završene osnovne škole*, one sa *osnovnom školom* kao i *završenom srednjom školom u trajanju od tri godine*.

Provedeno istraživanje može biti od velike pomoći kreatorima strategije vezane uz e-uključenost jer prikazuje rezultate vezane uz široki spektar kategorija i atributa vezanih uz e-uključenost kao i kritične faktore koji imaju veliki utjecaj na aktivnu participaciju individua/grupa/zajednica u svim segmentima informacijskog društva. Preporuke koje bi se mogle izvesti iz analize podataka dobivenih provođenjem glavnog dijela istraživanja ogledaju se kao prvo u kreiranju a zatim i provedbi strategije e-uključenosti prema svim smjernicama koje je kroz niz strategija predlagala Europska komisija (strategije Europske komisije vezane uz e-uključenost detaljnije su opisane u poglavlju 11.1.). Jedan od glavnih ciljeva strategije trebao bi biti uspostavljanje kako u urbanim tako ponajprije u ruralnim i teško dostupnim područjima slobodnog i besplatnog pristupa ICT i Internetu za sve građane po uzoru na mnoge zemlje članice Europske unije (vidi prilog 3). Da bi se povećala razina vještina korištenja ICT-a i Interneta građana preporuka je organiziranja i provođenja besplatnih radionica za građane. Kako bi se pojednostavile administrativne procedure u vezi javnih usluga preporuka je da se za gotovo sve javne usluge koje se pružaju od strane javnih vlasti kreiraju kao jednostavne i lako primjenjive elektroničke usluge prilagođene i za osobe sa posebnim potrebama na jednom centralnom portalu i za to dostupna javna mjesta gdje oni korisnici koji iz bilo kojeg razloga nemaju pristup ICT-u i Internetu ili znanja korištenja mogu uz stručnu pomoć obaviti sve aktivnosti vezane uz primjerice pribavljanje osobnih dokumenata, prijave i plaćanja poreza, registracije trgovačkih društava ili obrta, registracije vozila itd. besplatno. Uz to potrebna je potpora i motivacija građana za korištenje elektronički usluga putem promocije kroz tradicionalne vrste medija kao što su novine, javna televizija, plakati. Da bi se povećala razina pristupa i korištenja ICT-a i Interneta kod kuće po uzoru na druge zemlje Europske unije potrebna je aktivna participacija na nacionalnoj razini ili lokalnim razina u troškovima pribavljanja za one skupine koje su najugroženije kao što su umirovljenici, osobe sa invaliditetom, kućanstva sa niskim dohodovnim primanjima, nezaposleni, studenti, učenici

osnovnih i srednjih škola. Promovirati sve prednosti koje nudi ICT i Internet kao i rastuće digitalno tržište u smislu zaposlenja, veće zarade kao i povoljnije i jednostavnije dostupnosti i kupnje proizvoda na globalnom svjetskom tržištu. Podupirati i motivirati građane na veću društvenu interakciju umrežavanjem preko najrazličitijih društvenih, poslovnih, istraživačkih mreža. Omogućiti građanima i poticati ih na aktivno participiranje u što većem broju procesa donošenja odluka kako na nacionalnim razinama tako i lokalnim razinama vlasti uz pomoć ICT-a i Interneta. Omogućiti građanima da imaju pristup svim informacijama vezanim uz donošenje zakona, regulativa… u digitalnom obliku kako bi se povećala transparentnost rada kako nacionalnih tako i lokalnih razina vlasti. Sudjelovati u poticanju pojedinaca/grupa/zajednica u kreiranju novih znanja, stjecanju novih znanja i vještina te dijeljenju znanja kroz besplatne pristupe formalnog i neformalnog učenja preko dostupnih online tečajeva. Promovirati sve prednosti i poticati korištenje sustava e-zdravstva u svrhu prvenstveno prevencije bolesti odnosno lakše i jednostavnije dostupnosti usluge zdravstva za sve oboljele. Poticati kao i omogućiti pribavljanje tzv. „asistivnih tehnologija“ za oboljele osobe odnosno osobe sa invaliditetom u svrhu poboljšanja kvalitete njihovih života. Važno je napomenuti da je kreirani model primjenjiv za istraživanje i u drugim zemljama posebice članicama Europske unije jer se identifikacija glavnih kategorija, atributa kao i indikatora temeljila uglavnom na relevantnoj literaturi objavljenoj od strane Europske komisije. I kao zaključno potrebno je istaknuti da se prilikom odabira teme doktorske disertacije razmišljalo o pitanju da li kao znanstvenik i istraživač u području društvenih znanosti treba biti „neutralan promatrač“ s glavnim fokusom samo opisa i objašnjavanja kompleksne stvarnosti i stati na tome ili odabrati temu i provesti istraživanje koje će ispitati postojeće stvarne probleme dati adekvatne preporuke i tako pomoći onima koji su u mogućnosti i koji nose odgovornost za njihovo rješavanje.

Postoji nekoliko ograničenja provedenog i opisanog istraživanja u ovoj doktorskoj disertaciji na koje treba obratiti pozornost. Prvo ograničenje veže se uz uzorak ispitanika glavnog dijela istraživanja koji se sastoji isključivo od ispitanika iz dvije veoma slične županije u sjeverozapadnom dijelu Republike Hrvatske (Međimurska i Varaždinska) te da u uzorku nisu obuhvaćena teško dostupna područja koja nemaju istu razinu infrastrukture koja omogućuje pristup Internetu. Stoga se u daljnjim istraživanjima postojećim validiranim mjernim instrumentom namjerava provesti istraživanje na većem uzorku ispitanika na način da se obuhvati što veći i raznovrsniji broj područja u Hrvatskoj kao i po mogućnosti nekim drugim zemljama članicama Europske unije. Dobna skupina ispitanika bili su punoljetni građani što isključuje ispitanike mlađe generacije tzv „digitalne urođenike“ tako da po pitanju e-uključenosti mlađih generacija ne mogu se donositi nikakvi zaključci. Najvažniji je razlog zbog kojeg se nije uključilo u istraživanje ispitanike mlađe od 18 godina što su određene tvrdnje na koje se tražilo mišljenje ispitanika povezane s aktivnostima koje maloljetne osobe po zakonu ne smiju obavljati, primjerice tvrdnje vezane uz e-bankarstvo ili e-upravu.

Namjera budućeg istraživanja je postojeći model prilagoditi i mlađim dobnim skupinama ispitanika primjerice od osnovnoškolske dobi kao i onima srednjoškolske dobi kako bi se ispitala e-uključenost navedene populacije i identificirali ključni faktori prihvaćanja i korištenja ICT-a i Interneta te moguće prepreke koje mogu utjecati da pojedinci tih dobnih skupina ne postaju dijelom informacijskog društva. Kao ograničenje istraživanja između ostalog

navedenog treba naglasiti da se identificirane latentne kategorije prve i druge razine kao i potvrđene veze između latentnih kategorija korištenjem neparametrijske metode strukturalnog modeliranja (PLS-SEM) moraju uzeti s oprezom pri generalizaciji nalaza i vrednovanju doprinosa kako konceptualnih tako i empirijskih barem dok se ne potvrde provjerama u novim istraživanjima koja se namjeravaju provesti na većem uzroku ispitanika uključujući ne samo ispitanike iz Hrvatske već i iz drugih zemalja. To se posebice odnosi na identificirane latentne kategorije kao i one veze koje još uvijek nemaju jasnu i teorijski utemeljenu podlogu. Razlog je tome što predloženi konceptualni model nema čvrsti teorijski sustav već je konstruiran uz pomoć brojnih teorija, koncepata i empirijski provjerenih postavki do kojih se došlo detaljnim pregledom i analizom relevantnih istraživanja, studija i strategija vezenih uz pojam e-uključenosti kao i većeg broja drugih predloženih i empirijskih potvrđenih modela vezanih uz pojmove *digitalnog jaza* i *e-spremnosti*.

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1. INTRODUCTION

Nowadays, both governmental institutions and non-governmental organizations are taking considerable steps to ensure all citizens have an opportunity to fully exploit the advantages of using ICT. Nevertheless, research consistently shows that, in spite of all the efforts that are being made, individuals are not able to equally benefit from ICT owing to economic, geographic and other constraints. The problem related to ICT expansion also is in the differences in economic and technological achievements between countries (Van Ark et al., 2003, Timmer, Van Ark, 2005). Such complex problems emphasize the need for joint international approach to monitoring their development. Notwithstanding growing literature on expansion and acceptance, qualitative and quantitative understanding and monitoring ICT is still exceptionally low and without coordination. Due to this facts, it is necessary to define the ways of data and information gathering on an adequate manner and identifying indicators for developing instruments of national politics and strategies of ICT sector. Hereby, quantitative as well as of qualitative data and models are indispensable for following the changes in ICT's expansion in regions and countries. If the government does not establish specific process immediately, there is not possibility to establish the model for future development and the way how the set of goals will be achieved. Therefore, defining corresponding parameters and establishing the present state of ICT's expansion with help of collecting data and adequate statistic analysis is necessary for all creators of economic policies and strategies, as well as for private business subjects.

In the early stages of ICT's expansion the research was focused solely on establishing the so-called *digital divide* defined as divide between those with access to the latest information technology and those without it. Such so-called binary model studies this phenomenon from only two aspects, those with and those without access, what does not ignore solely the remaining models ignoring all other existing but not confirmed differences between these two groups of people. Therefore, the classification suggested according to Wilhelm differentiates these two groups in relation to proximity to/distance from the information society, based on the sequence of variables including the social-economic status, technological capacity, ownership of specific skills and talents, attitudes and perceptions of the sole term of information society for these two groups (Wilhelm, 2000). A similar perspective can be noted in research by Van Dijk which defines digital divide as a social and political problem and generally as the problem of inequality of distribution of goods, and not as a technological problem. In the same manner, he emphasizes the importance of indicators such as motivation, skills and talents, will to use, the literacy level, deficiency of interest, literacy deficiency, difficulties concerning access etc.

(Van Dijk, 2005). It can be concluded that original division when determining *digital divide* to those with and those without access, loses its sense concerning the complex form of classification made according to a sequence of other variables which are identified and connected to ICT's utilization and expansion and one should introduce a new term with a combination of not only technological but also social factors of the so-called *e-inclusion*.

Insufficient operationalization of the e-inclusion concept, which implies an insufficient number of identified indicators as well as the quantity of collected data, represents a major problem in the existing research on e-inclusion. As a result, the tendencies and changes as well as the efficiency of implemented policies concerning this fast-evolving phenomenon can only be partially monitored and accounted for. Dynamic changes in the development and expansion of ICT and its application call for modification of monitoring models in order to adapt them to newly arisen developments. On the basis of detailed literature research in the field of e-inclusion it can be concluded that the existing models and conceptual frameworks do not encompass all the aspects of e-inclusion. Most of them are focused exclusively on measuring access to ICT and its use, which is not sufficient when monitoring of such a complex phenomenon is concerned. Furthermore, the concept of e-inclusion also includes the empowerment component. In context of e-inclusion, empowerment can be defined as a target and as a process. Empowerment as a target for an individual means to have control over the determinants of one's quality of life and empowerment as a process means development a professional relation where the client or community takes control over the change process. Extending the e-inclusion model by adding new components, identifying indicators and establishing correlations between variables would therefore provide clearer insight into the development current state of this phenomenon.

2. SUBJECT OF RESEARCH

Information and communication technologies (ICT) play an important role in the development of knowledge society which, on the whole, constitutes a priority for governments worldwide. Both governmental institutions and non-governmental organizations are taking considerable steps to ensure all citizens have an opportunity to fully exploit the advantages of using ICT. For a long time, measurement of unequal access to exploiting the potential of ICT used to be based on the *digital divide* concept. However, due to a strong relationship between ICT use and social inclusion/exclusion confirmed in current research, this concept has lately become inadequate. Namely, using concept focused solely on the technological component, it is not possible to sufficiently encompass and monitor all the aspects and issues related to ICT development and expansion. Such a complex issue also requires a much more complex approach, which explains why the concept of e-inclusion is more adequate.

The underlying key objective of numerous strategies concerning e-inclusion was to enable each interested individual full participation in all the aspects of information society. Everyone should have equal opportunity to use the state-of-the-art technologies in their everyday activities and be able to enjoy all its advantages that are reflected in higher income and better employment, among others. One of the objectives in the forthcoming strategies and current strategies is for individuals/groups to become not only users, but also innovators that would create new technological and social systems, which should eventually contribute to continuous and sustainable development and growth (Hatlevik and Christophersen, 2013; European Commission, 2006; Kubitschke et. al., 2006).

Insufficient operationalization of the e-inclusion concept, which implies an insufficient number of identified indicators as well as the quantity of collected data, represents a major problem in the existing research on e-inclusion. As a result, the tendencies and changes as well as the efficiency of implemented policies concerning this fast-evolving phenomenon can only be partially monitored and accounted for. A multi-perspective, multi-methodological and multi-dimensional approach is therefore proposed to overcome this problem. A multi-perspective approach enables the collection of data on individuals and communities (local, cultural, ethnic, professional, interest-based, etc.), taking into account that the same individual can belong to several communities and that community membership is an important component of individuals' participation in the e-inclusion process. It is necessary to identify indicators that

would show the individual as pertaining to population as well as a member of a certain target group such as women, low-income groups, low-level education, unemployed and ethnic minorities, among others.

The data should also represent geographical differences, wherein distinction should be made between regional areas, urban and rural areas, easily accessible or hard-to-access areas, isolated areas beyond the access of broadband and advanced mobile and satellite networks. Such an approach to structuring data should be recognizable in the general e-inclusion model to enable for the state of e-inclusion to be determined and the process of e-inclusion to be monitored. The adoption of a multi-methodological approach in monitoring the e-inclusion phenomenon should be complemented by qualitative and quantitative techniques and tools, enabling the creation of a data bank that would also reflect all the changes that may occur with regards to the e-inclusion phenomenon. Special attention would be given to analyzing the use of ICT in individuals/users' everyday lives, which would entail the observation of relevant socio-technological phenomena in the present and future phase of ICT expansion. Defining a multi-dimensional model of e-inclusion may provide useful data to those in charge of creating the national strategy and policy concerning the e-inclusion process, while making it possible to accurately estimate the impact of ICT on the development of information society and knowledge society. The motivation for research arises from the aforementioned premises.

3. MOTIVATION FOR RESEARCH AND RESEARCH PROBLEM

Dynamic changes in the ICT development and expansion and its application call for modification of monitoring models in order to adapt them to newly arisen developments. On the basis of detailed literature research in the field of e-inclusion, it can be concluded that the existing models and conceptual frameworks do not encompass all the aspects of e-inclusion. Most of them are focused exclusively on measuring access to ICT and its use, which is not sufficient when monitoring of such a complex phenomenon is concerned. Furthermore, the concept of e-inclusion also includes the empowerment component, which is particularly prominent at present owing to a strong relationship between e-inclusion/exclusion and social inclusion/exclusion established in vast body of research (Meyer, Muller, Kubitscheke, 2006; Mancinelli, 2008; Hatlevik, Christophersen, 2013; Digital Inclusion Initiative; Castells, 2001.; Selwyn, Facer; Isaila, 2012; Wolske, et. al., 2010; Kidd, Lee, Rosenberg; Salinas,Sa´nchez, 2009; Pricewaterhouse and Coopers, 2009.). Extending the e-inclusion model by adding new components, identifying indicators and establishing correlations between variables would therefore provide clearer insight into the current state of development of this phenomenon. Over the last decade, the European Commission has been promoting the importance of implementing the e-inclusion process among all EU member countries (with Croatia accessing the European Union on July 1, 2013), evidenced in a number of declarations and strategies concerning the e-inclusion process (Commision of the European Communities, 1999; European Parliament, 2000; Commision of the European Communities, 2002; Commision of the European Communities, 2006; Commision of the European Communities, 2005a; Commision of the European Communities, 2005b; Commision of the European Communities2007; European Commission, 2010).

The Government of Croatia, as well as a lot of private business organizations, have invested a great effort and a considerable portion of their funds in creating and providing e-services to citizens. However, the issue of the services using level on the part of individuals that they are intended for still needs to be addressed. An increasing amount of information that is essential for the life of every individual is published exclusively via web pages, which brings to attention individuals who for whichever reason do not have access to ICT and the Internet. Numerous studies have shown that, to a certain extent, such individuals are currently also affected with social exclusion. In cases in which such individuals constitute a majority, the concept of informatised state is more applicable, to be distinguished from information society. The digital

divide in Croatia has recently been reduced by enforcement of fiscalisation, but the question of its impact on increasing e-inclusion remains open. Another unresolved issue with regards to persons who, due to fiscalisation as a legal obligation, had to start using ICT and the Internet, is whether they will start using ICT and the Internet in their everyday life and whether they are willing to exploit all the benefits and opportunities provided by such technologies. It would therefore be worthwhile to explore the current state of the e-inclusion process by regions/counties of the Croatia, taking into account that to date no similar research has been conducted. The necessity of performing such research is also reflected in the fact that in 2010 Croatia was among accession countries that failed to submit their report on e-inclusion, along with Macedonia, Lichtenstein and Iceland [http://www.epractice.eu/en/factsheets/.].

4. RESEARCH OBJECTIVES AND RESEARCH QUESTIONS

Based on the research problem the following research objectives have been defined:

- Developing a conceptual model for monitoring the e-inclusion;
- Establishing differences in components of e-Inclusion between subgroups of participants defined by demographic, social, economic and cultural variables;
- Exploring relationship between two main components of the conceptual model impact of ICT and the Internet on the quality of life and empowerment.

In accordance with the aforementioned research objectives the following research questions have been formulated:

- What is the level of access to ICT and the Internet in Croatia?
- What is the level of the use of ICT and the Internet in Croatia?
- What is the extent of the use of ICT and Internet supported services that have an impact on the extension, the range of quality of life and are provided by governmental and business organizations in Croatia?
- What is the extent of the use of ICT and the Internet for individual empowerment in Croatia?
- Are there any difference in components of e-inclusion between subgroups of participants defined by demographic, social, economic and cultural factors?
- Is there any relationship between two main components of the e-inclusion model impact on the quality of life and empowerment?
- What are the potential disadvantages of the implementation the e-inclusion policies and strategies and what guidelines for overcoming these disadvantages can be identified?

Drawing on the aforementioned research objectives and research questions, it will be attempted to define guidelines for the improvement of e-inclusion policies and strategies. The stated research objectives will be achieved through the research stages specified in the following section.

5. HYPOTHESES OF RESEARCH

Hypotheses emerging from the defined research objectives:

H_1 Developed general empirical model of e-inclusion well reproduces real relationships between observed variables values, based on sample items obtained using a valid measuring instrument.

H_2 There is a difference in components of e-inclusion between subgroups of participants defined by demographic, social, economic and cultural variables.

H_3 There is a relationship between components of e-inclusion model *empowerment* and *impact of ICT and the Internet on quality of life*.

6. THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN GROWTH AND DEVELOPMENT

Information and communication technology (ICT) has become the most important driver of continued growth and development of each economy. ICT can, among other things, play a significant role in globalization of production, as well as in transfer of technologies, enabling constant interaction, regardless of geographical position or time zone via the Internet, mobile communications, digital television and e-commerce, and they stimulate creation of new and more efficient models of organizational structures in the global economy. ICT enables breakthrough to world global market in a very short period of time not only to big corporations, but to small companies as well. The latest research associated with ICT indicates that the dynamics of ICT has indeed become one of the major driving forces for productivity, competitiveness, collaboration, and superposition of resources on both national and international level (Menou andTaylor, 2006; Popova, Popov, and Dalin, 2005). The influence of ICT on productivity, economic growth and total development can be observed through the aspect of investment and utilization of ICT, which contributes to total increase in capital by the employee, higher efficiency, rapid technological progress in production of ICT goods and services and faster growth and development of the sole ICT productive sector (Azari and Pick, 2005; Nashab, 2009; Van Dijk, 2005). The significance of goods of industrial production is decreasing in the leading industrial countries and, instead of it, the importance of production, data and information processing is rapidly increasing. Generally speaking, one can presume that, due to transition from industrial to information society on macroeconomical level, the production and consumption of ICT goods and services is significantly increasing which finally positively influences the growth and development of economy (Ceccobelli et. al., 2012; Khuong, 2011). This was recognized by the United States of America which intends to invest 7.2 billion dollars in the expansion of ICT, as declared in the American Recovery and Reinvestment Act of 2009. Europe has taken a similar path which is reflected in the goals of Digital Agenda: by the year 2020 at least 50% of Europe's population should have Internet access which will be significantly stimulate by the projects. Many studies have confirmed that ICT can also be classified as the so-called technologies for general purposes, as ICT is a generic technology because its use expands all productive economic and social systems (Basu and Fernald, 2006). The main significance of each technology named *general purpose technology* is that its use leads to fundamental changes in productive processes, while other characteristics

are, fast expansion, technological dynamics and innovative complementarity, which means that productivity in many sectors is increased precisely due to constant progress of ICT technology. The advancement of technologies for general purposes directly reflects on the entire economy in the sense of increased productivity (Guerrieri, at. al., 2007). With regard to these characteristics, ICT is classified in the group of *general purpose technology*, since computers today and all their accompanying equipment are used in nearly all economic and social sectors (Bresnahan and Tratjenberg 1995). The contribution of ICT as a general purpose technology was also confirmed by Jalava and Pohjola (2008) whose study shows that the ICT contribution to Finland's GDP between 1990 and 2004 was three times greater than the contribution of electricity from 1920 to 1938. ICT appears to have an even greater impact on the economy considering that supports many service sectors. This is particularly evident at the present time when new forms of services are gaining importance, such as e-banking, e-commerce, e-learning, e-health, and others services (EC, 2006, Selwyn and Facer, 2007). Starting from the mid 1990s, majority of researchers have found a positive correlation between ICT investment and economic performance at each level of aggregation which includes firm, industry, and country (Wan et al., 2007; Bloom, Sadun, Van Reenen, 2007; Jorgenson, Ho, Stiroh, 2008; Oliner, Sichel, 2000, 2002; Kretschmer, 2012). In the last decade, ICT investment has contributed between 0.6 and 0.2 percentage points to GDP annual growth in OECD countries (OECD, 2014, p. 128). Moreover, studies on macro-level conducted by van Ark as well as other researchers clearly demonstrate productivity gap which has grown between Europe and the U.S due to a less effective and widespread adoption of ICT by European companies (Timmer, Van Ark, 2005; van Ark, 2002; van Ark et al., 2003, 2008; Daveri, 2002, 2004; Gordon, 2004; Inklaar et al., 2005, 2007, 2008). On the other side, micro-economic perspective confirmed that ICT, together with the redesign of business processes, significantly improves the performance of a company (Bresnahan, Brynjolfsson and Hitt, 2002; Brynjolfsson and Hitt, 2003; Crespi et al., 2007; Doms et al. 2004; Hempell, 2005; Maliranta and Rouvinen, 2004; Miyagawa, Kim, 2007). On the level of production systems, ICT contributes directly to the innovation production in several ways. Kleis et al. (2010) have identified three major levels of innovation process, for which the application of ICT has great importance. The first is the level of generation of ideas for new products and this level can benefit from ICT supported systems such as Customer Relationship Management (CRM). CRM allows a company to analyze customers communication and transaction data and identify their wishes and needs that can result in the creation of new personalized products or significant modifications of the current products. Computer-aided manufacturing and computer-aided design technology enables the

development of efficient design capabilities for new products by assisting the digitization a new product's design, making it available throughout the whole innovation process. ICT helps in the integration of design and production systems, so that errors are reduced to a minimum and, and as a result, the efficiency of this last stage of the innovation process is enlarged. Furthermore, ICT can also directly drive ICT-based innovations in firms' processes, products and services, and even business models which were not operationally and economically feasible before utilising ICT (Tapscot et al., 2000; Bresnahan et al., 2002; Brynjolfsson, Saunders, 2010). ICT sector itself is prone to innovation: according to OECD data about 70% of the firms in ICT sector introduce innovations, about 54% of innovative firms in ICT manufacturing engaged in collaboration with other organizations, and about a quarter of ICT-related patents also belonged to one or more other technological fields such as medicine, biotechnology, pharmaceutics, transportation, logistics etc. (OECD, 2014, p. 108, 120). Investments in knowledge and skills of workforce, especially their use of new technology (ICT and Internet), are the key factor to improving labour quality and quantity and cause increasing economic efficiency in the labour market and also make positive effects not only in developed countries but especially in developing countries (Tas, 2011; Gholami, at. al., 2010). An empirical research conducted by Indjikian and Siegel (2005) proves that investment in ICT and the Internet is a wise manner because generate high social returns in countries that invest in these technologies, because this kind of product are becoming more affordable to businesses and households. Looking from the aspect of developing countries, there exists a critical opportunity for striving to improve their global competitiveness and enhance economic growth through ICT-related investment. Investments in new ICT and Internet technologies enable them to improve their export competitiveness through participation in local, regional, and global e-marketplaces. In terms of e-Inclusion domain, the positive link between digital skills and labour market outcomes is for the moment the main area where systematic, empirical evidence is available. Studies also confirm that ICT-skilled workers are more employable and have higher incomes, while lack of these skills could be a reason for excluding workers form labour market, particularly the elderly (Acemoglu, 2002; DiNardo, Pischke, 1997; Entorf et al., 1999; Faggio et al., 2007; Freeman, 2002; Friedberg, 2003; Krueger, 1993). Codagone's (2009) finding confirms that in the age group 50-65, having ICT skills increases employability by 20% compared to not having them. Economic research shows that there is a 3% to 10% wage premium for jobs involving ICT skills, which is a measure of the increased productivity that such skills entail. According to Epodoi (2003), implementation of ICT in education, public administration, health care, financial and private sector increases the potential of production, delivery, consumption and

availability of various goods and services at much lower prices which ultimately results in an increase in people's living standards as well as in transformation of economic systems. As a result, it can be concluded that ICT, as well as Internet access, and the knowledge necessary to use such technology can be seen as the most cost-effective and can contribute to greatest extent for sustainable development and prosperity. On the other hand, Goslee (1998) warns that this may not be applicable to every individual because all individuals do not have the same opportunities of access to the most modern technology and the Internet due to financial or other constraints. That cause that many individual cannot find a better and more satisfying job, acquire the necessary skills and fully participate in business and public spheres. Therefore, strategies that contribute to the inclusion of each individual in the information society are necessary for maintenance continued growth and development of each national economy.

7. THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN PEOPLE'S DAILY LIVES

The growing influence of information and communication technologies (ICT) in daily lives of people is more and more transforming economic and social activities. Commerce, healthcare, political participation, entertainment, everyday culture and education are increasingly shifting to digital forms of delivery. The latest report from the International Telecommunication Union states that the world witnessed continued growth in the uptake of ICT and, by the end 2014 almost 3 billion people were using the Internet, up for 2.7 billion at end 2013 (ITU, 2014). According to OECD report for 2014, more than 60% of Internet users in the OECD area use laptop computers and almost as many use desktops. Likewise, 37% of users now connect to the Internet via smartphones, 13% via tablets and around 10% via game consoles or smart TVs (OECD, 2014, p. 60). The same report shows that during 2012 and 2013, on average almost 90% of Internet users are sending emails, about 80% are using the Internet to obtain information on goods and products, 60% are participated in social networks and 70% are reading online news, while less than 30% are sending filled forms to public administrations. The share of Internet users ordering products online was 57%, whereas only 22% sold products over the Internet. The use of online banking varied significantly among OECD countries: from 90% in Estonia, Finland and Norway to less than 20% in Chile and Greece (Ibidem, p. 78). A number of studies have explored the impact that ICT can have on the daily life of individuals, and have directly linked ICT use with improved quality of life. Scotland is a good example of a country which has implemented a number of initiatives and projects with aim to improving the quality of life of the citizens through digital technology (Malina, Macintosh, 2003). UK also sets an example by undertaking a variety of initiatives to explore how ICT can improve the lives of the socially marginalised and strengthen disadvantaged communities (Digital Inclusion Team, 2007; Harris, Dudley, 2000; Harris, 2000). Another positive example is the largest community technology project in the world conducted in Ireland which refers to the study of the impact of a virtual community to enhancement of social cohesion (McQuillan, 2000, 2001). According to a survey conducted by the UN (2005), countries where the majority of the population has the potential of achieving real access to ICT and the Internet have higher opportunities for economic prosperity, social empowerment and improvement ,than countries where the majority of the population has no income, access and skills for ICT and Internet usage (UN, 2005). With the emergence of ICT and Internet tools such as blogs, voice-over Internet protocols and wireless communication devices, people are able to communicate, distribute and access

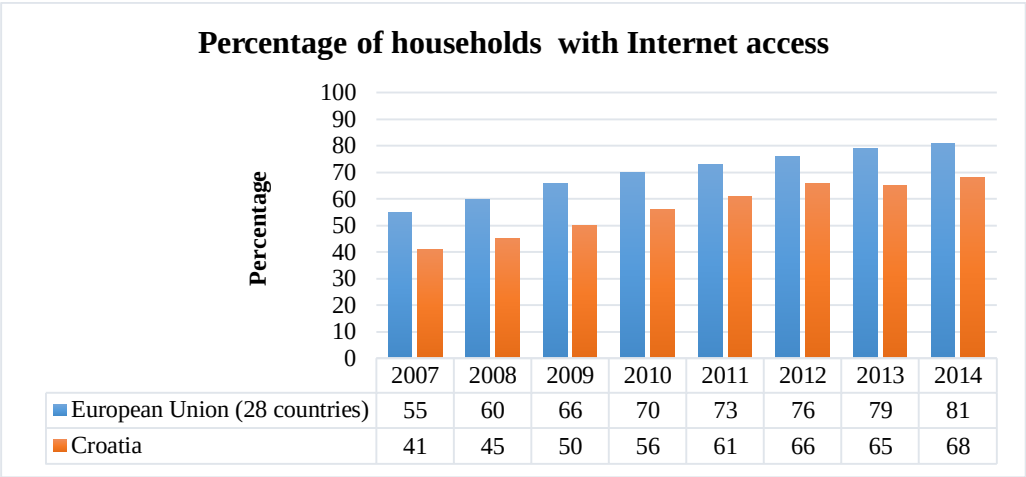
information more easily, faster and cheaper. People use email to connect with families and friends abroad, hospitalized patients read emails from friends and family to lift their spirits and encourage their recovery. Social benefits of ICT and Internet usage include increasing the feeling of belonging of socially excluded people as they develop skills in communication and handling information through ICT. Observing from the aspect of social networking, ICT and the Internet help individuals not only to find new people with whom to build relationships but also provide the tools with which many individuals maintain and strengthen their relationships through various online social networks. For those people who live in rural or places difficult to reach, the Internet offers opportunities to engage in social interactions more easily and effectively. The pervasiveness of ICT and the Internet has created a world of instant communication that has eliminated barriers to relationships such as distance. Technologies such as instant messaging, e-mail, blogs and social networks have enabled a new era of long-distance relationships and help in maintaining strong relationships for families and friends by enabling people stay connected. ICT and the Internet are also becoming an essential element of children's lives. Results of OECD Programme for International Student Assessment from 2012 show that in OECD countries less than 0.5% of 15 year-olds reported that never had accessed the Internet, and that 90% of students first access the internet before the age of 13. The study also says that, on average, fifteen year-olds spend about three hours a day online (OECD, 2014, p. 82). The positive side of ICT and the Internet is that they offer children great educational opportunities, as well as being a source of entertainment and social networking (Hasebrink, 2008, p. 25). However, like any other technology, ICT and the Internet have their negative sides, especially for young users who may give out personal information, come across inappropriate or aggressive commercial content as well as experience harmful interactions with other children or adults because of the anonymity that the Internet offers to a large extent. Based on EU Kids Online survey of 9-16 year olds and their parents in 25 countries, Hasebrink (2008) and Livingstone et al. (2011) have concluded that the percentage of children who report experiencing one or more online risks increases with the daily use of the Internet. In the same study empirical findings suggest that techniques mediating the Internet for children, such as parental control, parental supervision, conversation, rules setting and restrictive mediation indirectly through decreasing child's activities online, might be efficient in reducing child's online risks (Hasebrink, 2008, p. 59). In terms of access to public information via ICT and the Internet include improved access to relevant information and public services from any location and at any time. ICT and the Internet allow better interaction with government for people with poor transportation abilities, health problems or physical mobility problems. They also open up

potential opportunities for increased political participation as well as participation in decision-making processes. Usage of ICT and the Internet for the labour force includes building skills that can open up new and better employment possibilities, higher income, and better working conditions. Other opportunities that arise from it are distance working (telework) and homeworking. Whereas, digitally skilled people have increased chances of self-employment and be successful in starting a new form of online business. From the educational aspect ICT and the Internet can be used for different purposes such as access to learning materials, homework assignments, foreign language learning, communication, sharing of knowledge and experiences. It also allows a more flexible and individualised learning possibilities for people who were previously unable to participate in education. Hundreds of universities nowadays are proposing online programmes and massive online courses, in many cases making training and education freely accessible worldwide. During 2012 and 2013, according to the OECD report on thirty OECD countries, on average, about 9.5% of individuals reported having followed an online course, and results of the 1012 OECD Program for International Students Assessment show that more than 70% of 15-year-olds across the OECD countries use the Internet at school (OECD, 2014, p. 42, 86). The use of ICT and the Internet enhanced the possibility for easier access to information and services related to improving health conditions as well as health care. People can effectively use these health information and services to make better decisions about their treatment and care. ICT and the Internet provide better living conditions for millions of people with disabilities. Thus, for example, GPS navigation systems with voice prompts are bringing new mobility to individuals with visual impairments. The use of ICT and the Internet can be especially useful for people with disabilities in the sense of supplementing physical mobility. Looking from the security aspect of the impact of ICT and the Internet on the daily lives of people, the evidence shows that this technology provides people with much greater security. New types of detection systems can send information to mobile devices to let us know if a burglar is in our house. Webcams in daycare centers can let parents know how their children are doing throughout the day. Smartphones with GPS system can let parents know the location of their children, and in-vehicle systems can let parents know where their children are driving and even how fast. ICT is making our lives safer in a way that it enables a range of products to be safe, for example, by letting drivers know in real time of impending problems in their cars. Some other products that make our lives safer thanks to ICT are chemical and biological weapons sensors, robots for bomb disposal or integrated communication networks. ICT and the Internet are, at present, changing the way of buying and selling products and services. E-inclusion through e-commerce increases buyers' opportunities and ensures much more

diversified, easier and cheaper purchase while stimulating competition in the global market. Commercial organizations which offer their products and services using e-commerce also benefit hugely from e-inclusion in reaching out to more customers around the world and are not limited by selling only to local or national level market. All aforementioned opportunities that use ICT and the Internet offer refer to the distribution and circulation of knowledge resources, the potential of new information and communication services, new job opportunities and better access to employment, and more traditionally as regards to ICT, overcoming barriers of distance or mobility. The problem is that, even today, there is a large mass of people who cannot access ICT and the Internet, as proven by previously mentioned study by the International Telecommunication Union (ITU). The study points out that regardless of encouraging progress of expansion of ICT and the Internet in the world, 4.3 billion people are still not online, and 90 per cent of them live in the developing world (ITU, 2014). Such people are potentially excluded from the information society as well as from knowledge society, which is to a large degree already a form of social exclusion. The consequences of exclusion are costly for the individual and for the society as a whole and are evident in social isolation, increased unemployment, lower productivity and competitiveness, and exclusion from social and political spheres (Steyaert, Gould, 2009). Since information and communication technology and the Internet together offer people work more effectively, affordably and creatively, it is necessary that citizens from all socio-economic strata and regardless of race, class, culture, gender, age, abilities and social locations should have the opportunity to use ICT, and particularly the Internet, to improve the quality of their lives and their communities. Although many governments promised that all citizens would have equal access to ICT and Internet and benefit from the opportunities in the new digital economy, this promise has not yet been realized because socially inclusive goals in current short and long term governments' policies and strategies related to ICT are not well defined. This concern finds its expression in term "e-inclusion.

8. ACCESS AND USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES AND THE INTERNET – COMPARATIVE ANALYSIS OF CROATIA AND THE EUROPEAN UNION COUNTRIES

The past ten years have been characterized by continuous growth in the expansion of information and communication technology (ICT) infrastructure and in access and usage of ICT and the Internet by citizens and public and private organizations. Expansion is present on both global and national, local and individual levels in developed countries, as well as in developing countries. Croatia does not lag behind. In the continuation of this work the expansion in use of ICT and the Internet in Croatia in the last 7-8 years will be presented (depending on the data availability, with reference to the European Union countries). Data for the analysis were taken from EUROSTAT data base of the European Union official statistics office.



	2007	2008	2009	2010	2011	2012	2013	2014
European Union (28 countries)	55	60	66	70	73	76	79	81
Croatia	41	45	50	56	61	66	65	68

Chart 1. Comparison of households with Internet access between the average of 28 European Union countries and Croatia
Source: made by the author, based on EUROSTAT data

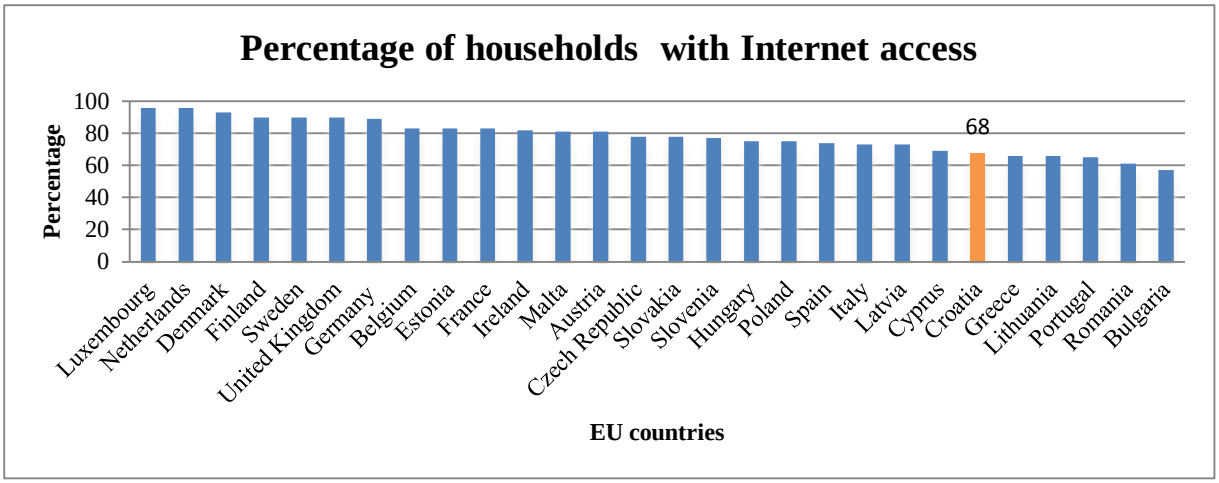


Chart 2. Comparison of Internet access between the 28 EU countries and Croatia in 2014
Source: made by the author, based on EUROSTAT data

In Chart 1. from 2007 to 2013, for the European Union countries, constant growth in the number of households with Internet access is visible, which is not the case for Croatia, regarding the fact that a decrease was registered in 2013 with reference to 2012. Chart 2. outlines Internet access in households for 2014 among the countries of European Union, where it is visible that the highest rate of Internet access is in the households of Luxembourg and the Netherlands (96.00%), while Croatia is at the bottom of the scale with 68.00%.

In the period from 2007 to 2013, in Chart 3, one can see continuing growth in number of households with access to computers in EU countries, while in this aspect, as well as in Internet access in Croatia the growth is noticeable up to the year 2012, with a mild fall in 2013.

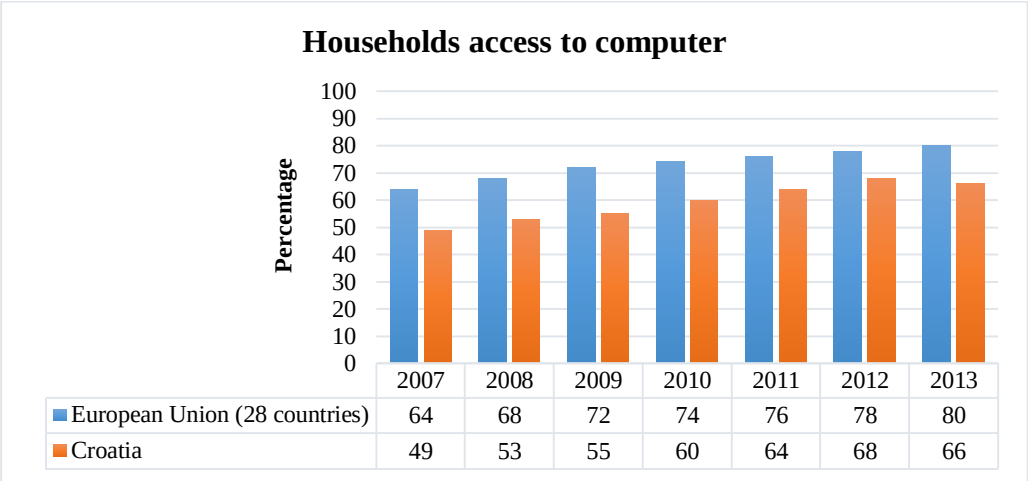


Chart 3. Comparison of households with access to computer between the average of 28 EU countries and Croatia
Source: made by the author, based on EUROSTAT data

According to the Chart 4 it is also visible that Croatia is at the bottom of the scale with 66.00% in computer access, in comparison to other EU countries, e.g. with reference to the Netherlands, where the households' computer access in 2013 was 95.00%

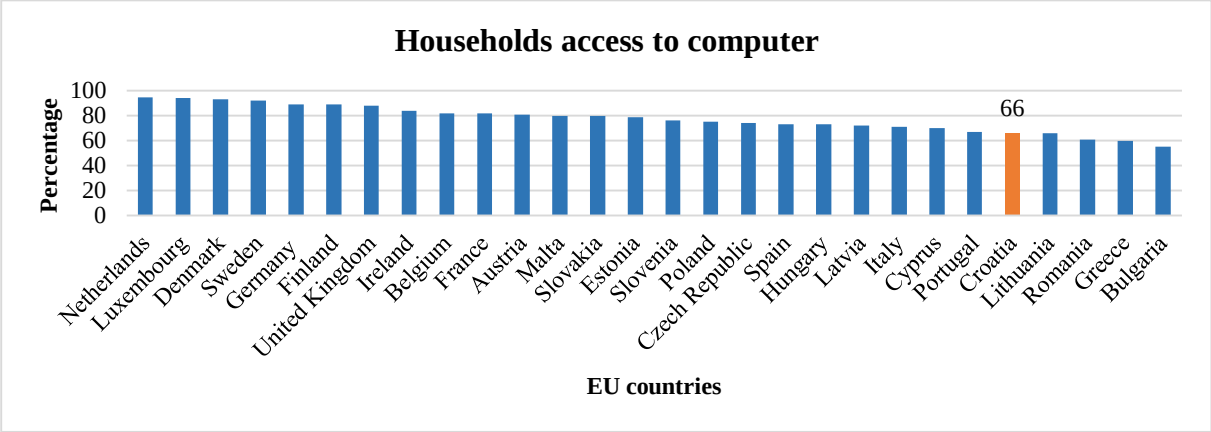


Chart 4. Comparison of households' computer access between the 28 EU countries and Croatia in 2013
Source: made by the author, based on EUROSTAT data

According to frequency of Internet use by individuals, Croatia registers constant growth in the period from 2007 to 2013, but it nevertheless continuingly falls behind the average of EU countries in 10.00% during almost the entire stated period.

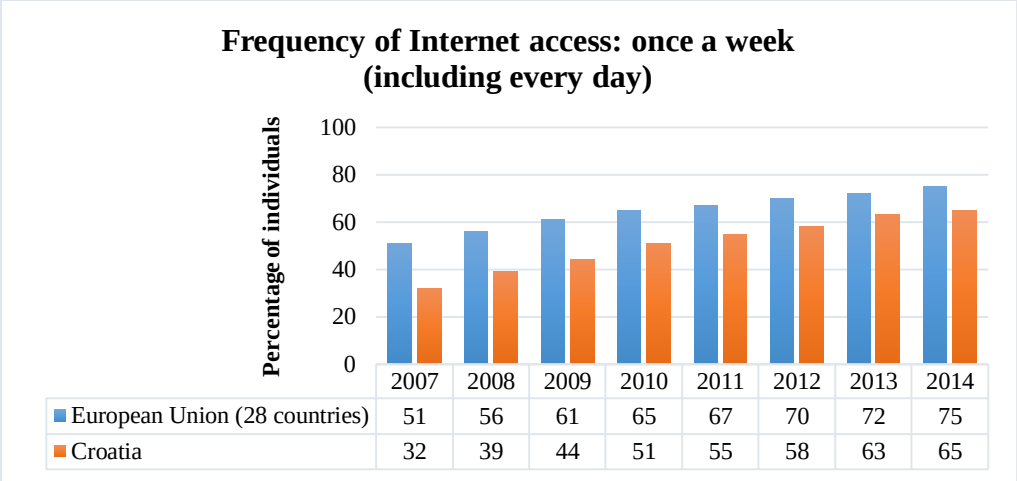


Chart 5. Frequency of Internet access by individuals once a week (including every day)
Source: made by the author, based on EUROSTAT data

According to frequency of everyday Internet access by users/individuals, with reference to other EU countries, Croatia is holding the 21st place with 65.00%, while Luxembourg (93.00%) and Germany (92.00%) are at the top of the scale.

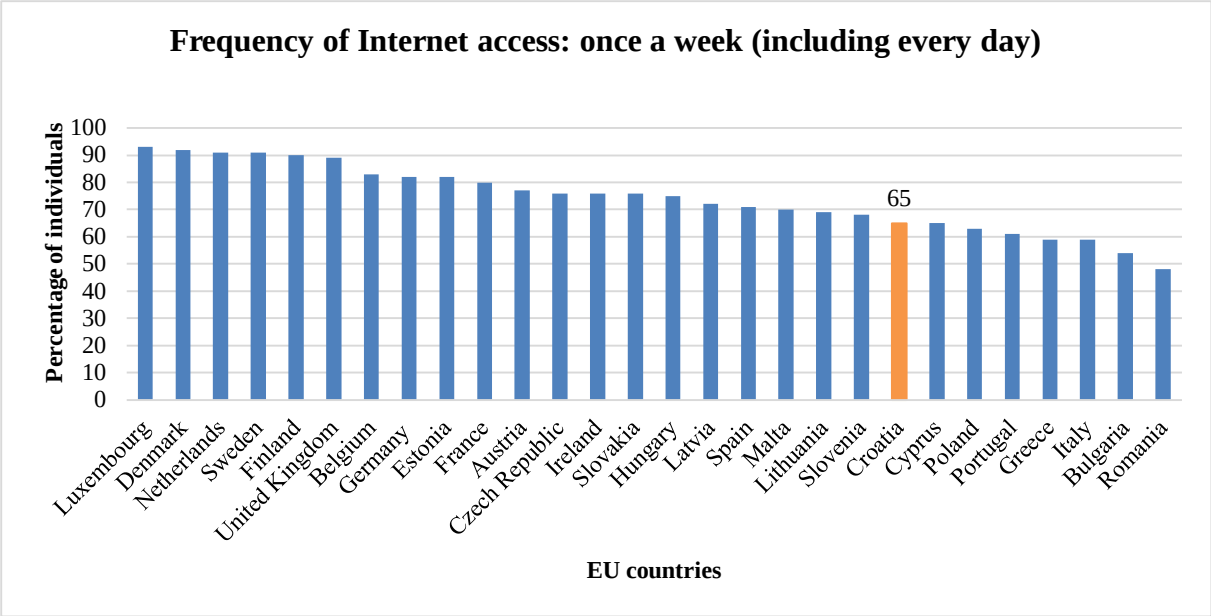


Chart 6. Comparison of frequency of Internet access by individuals between 28 EU countries and Croatia in 2014
Source: made by the author, based on EUROSTAT data

While observing the individual Internet access according to the place of access in 2013, the figure 7 shows that, on average, in EU countries and Croatia alike, users most likely access the Internet from home (28 EU countries – 72.00%, Croatia – 62.00%), and least likely in places of education (28 EU countries – 10.00%, Croatia – 6.00%).

While analyzing the interaction of citizens with public authorities, according to Chart 8 one can notice the lack of continuing growth in the last seven years, either for EU countries, or for Croatia. Oscillations appear in both cases.

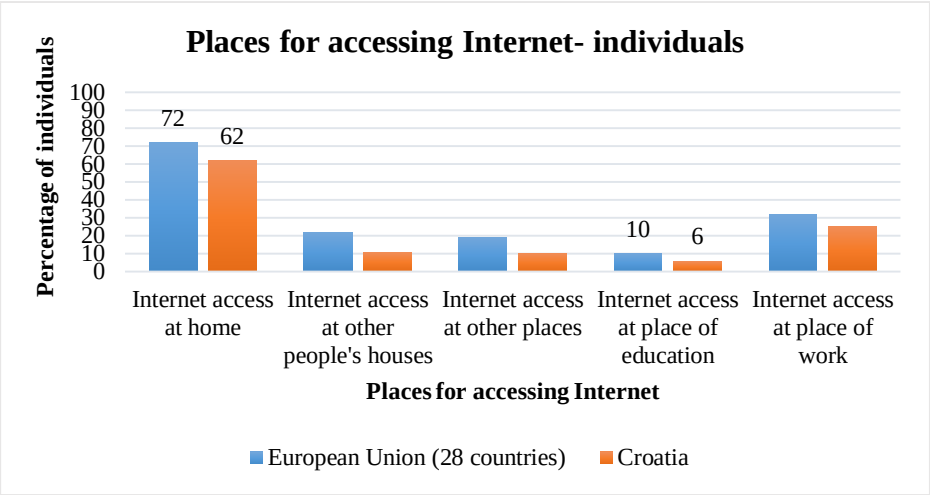
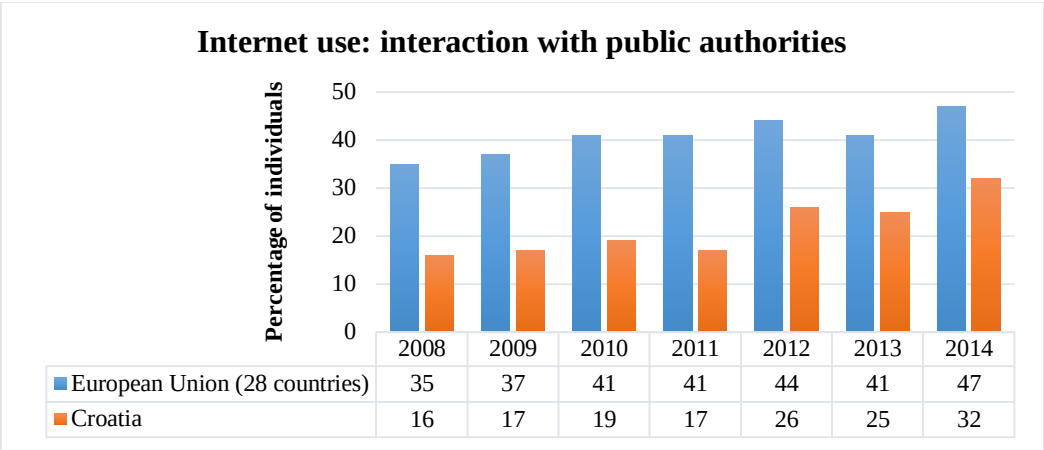


Chart 7. Comparison of individual users' access, according to the place of Internet access, between 28 EU countries and Croatia in 2014
Source: made by the author, based on EUROSTAT data

The average of EU countries, connected to the interaction of citizens with public authorities from 2010 to 2011, is stagnant, then it grows in 2012 in order to be reduced again in 2013 on the level from 2011. Regarding Croatia, in 2011, a fall in 2.00% with reference to 2010 was registered, in order for growth in 9.00% to be registered, with reference to year 2011; in 2013 an insignificant fall was registered and the last year, 2014, registers growth due to the introduction of central state-owned portal called "e-citizens".



	2008	2009	2010	2011	2012	2013	2014
European Union (28 countries)	35	37	41	41	44	41	47
Croatia	16	17	19	17	26	25	32

Chart 8. Comparison of Internet use for interaction with public authorities between the average of 28 EU countries and Croatia in 2014
Source: made by the author, based on EUROSTAT data

While observing the use of e-public services, one can notice that, on average, these services are seldomly used, both by the citizens of EU and Croatia. In order to obtain information, in 2014, 41.00% of EU citizens used Internet pages of public authorities, while in Croatia this percentage was hardly 25.00%. Connected to the use of e-services of public authorities for downloading and completing the forms, the data show that citizens rather use the classical way of obtaining services, regarding that, on average, this use in EU countries is under 30.00%, while in Croatia the percentage for downloading forms is hardly 20.00% of respondents, and 13.00% for sending completed forms via electronic means.

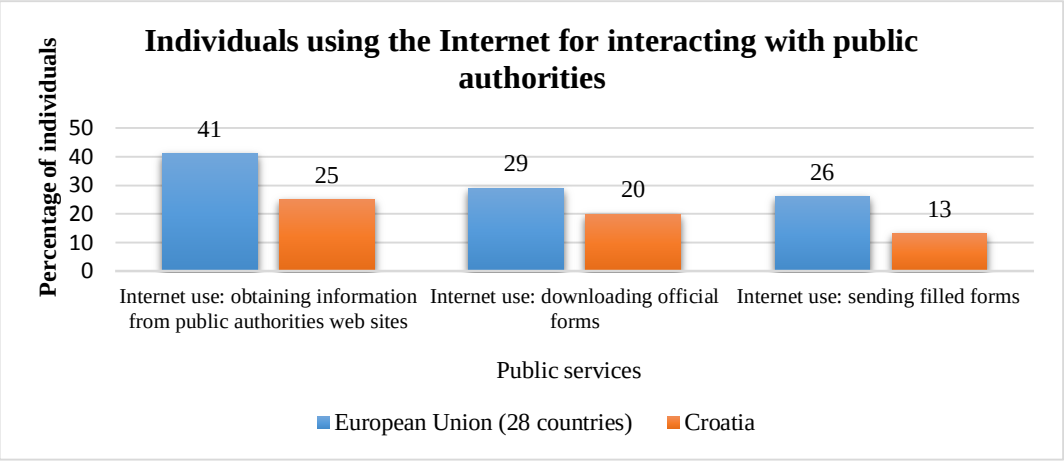


Chart 9. Comparison of Internet use for interacting with public authorities between the average of 28 EU countries and Croatia in 2014
Source: made by the author, based on EUROSTAT data

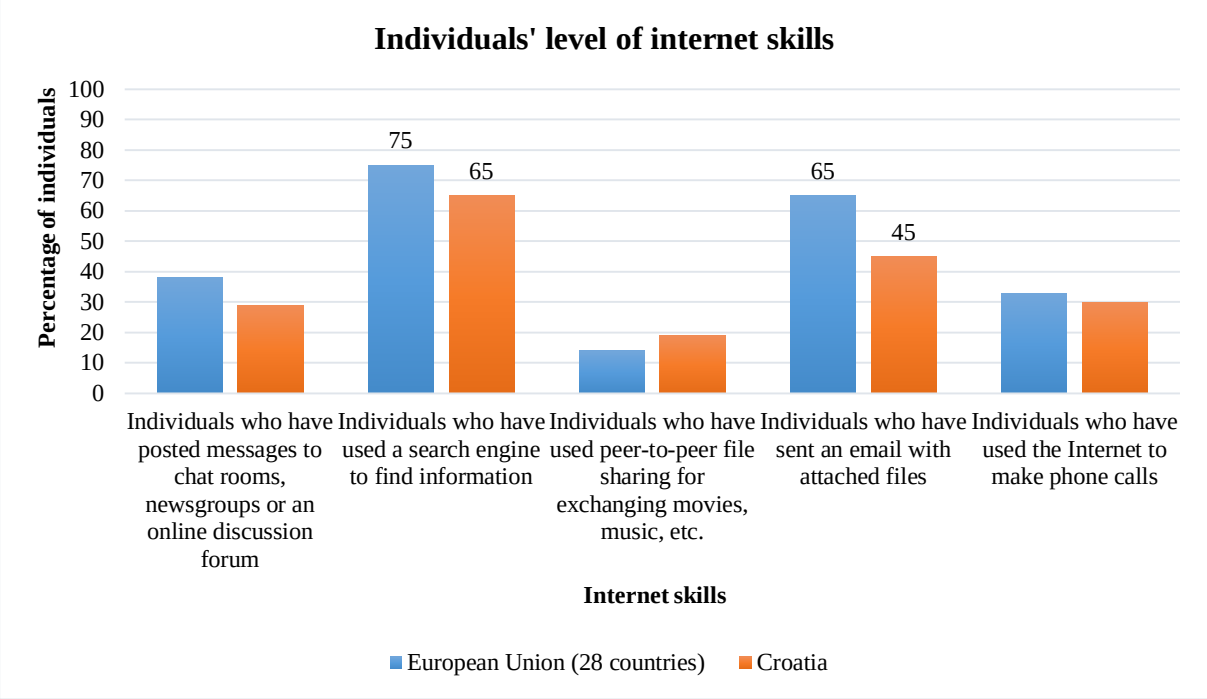


Chart 10. Comparison of Internet skills of users/individuals between the average of 28 EU countries and Croatia in 2013
Source: made by the author, based on EUROSTAT data

In the chart above it is perceptible that, on average, in the EU countries (75.00%), as well as in Croatia (65.00%), Internet users most likely know how to use Internet search engines, then to send e-mails with attachments (EU – 65.00%, CRO – 45.00%), and of all the suggested skills, they least know how to use the skills for exchanging and sharing music, films and other types of documents.

In the bottom chart one has presented the level of basic computer skills of respondents, on average, for 28 EU countries and Croatia. A very poor level of users' knowledge is evident from the data; more than 50.00% of respondents in 28 EU countries have only two of suggested computer skills which are very similar, while more than 50.00% of Croatian respondents have the knowledge to use only one skill, that is copying or relocating documents. The average for 28 EU countries is 39.00% for a slightly more complex activity, such as compressing files, while the percentage for the same activity in Croatia is 31.00%.

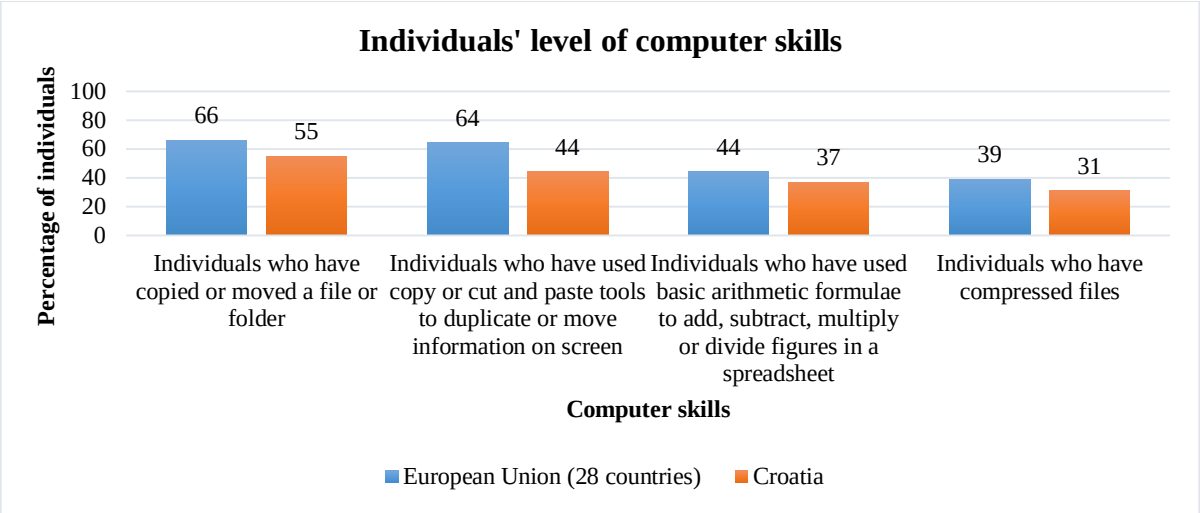
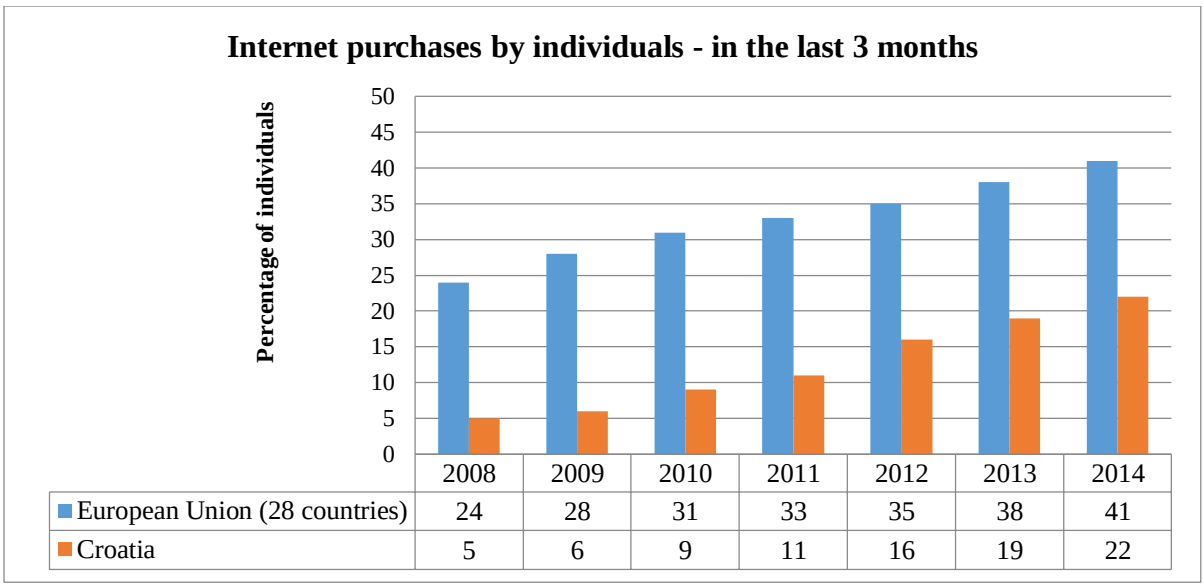


Chart 11. Comparison of users/individuals' computer skills between the average of 28 EU countries and Croatia in 2014
Source: made by the author, based on EUROSTAT data



	2008	2009	2010	2011	2012	2013	2014
European Union (28 countries)	24	28	31	33	35	38	41
Croatia	5	6	9	11	16	19	22

Chart 12. Comparison of Internet purchases by individuals between the average of 28 EU countries and Croatia in period 2008-2014
Source: made by the author, based on EUROSTAT data

In Chart 12. continuing growth in number of users of Internet purchase is visible, in the average of 28 EU countries and Croatia alike, however in the picture it is also equally noticeable that in Croatia, with reference to the average of 28 EU countries, Internet purchase is seldomly used, since in 2014 the level of Internet purchase in Croatia (22.00%) does not even reach the average of EU countries for the year 2008 (24.00%).

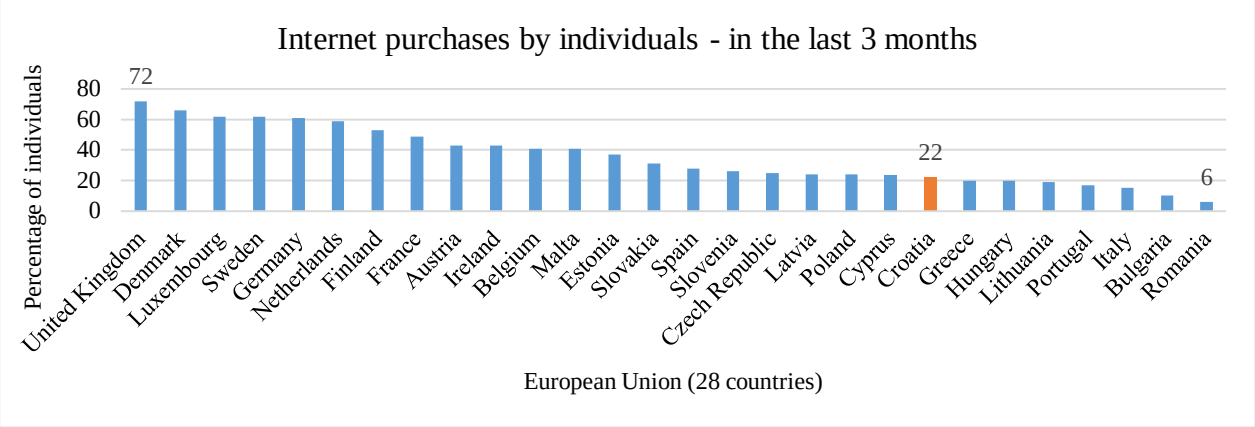
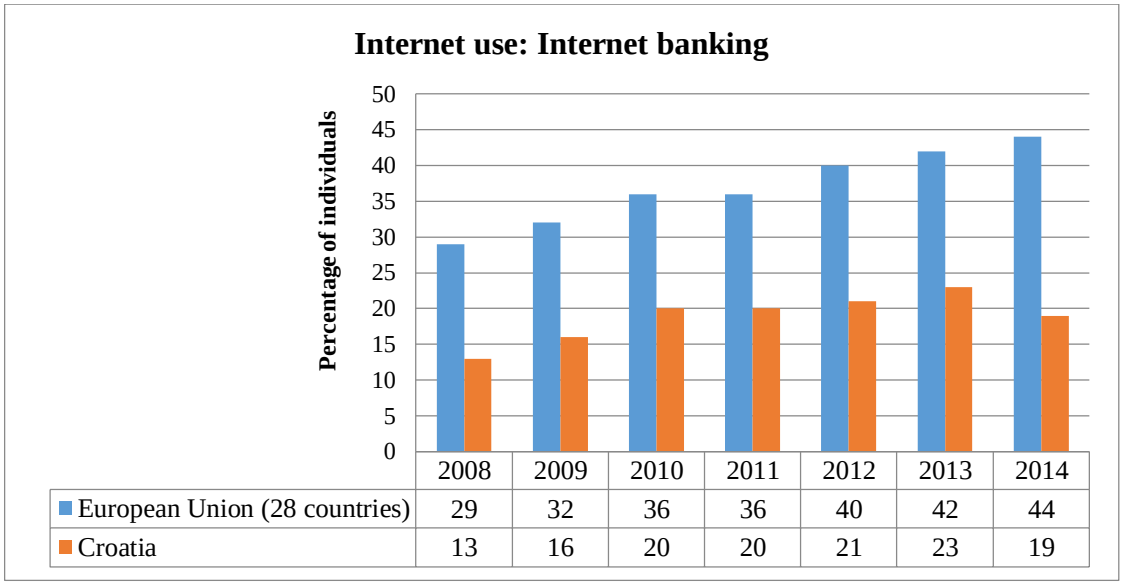


Chart 13. Comparison of Internet purchases by individuals between the 28 EU countries and Croatia in 2014
Source: made by the author, based on EUROSTAT data

In Chart 13. it is perceptible that Internet purchase in European Union is mostly used by the UK citizens, no less than 72.00%, and the minimum of users is in Romania (6.00%), while Croatia is in the 21st place.



	2008	2009	2010	2011	2012	2013	2014
European Union (28 countries)	29	32	36	36	40	42	44
Croatia	13	16	20	20	21	23	19

Chart 14. Comparison of Internet banking by individuals between the average of 28 EU countries and Croatia in the period 2008-2014
Source: made by the author, based on EUROSTAT data

In Chart 14 almost continuing growth in number of Internet banking users in 28 EU countries within the last seven years is noticeable. In 2014 it reached the level of 44.00%, which cannot be said for Croatia. The number of Croatian Internet banking users in the last seven years does not register significant growth; in the period from 2010 to 2011 stagnation was registered, and in the year 2014 the fall in no less than 4.00% with reference to the previous year, was noted. When making comparison to other countries in using Internet banking for 2014, in Chart 15 it is visible that Croatia is, according to number of users, almost at the scale's rear with no less than 19.00%. The most of users of Internet banking in EU countries is in Finland (86.00%), followed by Germany (84.00%), and the least percentage of users was registered in Romania, only 4.00%.

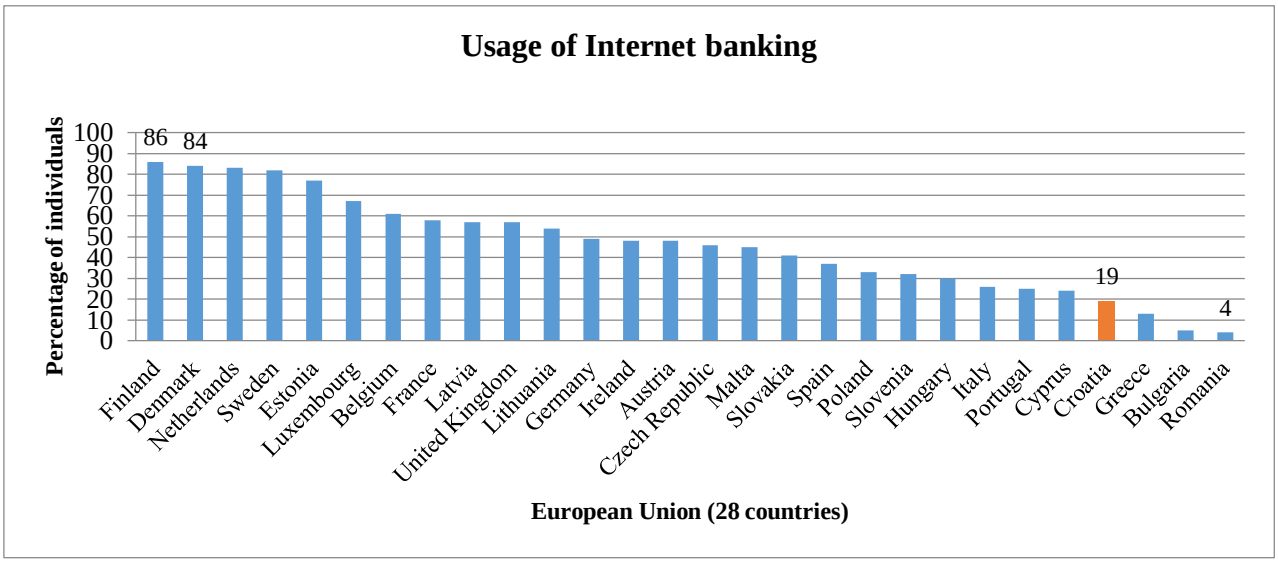


Chart 15. Comparison of Internet banking by individuals between the 28 EU countries and Croatia in 2014
Source: made by the author, based on EUROSTAT data

While recapitulating results of the analysis of the ICT and Internet usage in Croatia and, when compared to the average in EU countries, one can conclude that Croatia lags far behind in almost everything. When the situation of comparison with individual countries in 2014 as the referential year is taken into consideration, one can also notice that Croatia is at the scale's end in almost all aspects. Such data indicate the large necessity for the development of a realistic and adequate strategy of e-inclusion of population on the national level, but also on the local levels, and great engagement of the Government in stimulating theoretical and intellectual organization and realization of target projects of e-inclusion. The data demonstrated above relate to the national level and comprise the population starting with the age of 16, that is 18

(depending on activity), or more, without the multiperspective analysis of e-inclusion of individual target groups, such as the elderly, women, the disabled, people living in remote areas, people with low income, the unemployed, etc. The author presumes that, if and when an analysis in such groups would be conducted, the data would be even more unfavorable, hence this work suggests such an approach in order to obtain a more realistic image of e-inclusion in Croatia and to identify the target groups which further strategies of e-inclusion should necessarily focus on.

Connected to the term of e-inclusion, a project named *e-citizen for e-collaboration* was set in motion in Croatia. However, this project, which should have included the entire population of Croatia and which should have taken place in the whole country, had only two headquarters: in Zagreb and in the district of Zadar. Cost-free workshops were conducted with the purpose of bringing informatics literacy to a higher level, but only in the largest cities. There is a question of motivating the informatics literacy in rural areas, heavily accessible areas and insular areas. During the process of creating and implementing the projects of e-inclusion in Croatia, one did not take the guidelines given by the European Commission into consideration, which stimulate the inclusion in the information society of people with special needs, as well as the projects which include the elderly, the minorities, as well as the guidelines connected to the infrastructure; for instance, stimulation of introduction of broadband Internet and enabling all citizens the access to broadband Internet of high capacity and the action plan "eEurope 2005 Action Plan – "An Information Society for all", which needed to animate the development of the ICT sector and hereby increase the growth and the development, as well as employment.

Therefore the ministries responsible for the development of use of ICTs and public access to Internet services and contents should create a national strategy of e-inclusion, the focus of which would be on connecting mobility and networking, with purpose of promoting the information society via targeted and defined politics, via modernization of legal and technical framework, motivation of research and market-oriented development. The strategy should be oriented on the development of the ICT sector in order to maximize the growth of economy and employment and digital connection in the country. E-inclusion, that is participation in the information society of all individuals, should be the most important goal of the e-inclusion strategy. For digital technologies and services to be completely exploited, citizens/users should know how to use the digital contents that are offered correctly; therefore, it is of great importance to implement projects which will inform people who do not use ICT in an acceptable and efficient way about all the advantages these technologies have to offer.

Government must take actions in this field, which have to be in concordance with recommendations of the European Commission and should be on European level, in case they want to significantly increase access to information and ICT services, especially with the elderly, people with special needs, people with lower education or young people in unfavorable position or the unemployed. The strategy of e-inclusion should stimulate efficiency through the use of ICT for the final users, citizens and Government institutions alike. The usage of services supported by ICT technologies should shorten administrative processes and procedures in form of centralized portals, in order to shorten the time for acquiring the necessary information. All public institutions should operate interactively in order for the information to be accessible to everyone in the same moment, as if they derive from one source. This strategy should focus especially on people with special needs and the elderly, who should be stimulated to use such kind of technology in order to exploit all the advantages of new administrative processes supported by Internet technologies, as well as all forms of social participation which should be made possible via ICT and the Internet. The target population which should also be comprised by the strategy are the people who have never, for whatever reason, used the Internet, which has, as a consequence, the exclusion of such people and under-utilization of all possibilities offered to them by ICT in their private and business environment. This relates to specific social groups excluded from the information society due to cultural, religious or other specific social and demographic factors. For the inclusion of such groups one should cooperate on local, regional and national level, identify such groups through research and then use the projects and act with purpose of improving the condition which was come across. Within the strategy, as an important goal one should define enabling a greater number of households, as well as business subjects in urban and rural areas, the access to fast broadband Internet connection. One should also define legal framework of e-inclusion and basic participants in the implementation of the strategy of e-inclusion, which includes ministries and members of local administrations and autonomies, non-profit organizations, associations, etc.

9. MONITORING OF ACCESS TO AND USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGY AND THE INTERNET

Nowadays, in the literature related to the expansion of ICT there is a general consensus that there is still a significant digital gap which is a consequence of political, economic and sociocultural inequalities. Worldwide opportunities to access and use ICT and the Internet vary dramatically among different countries and individuals. Monitoring the expansion of ICT and the Internet research and monitoring models, in the earlier stages, were focused solely on determining the so-called the "digital divide". This was continued by determining the readiness of government and private business organizations in adopting and implementing ICT and the Internet to enhance their products and services offered to citizens and customers covering by the concept of e-readiness. Because of observed strong correlations between social inclusion / exclusion and ICT, these two terms have become inadequate for monitoring such a complex phenomenon, therefore the concept of e-inclusion has become much more acceptable. In subsequent parts of this study, these three concepts and monitoring models related to them will be explained in more detail, with particular emphasis on the definition and conceptualization of e-inclusion which is one of the main objectives of this study.

9.1.THE DIGITAL DIVIDE

Historically, societies have been divided into various social classes or stratums that differentiate rights and benefits of people based on a number of factors including class, race, gender, age and disability. In the information-based era, these same distinctions play a significant role. Inequality of access to and usage of ICT and the Internet might have a significant impact on the emergence of social inequalities. In literature, this phenomenon is commonly referred to as the *digital divide* (Bindé, 2005; van Dijk, 2005; DiMaggio, Hargittai, 2001; Norris, 2001). The term was originally used by the US Department of Commerce's National Telecommunications and Information Administration (NTIA) in 1998 in its second report entitled *Falling Through The Net II: New Data on the Digital Divide*. The report analysed telephone and computer penetration rates for low-income groups, minorities, women and the elderly, among other groups in society (NTIA, 1998). In the mid-1990s, the phrase *digital divide* was seen as an indicator for the information highway shortcoming and as an appeal to society to solve this problem (Mordini et al., 2009).

The major share of research on *digital divide* focuses on computer and Internet haves and not-haves, but other electronic equipment such as mobile phones or digital television has been investigated as well. Initial studies on this topic focused on technical access, thus identifying the digital divide as the result of differences in accessing technologies (NTIA, 1998, 1999; OECD, 2001). Later scholars underlined that it *refers not just to differences in access*, but also to *inequality among the Internet users in the extent to which they are able to reap benefits from their use of the technology* (DiMaggio and Hargittai, 2001). Through time, different types and levels of the digital divide have been identified by various researchers. Thus according to Molnar (2003), three broad types of the *digital divide* can be identified:

1.) Access divide, or *early digital divide* considers the gap between those with and those without access ICT and the Internet.
2.) Usage divide or *primary digital divide* concentrates on those who have access but are non-users and on the difference between users and non-users.
3.) Quality of use or *secondary digital divide* focuses on the differences in participation rates of those people who have access and are users and shows the difference between different types of users.

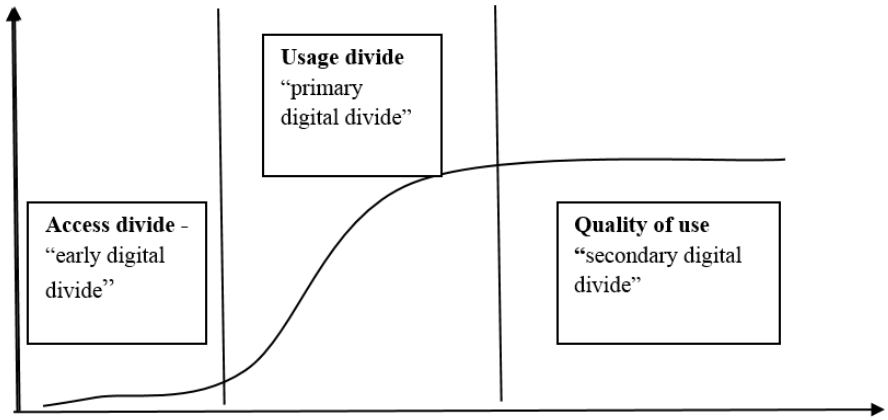


Figure 1: Diffusion model of innovation regarding the use of ICT means
Source: Adjusted according to Molnar (2003)

Dewan and Riggins (2005) defined three levels of the digital divide. The first level of the digital divide covers both hardware access as well as use of software. The second level refers to the inequality of IT capability or the ability to use technology. Their research shows that one of the most important aspects of inequality of use are the differences in computer skill levels. Third-level digital divide is the digital outcome divide, which arises due to the second level digital

divide and other contextual factors. Examples of digital outcome divide include differences in learning outcomes and productivity. The main focus of their study was first and second digital divide level.

Van Dijk identifies 4 types of digital divide (Van Dijk, 2006):

1) Material access (have / have not): refers to the problems related to physical access to ICT and the Internet.
2) Motivational access (want / want not): refers to the motivational problems of users.
3) Skills access (are able / are not able): refers to the problems related to differences in ICT skills between users.
4) Usage access (use enough / not use enough): refers to the problems linked with the differences in the quality of ICT usage.

Widely accepted definition of the digital divide is the one by OECD (2001) according to which the digital divide is a "*gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access Information and communication technologies (ICTs) and their Internet implication in wide variety activities*" (OECD, 2001, p. 5). Looking from OECD perspective, the digital divide becomes a complex reality with many influencing factors. Digital divide has been the subject of a number of scholarly studies (Norris, 2001; Van Dijk, 2005; Warschauer, 2003). According to Bindé (2005) at the macro level, the main causes of the digital divide include the wealth of a country, availability of infrastructure and costs of ICT and the Internet, digital literacy education in school systems, etc. At the micro level, conducted research proves that the influential factors related to the term "digital divide" include socio-cultural-economic factors such as gender, age, race, locations, income levels, social support, educational background, etc. (Meyer, Muller, Kubitscheke, 2006; Judge, Puckett, Bell, 2006; Li, Ranieri, 2010;Warschauer, 2000; Zhao et al., 2010). For the digital divide, we can say that is a special case of social exclusion. The dynamic of digital gaps and exclusion dynamic are complex concepts and the majority of researchers in the field do not believe that this divide can be simply overcome with the provision of computers or by connecting people to the Internet. Considering the many studies conducted, it is more than evident that the digital divide depends on the socioeconomic conditions and on the geographic position of a population. This problem is complex and some researchers are calling for solutions based on novel paradigms and multi-dimensional approaches that promote digital opportunity such as e-inclusion as an effort to include people in the digital world (WSIS, 2003). Proponents of e-inclusion argue that this gap can be overcome completely or reduced to a minimum by applying this concept which also allows, among other things, the promotion of

democracy, mutual understanding, training and education of the socially most vulnerable groups such as individuals with the lowest incomes, people with disabilities and the unemployed (Mancinelli, 2008).

9.2. E – READINESS

The first step in solving the digital divide problem, regardless of a country's level of development, is to determine the country's readiness to integrate ICT and the Internet that citizens can fully participate in the information society, called *e-readiness*. There are various perspectives of e-readiness, so researchers have defined e-readiness in various ways. These perspectives are based on the country's social, legal and economic climate and the current ability of people, governments and businesses to access ICT and Internet technology. The first definition and the tool known as Readiness Guide for Living in the Networked World of *e-readiness* in 1998 came from the Computer Systems Policy Project. In this Guide e-readiness have been defined as the degree on community is prepared to participate in the networked world (CSPP, 1998, Mutula and van Brakel, 2006). To the same definition of *e-readiness* came also Centre for International Development at Harvard in 2000 with the support of International Business Machines and World Bank, World Economic Forum and INSEAD. In addition to these definitions and tools, several e-readiness definitions and tools have emerged through efforts of various organizations, business enterprises, development agencies, academies and researchers from macro-level and micro-level perspectives. Viewed from macro-level perspective, concept and tools of e-readiness have been created as a result of an attempt to provide a unified framework to evaluate the digital divide between the developed and developing countries during the later part of the 1990s. From micro-level perspective, definitions and tools have been focused on evaluation of ICT and Internet penetration throughout the world, as well as on the rapid achievements in application of ICT and Internet tools in business and industry (Mutula and van Brakel, 2006). Thus the Asian Pacific Economic Cooperation and McConnell International in 2000, and Association of Southeast Asian Nations in 2001 defined e-readiness as the degree to which an economy or community is prepared to participate in the digital economy. The World Information Technology and Services Alliance in 2000 defined e-readiness as existence of consumer trust in e-commerce security and privacy, better and secure technology, more trained workers and lower training costs, less restrictive public policy, new business practices adapted to the information age, and lower costs for e-commerce technology (Bui, Sankaran, and Sebastian, 2003). Massachusetts Institute of Technology (MIT) (2003) defines e-readiness as the ability to pursue value creation

opportunities facilitated by the use of the Internet (Choucri et al., 2003). Empirica Gmbh (2001) defines e-ready society as: (1) a society where an increasing portion of social activities, work, economic transactions, communications, and other interactions between individuals, private sector organizations, as well as between governments are conducted via ICT networks or are dependent on ICT technologies, all of which are increasingly interoperable. In addition, an e-ready society is (2) a society where information and knowledge are increasingly important economic goods at all levels – that is, as determinants of wage levels for individuals, as factors of production for firms, and as sources of competitiveness among nations and regions or both (EmpiricaGmbh, 2001). McConnell International (2001) defines e-ready country "as a country that has extensive usage of computers in schools, businesses, government, and homes; affordable reliable access in a competitive market; free trade; skilled workforces and training in schools; a culture of creativity; government-business partnerships; transparency and stability in government and an evenly enforced legal system; secure networks and personal privacy and regulations allowing digital signatures and encryption. Siegel et al. (2002) defined e-readiness as an "ability to pursue value creation opportunities facilitated by the use of the Internet". From the e-government perspective, Center for International Development (2002) has defined e-ready society as one that has the necessary: (1) physical infrastructure which means high bandwidth, reliability, and affordable prices; (2) integrated current ICTs throughout e-commerce businesses and local ICT sector as well as throughout communities with local content, many organisations online, usage of ICTs in everyday life, ICT education in schools, and a government which mediates through e-government; (3) strong telecommunications competition; (4) independent regulation with a commitment to universal access; (5) no limits on trade or foreign investment. From the latter perspective, e-readiness can be defined as "the level of preparedness pertaining to the ability of exploiting Internet technology for economic purposes through the rapid adoption of e-business" (Jutla et al., 2002). In the study of Hartman, Sifonis, and Kador (2000), net readiness is measured as a company's preparedness to exploit the enormous opportunities in the e-economy landscape (Hartman, et al., 2000; for more definitions see Hanafizadeh et al., 2009). As can be concluded from the above mentioned definition *e-readiness* can be defined differently depending on each country's priorities and perspective, but in general, this concept can be defined as the degree to which a society is prepared to participate in the digital economy. Success in the information age is dependent largely upon the widespread integration of ICTs into the society at large, therefore it is crucial to understand what it means for a country or economy to be *e-ready* and conduct an evaluation based on objective criteria to establish a baseline that can be used for global and regional comparisons and planning. The main objective

of the e-readiness process is to identify how the ICTs and the participation in the digital economy can help a government reach more expeditiously its objectives in terms of economic and social progress and growth. E-readiness process comprises three main phases: (1) assessment, (2) development of a strategy and the preparation of an action plan as well as (3) implementation of the action plan. Studies have shown that these three phases have to be connected with five main areas of activities that contribute to the overall e-readiness of a country: (1) access and connectivity; (2) training, education and public awareness; (3) government leadership; (4) business and private sector initiatives and (5) social development (GeoSINC International, 2002). All the e-readiness tools presented by different researchers and organizations have largely adopted qualitative as well as quantitative approaches. Quantitative approaches differentiate countries depending on how well they performed on specific components of e-readiness measures. The results of e-readiness rankings of countries are regularly published by various agencies and international organizations. The consequence of these ratings is the classification of the world's largest economies on the basis of perception in which adopter category they belong. For example, Economist Intelligence Unit categorizes countries as (Economist Intelligence Unit Limited, 2001):

a) *laggards* - countries that are at a risk of being left behind,
b) *followers* - countries that lack the sophistication of the leader and contender but have seen the importance of the Internet and are moving towards establishing the necessary infrastructure to support it,
c) *contenders* - countries that have both a satisfactory infrastructure and business environment but are lacking in some other areas and
d) *leaders or innovators* - countries with most of the elements of e-readiness in place.

The ranking categorises countries of overall e-readiness usually includes dimensions such as: legal and regulatory environment, social and cultural infrastructure, business environment, supporting services, connectivity, consumer and business adoption.

Most of the top ranked countries in e-readiness status are also economic leaders and the most developed countries of the world. For the citizens, high level of e-readiness makes quality information available, reduces the digital divide between individuals, overcomes virtual and physical isolation and maintains interconnectivity between people of similar interests and needs. The advantages of high level of e-readiness for companies in which all transactions are carried out electronically, are faster delivery of product and services, high international competitive advantage, greater opportunities to sell products and services to international markets, simpler and easier retaining of existing customers and gaining new ones, reduced

procurements and production costs and more efficient connection and improvement in their business processes (Commission of the European Communities, 2002). From all of the above mentioned, it can be concluded that the assignment of the government of all national economies should be to encourage e-readiness with citizens and companies through proactive strategies in order to keep up with the development of information society.

10. MODELS FOR MEASURING DEVELOPMENT OF INFORMATION SOCIETY

Looking from the economic aspect, inclusion of all individuals in the information society and knowledge society opens great opportunities in terms of growth of the ICT sector, productivity growth and costs reduction related to the social and economic exclusion. Over time, it has been noticed that the process of transformation society to the information and knowledge-based society is very complex and involves a large number of factors that must be met. The process of transformation depends on a number of different assumptions, political support, and requires continuous work on the realization of objectives defined by the strategy of the information society development for each nation's economy. Recently, more specific goals that are tied to the development of the information society at national and international levels have been developed. These goals are based on an international agreement including the Millennium Declaration. The specific objectives refer to connectivity, improvement, access and use of ICT. The current continuous and dynamic development of technology has led to the identification and monitoring of a much greater number of indicators that are not based only on the availability of ICT in the material sense and on Internet connection, but also on examination the content and consumer services offered, costs and quality of usage, and in recent times, impact on quality of life. In the late 1990s, a critical mass of indicators for measuring different aspects of the so-called information society was created and the term *digital divide* was formed. At the beginning of this millennium, a large number of *e-readiness* indexes were created with the intention to achieve a broader picture of what is happening in the field of ICT sector and what this rapid expansion of ICT and the Internet means for the national economies and the society as a whole. The aim of creating this type of indexes was, among other things, to examine whether the government of national economies as well as private business organizations are prepared to implement the latest technologies and services for the benefit of their citizens / customers.

In the earlier stages of *e-readiness*, a large number of composite *e-readiness* indexes was created. Each of these indexes, in their own way, tried to identify the positive effects that are associated with the implementation and acceptance of ICT and the Internet as well as the opportunity costs related to marginalized people who have no possibility of benefiting from all advantages that participation in the information society can provide. For policy makers, as well as for those that are responsible for creating strategies in the field of ICT and the Internet, composite indexes and indicators are of great importance for identification of current situation and prediction of future trends. Nowadays, there exists a number of different indexes that

measure different aspects of the use and acceptance of ICT and the Internet. The most important of them are shown in Table 1 along with their basic features.

Table 1. Indices and frameworks for monitoring of expansion of ICT and the Internet

Index /Framework	The institution which has developed Index / Framework	Measures areas
CSPP Readiness Framework	Computer Systems Policy Project (CSPP) (1998)	1.) Infrastructure 2.) Access 3.) Applications and services 4.) Economy 5.) "Enablers" (policy, privacy, security, ubiquity)
Mosaic's framework	Mosaic Group (1998)	1.) Pervasiveness - per capita usage of the Internet 2.) Geographic dispersion usage of the Internet 3.) Sectorial absorption 4.) Connectivity infrastructure 5.) Organizational infrastructure 6.) Sophistication of use
APEC'S e-commerce readiness assessment	Asian Pacific Economic Cooperation (APEC) (2000)	1.) Basic infrastructure and technology 2.) Access to network services 3.) Use of the Internet 4.) Promotion and facilitation 5.) Skills and human resources 6.) Positioning for the digital economy
CID'S readiness for the networked world	Center for International Development (2000)	1.) Availability, speed availability and quality of network access 2.) Use of ICTs in schools, workplace, economy, government, and everyday life 3.) ICT policy (telecommunications and trade), 4.) ICT training programs, 5.) Diversity of organizations and relevant content online
McCONNELL international's risk e-business	McConnell International , World Information Technology and Services Alliance (WITSA) (2000)	1.) Connectivity 2.) E-leadership 3.) Information security 4.) Human capital 5.) E-business climate
E-readiness rankings model	Economist Intelligence Unit (EIU), IBM (2000)	1.) Connectivity and technology infrastructure 2.) Business environment 3.) Consumer and business adoption 4.) Legal and policy environment 5.) Social and cultural infrastructure 6.) Supporting e-services

Index /Framework	The institution which has developed Index / Framework	Measures areas
E-business readiness rankings	Economist intelligence unit (EIU) (2001)	1.) Connectivity 2.) Business environment 3.) E-commerce consumer and business adoption 4.) Legal and regulatory framework 5.) Supporting e-services 6.) Social and cultural infrastructure
Statistical indicators benchmarking the information society (SIBIS)	Empirica, Work Research Centre (Ireland), Danish Technological Institute,Technopolis , Databank Consulting, Stichting RAND Europe, Fachhochschule Solothurn (2002)	1.) Telecommunication and access 2.) Internet for research 3.) Security and trust 4.) Education 5.) E-Work 6.) Employment and skills 7.) Social inclusion 8.) E-commerce 9.) E-government 10.) E-health
Networked readiness index (NRI)	Kirkman, Osorio, and Sachs (2002)	1.) The environment for ICT offered by a given country or community 2.) The readiness of the community's key stakeholders to use ICT 3.) The actual use of ICT amongst these stakeholders
Mobile /Internet Index	International Telecommunication Union ITU (2002)	1.) Infrastructure 2.) Network usage 3.) Market conditions
Orbicom's DDI – Digital Divide Project Index	Orbicom (2003)	1.) Infodensity – the sum of all ICT stocks 2.) Info-Use – consumption flows of ICT over a set period
Digital Accessibility Indeks (DAI)	International Telecommunication Union ITU (2003)	1.) Availability of infrastructure 2.) Affordability of access 3.) Educational level 4.) Quality of ICT services 5.) Internet usage
E-Participation Index (EPI)	UN (2003)	1.) E-information sharing 2.) E-consultation 6.) E-decision making
Digital Opportunity Indeks (DOI)	International Telecommunication Union ITU (2006)	1.) Opportunity 2.) Infrastructure 3.) Usage
ICT-OI – ICT Opportunity Index	International Telecommunication Union ITU (2005)	1.) Infodensity (networks and skills) 2.) Info-Use (uptake and intensity)
Partnership core list of ICT indicators	United Nations Statistical Commission (UNSC) (2007)	1.) ICT infrastructure, 2.) ICT access and use by households and businesses, 3.) the ICT-producing sector, 4.) trade in ICT goods

Index /Framework	The institution which has developed Index / Framework	Measures areas
ICT Development Index (IDI)	International Telecommunication Union ITU (2009)	1.) Access sub-index, 2.) Use sub-index, 3.) Skills sub-index
Working Party on Indicators for the Information Society (WPIIS)	OECD (2009)	1.) ICT access by households and individuals 2.) ICT use by households and individuals
E-government development index (EGDI)	UN (2012)	1.) The online service index 2.) The telecommunication infrastructure index 3.) The human capital index
Community survey on ICT usage in households and by individuals	Eurostat (2014)	1.) ICT access by households and individuals 2.) ICT use by households and individuals
Digital Economy and Society Index (DESI)	European commission (2015a)	1.) Connectivity 2.) Human Capital 3.) Use of the internet 4.) Integration of digital technology 5.) Public services

Source: made by the author

The CSPP Readiness Guide was developed by Computer Systems Policy Project (CSPP) in 1998. This tool is created to help governments determine how to prepare their citizens and communities for participation in the *Networked World*. The tool measures the expansion and integration of ICT in households and public and community organizations (schools, businesses, health care facilities, government offices, etc.) with special focus on government policy, competition among access providers and speed of access. The assessment rates the community development stage, between four progressive stages, each of the five categories are listed in the Table 1 (CSPP, 1998).

In 1998, Mosaic Group developed a Mosaic's framework as a part of the Global Diffusion of the Internet Project (GDI). This framework is a combination of statistics, narrative description and comparison which describes the diffusion of the Internet in a country and analyses the growth of the Internet throughout the world. The research made by Mosaic Group incorporates measurement of all six dimensions listed in Table 1 It was conducted in about 25 countries since 1997, and gives a clear picture of the state of the Internet expansion. Determining factors

include metrics such as teledensity, PC density, per capita GDP, foreign and domestic investment, geography, educational system, and government policy. The framework focuses on the most important social, economic, and political events as well as the legal and regulatory system and their impact on the countries' Internet penetration (Mosaic, 1998).

The Asian Pacific Economic Cooperation (APEC) and Electronic Commerce Steering Group developed and introduced a guide to help governments develop focused ICT policies, adapted to their specific environment with the purpose of the development of e-commerce. The guide contains one hundred well constructed multiple-choice questions grouped into six categories listed in the table above. The participants' answers indicate progressive levels of e-readiness for a country and countries are supposed to work on areas with less optimal answers (APEC, 2000).

CID'S readiness for the networked world was developed in 2000 by Center for International Development at Harvard University. The main purpose of the guide is to serve as a basis for further analysis and planning. The guide contains numerous factors that determine the networked readiness of a community in the developing world. It measures 19 different categories with four stages of advancement in each of the categories which are then placed into five groups (Table 1). For each measured community, estimate present stage of development for 19 categories, and gives descriptions of what is required to be in a particular stage (CID 2000).

In 2000, McConnell International published a report in collaboration with World Information Technology and Services Alliance (WITSA). The report rated 42 countries, and analysed the results by region of the world. The countries were rated according to five categories listed in Table 1 on a scale of one to three (*blue, amber, red*). For each country and for each category, the report offers a complete evaluation of the relevance and precision of available quantitative data also providing an understanding of a large number of cultural, institutional, and historical factors (McConnell, 2000).

In 2000, Economist Intelligence Unit (EIU) and IBM corporation developed the e-readiness rankings model. In their reports, the rankings of the world's largest 60 economies were presented and the methodology used was explained. Detailed findings for the top ten countries in each category were also provided. The six categories that feed into the rankings and their

weight in the model are: (1) connectivity and technology infrastructure, (2) business environment, (3) consumer and business adoption, (4) legal and policy environment, (5) social and cultural infrastructure, (6) supporting e-services. The report contains category-by-category assessment performance of each country, along with an explanation of the Economist Intelligence Unit's e-readiness criteria. Pointers are also given in order to indicate how countries could do more to seize the advantages that the Internet offers (EIU, 2002).

E-business readiness rankings model was created by Economist intelligence unit (EIU) in 2000. The model focuses on measuring the extent to which a market is conducive to Internet-based opportunities. It is organized into six categories taking into account a nearly 100 qualitative and quantitative criteria, from the quality of IT infrastructure to the ambition of government initiatives and the degree to which the Internet is creating real commercial efficiencies (Bridges, 2001).

The main aim of Empirica Gmbh was to provide a conceptual and methodological framework for the Statistical Indicators Benchmarking the Information Society (SIBIS) project and in particular, for the development of statistical indicators on the information society in the nine topics. One of the objectives of the SIBIS project was to provide additional indicators and data using for benchmarking the information and communication technology expansion in EU country´s. For each of the different topics and actions addressed by the eEurope Initiative and subsequent Action Plans, a large number of indicators with additional explanations and descriptions of each indicator and its usage was developed. Based on the developed indicators, the questionnaires have been created for each area listed in Table 1 Created questionnaires were then used for the corresponding data collection. Analysis of the data was presented in a comprehensive report for each area of measurement for the EU countries (Empirica Gmbh, 2001).

The Networked Readiness Index (NRI) was created by Kirkman, Osorio and Sachs in 2002. NRI measures the degree of readiness of a nation or community to participate in and benefit from ICT developments. The component index and sub-index rankings can be used to understand the performance of a nation or even a region with regards to ICT development and serve to identify key areas where a nation is under or over-performing. NRI captures key factors relating to readiness usage and environment of the three of the most important stakeholders in ICT: governments, individuals and businesses (Kirkman et al., 2002).

Mobile / Internet index was published in 2002 by the ITU. It was created with the intention to examine the probability of acceptance of mobile Internet in various economies. However, its narrow area of interest does not provide any insights into the overall use and access to ICT. (ITU, 2002).

Orbicom InfoStates developed by ORBICO was presented in 2003 for the first time. The index provides systematic international measuring of digital divide between developed and developing countries and monitors the digital divide across countries at a given point in time and between economies over a given period. The index places special attention on monitoring developing countries. It arrives at the degree of a country's infostate, as the combination of infodensity and info-use. Infodensity refers to the ICT capital and labour stocks and their role in the productive capacity of an economy. It includes ICT networks, machinery and equipment, as well as ICT skills, indispensable for the functioning of information, knowledge-oriented societies. Info-use refers to the uptake of various ICTs by households, businesses and governments and the intensity of their actual use (Sciadas, 2003).

Digital Access Index (DAI) was published in 2003 in the first phase of the World Summit on the Information Society (WSIS). The index measures the overall ability of individuals in a country to access and use Information and Communication Technology. The Index is based on quantitative indicators. Countries are classified into one of four categories: high, upper, medium and low. The results can be used to identify a country's strengths and weaknesses. The DAI was built up on five fundamental factors that influence a country's ability to access ICT, namely: infrastructure, affordability, knowledge, quality, and usage this index included 8 indicators and was estimated for 178 countries in 2003 (ITU, 2003).

The main goal of e-participation initiatives is to improve the citizen's access and usage of public information and public services and promoting active participation of citizen's in public decision-making processes. The e-participation index (EPI) is a qualitative assessment which extends the dimension of UN E-Government Survey. The primary purpose of this measure is illustrative demonstrate how different countries are using online tools to promote interaction between citizen and government, as well as among citizens, for that reason should serve only as indicative of the broad trends in promoting citizen engagement. The index is created in 2003 and is derived from e-Participation Framework which comprises: e-information, e-consultation and e-decision-making. The first publication where index can be found is United Nations 2004

Global E-Government Readiness. For purposes of UN E-Government Survey 2014 the e-participation questions were carefully reviewed and expanded to reflect current trends and modalities in the sense of data publishing and sharing by government agencies as well as availability of information on the citizens' rights to access government information, providing the tools in order to obtain public opinion for public policy deliberation through social media, providing outcome on feedback received from citizens concerning the improvement of its online services, e-petition tools, e-voting tools, and online discussion forums (UN, 2014, p. 196,197).

The Digital Opportunity Index (DOI) is a composite index that measures *digital opportunity*, or the possibility for the citizens of a particular country to benefit from access to information that is *universal, ubiquitous, equitable and affordable*. The DOI is one of the two indices endorsed in the World Summit on the Information Society (WSIS) (2003) where is recognized an urgent need for improving the measurement capabilities for ICT investment, adoption and impact. The DOI used the core infrastructure indicators, which were the most widely available in all the countries. The index takes four categories and 11 indicators into account to measure the digital divide between countries. The DOI was applied to a group of 40 leading economies that are geographically and economically diverse (ITU, 2005).

ICT Opportunity Index (ICT-OI) was first published in 2005 by Information and Communication Union (ITU). This index is the result of the merger of the Digital Access Index (DAI) and Orbicom's InfoState conceptual framework and model. The prime objective of the ICT-OI is to identify the digital divide and to help understand how it has evolved since the beginning of this century. To adequately measure differences among economies with highly developed ICT levels, a more precise and qualitative indicators will be needed to measure access to and usage of ICT by individuals and households in its inclusive sense. The fundamental principle behind this is to interpret the notion of ICT access and usage within the context of the global information society, thus recognizing ICT opportunities as an important part of social development (ITU, Orbicom, 2005).

ICT Development Index (IDI) was created by Information and Communication Union (ITU) and first published in 2009. The Index combines 11 indicators into a single measure. The indicators are related to ICT access, use and skills, and literacy levels. The main goals of the IDI is measurement of: (1) the level and evolution over time of ICT developments in countries

and relative to other countries; (2) progress in ICT development in developed and developing countries; (3) differences between countries in terms of their levels of ICT development; (4) the extent to which countries can make use of ICTs to enhance growth and development. The first report compares developments in information and communication technologies (ICT) in 154 countries over a five-year period from 2002 to 2007. This index is still in use, thus the report for 2014 presents IDI values for a total of 166 economies based on 2013 data, and makes comparisons with 2012 (ITU, 2014, p. 9).

United Nations Statistical Commission (UNSC) at its meeting of 2007, introduced the Partnership core list of ICT indicators and recommended countries to use it in collection of data related to the expansion and use of ICT. The core list was originally composed of 41 ICT indicators, covering ICT infrastructure, ICT access and use by households and businesses, the ICT-producing sector and trade of ICT goods. The main purpose of the core list of ICT indicators is to help countries produce high quality and internationally comparable ICT statistics. Each indicator has associated standards and metadata, including definitions, model questions, classificatory variables, scope and statistical units (UNSC, 2007).

Since 1999, through its Working Party on Indicators for the Information Society (WPIIS), the OECD has developed statistical standards and comparable data on member countries and to the wider international community, covering a number of aspects of information society measurement. With the forum for national experts on ICT statistics, share national experiences and good practices for measuring information society in a comparable way across countries. The main outcome of this project is the OECD Guide to Measuring the Information Society first released in 2005. This guide is updated every two years to reflect changes in the information society. For measuring the expansion of ICT in households and by individuals, WPIIS has developed two models and another for measuring ICT use by business. WPIIS has also developed definitions of ICT sector and products, electronic commerce and ICT infrastructures and one model for monitoring ICT use by business (OECD, 2011).

E-government development index (EGDI) measure the willingness and capacity of national administrations to use ICT to deliver public services. The EGDI is a weighted average of three normalized scores on three indices: the online service index, the telecommunication infrastructure index and the human capital index. The online service index measures a government's capability and willingness to provide services and communicate with its citizens

electronically, telecommunication infrastructure index measures the existing infrastructure that is required for citizens to participate in e-government and the human capital index is used to measure citizens' ability to use e-government services. The index is based on an expert assessment survey of the online presence of all 193 United Nations Member States, which assesses national websites and how e-government policies and strategies are applied in general and in specific sectors for delivery of essential services (UN, 2014, p. 185-192).

Eurostat, the statistical office of the European Union, works closely with information society statisticians from its member states and other participating countries, to develop and run the annual Community survey on ICT usage in households and by individuals. This approach provides a detailed and highly comparable dataset on household and individual ICT statistics. Eurostat produces model questionnaires and methodological manuals dealing with measurement of ICT access and use by households and individuals (EUROSTAT, 2014).

In 2015 European commission has developed a new indicator of the economy and digital society the Digital Economy and Society Index (DESI). DESI is a composite indicator that summarizes over 30 relevant indicators of the development of Digital Europe and follows the evolution of member states under 5 main dimensions. The first dimension is *connectivity* which measures the deployment of broadband infrastructure and its quality. *Human Capital* is the second dimension, this dimension measures the users skills go from basic user skills that enable individuals to interact online and consume digital goods and services, to advanced skills that empower the workforce to take advantage of technology for enhanced productivity and economic growth. The third dimension is *Use of the internet*, which accounts for the variety of activities performed by citizens already online. By adopting digital technology businesses can enhance efficiency, reduce costs and better engage customers, therefore a fourth dimension included is *Integration of digital technology*. The last dimension comprises *Public services* such as e-government and e-health services. The DESI 2015 shows progressing towards a digital economy and society for both the European Union as a whole as well as individual Member States (EC, 2015).

11. E-INCLUSION

Development of information society is the priority in almost every country today. Governments take steps in order to provide all the citizens the possibility of full participation in all aspects of information society to. With all the efforts that have been made so far, all people still cannot equally benefit from all the advantages offered by the information and communication technology and the Internet due to economic, geographical and other limiting factors. Many studies conducted by now with the aim to establish the inequalities in possibilities of using ICT confirmed that ICT is not connected merely to economic variables, such as income per capita or access and utilization costs. It has also become a social problem today, unless an individual has access to ICT, he or she is condemned to social exclusion from society.

Aside from bringing new opportunities, new technologies also bring risks, such as those of creating even greater digital divide and weakening social cohesion. The advantage of new ICT and Internet technologies is that they are flexible, allow to be used in multiple ways and by different groups of people. Therefore, when designing new ICT and Internet technologies and tools, the developers of new technologies should consider the perspective of the people with risk of exclusion, regardless of the reason. This way, the risk of a digital divide is turned into digital cohesion, bringing the benefit of the Internet and related technology into all segments of the population, including people who are disadvantaged due to education, gender, age, ethnicity, disabilities. If the digital divide is not taken into consideration in the design process, the digital gap is ultimately increased which leads to more inequality and empowerment of those who have already benefited from the advantages of using ICT and the Internet whilst those lacking this opportunity move even further away from the information society.

To avoid this and similar scenarios, the European Union supported through the last two decades a number of strategies and numerous activities related to socially meaningful processes associated with achievement of an inclusive information society. Out of this stems the concept of e-inclusion. A concept opposite to e-inclusion is e-exclusion. In this study, the terms refers to those who do not want or are not able to use ICT and the Internet. The e-excluded are not a homogeneous group just as there are various reason why they are not using ICT and the Internet. The most common examples of e-exclusion groups are: those who live in areas without Internet access, those who cannot afford a computer or other means of Internet connection, those who do not have the knowledge or training in how to use a computer or to navigate the Internet, those who suffer from a physical disability or a cognitive impairment that makes it difficult or

impossible to connect to and use ICT and the Internet, as well as those linguistically excluded—those who do not know one of the major languages of the Internet and those content excluded—those who cannot find any content on the Internet relevant to them, those who suffer from discrimination, the older employee whose employer do not see benefits of ICT and Internet, those who think they do not have the time to use the Internet, those who think they are too old or otherwise incapable to learn how to use new technologies, those who do not see any benefit to them or any reason why they should learn how to use the Internet, those who do not want to be connected to the Internet.

According to the aforementioned examples, it can be concluded that e-exclusion is also very complex and requires deeper research as there is a variety of factors that impacts and causes e-exclusion. Likewise, these examples demonstrate that the e-excluded do not form a homogenous group. An e-excluded person may belong to several of the above groups.

Since this study is concerned primarily with the concept of e-inclusion, in continuation the concept of e-inclusion will be defined, the benefits of e-inclusion highlighted, and descriptions of the significant influencing factors on e-Inclusion and the identified categories of latent and manifest variables and attributes provided.

11.1. DEFINING THE CONCEPT OF E-INCLUSION

The term e-inclusion refers to information society which includes all citizens, defined as *information society for all*. The goal is to include each willing individual in the participation in information society with the goal to reap all the benefits offered by ICT. For this reason, e-inclusion can be seen as a vision of the future, or the vision of the 21st century.

E-inclusion may be approached in several ways. It can be seen as the promise to improve social inclusion through means of new technology and an opportunity to reduce social exclusion. As a societal imperative, it can help people keep up with technological developments. By reviewing the literature, it can be concluded that the research that is moving from the concept of *digital divide* to the concept of *e-inclusion* can mostly be linked to European researchers. This is due to a number of strategies and projects promoted by the European Commission in the last ten years which should ultimately result in greater social inclusion and increased opportunities and benefits that arise from it. Each of the strategies covered three basic segments: technology, expected benefits and interest groups. Among other things, the aim of almost all

strategies was to encourage regular users of ICT to move a step further. This entailed encouraging them to shift from the use of ICT solely for the purpose of communication (e-mailing and social networking), to the use of ICT for education, transaction activities such as the purchase of goods and services, internet banking, health services and the use of government services. Review of the strategy and declaration of the European Commission promoting e-inclusion is presented in Table 2.

As can be seen from the table above, through the years, the challenges in strategies that have been linked with the concept of e-inclusion were ensuring that all citizens would benefit from the Information Society, development of the knowledge based economy, sustainable economic growth with more and better jobs and employment opportunities, greater social cohesion, reduction of poverty and social exclusion, improvement of education and promotion lifelong learning, improvement of digital skills and digital literacy, achievement of progress in the use of e-services, promote networking, promote ICT and Internet as a driver of inclusion, quality of life and empowerment.

Table 2. European strategy for the promotion of e-inclusion

Strategy/Declaration	Location / Year	The main objectives of the Strategy/ Declaration
eEuropa –"an information society for all" (Communication on a Commission Initiative for the Special European Council of Lisbon, 23 and 24 March 2000) (Commission of the European Communities, 1999)	Brussels, 8.12.1999.	"…eEurope aims at bringing the benefits of the Information Society to the reach of all Europeans." Main objectives: "Bringing every citizen, home and school, every business and administration, into the digital age and online; Creating a digitally literate Europe, supported by an entrepreneurial culture ready to finance and develop new ideas; Ensuring the whole process is socially inclusive, builds consumer trust and strengthens social cohesion."
The European Council special meeting on 23-24 March 2000 in Lisbon (Digital Inclusion Initiative, 2000)	Lisbon, 23-24 March 2000.	The Lisbon strategy considers e-inclusion as one of the social dimensions of the development of the knowledge based economy; set the goal of the European Union's becoming the most competitive and dynamic knowledge based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion'; also agreed to make a decisive impact on the reduction of poverty and social exclusion by 2010.

Strategy/Declaration	Location / Year	The main objectives of the Strategy/ Declaration
The European Council on 23-24 March 2001 in Stockholm (The European Council, 2001)	Stockholm, 23-24 March 2001.	European Council focused on the development of more contemporary European model of competitive and dynamic knowledge-based economy; priority are related to the education and lifelong learning, improvement of digital skills and digital literacy, achievement of progress in the use of e-services (e-commerce, e-government) and creating conditions in areas such as network security and data protection and privacy.
Councils meeting in Nice 2001.[http://www.epractice.eu/en/ factsheets]	Nice, 2001.	In the Councils meeting specific criteria were set out, together with a requirement that each Member State produce a biennial national action plan on social inclusion.
eEurope 2005 Action Plan – "An Information Society for all" (Commission of the European Communities, 2002)	Seville, 21-22 June 2002.	Key targets of the first eEurope 2002 Action Plan: (1) Connecting public administrations, schools, health care to broadband; (2) Interactive public services, accessible for all, and offered on multiple platforms; (3) Provide online health services; (4) Removal of obstacles to the deployment of broadband networks; (5) Review of legislation affecting e-business; (6) Creation of a Cyber Security Task Force. This Action Plan primarily focusing on thematic domains: (1) e-government; (2) e-learning; (3) e-health and (4) e-business, e-commerce and cheaper internet access, safer networks and digital skills remained important points of attention.
Ministerial symposium on e-inclusion April 2003., Greece (Ministerial Symposium, 2003)	Crete, Greece 11. April, 2003.	Ministers discussed ways to make the Information Society open, inclusive and accessible to all European citizens. The Ministerial declaration, which concluded the symposium, emphasis a commitment to promote networking and exchange of experience between the Member States.
eInclusion revisited: The Local Dimension of the Information Society (Commission of the European Communities, 2005a)	2005.	Evaluation of e-inclusion – „analyze how the situation has evolved from 2001 to 2003; address the key components of e-inclusion, as well as the processes of technology appropriation which can lead to enhanced social inclusion; solutions and ways for eInclusion and local development / regional cohesion to combine successfully"

Strategy/Declaration	Location / Year	The main objectives of the Strategy/ Declaration
i2010 - European Information Society 2010 (Commission of the European Communities, 2005b)	2005.	It promotes an open and competitive digital economy, focusing on ICT as a driver of inclusion and quality of life. Policy objectives are developed around: (1) creating a single information space; (2) increasing EU investments in ICT research and (3) promoting an inclusive European information society. Inclusion as contextual setting socio-cultural issues and their balance and as a matter of motivation and active empowerment.
Ministerial Declaration, 11. June 2006, Riga 2006. (European Commission, 2006)	Riga, 2006.	Main objectives: „definition of the concept e-inclusion; achievement of the objectives of the i2010 policy; with strategy of e-inclusion improve motivation and confidence of users of ICT through ensuring better security and privacy protection; e-Inclusion policy aims at reducing gaps in ICT usage and promoting the use of ICT to overcome exclusion, and improve economic performance, employment opportunities, quality of life, social participation and cohesion“
e-Skills for the 21st century: fostering competitiveness, growth and jobs (Commission of the European Communities, 2007)	2007.	Underlines importance of acquiring and improvement e-skills and in what way contributes the strategy of e-inclusion.
The Europe 2020 Strategy – “A strategy for smart, sustainable and inclusive growth” (European Commission, 2010a)	2010.	The smart growth refers to developing an economy based on knowledge and innovation, sustainable growth aims at promoting a more resource efficient, greener and more competitive while inclusive growth should foster a high employment economy delivering social and territorial cohesion.
Digital Agenda for Europe (European Commission, 2010b)	2010.	Is one of the seven initiatives of Europe2020 and aims to define the role that information and communication technology must play for achieving the objectives of Europe for 2020.
ICT 2015 - Innovate, Connect, Transform (European Commission, 2015b)	Lisbon, 20-22 October, 2015.	A policy conference presenting the best results and impact of most recent EU ICT Research & Innovation and new Commission's policies and initiatives on Research & Innovation in ICT.

Source: made by the author

Initially, groups of individuals identified as interest groups in the strategies of e-inclusion were groups which were considered to have a potentially greater risk to be socially excluded due to non-use of the ICT, such as people with disabilities, elderly, persons belonging to national minorities, and immigrants. The objectives of further strategies has started to focus on society in general, on all individuals who could be excluded from the information society or who, for whatever the reason, could not benefit in any way from the all the advantages of the information society. This refers to various segments of population, such as people with low income, lower education level, the unemployed, people living in isolated rural areas etc.

While the main objectives of e-inclusion strategies nowadays aim at removing the structural disparities within the group of people included in information society which were caused by different degrees of ICT appropriation, the homogeneity of skills among individuals and social groups and the progressive sophistication in use (DiMaggio, Hargittai 2001; Molnár, 2003; Levitas, 2005; Mossberger et al., 2008; EC, 2009a). The first document of the European Commission eEurope initiative related with e-inclusion concept was published in late 1999. The document is specific because of its main objective which is: „bringing every citizen, home and school, every business and administration, into the digital age and online communication“ (CEC, 1999). In 2000, the Lisbon strategy included the objective to ensure that all citizens are capable of living and working in an information society. As a part of the Lisbon strategy, the eEurope action plan contained an e-inclusion action line directed at enhancing a *design for all* and public Internet access points (Digital Inclusion Initiative, 2000).

In 2001, European Commission adopted the definition of the concept of e-inclusion as a twofold approach: (1) preventing digital exclusion and (2) exploiting new digital opportunities for a better inclusion of socially disadvantaged people or groups, or less-favored areas (EC, 2001). eEurope 2005 strategy devotes special attention to areas such as e-government, e-health and e-learning as well as e-skills and digital literacy (CEC, 2002). In June 2005 the i2010 EU initiative1 was launched. This five-year strategy i2010 - European Information Society 2010 managed by Directorate-General for Information Society and Media of the European Commission, aimed at developing digital economy, creating a single information space, fostering innovation and investment in research and technological leadership in the EU. i2010 EU initiative can be seen as a revised Lisbon strategy for growth and jobs. The most important in i2010 EU initiative was the third pillar of the program i2010 which introduces the field of

inclusion, *better public services and quality of life*, which is crucial in creating inclusive e-society (CEC, 2005). With the Riga Ministerial Declaration in July 2006, 34 European countries set quantitative targets which collectively constitute a promise of progress towards e-inclusion in Europe. The target groups at which this declaration was primarily focused are: people with disabilities, women, people from less developed regions, marginalised young people, unemployed, older people, immigrants and people with lower education. The European Commission set under The Europe 2020 Strategy, – "A strategy for smart, sustainable and inclusive growth" the flagship Initiative: "A Digital Agenda for Europe". The key objective of the "Digital Agenda for Europe" is to deliver sustainable economic and social benefits from a Digital Single Market based on fast and ultrafast internet and interoperable applications, with broadband access for all by 2013, access for all to much higher internet speeds (30 Mbps or above) by 2020, and 50% or more of European households subscribing to internet connections above 100 Mbps. (EC, 2010, p.12).

Many identify the term e-inclusion with the term e-government, but in the report made by the United Nations in 2005, "From e-government to e-inclusion", it is cited that e-inclusion exceeds the term e-government and can be defined as the use of modern information and communication technologies as well as the Internet for solving problems connected to differences in approach, inclusion and promotion of the possibilities of economic and social strengthening of the citizens. The same report emphasizes that implementation of the process of e-inclusion depends considerably on politics conducted by the government of a specific country in the sense of realization of the following goals: including all groups and individuals in the information society, efficient and transparent offering of services to the citizens, strengthening people by providing access to all relevant information, efficient managing of information for citizens, promoting consciousness among the citizens about the importance of inclusion in the information society, and creating social and cultural consensus. This makes obvious the fact that e-inclusion is about providing the same opportunities for participation in e-society to each individual which results with advantages in the sense of greater income, better employment and other aspects of the society. As well as that, e-Inclusion should not be reduced to terms such as *e-redlines* and *digital divide* which observe ICT from the technological aspect of access and usage only while neglecting the most important one, the social impact of the differences in ICT use among different socio-economic groups of people and individuals.

There are different ideas, and through the years, the term *e-inclusion* has been defined in different ways, but essentially it refers to the inclusion of all citizens in the *information society* ensuring that they all benefit from it by having equal access to the social and economic opportunities of the 21st century and can use the latest technology in everyday life for work, entertainment, leisure, learning, etc. According to eInclusion@EU (2007), the definition of the term e-inclusion must comprise the three essential dimensions of social inclusion: digital disadvantages, digital opportunities and digital empowerment. European advisory group says that e-inclusion in its core represents social inclusion in the knowledge society, and one can conclude that the degree of access to ICT represents an important prerequisite for strengthening individual capabilities in participating in different social areas. This produces a more accurate definition of *e-inclusion* proposed by the eEurope Advisory Group (Kaplan, 2005): "e-inclusion refers to enabling participation of individuals, community and economics in all dimensions of society based on the knowledge with help of ICT, in the manner that the barriers of access and accessibility are removed and social benefits of such access are exploited". E-inclusion refers to degree in which ICT contributes to equalization and promoting the participation of individuals in society on all levels (ie. social relations, work, culture, political participation etc.).

The year 2006 represents a turning point in understanding and monitoring e-inclusion concept. With the Riga Declaration, the European policy switches from the objective of increasing the capacity of accessing information and communication technologies (ICT) to the utilization of the technology for achieving the social inclusion objectives (EC, 2006). The Ministry Declaration from June 11, 2006, signed in Riga by the ministers of European Union countries defines *e-inclusion* as: "*eInclusion* means both inclusive ICT and the use of ICT to achieve wider inclusion objectives. It focuses on participation of all individuals and communities in all aspects of the information society" (EC, 2006, p. 1). The extended version of e-inclusion definition sets the focus on empowerment and participation of each individual in information society.

The Riga Declaration has identified six relevant themes for *e-inclusion* (EC, 2006): *e-accessibility, e-ageing, e-skills, socio–cultural e-inclusion, geographical e-inclusion and promotion of an inclusive e-government*. The term *e-accessibility* implies the accessibility to ICT technologies by all categories of people. *E-ageing* deals with ensuring the possibility to improve the quality of life and to be actively involved in all social and political activities for

elderly people. With part of Riga Declaration that refers to *e-skills* ensuring to all citizens the necessary level of education and digital skills. Facilitation of the social integration of minorities and immigrants through access and active usage of ICT and the Internet ensuring the themes related to *socio–cultural e-inclusion*. Finally, *geographical e-inclusion* and promotion of an inclusive *e-government* refers to the empowerment of individuals providing more accessible, user centered and diversified services and stimulates democratic participation of the citizens which are becoming not only observers, but also active creators of new social and technological systems. According to all the definitions created by the European Commission, it can be concluded that the European Commission conceives e-inclusion as a solution for reducing gaps in ICT and the Internet access and usage and as a driving forces for improvement quality of life and social participation for all individuals (EC, 2010). But if this were so, it would mean that all citizens have access to: (1) hardware, software and connectivity to the Internet; (2) meaningful, high quality, culturally relevant content in local languages; (3) creating, sharing and exchanging digital content; (4) educators able to use digital tools and resources; and (5) high quality research on the application of digital technologies to enhance learning. Among others, all this requires collaboration among different fields, which include politics, economy and education (Solomon, 2002; Selwyn, 2004a; Resta and Laferriere, 2008). The greatest problem is, how to reach these goals, considering that nowadays the technological innovation constantly creates new gaps, and continuously generates new professional and social requirements which are difficulty achievable for the majority of population. The last element of e-inclusion which should be taken into consideration when defining this term relates to its alterable nature as e-inclusion acts like a moving target. This characteristic results from the fact that e-inclusion is fast developing together with the process of technological innovation (Codagone, 2009). ICT is the factor of change, but also the subject of the sole change which is shaped and reshaped by the user in all its segments. Therefore both the definition as well as the concepts and means of monitoring e-inclusion have to simultaneously change with continuity.

11.2. CONNECTION BETWEEN E-INCLUSION AND SOCIAL INCLUSION/EXCLUSION

In the social sciences, inclusion refers to a process of including people in a given social structure, most often, in society at large. Social inclusion implies people are economically secured, active members of society and active parts of social networks. Social inclusion is a social process, related to a goal which relies on three main dimensions (EC, 2004c, p. 10): “(1)

overcoming the disadvantages resulting from social inequalities in order to avoid exclusion processes; (2) harnessing the opportunities offered by the targeted societal goals, in order to reduce existing inequalities and improve the quality of life in society; and (3) fostering participation and empowerment in upcoming societal processes in order to improve individual and collective expression, civic commitment and democratic participation". In contrast, exclusion occurs when individuals or social groups are left behind or do not benefit from equal opportunities to achieve societal goals. According to Empirica (2006), the term exclusion involves the concept of being deprived of the economic and social capabilities and opportunities to participate in society. Power and Wilson describe social exclusion as the inability of our society to keep all groups and individuals within the reach of what we expect as a society (Power and Wilson, 2002). Social exclusion is also a social process, built on social inequalities and leading to the marginalisation of individuals and groups as regards to societal goals. Social inequalities are related to a series of factors and indicators such as: gender, ethnicity, age, low income, low educational attainment and lack of skills, no access to education and learning opportunities, long-term unemployment, labour market exclusion, professional status, housing status, family structure, poor health and low quality of environment, disability, infrequency of social contacts, geographical location, etc. (Atkinson, Marlier, Nolan, 2004; SEU, 2005; Wong, at al., 2010; Molina, 2001).

There is a considerable body of research to demonstrate that social inclusion/exclusion are complex and multi-dimensional (Bradshaw et al., 2004). Inclusion/exclusion can be defined in relation to a goal. In case of *e-inclusion*, it is the participation in the information society. Contrary to that, the inability to participate in the information society, is digital exclusion or e-exclusion. The research findings by Li and Ranieri (2013) examining educational and social correlations of the digital divide for rural and urban children in primary schools in China confirm that in a world where access to information and knowledge is an indicator for measuring wealth and development, exclusion from electronic networks within which goods and services circulate may generate dramatic forms of social and cultural exclusions (Li and Ranieri, 2013).

State governments play a great role in that process because people are particularly weak because of their socio-economic and cultural background so governments should play a fundamental role in providing them with the necessary support and opportunities. That is recognized by the European Union, and hence this term was taken in the late 80's of the 20th Century as a key concept for creating social policies and strategies. In the context of the European policy, the

term social inclusion/exclusion tends to be used to frame individual life chances and circumstances. The European Commission identifies ten risk factors of social exclusion (CEC, 2001): monetary poverty; unemployment and quality of employment; education; the family situation; disability; health problems and difficult living conditions; housing conditions and neighbourhood disadvantages; immigration; ethnicity; racism and discrimination.

According to Centre for Economic and Social Inclusion (2002) social inclusion is defined as: "the process by which efforts are made to ensure that everyone, regardless of their experiences and circumstances, can achieve their potential in life. To achieve inclusion, income and employment are necessary but not sufficient".

An inclusive society is also characterised by a striving for reduced inequality, a balance between individuals' rights and duties, and increased social cohesion" (Centre for Economic and Social Inclusion, 2002). It is usually the case that the same individuals and groups that are at risk from social exclusion in general are just as likely to be excluded from the information society. In the context of social inclusion/exclusion, e-inclusion can be viewed as a social movement which aims to reduce social exclusion by means of ICT and inclusion of people in the information society. One of the contributions of e-inclusion projects is the framework created by SIBIS working group in 2003, are the steps of inclusion in the *information society*. Through this framework, among other things, researchers tried to investigate the relationship and impact of ICT and social inclusion / exclusion.

From this framework, a continuous perspective of inclusion in the *information society* can be seen. ICT, according to this framework, is perceived as a tool of great opportunities – a tool which can improve the position of those who are vulnerable or disadvantaged in relation to others. It is believed that its application can solve deep-seated problems of social exclusion, as well as act as a flexible tool that can be adapted to the needs of different types of policies attempted to be applied. From the framework it can be concluded that ICT can be see as the technology that enabling sustainable social inclusion and participation opportunities for the maintenance of social contacts and obtaining all relevant public information and services through various types of networks and communications channels.

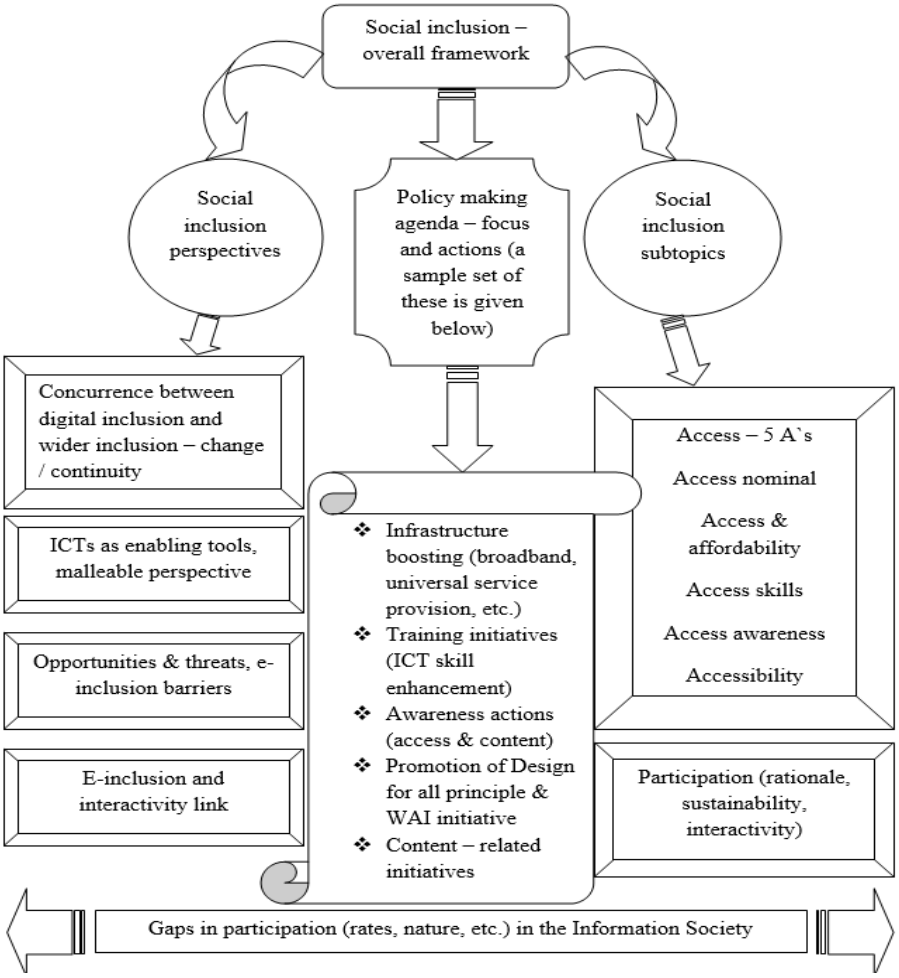


Figure 2.Overall framework - social inclusion/exclusion
Source: Adjusted according to (SIBIS, 2003)

As with each technology, ICT can be seen as a possibility but also as a threat of even greater social exclusion. Among other things, ICT enables the foundation of the so-called "virtual world", an unreal world for individuals who are prone to isolation and could lead to total social exclusion in the classical sense. That has been confirmed by Nie, et al. (2002) who state that Internet use increases social interactions only for people rich in social capital, while on the other hand for people who have few friends, Internet use tends to strengthen social isolation.

Numerous socioeconomic ICT research in the field of economics, e-government, e-work, ICT in education and life-long learning and e-health confirm that ICT significantly enhances employability, increases access to education and training, enhances labour market information and thus reduces frictional unemployment, and improves people's ability to draw on public services. ICT also has the potential to improve access to the health system and necessary health information and thus improve preventive treatment and healthcare delivery. It can also be used

to sustain social networks, build communities and increase political participation. Hereby an important role is given to education, which should promote e-inclusion and creating the necessary e-competences (Hatlevik and Christophersen, 2013; Salinas and Sanchez, 2009) and thus reduce social exclusion and increase social capital which, in this context, can be understood as an approach, a possibility of use and desire to use technologies.

In his studies, Castells proves the strong connection between e-exclusion and social exclusion by using in his measurements criteria such as demographic characteristics, social-economic status and geographic area. In the process, he states that e-exclusion is one of the most damaging forms of social exclusion (Castells, 2001). Selwyn and Facer have come to similar notions in the research called "Beyond the Digital Divide – Rethinking Digital Inclusion for the 21st Century" in which they say that, in the 21st century, ICT possesses a series of integral roles in people's lives. Some of these roles are: communication, purchase of goods and services, education, employment, participation in political and cultural events, entertainment and leisure, which in the end leads to social inclusion (Selwyn and Facer, 2007).

Summing up the rest of the studies which prove the connection between e-inclusion and social inclusion/exclusion, one can conclude that, for young people, e-exclusion means lesser chances of getting top-quality jobs on the global market of labour force, while for adults and parents e-exclusion can be the cause of financial insecurities (unemployment) and limited access to information, advice and support, For the elderly, the disabled and the rest of other marginalized groups, e-exclusion means that they are also withheld from equal participation in the society together with the rest of the members of the community, independent life, work and that they are, in larger proportion, exposed to social isolation (Isaila, 2012; Wolske, et al., 2010; Kidd, et al., 2009). This all suggests that is of great importance for each national economy to implement means to achieve all relevant goals associated with e-inclusion because research conducted so far suggests that e-exclusion of a great number of citizens in a community results in many social problems.

11.3. BENEFITS OF E-INCLUSION

Most people would agree that the ability to use information and communications technology and the Internet is a prerequisite for living in *information society*. The digital revolution which is happening nowadays is opening up a whole range of opportunities for people. Everyone

agrees that ICT and the Internet are one of the greatest innovative achievements of our civilization, but the full breadth and depth of the digital revolution goes far beyond online surfing – it influences almost every aspects of people's lives, all organizations, all nations and all parts of society. The benefits of e-inclusion are multiple, and are reflected in improved outcomes in education which is finally positively reflected in simpler and better employment, improved outcomes concerning the health care due to simpler access to information and health services and reduced costs for health services and decrease in number of users who need such services, increase in efficiency and savings in public services, savings in time, simpler and cheaper connection and communication and potential advantages for consumers due to the possibility of cheaper purchase of products and services (Pricewaterhouse Coopers, 2009; Digital Inclusion Initiative, 2000). The "Study on Inclusive Innovation for Growth and Cohesion: Modelling and demonstrating the impact of e-Inclusion", which was prepared for the ministerial conference on e-Inclusion held in Vienna in 2008, provided evidence on direct and indirect economic and social benefits of e-inclusion. Creators of this study have proved that e-inclusion, through empowering individuals and communities, is one of the key elements of sustainable economic growth and development (Codagnone, 2009). The benefits that e-Inclusion brings can be categorized into: economic, social and individual benefits.

11.3.1. Economic benefits

E-inclusion contributes to more competitive and growing economy, which brings advantages for both citizens and companies and for economy as a whole. From the standpoint of the individual, people are able to find better jobs, earn higher incomes, and provide a better life for themselves and their families (Madon, 2000; Tas, 2011; Paterson, 2011; Bankole, et al., 2011). From the aspect of companies, e-inclusion enables them to find qualified workers, reduce costs, and by offering their products and services online, increase the sales which is a prerequisite for success and survival in today's "digital economy" (EC, 2007). In a strictly economic view, as a concept, e-inclusion has been seen as an important mechanism of digital economy which helps in the integration of workers and employers in labour market. E-inclusion contributes to the development of new organizational models as well as new models for production and provision of services within companies by enabling better coordination and automation of certain production and service processes (Fornefeld et al., 2008). When the workers are in a position in which they can actively use ICT and Internet tools in the workplace they can contribute to a faster development of new innovative solutions, greater efficiency, greater flexibility and

stronger customer relationships, all of which ultimately generates competitiveness and growth. ICT and digital skills offer workers much more opportunities for job mobility which is nowadays in the digital economy an important driver of innovation and growth. Slightly discouraging, however, is that according to the OECD study for 2013 only 39% of individuals in the EU labour force judged their computer skills to be sufficient to look for a job or change a job within a year (OECD, 2014, p. 88).

When we talk about new forms of work that enable e-inclusion, telework is the fastest growing mode of "travel" to work, and millions of workers are able to choose this option because an increasing number of companies in the world decide to this form of work. Larger e-inclusion contributes to the development of new models for commerce, trade and provides opportunities for digital business. Electronic commerce gives businesses and consumers in rural, remote and hard to reach areas an opportunity to access markets around the world (Pilat, 2004; Hyytinen, Pajarinen, 2005). E-inclusion expands the number of consumers and increases opportunities of consumers in the electronic marketplace, and thus stimulates digital economy and eventually also contributes to the overall economic growth (European Commission, 2009b). Information and transparency are prerequisites for good functioning of the free global world market and ICT and the Internet in the present time can provide both.

An interesting trend which is associated with e-inclusion is the increasing importance of corporate social responsibility. E-inclusion contributes to more effective use of limited resources for both companies and government, multiplying the reach of experts and professionals beyond their normal geographic area of influence. Implemented e-inclusion projects in the field of e-government, which encourages governments to develop advanced online services, make public administration more efficient and cost acceptable, and for the citizens more accessible (UK online centres, 2009). E-inclusion can influence on the reduction of costs of social and care systems (Gaddi, Capello, 2014). Likewise, projects of e-inclusion which were conducted in areas with a lack of basic infrastructure for Internet access, such as remote areas, isolated rural areas or less populated areas, have resulted in an increased spending on new telecom infrastructure. However, this increased productivity and employment potential of the local economy which finally brought greater benefits for individuals as well as for the community.

Promoting e-inclusion brings significant benefits and opportunities especially in the ICT sector market. It is confirmed that the industries that are closely connected with e-inclusion such as

telecommunications (like Nokia, Ericsson, Simens), media and online services, directly contribute to economic growth (Codagnone, 2009). The European Commission also clearly emphasizes the economic benefits of *e-inclusion*, ‘‘the impact on European industry is clearly positive: apart from civil work for networks which has a direct impact on local employment, sales of network equipment will also benefit global European suppliers, as well as telecoms or satellite operators, and areas with advanced broadband connections will see an increase in demand for products and services’’ (EC, 2009). Economic benefits translate e-inclusion into social and cultural benefits because they provide people/communities with new products and services and faster, easier and less expensive delivery of existing products and services. Among the economic benefits cited for e-inclusion are the following: “The European Commission (2007) has said, initial estimates indicate that benefits from e-inclusion in the countries of the European Union could be in the order of €35 to €85 billion over 5 years. Some have estimated that broadband Internet connection is expected to create 1 million jobs and boost the EU’s economy by €850 billion between 2006 and 2015“ (Fornefeld, et. al., 2008). To take full advantage of the economic benefits that e-inclusion offers, countries must be led by governments that recognize ICT and the Internet as a major driver of growth, innovation and economic development, and which are ready to make an effort and set up ambitious ICT targets and take all measures for their achievement.

11.3.2. Social benefits

In digital revolution era, a large number of people are empowered by new ICT and Internet tools making society as a whole more dynamic and cohesive. The society is becoming increasingly networked and ICT and the Internet serve as one of the primary and critical forces for shaping society structures. Therefore, social power in today's digital era is increasingly related to the abilities to use new forms of ICT (Selwyn, 2004b). On the other hand, inequality in the use and application of ICT and the Internet is nowadays a potentially significant new driver of social exclusion which can potentially accelerate existing social divides and create new ones (UK online centres, 2008). In countries where the policy initiatives were designed to promote e-inclusion, which means a high level of ICT and the Internet use by the citizens, have been minimize this risk. In such countries the risk of social exclusion is replaced by social cohesion that stems from active citizenship and a strong culture participation (Isaila, 2012). By using ICT and the Internet, people can express themselves, live, learn, create and work in a completely different way and in a completely different environment - the so-called *virtual environment*, which greatly contributes to the creation of one inclusive society. The use of ICT

and the Internet allows people simpler, easier and cheaper way to create and maintain contact with communities, family and friends and thereby prevent or reduce the risk of isolation and social exclusion. It also contribute to an increase of social capital (Shklovski et al., 2006; Penard, et al., 2011) which is important for all people, but mainly for the disabled and people with special needs. ICT and the Internet can dramatically increase their integration in the society by providing tools for overcoming the motoric, perceptual or cognitive difficulties that make this participation difficult (Martinengo, Curatelli, 2009). A good example is research conducted by Martinengo and Curatelli (2009) in which they conclude that activities that are correlated to the use of ICT tools are very useful for children with motoric disability due to cerebral palsy in the logical-linguistic field. It helps them not only by providing leisure and aid scholastic learning, but also to improve motor and visual coordination. Selwyn (2004a) characterises the benefit from the use of ICT and the Internet as leading to social and self-understanding benefits, interaction benefits and task-orientated goals. Under self-understanding benefits he implies, for example, increased access to ongoing social and political affairs or health information, interaction benefits, increased connectivity and social support, while under task-orientated benefits Selwyn entails financial management, telework, travel, shopping etc.

Through numerous positive examples, it has been proven that e-inclusion brings great social benefits, especially to those with lower incomes, people with low levels of education, the unemployed, older people or those remote from physical distribution points of public services, and other currently excluded communities and groups. Those who are disadvantaged, in one way or another, are arguably those who would benefit the most from electronic public services, presuming that they were familiar with ICT and the Internet. But the most common problem is that such persons also appear to be the least likely to use ICT and the Internet for access to public services via electronic channels. Therefore, one of the basic government tasks in implementing active policies and strategies of e-inclusion is to recognize such people and provide them with assistance in their socialization and integration into information society (Hanna, 2011). Active participation in the information society for such a group of people would result in improvement of social relationships, improvement of job possibilities and, in general, in active participation in all other spheres of society. Through the years, The European Commission has, in many strategies, emphasized the importance of ICT and the Internet and the potential of social inclusion of the most sensitive society groups such as the elderly (called *e-ageing*), disabled persons (called *e-accessibility*), ethnical minorities, and/or those living in remote regions (and are subject to the *geographical digital divide*) in areas such as civic

participation (*e-government*) and public welfare *(e-health*). E-services for these groups of people in the areas mentioned could generate many direct and indirect social benefits. Indirect benefits refer to the quality of service which can be improved due to government to government (G2G) process optimization, back-office integration, and other activities that support coordination and delivery. While almost all such indirect benefits have been previously mentioned, the direct benefits of ICT to the individual depended on the existence of match between supply and demand which can greatly contribute the government's proactive e-inclusion policies.

11.3.3. Individual benefits

Rapid diffusion of ICT and Internet applications in today's digital era brings multiple individual benefits for those who are part of the information society. A major role in the utilization of all these benefits play mechanisms for e-inclusion. From the literature review, individual benefits of e-inclusion can be classified into several categories (UK online centers, 2008; Codagnone, 2009): (1) improved access to information and dissemination of information; (2) improved opportunities for education; (3) facilitation of employment, improvement of working conditions and salary prospects; (4) improved opportunities for social interaction and communication; (5) improved supply of commercial and public goods and services; (6) improved opportunities for saving time and money; (7) improved opportunities for entertainment and leisure; (8) improved opportunities for identity formation and psychological development; (9) improved opportunities in health and social care; (10) improved opportunities for cultural understanding. In terms of access to information and the dissemination of information, e-inclusion brings users opportunities to be constantly up-to-date and informed, rapidly and efficiently reach all the contents needed in a given moment and at a given place - at home, at work, on the move… In other words, anytime and anywhere.

ICT and Internet tools enable information to be collected, organized, and presented in near real time so that users can make the right decisions at the right time, while real-time language translation software is now letting users in much simpler and easier way access information in languages other than their own. Accurate and reliable information is nowadays of major importance for successful functioning to almost every person. Therefore, each new improvement of the ability to obtain or access information can be seen as a great benefit to society. The possibilities of ICT and the Internet are reflected in fast and easy dissemination of information and making information available to a large number of people. In this sense, ICT

and the Internet can be seen as a useful tool to promote and encourage freedom of speech by increasing the ability of individuals to exchange ideas and opinions and inform and influence others, which can be considered as a great benefit of e-inclusion for the society as a whole. However, for people that do not have access to ICT and the Internet, or who cannot afford it, today's digital divide may become tomorrow's social-exclusion.

New ICT and Internet applications can also be a stimulating and engaging medium in the form of e-learning for learning, acquisition of knowledge and exchange of experiences, especially for people in remote areas or those who want to further their education but cannot afford enrolling in the school system. Research in this area proves that people are often more motivated by e-learning and encouraged to conduct greater independent study. A growing array of educational software applications and the use of social media applications offer opportunities for lessons to be individually adjusted to the student's needs in ways that the classic way of teaching never could (Svendsen and Mondahl, 2013). In his empirical research Van Dijk (1999) proves that the usage of ICT and the Internet has positive effects on learning and cognitive development through interactive learning styles, by supporting new multimedial ways of presenting information. IT is putting a variety of possibilities at people's finger tips, such as enabling Croatian students to access Oxford University course materials online.

All the above mentioned possibilities eventually contribute to increase in employability and salary prospects of individuals in the world of work. The opportunities for a satisfactory working life are reflected in an important ICT trend, nowadays termed e-business. The concept of e-business comprises broadband connection between different enterprise premises, videoconferencing, remote training and other forms of home-based or mobile based teleworking. According to Dyson (1997), ICT and the Internet offer self-fulfillment and self-achievement which can be realized through working activities which enable people to exploit their talents and education and enables them to redefine their work as they see fit. New features and performance of ICT greatly change the of meaning of the term "be at work". A major role in employment nowadays play the necessary skills that one must possess for the use of ICT, the so-called e-skills or digital skills. For individuals, lack of e-skills and low digital literacy can affect life chances including educational and employment opportunities. According to research of Department for Education and Skills (2002) 60% of existing and 90% of new jobs require ICT skills. People who are ICT-literate, in principle, stand a better chance in the job market. In turn, job vacancies are increasingly advertised on the Internet. In this respect, European e-skills forum (2004) emphasizes that e-Inclusion is crucial and to a large extent can help each

individual realise their full potential by empowering them. Through different types of social (Facebook, Twitter, etc.) and professional networks (such as LinkedIn) people can establish social connections but also accessed job seekers and enterprises around the world. ICT skills enable effective job searching, increase employability and business start-up (Codagnone, 2009). According to Drever and Hoffmeister (2008), the extent to which an individual is able to establish diverse social connections can be an important factor in their successful incorporation into the labour market. A large number of researches have confirmed that a large portion of workers find jobs through various social networks. Enhanced employability and salary prospects could include greater self-sufficiency from the state, improved financial security and greater quality of life for an individual. Slightly discouraging is that, regardless of the number of strategies adopted by EU countries related to the acquisition of ICT and digital skills, according to the study of OECD for 2013, more than 60% of the EU labour force reported their computer skills as being insufficient to apply for a new job (OECD, 2014, p. 88).

Social relations are very important for the functioning of individuals and society as a whole. Through different types of social networks individuals have an opportunity to establish new or enhance old contacts and create and maintain connections with various social groups and organizations (Osatuyi, 2013; Chung, 2013). *Telepresence* enables people from around the world to virtually meet other people with similar interests, needs or problems and help each other by actively sharing their knowledge and experiences that previously could only happen in face-to-face meetings. Among other, specialized ICT and Internet communication tools allow one-to-one, one-to-many and many to-many types of communication and all that much easily and cheaper. ICT and the Internet are a powerful tool helpful for individuals to engage in collective behavior and form social movements (Ali, 2011; Conroy, Feezell, Guerrero, 2012; Pereira, Rocha and Poplin, 2012). ICT and the Internet also play a considerable role in simpyfing interactions between citizens and public authorities thanks to the digitalisation and automatisation of many processes. The overall share of citizens that use ICT and the Internet to perform administrative procedures has increased in recent years. However, still not sufficiently, which is confirmed by the OECD report for 2014 which states that, on average, only 35% of users in OECD countries use e-government services (OECD, 2014, p. 94).

In order to satisfy the wishes and needs for products and services, e-inclusion provides great benefits for consumers in terms of access to information about products and services from any part of world, as well as the possibility of purchasing them. ICT and the Internet offer consumers access to global network of suppliers and in this manner, expand the degree of

consumer choices. With a wide range of search engines and price comparison sites, consumers can also reduce the time and cost spent finding goods and services. Increased capacity for consumers to find and compare products not only increases efficiency of matching customers and sellers, but also drives up price competition which can also lead to significant monetary savings. Research conducted by the OECD shows that today, on average, 47% of customers in OECD countries decides to buy products or services online, up from 30% in 2007. It is expected that in future this trend will continue because at the present time this way of purchase already replaced traditional distribution channels for some categories of products and services (OECD, 2014, p. 90).

One of the main goals of ICT and Internet services nowadays is to satisfy the necessity of people for entertainment. For the purpose of entertainment various forms of services and tools are available from on-line gaming, portable consoles, MP3 players, social networking (YouTube, Facebook, SecondLife) to watching movies, listening to music, sharing and trading pictures, stories, drawings, software, music, videos, visiting museums, watching theatrical performances, searching for travel destinations, visiting forums in order to collectively practice hobbies and etc. According to Turkle (1995) and Rheingold (2000), ICT and the Internet can have positive effect on identity formation and psychological development by allowing people to experiment with alternative identities, to reveal aspects of themselves in relative anonymity which they would not reveal in real life, and to expose themselves to a very broad variety of views and opinions. E-inclusion greatly contributes to cultural connections and understanding which ultimately contributes to the overall cohesion in a a country and in the world.

According to Ess and Sudweeks (2005), the Internet can promote a better understanding between cultures and cultural identities by enabling people from different cultural backgrounds and with different social and cultural identities to come together and communicate with each other under conditions that are conducive to cultural exchange. Due to the high availability of information that ICT and the Internet provide, people can also share knowledge, explore and better understand other cultures. In other words, ICT and the Internet contribute to the creation of an umbrella cosmopolitan culture which is necessary for communication among people from disparate cultures (Hongladarom, 1999).

One of the most outstanding benefits of e-inclusion is in the field of health and social care. Thanks to ICT and Internet tools, doctors can remotely assist or monitoring vital parameters of patients anywhere and anytime. The so-called *assistive technologies*, supported by ICT and the

Internet, play an important role in health care. *Assistive technologies* for the elderly, disabled people and for people with special needs include affective computing, memory assistance, robotics, ambient intelligence and sensors, ICT for physical and cognitive training, brain-computer interaction or more generally neuro-ICT interfacing, navigation systems, speech, sign and movement recognition, ICT for modelling and simulation of users and their interaction with devices, ICT for social networking, automatic language translation, collaborative creativity, alternative communication environments and virtual worlds. *E-health* and a large number of aforementioned *assistive technologies* which are already available are the response to critical social challenges at significantly reduced social cost (Eccles, et al., 2013). Many studies have researched the benefits of ICT and assistive technologies for the elderly, disabled people and for people with special needs. Such technologies enable such groups to reach autonomy, dignity and opportunities for independent living (Loader, Hardey, Keeble, 2008; Hardey, Loader, 2009; Mort, et al., 2013). To summarize, we can conclude that e-inclusion gives people a wide variety of choices and opportunities enabling them to get the kinds of products and services that best fit their desires and needs. All these opportunities are also excellent responses to the social challenge of inclusion, which contributes to minimizing person isolation from the society through *e-inclusion* mechanisms.

11.4. FACTORS INFLUENCING E-INCLUSION

Literature review shows that *e-inclusion* ensures opportunities for fighting poverty and general exclusion from the social sphere for both individuals and communities by providing access to most of the commercial and public services through electronic means. Observing *e-inclusion* as a multidimensional construct by several researchers (Bentivega, Guerrieri 2010; Guerrieri, et al., 2007; Cullen, et al. 2007, Codagnone, 2009), it was concluded that e-inclusion is influenced by a variety of factors namely demographic factors, cultural factors, social factors and economic factors.

11.4.1. Demographic and cultural factors

Demographic factors have been proved as one of the most important factors that influence *e-inclusion/exclusion* as well as social inclusion/exclusion. Influencing demographic factors that have been identified in previous research in the field of digital divide and *e-inclusion* are age, gender, household structure and ethnicity. Age is one of the most important demographic factors that influence *e-inclusion*, according to previous research especially in technology acceptance, online services acceptance, acquiring of digital skills, as well as in digital

engagement (Dyck and Al-Awar Smither, 1994; Czaja and Sharit, 1998; van Dijk, et al., 2007; Becker et al. 2008; Helsper, 2008, 2009, 2010, 2013; Steyaert 2010; Pautasso, Ferro, Raguseo, 2011). Taking into account the present situation, the population worldwide is getting older thanks to high achievements in health care, better quality of life and higher living standard. Therefore, it is of great importance that technology is accepted by elderly population. Otherwise, these groups of people are at high risk of being digitally, as well as socially, excluded (McMurtrey et al., 2013; Digital Inclusion Team, 2007; Brandtzaeg, Heim, Karahasanovic, 2011; Mordini et al., 2009; Kiel, 2005).

The elderly are also a large market segment for ICT products or ICT based services, the main barriers are accessibility and usability issues as well as overall customer support. If governments take appropriate actions, older people can, and often do want to remain active in society. However, this scenario is rarely the case so they are often left out, especially those in rural and remote areas. A recent study, in which data of EU-25 were analysed, indicates that the age group of 16 to 24 has a three times higher proportion of ICT or Internet use than the age group of 55 to 74 (Demunter, 2005). This was also confirmed by OECD report from 2014 which states that on average 95% of people between 16 and 24 years old in the OECD countries use the Internet, most of them on a daily basis (OECD, 2014, p. 76). In general, Internet access and ICT use tend to be higher for younger people than for older people.

Gender stands out as an important demographic factor. Numerous studies show that significant differences exist in the acceptance and use of ICT and the Internet between men and women (Venkatesh et al., 2003; Empirica, 2006; Brown, Venkatesh, 2005; van Dijk 2006; Helsper, 2007, 2008; Mordini et al. 2009; Belanger, Carter, 2009; Hargittai, 2010; Brandtzaeg, Heim, Karahasanovic, 2011). For instance, significant differences in gender were found in ICT and the Internet aided communication (Sussman,Tyson, 2000; Leung, 2004; Verhaagen, 2005), e-learning (Sumacher, Morahan-Martin, 2001), attitudes related to the level of experience and usage of ICT and the Interent (Durndell, Thomson, 1997; Durndell, et al., 1997; Whitely,1997; Brosnan, Lee, 1998; Balka, Smith, 2000), and confidence and efficiency in the use of ICT and the Internet, almost all in favour of men. Compared to women, men have more confidence and efficiency (Torkzadeh, Koufteros, 1994; Bandura, 1997; Durndell, Haag and Laithwaite 2000) in ICT and Internet use. For many years, research has stressed that women and girls used less ICT and consequently developed fewer skills to work with (Sutton 1991; Volman, van Eck 2001; Losh 2004). Similar results arise from research conducted by Empirica (2006). The results indicate that in general, males in all age groups have slightly higher usage rates of ICT

and the Internet than the females (Empricia, 2006, p. 96). According to a research published by the OECD (2007), men use the Internet more frequently and intensely, as opposed to women, who tend to perform more functional activities related to health, education and training, or family matters. Men seem to prefer leisure activities (games, reading sports newspapers) or downloading software (OECD, 2007). The role of gender in accessing and using ICTs is often examined in parallel with age. However, most studies show that contrary to what happens with age, gender contributes less to the digital divide widening. The differences in ICT use, regarding gender, are mainly present between older men (over 50) and younger women (up to 45). Men over 50 years old are more likely to use the Internet than women of the same age, while women up to 40 make a greater use when compared with men of the same age (NTIA, 2002). Nowadays, this divide is often described as less wide than a decade ago.

Among the demographic factors that significantly influence *e-inclusion* is also family structure which can be composed of one or more members, marital community and families with or without children. Studies conducted in this area came to the conclusion that families with children are more prone to possession and use of ICT and the Internet because of the need for education, communication and entertainment (Kennedy, et al., 2003; Heim et al., 2007; Helsper, 2008; Brandtzaeg, Heim, Karahasanovic, 2011). According to a study conducted in Greece, the use of ICT at home for households with dependent children is two times the percentage of households without children (Demunter, 2005). Similar conclusions is drawn by van Dijk et al. (2007) in their study associated with acceptance and use of e-services in Denmark. It shows that families with children are the most frequent users of e-services among all household types.

Cultural factors as well as cultural diversity also play a significant role in e-inclusion. Culture is another field where inclusion hopes and risks of exclusion occur simultaneously because nowadays the creation of ICT products and services, as well as Internet content are based on the fact that it should meet the wishes and needs of the dominant users. The cultural factors which have proven to be of high importance are (Weerakkody et al., 2012, p. 309): language, knowledge, traditions, skills, membership in organizations (religious, political, non-profit) and digital literacy. Language barriers proved to be very frequently one of the most important cultural factors that contribute to disparities in e-inclusion. Predominance of English language contents is a serious obstacle for many people outside English-speaking countries and people who have no knowledge of English language. Thus it becomes increasingly important that local digital content, directly relevant for the community in which people live is created in their native language (Foulger, 2001; EC, 2004c; Epratctice.eu, 2010). The same as language, social values

and traditions of certain communities are often of the great importance when there is a need for changes in thought or action (van Dijk, et al., 2007). Many communities are very traditional and closed for changes and innovations and there are examples of restricting community members and preventing a change of thinking or acting. In some communities, husbands and fathers think that it is dangerous or improper to let (their) women and daughter use ICT and the Internet (Brey, 2006), while others are much opening and they, according to the Barzilai-Nahon and Barzilai (2005) reshape ICT and the Internet to their culture and norms.

Likewise, ethnicity can prevent groups of people from accessing and using ICT and the Internet (Cultural Access Group, 2001; Volman, et al., 2005; Korupp, Szydlik, 2005). Inequalities in the field of usage of ICT and the Internet between people are not only necessary associated with technical access to the online world but also to the required competencies of users. The differences in knowledge and experience in usage of ICT and the Internet as well as digital literacy and skills which different groups of people possess could also be one of the major obstacles and can potentially lead to exclusion. Problems arise when relevant information is presented in a form which requires specific knowledge or when the access and use of commercial and public electronic services requires an advanced level of e-skills and digital literacy, which favours the more educated (Worcman, 2002; Robinson et al., 2003; van Dijk, et al., 2007; Verdegem, 2011; EC, 2004b; Ferro, et al., 2011; Warschauer, 2004; Hargittai, 2002, 2009). Such scenarios lead to the fact that the groups who were so far empowered are becoming so even more, and those groups that were at risk of exclusion are becoming even more excluded, thus the gap is becoming increasingly larger.

Finally, membership in organizations also has a major impact, taking into account that the same individual can belong to several organizations (religious, political, non-profit) and that organizational membership is an important component of individuals' participation in e-inclusion.

11.4.2. Social and economic factors

It has been shown that the same long established social and economic factors also define inequality in the e-inclusion including employment, income level, family assets situation, level of education, geographical location and place of residence and disabilities (Weerakkody et al., 2012; Cullen, 2001; Hilbert, Katz, 2003). Performed research shows that the level of education as well as motivation for continuous further education is the most consistent global predictor of access to and use of ICT and the Internet and plays a crucial role in e-inclusion (van Dijk, 2006;

van Dijk, et al., 2007; Agarwal, Animesh, Prasad, 2009; Helsper, 2009; Pautasso, Ferro, Raguseo, 2011). Studies conducted by the OECD (2014) confirm that the level of education appears to by much more relevant factor in ICT and Internet adaptation for older people than for younger people. Usage rates for 55-74 year-olds with tertiary education are generally in line with those of the overall population (OECD, 2014, p. 76). Therefore, older people, in particular those with lower education, must be in focus of all e-inclusion strategies. The same study shows that education gap is among the most important explanatory factors of the breadth of activities performed on the Internet. While users with tertiary education perform on average 7.3 different activities, those with at most secondary education perform only 4.6, from a total 12 offered activities. (Ibidem, p. 80). A more detailed analysis conducted Vicente and Lopez (2006) using the data collected as part of the project "Statistical Indicators for Benchmarking the Information Society" (SIBIS). The survey was conducted in in the EU-15 countries in year 2002 and it was resulted with 10,306 successfully completed interviews. Vicente and Lopez (2006) findings confirmed that education positively influences the likelihood of an individual using ICT. The results show that the highest effect is on Internet use, the people with university education are 5.1 times as likely to use the Internet as people with primary school. The same conclusion was reached by Hüsingand Selhofer (2002) who presented initial results for the 15 EU Member States and the European Union as a whole, higher educated people unlike low educated people have higher access and usage rates of ICT and the Internet. According to analysis of the data, in 1997 the percentage of ICT and Internet usage among the low education segment was 12.8 percentage points below the population average while in the year 2000 this gap has increased to 20.8%. These findings confirm that especially low education segment of people are not making much progress in their adoption of ICT and the Internet compared to the average population. This was also proved by Goldenberg (2006) study implemented in Canada. It was concluded that workers who have lower education levels also have a lower interest in further professional development and training in order to acquire new skills, unlike highly educated workers.

Strongly related to educational attainment are cognitive resources that are largely responsible for differences in ICT and Internet use and in the level of digital skills of different educational groups (De Haan et al., 2002). Similarly, research realized 2006 by Empirica confirms that higher educated citizens are using the Internet more intensively than those with lower education. In some areas the variance is higher than in others, for example the same research confirms that major differences become visible in the context of Internet use for seeking health information

and in communications with public authorities. The OECD report for 2014 year regarding the possession of ICT skills and the level of education shows that in all OECD countries individuals with a higher level of formal education report higher confidence in their computer skills, as compared to those with no or low formal education. The gap between these two groups in some countries exceeds 60% (OECD, 2014, p. 88). Summarizing all collected available research concerning the connection between the level of education and the access and use of ICT and the Internet, it can be concluded that almost all indicate that higher the education, higher the frequency of owning computers, having internet access at home (via broadband or mobile network), possessing better ICT and digital skills and spending more time online (Buente and Robbin, 2008; Goldin and Katz 2008).

Geographical location, type of country (developed, developing or least developed countries) and place of residence (urban or rural), as well as social impact and connection between people in a particular area also proved to be significant for access to and use of ICT and Internet applications. Thereby the social impact relates to learning from others, such as friends, family members, relatives or people from the neighborhood. For example, studies have shown that for adults who have young people in their place of residence, the likelihood of using the Internet is more frequently and, for more diverse purposes is higher than for people who live in residence that are technologically less stimulating (Rojas et al., 2004; Agarwal, Animesh, Prasad, 2005; Mordini et al., 2009; Digital Inclusion Team, 2007; DTI, 1999; Martin and McKeown,1993). The location of residence within a country or the location of a country within a geographical region also affects ICT and Internet access and usage (Donnermeyer, 2003; Chen and Wellman, 2003; Bell, et al., 2004). Study of Mills and Whitacre (2003) confirms that potential users from non-urban areas are less prone to use ICT and the Internet because they generally have lower incomes and less education. Urban areas tend to have better infrastructure and lower prices in contrast with rural. Similarly, the report from the International Telecommunication Union (ITU) states that in countries where the share of population living in rural areas is often high, the urban-rural digital divide is increasingly expressed. In countries where data are available, rural household ICT and Internet access fall far below urban household access, with differences ranging from 4 per cent in highly developed countries to 35 per cent in developing countries. Certainly the differences are presumably even greater in the least developed countries, but data are not readily available for those countries. In the same report the differences in access to the Internet in relation to the development of the country are emphasized. Thus in developed countries, 78% of households have Internet access, as compared with 31% in developing

countries and 5% in the least developed countries (ITU, 2014, p. 3, 4). While, Billon, at.al., (2008) state that adjacent regions of European Union countries tend to have similar rates of ICT and the Internet adoption. The level of income, family assets situation, employment status and disability also proved to be significant for access to and use of ICT, especially in acceptance of electronic services (Vicente, Lopez 2006; Pautasso, Ferro, Raguseo, 2011). Analysing the social positional background regarding the acceptance and use of electronic services in Denmark van Dijk, et al. (2007) came to the conclusion that large differences appear between those inside the labour process or schools and those outside it (retired, disabled and housewives/men).

Other factors that significantly affect e-inclusion are income and family assets situation, or the extent to which a user can afford the cost of ICT equipment and Internet access (Chakraborty, Bosman 2005; Vicente, Lopez 2006; Martin, Robinson, 2007; Hsieh, et al., 2008; Hilbert, 2010). Through the years, the performed studies mainly focus on comparison between individual or household income expressed as the Gross Domestic Product (GDP) per capita or per household and access to and use of ICT and Internet (Quibria, et al., 2002; McLaren, Zappala, 2002; Flores, 2003; Chinn, Fairlie, 2003). Numerous studies conducted by International Telecommunication Union (ITU) underline that household or individual income is a key determinant of the presence of ICT and the Internet at home and that higher income positively affects ICT and Internet adoption (ITU, 2014).

11.5. THEORIES AND MODELS ADOPTED IN E-INCLUSION

Access to ICT is a necessary but insufficient condition to ensure e-inclusion and achieve all the benefits and desired social and economic outcomes. The basic supposition of the concept of e-inclusion is allowing every interested individual to include ICT in their daily activities not only to take care of business, learning, communication, entertainment, purchasing goods and services and acquiring all necessary information, but also for interaction with government institutions and inclusion in public and cultural spheres. Heeley and Damodaran (2009) consider that it is necessary to strengthen citizens not only to use and choose information and communication technologies, but also to actively participate in making decisions in the process of forming technologies designated for them and for the rest of the participants of the information society. According to them, all willing citizens must be motivated to participate in the creation of socially-technical systems of information society.

Literature which was studied identifies merely few relevant models of e-inclusion, but the defect of these models is that chosen variables focused exclusively on a couple of aspects of e-inclusion and the majority of the existing indicators is identified for monitoring ICT on national level and for international comparison, while the research of influence of e-inclusion on the tendencies of an individual and a wider community to use ICT and promote overall social benefits gained by it are almost completely left out. In the continuation of this study an overview of models and conceptual frameworks from the domain of e-inclusion, will be described, but also the models and conceptual frameworks from the digital divide area, for a complete conceptualization of term e-inclusion.

The Access, Competence and Motivation Model (ACM model) developed by Viherä and Nurmela (2001) contains three main categories which are basic for a person to start using ICT and the Internet. These three relevant categories are: (1) access to computers and the internet; (2) competence in using the computer software and the Internet, and applying it for individual purposes, and (3) motivation, which includes attitudes to new technologies. Individuals may be grouped according to their propensity for becoming ICT users taking into account these three dimensions.

According to Viherä and Nurmela (2001) access point is an essential requirement for using ICT and the Internet, but it is not enough. An increasing number of new ICT and Internet applications require acquisition of new skills. Finally, the last main requirement for usage of ICT and Internet is motivation, as well as attitudes towards new technologies. This is a prediction model that takes into account the previously mentioned categories according to their propensity to become ICT and Internet users. Joia (2004) suggests the 2iD model of monitoring which includes education, infrastructure, local contents, economic, political, ethic and legal sustainability of participation and strengthening processes. By using this model, it is possible to identify the main actors and processes, evaluate influence of people and technologies on material and social network structures which comprise communication protocols, computer systems, people and social standards.

Bradbrook and Fisher (2004) gave a definition of the 5Cs model, which is used to emphasize the complexity of e-inclusion by using key components, such as access, skills, information contents, self efficiency and continuity in using ICT. The theoretical conceptual model of e-inclusion with identified components of access, impact and empowerment, and available

indicators on national level was created by Guerrieri and Padoan in 2007 by modelling ICT as a technology for general purposes.

To determine the digital divide between various groups of citizens, for example in the use of electronic services (senior citizens, citizens without employment, or citizens with low education) Becker, et al. (2008) have developed the so-called "The eInclusion Gap Model". The developed model enables identification of the gap between various groups of respondents in four areas: (1) Gap A: Total Population – Internet Usage – for interpreting inclusion gap: infrastructure and accessibility; (2) Gap B: Internet Usage – E-Commerce Usage - for interpreting inclusion gap: security, trust and complexity; (3) Gap C: E-Commerce Usage – E-Government for Information – for interpreting inclusion gap: marketing, marketability and personal contact; (4) Gap D: E-Government for Information – E-Government for Transaction – for interpreting inclusion gap: security, service complexity and costs. Helsper (2008), in an extensive research which he conducted, provides theoretical framework which identifies factors and barriers that are difficult to conquer by an individual in order to be fully able to benefit from all the advantages of using ICT via components of access, use, attitudes and skills.

Codagnone (2009) uses macroeconomic models of e-inclusion to examine the influence on the labour market, productivity, GDP (gross domestic product), supply and demand of goods and services. Wong et al. (2010) suggest a model based on research of the digital divide and attempt of its decrease which include access and use of basic components and ICT skills as well as literacy, accessibility, socio-cultural factors and content application as sub-components. Bentivegna and Guerrieri (2010) have created a composite index of e-inclusion which monitors the development and expansion of ICT, as well as the level of progress of e-inclusion among the European Union countries.

According to Nita (2011) who identified "determinants of e-inclusion", e-inclusion may be defined as the processes of increasing the number of individuals fully connected to the today's new global ICT technologies and networks with the ultimate goal of enhancing social inclusion. In his research, he emphasizes three main determinants of e-inclusion: global digital technologies and networks, access to and use of ICT, as well as possessing ICT skills and social structure. He points out also pre-existing social problems which are related to income and educational level and distribution, as well as those related to the traditional determinants of social exclusion - e.g. poverty, unemployment, living conditions, etc. The basic dimensions which influence the process of e-inclusion in using e-services of Governmental institutions were

identified by Weerakkody et al., in their research conducted in Great Britain during 2012. These basic dimensions are: demographic, economic, social, cultural, political and infrastructural dimension.

Table 3. Models and conceptual frameworks adopted in e-inclusion

Authors /year	Models / conceptual frameworks	Components of the model / conceptual framework
Viherä and Nurmela (2001)	The Access, Competence and Motivation Model (ACM model)	Access, Competence, Motivation
Joia (2004)	2iD model e-inclusion	Education, Infrastructure access, Local content, The economic, political, ethical and legal sustainability, Participation, Empowerment
Bradbrook and Fisher (2004)	5 Cs of digital inclusion	Connectivity, Capability, Content, Confidence and Continuity
Guerrieri and Padoan (2007)	E-inclusion model	Access – Material, Motivation, Skill, Usage Quality of life – eLearning, eHealth, eWork, eGovernment, eCommerce, eCulture Empowerment – Networking, eDemocracy, Content Creation
Becker, Niehaves, Bergener, and Räckers (2008)	The eInclusion GapModel	Internet usage , E-Commerce usage, E-Government usage for Information, E-Government usage for transaction
Helsper (2008)	Digital inclusion model	Access –Platforms, Location, Quality, Use - Nature of engagement, Extent of engagement, Attitudes – Importance, Regulation, ICTs, Skills – Technical, Social, Critical, Creative
Codagnone (2009)	Macroeconomic models of e-inclusion	Employment, GDP, Productivity, Supply and demand of goods and services
Wong et al. (2010)	The conceptual framework of the Digital Divide	Basic components :access and usage Sub-components: availability, ICT skills / literacy, accessibility, social-cultural factors, content / application
Bentivegna and Guerrieri (2010)	E-inclusion Index	Basic components : access, usage, impact Sub-components: network, affordability, availability and quality, autonomy, intensity, skills, economic, employment and labor, educational, health, government, culture, communication, entertainment
Nita (2011)	The determinants of e-inclusion	Global digital technologies and networks, ICT access, use and skills, Social structure
Weerakkody, et al. (2013)	The conceptual framework of the basic dimensions of e-inclusion	Demographical Dimension, Economic Dimension, Social Dimension, Culture Dimension, Political Dimension Infrastructure Dimension

Source: made by the author

Studies have established the existence of significant differences according to age, gender, employment, income, degree of education, skills, family structure, affordability and accessibility of technologies. From the previously presented model, it can be seen that monitoring e-inclusion is problematic because of multidisciplinary nature of this concept. In order to solve this, Warschau (2003) suggests that every intention of e-inclusion analysis must begin with ”the examination of social structures, social problems, social organization, and social relations rather than with an accounting of computer equipment and Internet lines”. According to Bianchi et al. (2006), the main e-inclusion objectives for e-inclusion policy makers in all countries have to be increased access of individuals to the labour market, stimulation of citizen participation and interaction with the government, enhanced continuous involvement in decision-making processes, stimulation of lifelong learning and through maximization of effects of active ageing, decrease in elderly population the frequency of illness, handicap and social exclusion. It can be concluded that changes in proposed existing models for monitoring e-inclusion through time is necessary, because e-inclusion is not a linear process, but one moving target. One of the most important reasons is that ICT and Internet tools are constantly subject to change, and this results in creating new waves of diffusion and new temporary gaps. On the other hand, ICT and Internet use is also subject to constant changes and require continuous acquisition of new ICT knowledge and skills, so-called e-skills and digital skills. The continuous changes into the nature of the information society cause the problems in monitoring such complex phenomenon and setting incessantly new challenges for e-inclusion policy makers, because of that, something more than only classic representation of a gradual diffusion of ICT and Internet is required.

11.6. CONCEPTUALIZING E-INCLUSION

According to previously described models, the basic dimensions of e-inclusion which are identified by reviewing literature are: access, usage, impact of ICT and the Internet on the quality of life and empowerment. The e-inclusion domain is a quite broad and complex one. One of the main reasons is that the advent of the Information Society added another dimension to the already extensive debate regarding social inclusion, which has then been enhanced with another, so-called digital dimension.

Another set of implications relates to the importance of the existing social theories’ concepts that need to be taken into account when considering e-Inclusion. The most important ones stem from the social network theory (e.g. the interaction of the exiting ties and the impact of new

media use), theory of social change (advent of changes and the resulting winners and losers scenario), social diffusion theory (early vs. late adopters scenario), and theories covering issues such as social capital (e.g. advent of ICTs and social interactions and impact on these), and ultimately social shaping of technology. All of these concepts had to be considered during the process of indicator generation, evaluation and interpretation. The key concepts that are related to the e-inclusion concept were identified, including access to ICT and the use of ICT as well as its impact on the quality of life of the individual and individual empowerment. The *access* category comprises the following attributes: network, affordability, material access and point of access. The *usage* category comprises the following attributes: intensity of use, skills, network availability and quality, motivation, attitudes, social support/coercion and digital engagement. The *impact on the quality of life* category comprises the following attributes: e-learning, e-business, e-health, e-government, e-commerce, e-banking, e-culture and e-communication. The following attributes were identified as comprising the final category, i.e. *empowerment*: networking, e-democracy, e-participation and content creation.

Table 4. The conceptualization of e-inclusion

Category	Attributes	References
Access	network, affordability and availability, material access and point of access	DiMaggio, Hargittai, (2001); Sicherl, (2003); DiMaggio, et al. (2004); Guerrieri, Padoan (2007); Cullen et al. (2007); Helsper (2008); Seale (2009); Bentivegna and Guerrieri (2010); Steyaert (2010)
Usage	intensity of use, skills, network availability and quality, motivation, attitudes, social support/coercion, digital engagement	Robinson et al. (2003); DiMaggio, et al. (2004); Cullen et al. (2007); Helsper (2008); Codagnone (2009); Seale (2009); Bentivegna, Guerrieri (2010); Steyaert (2010)
Impact of ICT and the Internet on the quality of life	e-education, e-commerce, e-health, e-government, e-work, e-banking, e-culture, e-entertainment, e-communication	Guerrieri and Padoan (2007); Cullen et al. (2007); Bentivegna and Guerrieri (2010)
Empowerment	e-democracy, e-participation, Social Computing – networking and content creation	Guerrieri, Padoan (2007); Kubitschke et al. (2006); Seale (2009); Cullen et al. (2007); Verdegem (2011)

Source: made by the author

One of the very important components identified as an integral part of e-inclusion, but will not be included in the presented model is e-accessibility. This term is closely associated with particular functional problems experienced by persons with special needs, disabled and older people. In this sense, e-accessibility can be viewed as a category of the expanded e-inclusion model, focusing on answers to questions how to overcome all of these technical barriers for such a specific group of people.

The main aspect of e-accessibility concept is that all the advantages that enable inclusion in the information society are also available for older people and people with disabilities using them in way that it can improve their quality of life, make some things easier and more accessible and enable them to participate in all segments of public, social and political life. All the efforts that have been made in this area include challenges presented by the physical environment for people with sensory and mobility disabilities and by the information or knowledge environment for people with intellectual disabilities.

New advanced technologies that are associated with the e-accessibility concept is called „assistive technology“ which includes variety of specifically designed devices and software applications that offer customized forms of interaction for such people, allowing them equal participation in the information society. In a broader sense, it includes all ICT and online tools and services (eHealth, eCare, eShopping, eWork and so on) that are developed to support or otherwise open up new opportunities for participation and access for disabled people and older people (Martinengo, Curatelli 2009; Wherton, Prendergast 2009; Calabro, Contini, Leporini, 2009; Chalamandaris, Raptis, Tsiakoulis, Karabetsos, 2009).

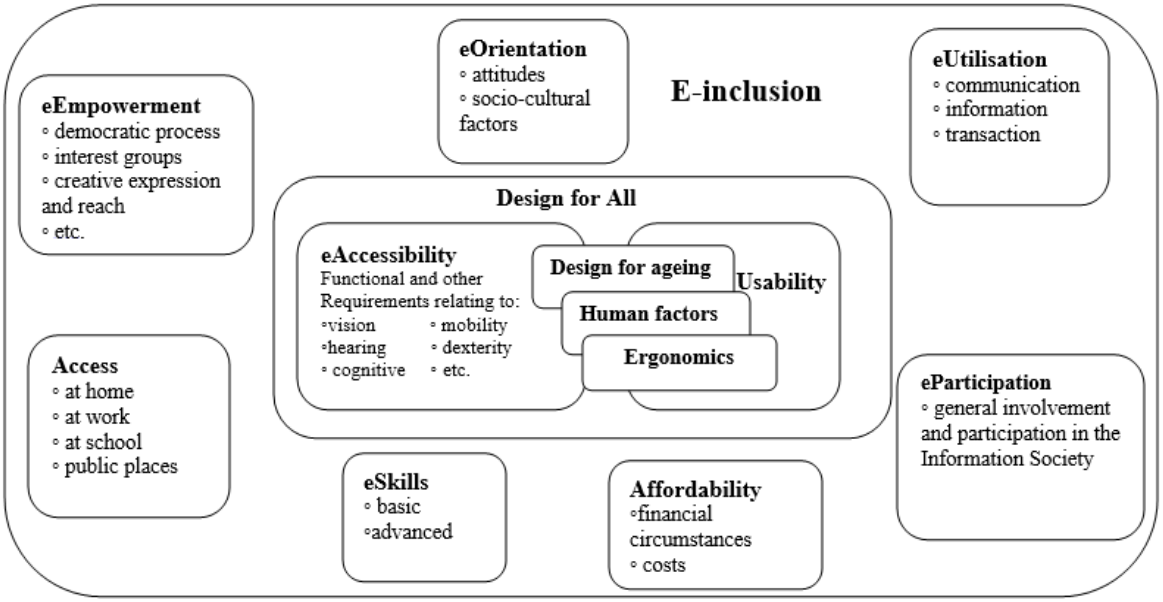


Figure 3. Relationships between the concepts of *e-accessibility* and *e-inclusion*

Source: Adjusted according to eInclusion@EU, Strengthening eInclusion &eAccessibility across Europe, Analytic framework - eInclusion and eAccessibility priority issues, October, 2004, IST-502553.

In Figure 3, it can be noticed that *e-accessibility* in the domain of e-inclusion is linked to concepts such as “usability”, “design for ageing”, “human factors” and “ergonomics” and represents diversity of people in their functional abilities, requirements and preferences. *E-accessibility* comprises a fundamental prerequisite for *e-inclusion* for many people. If the creators of ICT products and services are not inclined to take these requirements into account when devising new technologies and online services and tools, then these groups of people are excluded as potential users from the very beginning. In continuation of this study, the main categories and attributes of a model of e-inclusion will be described. The categories, attributes, indicators and items (manifest variable) which is defined for creating e-inclusion model was based on a broad review state-of–the art literature in the area *e-inclusion*. It is important to emphasize that the majority of indicators for monitoring *e-inclusion* have not been yet developed but some of the indicators presented in this study have been in use for some time. This particularly relates to the indicators regarding basic access and use that are still a basic starting point for researching and benchmarking this complex phenomenon.

11.6.1. Attributes related to access to information and communication technology and the Internet

Access to and ownership of ICTs and Internet connection is a fundamental prerequisite to effective uses of these technologies and basis for successful e-inclusion. Providing ICT and the Internet access is becoming an important contribution for the development of inclusive information society. Measuring access is therefore a key priority and relevant for all countries of the world. Operational definitions of access have varied from study to study. In earlier work, the concept *access* was used literally to refer to whether a person had the means to connect to the Internet. In some studies, *access* is sometimes used as a synonym for use (DiMaggio, Hargittai, 2001).

Over time, it has been confirmed that this is inappropriate, because studies that have measured access and the extent of Internet use have found that more people have access than use it (NTIA 1998). In the context of e-inclusion access is related to ICT in terms of physical and material access, as well as access to the Internet and refers to the possible contribution multiplatform access to services or information of public interest for disadvantaged groups of people. Different kinds of access can support online access and increase social inclusion of different disadvantaged and marginalized groups. Given that the concept of the e-inclusion is a very broad one, conceptualization of categories *access* in this study is focused on one of its main aspect, access to the ICT and Internet, and can be define as having access through different types of devices and being on-line or not.

According to ITU (2003) access to ICT and the Internet can be quantified in various ways, with indicators based on different categories such as individual, household and community access. In this study, access indicators are based on the individual, among others, under the category *access* with identified manifest variables will be examined also perceptions of consumers about the quality of access across different types of Internet networks, because this is one of the preconditions for successful e-inclusion. According to Helsper, the inequalities in the quality of access can be described with the term *digital disadvantage*, a situation in which socially less privileged groups are likely to have less ubiquitous and less private types of Internet access. This results with in these groups becoming particularly excluded from the advanced, networking, and participation resources of the Internet which have the potential to help them become less underprivileged (Helsper, 2008).

Although previous research and theoretical discussions in relation to e-inclusion have moved on from the focus on pure ICT and Internet access provision, this category must be included in the general model of monitoring e-inclusion because it plays the most important role in the process of e-inclusion. In terms of access, the focus will be on where and how people access the Internet via different devices. This study has defined and measured category *access* through identified attributes: material access and network, user satisfaction with the quality and availability of the network connection, place of access and affordability.

11.6.1.1. Material access and network

Material access and network comprises indicators related to the physical and material access which refers the prerequisites for the appropriation of ICTs and the Internet, or rather the conditions of physical access and quality (a computer and an Internet connection, a mobile device with the ability to access the Internet). Material access is translated into the context that covers the wide range of means by which users access electronic content (PCs, tablet, digital TV, mobile phones and games consoles). Network infrastructure is the most determinant factor of e-inclusion. Wireless Local Area Network (WLAN) is one in which a mobile user can connect to a local area network (LAN) through a wireless connection.

Nowadays, broadband access is considered to lead to a higher quality experience and broader use of the Internet than dial-up Internet access. Developments in access and infrastructure are rapid, and recent studies (Ofcom, 2006) have indicated that wireless or mobile access is a good indicator of access quality since it is available across different locations and provides high speed connection. It is presumed that individuals with access to broadband have higher quality of access and therefore to be more e-included. Fixed broadband includes DSL, cable, fibre to the home and other fixed wired technologies (DTI, 2002, p. 151). Mobile wireless broadband includes satellite, terrestrial fixed wireless and terrestrial mobile wireless (standard mobile and dedicated data) (OECD, 2014, p. 50). As broadband becomes a necessity of daily life, the final result of content exclusion for the citizens that do not have broadband access or who cannot afford it is social exclusion. Broadband enable and empower e-health, e-government, e-learning, e-culture, e-commerce, e-work, and last but not least, e-entertainment. Broadband can even facilitate e-inclusion and reduce the gap earlier termed the *digital divide*.

Table 5. Indicators *Material access and network*

Category	Access
Attribute name	Material access and network
Indicators	1. I access the Internet and digital content via desktop computer. 2. I access the Internet and digital content via portable computers (laptops, netbooks, tablet). 3. I access the Internet and digital content via mobile device (mobile phone, smart phone, e-book reader). 4. I access the Internet via fixed broadband connections (DSL, ADSL, VDSL, cable, optical fibre, satellite, public WiFi connections). 5. I access the Internet via mobile broadband connections (via mobile phone network, at least 3G, e.g. UMTS, using (SIM) card or USB key, mobile phone or smart phone as modem)
Definition and explanation	The indicators measure the frequency of use different type of devices through which respondents access the Internet and digital content.
Importance and value added	The indicator attempts to illustrate the penetration and frequency of usage of ICT and certain network connections surveyed in households. The number of devices used to access the Internet is an important factor to track. Different devices imply different Internet services and applications. Basic indicators are important for monitoring e-inclusion by individuals. One of the main objectives of the eEurope initiative (in both 2002 and 2005) is to track the penetration of access and broadband technologies in households.
Sources of indicators	Adjusted according to EUROSTAT (2014), ITU (2009), SIBIS (2003).
Additional indicators	1. I access to Internet and digital content via smart TV (Smart TV). 2. I access the Internet and digital content via game consoles. 3. I access the Internet dial-up over normal telephone line or ISDN. 4. I access the Internet mobile narrow band connection (less than 3G, e.g. 2G+/GPRS used by mobile phones or smart phones or modems in laptop).

Source: made by the author

11.6.1.2. User satisfaction with the quality and availability of the network connection

For the vast majority of people, decisions about whether to use the Internet, what type of electronic services to use, and what kind of activities to carry out via the Internet depend greatly on the quality, availability and speed of network connection. The development of supply of the network connection in every country depends on the existing network facilities as well as the level of investments. In most cases, availability and quality of network connection depends of network operators. Network operators are mostly commercially oriented companies that assess their investment opportunities according to the return of investments. The number of network

operators and quality and capacity of existing telecom networks in one country depend on financial factors such as the level of interests to be paid, the possibilities for use of various funding mechanisms such as government subsidies and the regulatory framework of the country. The level of competition on network operators market is important for assurance of network availability and quality. Competition includes competition among different suppliers of the same service and competition between different types of infrastructures.

Empirical research seems to indicate that a strict regulatory practise on interconnection with the aim of promoting real competition plays a major role in increasing the quality and availability of network connection. Decisions about investments in network infrastructure are another reason for creating inequality in access. For example, Internet connectivity in rural or remote areas is limited by relatively weak telecommunications infrastructure investment. As a result, there are fewer competition network operators and subscription costs are higher which ultimately, in most cases, results in a very low interest of people for using ICT and the Internet. In contrast, the superior availability of infrastructure in urban areas is responsible for relatively rapid penetration of high-speed Internet access and development that has helped to increase formal access for most of people at affordable and acceptable conditions. Most governments are well aware of the importance of the development of network infrastructure in all areas of the country and to the same extent in order to foster economic growth, employment rate and social welfare in general.

An inclusive information society fundamentally requires a sophisticated and reliable network infrastructure that enables citizens access to e-services and e-goods. Public policy may be an important factor for stimulation of both demand and supply of network connection as well as demand and supply of e-services and e-goods. One important question today for network operators is guaranteeing service availability and how to achieve networks to remain stable and secure in the presence of abnormal conditions. Any network availability problem can have an impact on customer satisfaction and the level of trust in the network.

Customer satisfaction is one of the key prerequisites for the further use of new technologies. Kotler defines customer satisfaction as a scale to which a company meets customer expectations (Kotler et al., 2001). Customer satisfaction is the feeling or attitude of a consumer toward a product or service after it has been used (Wells and Presky, 1996). A satisfied customer will repeat the purchase of the product or service and convey positive messages about it to others

(Dispensa, 1997). It is clear that customer perceptions have significant impact on their satisfaction and intention to adopt new technology and new services as well as on e-inclusion.

Table 6. Indicators *User satisfaction with the quality and availability of network connection*

Category	Access
Attribute name	User satisfaction with the quality and availability of network connection
Items	1. I am satisfied with the quality of the network connection which I use most of the time. 2. I am satisfied with how much the connection to the Internet is available to me.
Definition and explanation	The items indicate expressed user / consumer satisfaction with the quality, speed and availability of the network connection.
Importance and value added	This indicator is useful since currently there are substantial qualitative differences of broadband infrastructures across the countries. One of the main objectives of the eEurope initiative in 2002 and 2005 and also Europe 2020 Strategy is quality and availability of broadband technologies in households.
Sources of items	Adjusted according to EUROSTAT (2014), ITU (2009), SIBIS (2003).
Additional items	1. I am satisfied with the offer of Internet network connection. 2. I am satisfied with the speed of the network connection which I use most of the time.

Source: made by the author

11.6.1.3. Point/Location of access

Point/location of access proved to be one of the important influential factors related to the frequency of use of new technologies, acquiring new digital knowledge and skills and activities carried out by using ICT and the Internet by individuals. Research related to the digital divide as well as digital inclusion frequently emphasizes three locations or fields through which people access ICT: households, educational institutions and work (de Haan, 2004; Brainin, Bar-Lev, 2005; Helsper, 2008). Some authors also include locations such as community centers, public institutions, cyber cafes (Cilesiz, 2004) and public libraries (Bertot, McClure 1998; Schement, 2003). Location of access is highly related with autonomy; it defines the degree of autonomy which is significantly increased if one has access at home as opposed to any other location. Autonomy refers, at its most basic level, to the ability of an individual to make their own choices (Perry et al. 2010). In the context of e-inclusion, if people feel that they don’t have control over their choices they don’t feel free and safe and this can result in a decreasing motivation or complete nonacceptance of new technology or services on offer (Fisk, Rudel, 2013). People

have more freedom to use ICT and the Internet in their own home than in other locations and home access is now by most researchers defined as an indicator of high quality access (Mumtaz, 2001).

Table 7. Indicators *Point of access*

Category	Access
Attribute name	Point of access
Items	1. I access ICT and Internet connection at home. 2. I access ICT and Internet connection at workplace. 3. I access ICT and Internet connection at a public place where access is free.
Definition and explanation	The items indicate the different types of location at which respondents/individuals access ICT and the Internet.
Importance and value added	The indicator attempts to illustrate usage frequency of ICT and the Internet by different types of access location. This indicator supplies useful data about the context and nature of ICT and Internet usage. Different access locations can lead to different on-line activities. In addition to not being able to access ICT and the Internet at home at any time, a person may be less likely to access, for example, personal health or financial information from a public library or other public facility. Increasing penetration of the broadband network and mobile wireless connection makes this indicator less important for future use, but it will remain interesting, for example in Croatia probably for the next 3–5 years. Basic indicators are important for monitoring e-inclusion of individuals.
Sources of items	Adjusted according to EUROSTAT (2014), SIBIS (2003)
Additional items	1. I access ICT and Internet connection at other places where you have to pay for access. 2. I access ICT and Internet connection at neighbour's, friend's, relative's place? 3. I access ICT and Internet connection at faculty or other educational institution.

Source: made by the author

Studies conducted by Buckinghama (2005), Kalichmanet (2002) and Livungstone (2003) confirm that access at home enables individuals to become strongly connected with the technology and provides greater opportunities for efficient informal learning and acquisition of new skills. Public access points are very important for young people enabling them to acquire digital skills and to explore the opportunities of ICT and the Internet in a way that is learning oriented. Thus Helsper (2007) particularly emphasizes the importance of free access to ICT and the Internet for the younger generation in schools, colleges and other educational and public institutions such as public libraries. In the context of this study, several of the most important

locations identified by literature review are used for measuring persons access to ICT and the Internet.

11.6.2. Attributes related to usage of information and communication technology and the Internet

Nowadays, access to ICT and the Internet is much easier. The availability of equipment and infrastructure is largely enabled the majority of the population. But, it has been established that enabled access does not necessarily mean that it will be used by individuals. Likewise, different levels of use intensity/frequency among users are the result of numerous variables which intervene in and influence the real possibility of ICT appropriation in everyday life. Studies conducted with the intention of defining the factors that influence the use of ICT and the Internet turned out to be more complicated than was originally thought and that they require multidimensional and multi-item approach.

One of the key preconditions for the continuous use of technology is its acceptance by individuals. There are several theories for technology acceptance in existing literature that are used by the researchers of ICT and the Internet. In 1975, Martin Fishbein and Icek Ajzen developed a theory of attitude, the so-called Theory of Reasoned Action which led to the study of attitude and behavior. An extension of theTheory of Reasoned Action proposed by Ajzen implements an additional construct to account for situations where an individual lacks the control or resources necessary for carrying out the targeted behavior freely (Fishbein, Ajzen, 1975; Ajzen, Fishbein, 1980; Ajzen, 1985; Ajzen, 1991).

In this area, Roger's Diffusion of Innovations Theory is of great importance. It indicates that individuals possess different degrees of willingness to adopt innovations and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time (Rogers, 1983). The Technology Acceptance Model (TAM) developed by Davis is the most commonly used model for exploring users' technology acceptance. It is a theoretical model that evaluates the effect of system characteristics on user acceptance of computer-based information systems (Davis, 1986; Davis, 1989).

The specificity of the TAM model is reflected in the fact that technology usage is determined by behavioural intentions which is jointly determined by the user's attitude towards ICT use and perceived usefulness. Attitude towards ICT use is also jointly determined by perceived usefulness and perceived ease of use. Finally, perceived usefulness is influenced by perceived

ease of use and external variables such as system features, training, documentation and user support (Al-Hajri,Tatnall, 2008; Al-Somali et al., 2009; Al-maghrabi, Dennis, 2010).

TAM2 is an extended model of TAM developed by Venkatesh and Davis (2000) in which additional theoretical constructs are added such as subjective norm, voluntariness, job relevance, output quality and result demonstrability (Venkatesh, Davis, 2000). TAM3 is an integrated model of determinants of perceived usefulness and perceived ease of use developed by Venkatesh and Bala (Venkatesh, Bala, 2008). In this study, the use in the context of e-Inclusion refers to the use of ICT and the Internet and individual's possibilities and desires to use technology they have access to. The factors which affect the use of ICT are intensity of use, skills, accessibility and quality of network, motivation, attitudes, social support/coercion and digital engagement.

11.6.2.1. Intensity of use

Intensity of use in this research relates to the time spent by an individual in using ICT and Internet access at various locations and expressed in hours per week. Different studies use different periods for determining the intensity of use; for example within the last year, within the last three months, monthly, weekly and daily. As differences in levels of access through time diminish, differences in usage patterns also vary between users. Thus some people may use ICT and the Internet twelve or even more hours per day, while others may limit themselves to once a month. Between such extremes, it is difficult to define the appropriate and correct indicators.

Measuring the intensity of use is specific, because it can to a large extent depend on the type of connection used, the type of subscription package the user is subscribed to and the speed and quality of the connection. The reliability of collected time use data is potentially problematic. The most accurate collection of such type of data is through time diary surveys. Monitoring the intensity of use is important for e-inclusion because studies have shown that people who spend more time online will acquire more knowledge about the Internet, develop better online skills, have more experience in finding information online and also have greater technological expertise (Hargittai, 2002, 2005; Schumacher and Morahan-Martin, 2001).

Table 8. Items *Intensity of use*

Category	Usage
Attribute name	Intensity of use
Indicators	1. How much time per week do you spend using ICT and the Internet at home? 2. How much time per week do you spend using ICT and the Internet at the workplace? 3. How much time per week do you spend using ICT and the Internet in any of the educational institutions? 4. How much time per week do you spend using ICT and the Internet in public places where the access and use is free?
Definition and explanation	The items indicate the intensity of use of ICT and the Internet on different types of locations at which the respondents have access to ICT and the Internet.
Importance and value added	The indicator attempts to illustrate intensity of usage of ICT and the Internet by different types of access location. This indicator supplies useful data about the context and nature of ICT and Internet usage. The indicator has been designed to track the intensity of usage of ICT and the Internet at home, workplace and at community locations where there is a possibility to gain experience, assistance and training in using ICT and the Internet. Basic indicators are important for monitoring e-inclusion by individuals. The last two indicators are of special relevance in countries with relatively low Internet penetration and relatively high costs of Internet access and computer equipment.
Sources of indicators	Adjusted according to EUROSTAT (2014), SIBIS (2003)
Additional indicators	1. How much time per week do you spend using ICT and the Internet at public places where access and use is already paid for? 2. How much time per week do you spend using ICT and the Internet at neighbour's/friend's/relative's place?

Source: made by the author

11.6.2.2. Skills

Having access to ICT and the Internet is a necessary condition for e-inclusion but it is not enough, because effective use of such technology generated a demand for adequate skills. Unlike other communication technologies, one needs skills for using ICT and the Internet, the so-called *digital skills*. They are also known as *digital literacy*. These kind of skills do not come naturally and users have to developed them within the context of significant learning activities (Calvani et al., 2012). The key question relates to the type of literacy necessary for work on computer. Among many attempts at defining the areas of digital literacy, the Warschauer's stands out as the most intelligible and detailed one: computer literacy (basic types of computer operations), information science literacy (management of great quantities of data), multimedia

literacy (ability to understand and create multimedia contents), communications mediated via computer (ability to use online communication such as chat, videoconferences, forums etc.) (Warschauer, 2003). Creating a society based on knowledge demands digital literacy of each individual. Regardless of age, gender or education of an individual, everyone should have the same possibilities of participating in social work-related and educational processes, in order to avoid negative consequences of social exclusion as well as prejudice and inequality on the job market. Digital literacy is a request for every individual, whether he or she is a pupil, student, pensionary, entrepreneur, worker, unemployed, etc. because it is one of basic prerequisites for the creation of a society of knowledge.

Setting demands that every individual should be digitally literate was already defined in 2002 by the e-Learning Action Plan on the level of European Union member countries. This plan simultaneously stimulates the development of such strategies in connection to education. Thus it gives the opportunity to all individuals who are no longer in the education process (because they have finished it or have, for whatever the reason, abandoned it without acquiring the desired level of education) to get the chance of becoming digitally literate. Hence the aim is to implement digital literacy in various educational contexts and for various target groups. In 2001, during the Summit on Digital Literacy in Brussels, a suggestion was made that, along with the three basic skills of industrial era (reading, writing and calculating), a fourth skill essential today must be added and that is digital literacy as the basic skill of the information era.

Although governments use various means to raise awareness of citizens about the importance of digital literacy, every individual separately has a great role in this process. On the one hand, younger generations acquire digital skills more easily due to the fact that they encounter the use of ICT and the Internet from birth on by using these technologies in everyday lives and they obtain and improve those skills in most cases on their own with help of various text-books and tutorials which can be found online or as a part of a programme they wish to master. On the other hand, the elderly need specialized courses. Because of this, the problem with the elderly is their avoidance of using ICT and the Internet in everyday lives and this is exclusively due to the lack of digital skills. In the last couple of years, the number of individuals who have acquired skills of digital literacy has grown considerably. Although indicators of owning European Computer Driving License (ECDL) represent a useful indicator in the expansion of digital literacy, they do not offer a reliable and actual presentation of the expansion phenomenon,

taking into consideration that many individuals acquire necessary skills on their own or in other ways.

Besides information science skills, linguistic skills and the knowledge of English in conversation and writing are of great importance, since English has become the language of the Internet. Therefore, the access and usage elements are equally closely connected to the knowledge of English and, regarding this, to the possibility of acquiring and accessing relevant data. E-inclusion mainly refers to the first level of digital literacy, although in many studies there is a growing emphasis on user skills concerning the prevention of social exclusion from e-services, and the exploitation of digital opportunities for all. While identifying manifest variables for the attribute *skills*, the recommendation from the e-Learning Summit should be taken into consideration. According to this, the following types of knowledge are necessary for digital literacy (White, Overton, 2001): digital communication; choosing, applying and keeping up to date with digital tools; searching, processing and using information in a discriminating and responsible manner; learning and taking responsibility for continuous personal learning development and employability.

One should also be able to use the skills of the *information society* quoted by SIBIS (SIBIS, 2002, p.7): technical skills, communication skills, skills in acquiring and using information, self-learning and self-assessment skills, participation skills and directly assessing skills. For the purpose of defining digital variables connected to digital skills, one should also be able to define manifest variables, among others (Gareis, 2002, p. 10): indicators of measuring the acquisition of skills, indicators measuring the provision of skills, and indicators measuring skills requirements. There are three ways of measuring skills: through certificates individuals acquire with reference to the level of knowledge of a completed course, direct measuring through testing of some kind which is, simultaneously, time- and cost-related the most demanding. The third and the simplest way is self-assessment. The latter was taken into consideration during the process of creating indicators of this attribute.

Table 9. Items *Skills*

Category	Usage
Attribute name	Skills
Items	1. How would you evaluate your knowledge of using software for writing and text editing (eg. Word ...)? 2. How would you evaluate your knowledge of using a spreadsheet application (eg. Excel, Lotus)? 3. How would you evaluate your knowledge of creating electronic presentations by using presentation software (e.g. slides), including images, sound, video or charts (e.g. PowerPoint)? 4. How would you evaluate your knowledge of using Internet search engines (e.g. Google, Yahoo)? 5. How would you evaluate your knowledge of the use of ICT and the Internet to download and install software tools on the computer? 6. How would you evaluate your knowledge of using specialized programs for video communication via Internet (e.g. Skype)? 7. How would you evaluate your knowledge of using online forums for the exchange of information? 8. How would you evaluate your knowledge of using chat rooms for communication (e.g. Messenger, IRC)?
Definition of items and explanation	The items indicate user perceived degree of skills for usage of ICT and Internet tools. A limitation of these items is that the skills of using ICT were measured by using respondents self-evaluation. As a consequence, the results of the study do not necessarily represent their actual skills of using ICT. Still, the self-evaluation approach to some extent allows assessment of the skills level indicating the potential of increasing the skills level of the population.
Importance and value added	The perceived degree of knowledge of skills is a potential barrier to ICT and Internet use especially for late adopters. The skill issue, or the lack of thereof, has been identified as one of extremely relevant barriers to a wider uptake of the Internet amongst relatively disadvantaged groups within a society. Digital literacy and computer skills are a key policy objective of the European Commission as well as all Member States governments, and is a central objective in the eLearning Action Plan, eEurope 2005 and one of the priorities of Digital Agenda for Europe, The Europe 2020 Strategy. A high level of skills in using software for writing and text editing, using a spreadsheet application, using Internet search engines, obtaining and installing software, using specialized programs for video communication, using online forums and using chat rooms among respondents indicate a high potential for continuous adjustment of the computer as a central operating tool and is important in the study and work life, as well as in an approach of lifelong learning and responsibility for own learning. An increase in the share of respondents who have a very high score for these skills should be interpreted as an increase in the general level of practical computer use and digital skills which is essential for being part of the Information Society. The ECDL is by far the most important European initiative to provide certificates for basic computer training outside of the working place. Local ECDL initiatives have been integrated into the national Information Society strategy of many countries.

Sources of indicators	Adjusted according to EUROSTAT (2014), SIBIS (2003).
Additional indicators	1. How would you evaluate your knowledge of using e-mail for the purpose of communication? 2. How would you evaluate your knowledge of compressing (or zipping) files? 3. How would you evaluate your knowledge of transferring files between computer and other devices (from digital camera or from/to mobile phone, mp3/mp4 player)? 4. How would you evaluate your knowledge of installing a new or replacing an old operating system? 5. How would you evaluate your knowledge of writing a computer program using a specialised programming language? 6. How would you evaluate your knowledge of networking by using ICTs and the Internet via, for example, social networks (Facebook, Twitter, Instagram ...)?

Source: made by the author

11.6.2.3. Motivation and Attitudes

Access, and *usage* of ICT are closely connected to *motivation*. *Motivation* is one of the preliminary conditions for the readiness to use ICT by potential users. In the context of *e-inclusion* related to the concept of motivation, one can exclude the complex area of investing in oneself and expectations regarding the use of ICT. *Motivation* to use ICT is studied for a long time and it can be concluded that special attention should be paid to reasons because of which users stop using ICT or do this with occasional interruptions (Gareis, 2002, p. 10).

Attitudes are connected to personal perception of ICT utility and possible dangers and detriments brought on by the use of ICT and the Internet. Research identified various sorts of attitudes relating to the use of ICT. According to Helsper, one differentiates (Helsper, 2008): general attitudes, attitudes connected to regulations relating the use of ICT and the Internet and attitudes on importance of ICT from the standing point of various socio-cultural groups. General attitudes on ICT relate to the effects of ICT on the society and the quality of life of individuals who use ICT's products and services, impact on social activities and personal freedom and safety. Attitudes connected to regulations on utilization concern regulations on data and privacy protection and questionable and harmful contents which are accessible via various ICT platforms. Attitudes on importance of ICT from the standing point of various socio-cultural groups relate to groups developing ideas which stimulate the use of ICT and groups that consider ICT and the Internet as inappropriate for use, so that individuals from the community are not recommended to use ICT or are even prohibited to use ICT and the Internet.

Attitudes relating to the security and privacy of using ICT and the Internet are among the most challenging issues facing e-inclusion. A primary need of any person is to feel protected in all aspects of life. In an era where personal digital data is at the centre of almost all Internet applications, that is difficult to achieve. Nowadays popular social networks (Facebook, Twitter, Instagram etc.) are the most evident example of the dissemination of private data over the Internet, as well as various search engines (Google, Yahoo, etc.) which are also used to acquire and store data – the content of personal electronic mails is usually stored in remote servers and in some cases utilized for commercial reasons.

Security is a very important component that affects the growth of the digital economy. Valeri and Cremonini (2001) defined security as "the combination of technical and managerial processes that aim to foster confidentiality, privacy, integrity and availability of data and information systems, as well as to provide authentication and non-repudiation functionalities" (Valeri, Cremonini, 2001, p. 5). Persons who are concerned with Internet security can avoid using a number of on-line services, ranging from electronic commerce to e-government. Bad perception of user security and privacy could be related to lower trust in the tools of the information society and could, ultimately, result in refusal to use the existing as well as new e-services. Security is a serious matter of concern for the customers in deciding whether they would use a technology based service or not (Sathye, 1999). In 2009, security was cited as the main reason for not buying online over one-third of Internet users in the European Union who had not made any purchases online.

Privacy concerns account for a slightly smaller share, about 30%. (OECD, 2014, p. 66). When reviewing literature, no clear consensus on classifying and measuring attitudes and motivation in relation to e-inclusion can be found. In this study, it was decided to use items (manifest variables) towards attitudes and motivation related to general attitudes and motivation which examine respondents perception of the benefits of ICT and the Internet, perception of ease of use and attitudes related to personal security and privacy.

Table 10. Items *Motivation and Attitudes*

Category	Usage
Attribute name	Motivation/Attitudes
Items	1. I consider the use of ICT and the Internet beneficial to myself. 2. By using ICT and the Internet I acquire important information that help me make better decisions. 3. The use of ICT and the Internet is simple for me. 4. I am worried about Internet security and manipulation of my personal data. 5. I am worried about the privacy and confidentiality of my personal data on the Internet. 6. I avoid the use of e-services due to concerns about the ability to manipulate my personal data.
Definition and explanation	The items indicate user motivation and attitudes related to the use of ICT and the Internet. The indicator does not cover respondents on-line "experience", but their perceptions.
Importance and value added	This item provides an insight in motivation and attitudes and gives an idea about the general attitude and motivation of the respondents towards ICT and Internet tools and services. User perception of the usefulness, ease of use of ICT and the Internet and the perception of security and privacy are one of the key features for the adoption of technology and desire to use. The items related to user perception of security and privacy are important under a policy perspective because determining perceptions of respondents leads to creating appropriate approaches and appropriate policies for information security. This indicator is important because people's concerns over data privacy and security can strongly influence the development of information society. Hence, in order to ensure wide participation in the information society, policy makers need to know whether and how concerned their citizens are when going online. Combining indicators of security and privacy with other technically orientated indicators may also enable more useful insights into security concerns across profiles of users/social groups etc. These items are important because by differentiating this indicator among types of users by demographic, economic, social and cultural characteristics of the respondents, important insights into the profiles of different users and non-users are acquired.
Sources of items	Adjusted according to EUROSTAT (2014), SIBIS (2003).
Additional items	1. I consider the use of ICT and Internet to be fun. 2. I consider the use of ICT and the Internet to be frustrating. 3. I enjoy using ICT and the Internet for private purposes. 4. I avoid using ICT and the Internet for business and private purposes as much as possible. 5. I have come across illegal/inappropriate contents while using ICT and the Internet.

Source: made by the author

11.6.2.4. Social support/coercion

Social support/coercion in the sense of usage of ICT and Internet tools and services relates to support by family members, friends, colleagues, all the way to legally binding obligation. People whose friends and families are more familiar with new technologies are usually more motivated to adopt and use ICT and the Internet.

In the context of acceptance and usage of ICT and the Internet, DiMaggio and Hargittai (2001) distinguish three kinds of support: formal technical assistance from persons employed to provide it, technical assistance from friends and family members and emotional reinforcement from friends and family. Their findings indicate that social support of all kinds increases user motivation to use the technology when they reach the limits of their own skills and that variation in social support influences the returns to ICT and Internet access and usage (DiMaggio, Hargittai, 2001, p. 13-14).

Table 11. Items *Social support / coercion*

Category	Usage
Attribute name	Social support / coercion
Items	1. I have support from relatives and family members to use ICT and the Internet. 2. I have support from friends to use ICT and the Internet. 3. I have support from colleagues at work faculty/in the association to use ICT and the Internet. 4. I am obligated to use ICT and the Internet for business/educational/legal obligations.
Definition and explanation	The items indicate user perceived support they receive for the use of ICT and the Internet.
Importance and value added	These items are important because social support from relatives, friends, colleagues or community can help in e-inclusion of marginalized groups, groups with low level of digital skills, late adopters, children and young people and in this manner significantly decrease access and usage gaps.
Sources of items	Adjusted according to EUROSTAT (2014), SIBIS (2003).
Additional items	1. I have a lot of help from friends in solving problems related to the use of ICT and the Internet. 2. I have a lot of help from relatives and family members in solving problems related to the use of ICT and the Internet. 3. I have a lot of help from colleagues at work/faculty/in the association in solving problems related to the use of ICT and the Internet.

Source: made by the author

Social support proved to be also crucial for children as well as for late adopters. Many studies confirm that acceptance and usage of ICT and the Internet by children and young people is associated with the educational level of their parents. Parents with higher level of education are usually more skilled in using the Internet and have a higher level of digital literacy, therefore they might be more aware of potential opportunities which the use of ICT and the Internet can provide their children. Thus they are more likely to encourage their children to use the Internet and get wider social support for children's Internet activities (Hollingworth, Mansaray, Allen and Rose, 2011; Kiesler, Zdaniuk, Lundmark, 2000).

11.6.2.5. Digital engagement

Access to ICT and the Internet, usage skills as well as motivation and positive attitudes are an indispensable but not always sufficient conditions for successful and full engagement with technology, the so-called *digital engagement*. At the present time there is still no accurate and complete definition of the concept of *digital engagement* and what it means to be digitally engaged. Most of the research that has tried to define and classify digital engagement is based on the Internet, since the Internet is currently the most important medium in terms of various types of engagement (Cushman, Klecun, 2006; Selwyn, 2006; Helsper, 2008, 2012). Given that ICT and the Internet have a wider range of different functions and offer a new range of uses to individuals, for example for entertainment, work, education, communication, informing, economic activities, political activities etc., it is therefore important to analyse ICT and the Internet in these different areas and not only focus on users and non-users but also on the levels and types of usage and engagement (Slevin, 2000; Anderson, Tracey 2001; Didi, LaRose, 2006).

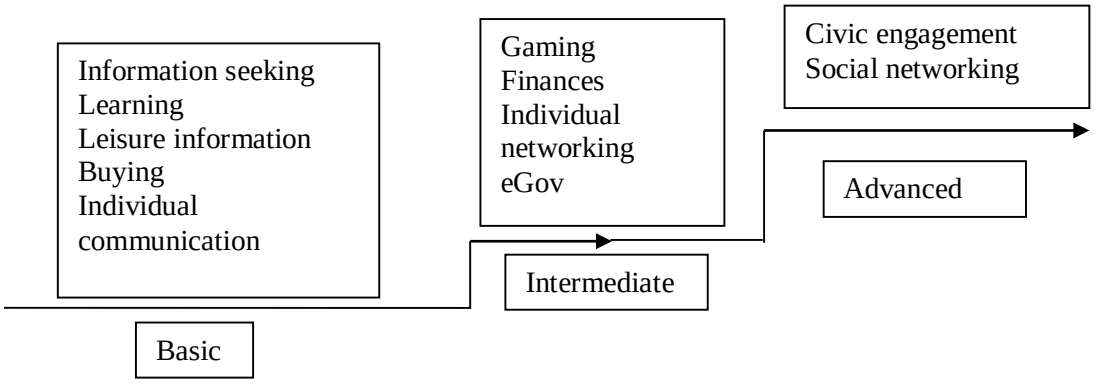


Figure 4. Levels of digital engagement
Source: Adjusted according to Helsper, E.J., Digital Inclusion: An Analysis of Social Disadvantage and the Information Society, Communities and Local Government Publications, 2008.

Digital engagement is difficult to measure because today's technology changes rapidly. Boundaries of use of ICT and the Internet are expanding every day and so are the possibilities of digital engagement. Different types of ICT technology give different possibilities of digital engagement, various online applications also offer different forms of engagement. Helsper (2008) distinguishes two basic approaches to measuring digital engagement: qualitative lens, focusing on the nature or content of engagement and quantitatively through an evaluation of the number of things that people do when using the technology.

Activities related to the concept of digital engagement and the level of digital engagement according to Helsper (2008) are:

a) *basic activities* - include informing with the help of ICT and the Internet, communicating and purchasing goods and services;
b) *intermediate activities* - include the use of e-services of public administration, online financial services, individual networking, playing video games;
c) *advanced* - include online civic participation(participating in online petitions and online decision-making) and the use of social networks like Facebook and Twitter.

Helsper (2008) conducted research to mention the two most important groups of the complete digital engagement benefits, namely prevention or complete removal of the social isolation of individuals and groups and reducing economic vulnerability. In terms of prevention or removal of social isolation, Helsper points out that ICT and the Internet could be significant in reducing isolation of vulnerable groups such as the elderly, pensioners, people with disabilities. For economically disadvantaged groups, such as the unemployed and individuals with low income, benefits of digital engagement are reflected in increasing educational opportunities through free access to a variety of educational materials, cheaper online purchase of products and services (Helsper, 2008). Digital engagement is strongly affected by the presence of younger people in the household. Enabling school children and students subsidized or free Internet from home can greatly affect digital engagement of their parents or elderly household members, such as grandparents in a positive direction. Reviewing the literature encountered in different forms digital engagement, those which belong to the socially desirable categories (for example, the use of financial services online, search for information) as well as those that belong to the socially undesirable categories (such as gambling or pornography). This indicates that some types of engagement would be better indicators of inclusion and ‘proper’ for use than others. This e-inclusion research tends to ignore the use of undesirable usage of ICT and the Internet

as indicators of inclusion and instead focus on those that are assumed to bring greater social advantage. However, this study also assumes that any type of engagement contributes towards e-inclusion and leads to a broader integration of technologies into other aspects of everyday life.

Table 12. Item *Digital engagement*

Category	Usage
Attribute name	Digital engagement
The items	1. In the last three months I have used ICT and the Internet to search for information (news, health, products, services...). 2. In the last three months I have used ICT and the Internet for learning purposes (educational materials, employment opportunities, training courses…). 3. In the last three months I have used ICT and the Internet for leisure activities (hobbies, travel…). 4. In the last three months I have used ICT and the Internet for entertainment (computer games, music, movies, theatre…). 5. The use of ICT and Internet has become a part of my daily routine.
Definition and explanation	The items indicate user engagement with technology through examination of the frequency of use of ICT and the Internet for different types of activities.
Importance and value added	Engagement with the technology is necessary, contributes to e-inclusion, and leads to a broader integration of technologies into almost all aspects of everyday life and thus positively affect the quality of life of individuals/groups.
Sources of items	Adjusted according to Helsper (2008).
Additional items	1. In the last three months I have used ICT and the Internet for communication (e-mail, text messaging, chat, forum…). 2. In the last three months I have used ICT and the Internet for social networking (Facebook, Twitter, YouTube…). 3. In the last three months I have used ICT and the Internet for commercial activities (buying/selling products and services, searching for information about products and services, comparing products and services…). 4. In the last three months I have used ICT and the Internet for financial activities (banking, investment activities…). 5. In the last three months I have used ICT and the Internet for participation in civic activities (signing petitions, participation in discussions…). 6. In the last three months I have used ICT and the Internet for participation in political activities (contacting politicians, participation in political parties).

Source: made by the author

The level of engagement can therefore be measured across a range of activities and technologies. In this research, digital engagement was measured as a sum of different activities conducted via ICT and the Internet. These activities include the use of ICT and the Internet for: acquiring information, learning and education, entertainment, communication, economic activities, financial activities, political participation activities and social participation activities. The assumption is that a broader and more frequent use of ICT and the Internet shows that the technology is more integrated into everyday life, and thus identifies greater level of digital engagement.

11.6.3. Attributes related to the role of ICT in improving quality of life

Digital technology is everywhere today–the new modern society has incorporated technology in its everyday life in a way that almost all activities are supported by ICT and the Internet. In December 2003 in Geneva, in the first phase of the World Summit on the Information Society, a "common desire and commitment to build a people-centred, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life" (WISIS, 2003) was expressed by all participants. The importance of the implementation of ICT and the Internet in the daily lives of people has been recognized by the governments of both developed and developing countries which, with various strategies and projects, are trying to create information societies in which their citizens can use ICT and the Internet to improve their quality of life, and enhance the economic and social growth and development (Madon, 2000; Kozma, 2005; Tas, 2011). Nurmela and his associates, through an extensive research, came to the conclusion that there are seven areas of implementation of ICT in the daily life of people, and these are: communication, personal production/self-expression, search for information, personal business from distance, automatic information and process system, mass media and media culture. The study assumes that the following: a) devices make everyday life easier because communication can intensify, diversify and expand beyond temporal and geographic obstacles, b) devices lower the participation threshold because obtaining information is easier and opinions can be expressed through several channels (Nurmela et al., 2004). A similar conclusion was made by Shih and Venkatesh who have also divided the use of ICT in the daily life of people in seven categories: work related, family communication, family recreation, home

management, home shopping, education/learning, information center (Shih and Venkatesh, 2004). In the project entitled *Transformative Use of ICT in EU Regions* Gareis and Lamp identified eight areas of activities using ICT in everyday life: communication and social interaction, perception of information, retrieval of information, personal business, transactions and requests for assistance, entertainment, generation and distribution of user-created content, participation in policymaking and public life, employment-related activities (Gareis, Lamp, 2007. p. 44). Amichai-Hamburger and Furnham (2007), in an attempt to prove a link between the use of ICT and its positive impact on the quality of life, concluded that, as technological devices enter into individual and collective spheres, ICT promotes higher social coherence, the recognition of being a part of a group and a strong attachment within a group/community enhances the members' mutual understanding and social approval, and helps to raise the sense of actualization.

The impact of e-inclusion on the quality of life of individuals who use ICT and the Internet is often very difficult to isolate and quantify. Therefore, the impact of ICT and the Internet on the quality of life, in the context of e-inclusion, in this study is monitored through the use of e-services created by public authorities and private business organizations. To create indicators to monitor the use of e-services, OECD working framework defines which areas of the identified set of indicators should be measured, and these are (OECD, 2009):

a) willingness to use e-services,

b) the intensity of use of e-services, and

c) the impact of the use of e-services on the quality of life of the users.

At the same time, the readiness indicators related to e-services should measure how many individuals use e-services (proportion of respondents) and also have take into account the socio-economic and infrastructural factors, and barriers that can influence on use of e-services. Infrastructural factors are related to the availability of ICT and the Internet, while socio-economic factors concern the willingness, ability, and the skills and knowledge needed to use and attitudes related to ICT and the Internet including all the benefits, as well as risks arising from their use.

Indicators of intensity of use are related to the measurement of the frequency, nature and extent of the use of e-services. Such indicators are very important for economic policies creation, as well as for private business organizations, because they provide information about the

differences and inequalities in order to use a particular e-service as well as about differences between the users. The impact of e-services on the quality of users' lives in this study refers to social and economic benefits such as saving time, material and financial resources, greater choice, acquiring new knowledge, however this is still difficult to measure, because there is no proven causal relationship. What can be defined as the potential impact on the actual users is: the impact on user behaviour, perception of security feature, privacy and confidence, and satisfaction that comes from using e-services. In the process of improving the quality of citizen life, economic policies play a significant role. Many of e-services that drive digital progress are developed by the private sector, but many e-services are inherently related to core public functions including education, health care, public safety, community development, and the environment. These e-services must be considered as critical areas for increased public investment because they form core components of the new intangible public infrastructure that drives improvements in quality of life.

The dimension *impact of ICT and the Internet on the quality of life* is identified in several areas: economic area, educational area, the area of labour and employment, health area, the interaction of government, culture, and communication and entertainment. An attribute that refers to the economic sphere includes e-banking and e-commerce, educational area includes the attribute e-learning, e-health area health care, for the area of interaction between government and the citizens e-government, e-culture area of culture, while the area of communication entertainment includes e-communication and e-entertainment.

11.6.3.1. E-learning

The attribute *e-learning* comprises numerous different processes of long distance studying, including the organization of traditional institutions, as well as professional improvement of adults and workers. According to the logic of life-long learning and the characteristics of contemporary societies, possibilities and accessibility of various tools and educational materials undoubtedly represent a significant step in direction of continued development and potentially unlimited educational improvement and improvement of the educational system.

In view of the obviously growing importance of electronic learning tools and learning arrangements, in the context of e-inclusion, they should be accessible and usable by the widest possible range of learners including persons with functional restrictions, persons with limited ICT skills and socially disadvantaged population groups (Savidis, Stephanidis, 2005; Rodríguez, et al., 2006; Savidis, et al., 2006; Huang, Huang, 2011; Bjekić, et al., 2014).

Reviewing the literature one comes across many different definitions of e-learning, depending on the profession and the field of research. In general, it can be divided into two groups, namely those that place the focus more on technological aspects and those that are more focused on education. The European Commission members defined e-learning in the "eLearning Action Plan" (EC, 2001, p. 2) as: “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration.” According to European Commission, a great advantage of e-learning for all citizens is providing access to education and training opportunities, in particular to those who have access problems because of social, economic, geographic or other reasons. ICT offers possibilities of transforming the learning paradigm and bringing knowledge to those who have not earlier been able to participate in education. E-learning can also play a significant role in implementing the concept of flexible and individualised learning, answering individual education needs, and avoiding the limitations of current systems, based mainly on pre-defined options (EC, 2001). Hundreds of institutions and businesses are using e-learning. As web technologies grow and become more versatile, more adaptable paths and opportunities to learn and be assessed are revealed.

Through time, the concept of education is changing. So, nowadays education and lifelong learning are the key factors and the basis for inclusion in the information society. Introduction of electronic supported learning requires satisfaction of certain conditions. The first of these is adequate infrastructure in the education system, which includes material component. ICT equipment and networks form the basis for the connection within educational institutions as well as a global connection. This component is crucial and represents the base for e-learning as well as the availability of appropriate software solution for e-learning and digital educational content, as well as possible new pedagogical methods.

New pedagogical aspects are reflected in the creation of new curricula which include the implementation of ICT and the Internet as well as new forms of teaching process (Law, 2009). The specific features e-learning platforms is that this platforms connecting both educational institutions on a global level, and the institutions and individuals who are involved in the education process. This includes teachers, students, elementary and secondary schools as well as administrative and other non-teaching staff in the education system with the main purpose of exchanging knowledge and experience as shown in Figure 5.

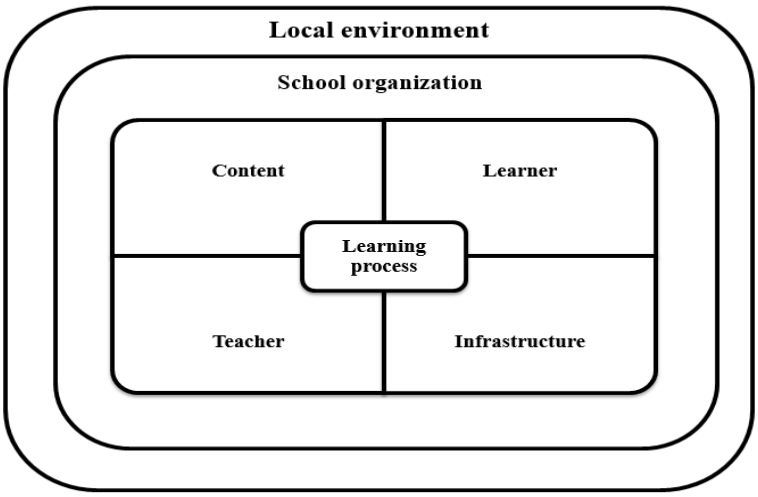


Figure 5. The role of ICT in connecting the main actors in the educational process
Source: Adjusted according ten Brummelhuis and Kuiper, 2008, p. 98.

Teachers and students are fundamental elements in the educational process. Therefore, in order to implement ICT in the educational process, it is not enough just to equip educational institutions with the latest ICT equipment and allow access to the Internet. Teachers are the ones who should use ICT as an aid in the transfer and creation of new knowledge and possess the necessary skills, competences and positive attitudes towards the use of ICT (Akaslan, Law, 2012) as well as be familiar with the available e-learning system. A prerequisite for the successful implementation of e-learning is the development of digital skills among students and teachers and integration of ICT at all levels of the educational curriculum.

ICT can act as a connection between businesses and educational courses in the system, or as a separate element of the curriculum. Flexible virtual educational institution running in virtual environment does not require mobility of students and teachers as online education training and courses can attract students from around the world. Virtual network between two or more universities enables joint cooperation them in a way that both of them participate in the creation of educational content and deliver joint curriculum (Yang, 2013). A prerequisite for the successful implementation of e-learning and the development of digital skills is also integration of ICT at all levels of the educational curriculum. Such flexible virtual educational campuses provide access to materials and courses irrespective of time and place.

Table 13. Items *E-learning*

Category	ICT and quality of life
Attribute name	e-Learning
Items	1. I use ICT and the Internet to attend learning courses. 2. I use ICT and the Internet to find information about learning courses. 3. I use ICT and the Internet to access and download materials for education /training. 4. I use ICT and the Internet to read/download digital books.
Definition and explanation	The items indicate usage of ICT and the Internet for any aspect of learning (from seeking information related to learning and learning courses up to the access to digital resources related to learning). Learning activities here include all activities considered to be as an improvement in education /training/knowledge by the respondents.
Importance and value added	ICT and the Internet, as a helpful tool for improvement of learning activities, can considerably increase the efficiency and effectiveness of the learning process and reduce learner's costs of acquisitions of knowledge when compared to traditional media. Indicators that refers to e-learning, as an innovative way of skills and knowledge acquisition, are of key importance in measuring the information society. e-Learning can help meeting the challenge and goals of the Information Society, since it can be adapted to the specific needs and characteristics of the learner. High number of individuals/groups who use e-learning can generally be considered as beneficial for a country and society for several reasons: users of e-learning learn more about computer applications in general which gives them a competitive advantage on the labour market, e-learning enables individuals/groups to take part in learning activities irrespective of time and location, from a macro perspective countries which have high numbers of users of e-learning are more likely to gather the user experience required for successful participation or leadership in global market. As e-learning plays an important role in almost all e-inclusion strategies for knowledge dissemination planned by the European Commission, items on current usage of ICT and Internet for activities related to e-learning need to be included in general model of e-inclusion.
Sources of items	Adjusted according to SIBIS (2003)
Additional items	1. Computer and Web-educational courses should have an important role in education. 2. Web-based learning programs should replace lectures and exercises. 3. E-learning should not be anything more than distribution of educational materials via the Internet.

Source: made by the author

Exploring the recent literature, a conclusion can be drawn: there is a large gap between researchers in identifying relevant indicators of *e-learning*. Thus, many authors focus exclusively on the technological component of e-learning. At the present time the central focus of indicators should be the users of the education system to improve their competence by using new e-learning systems. There is a need to obtain information related to the attitudes of individuals (Alkhalaf, et al., 2013), and competencies that are a request to be able to participate in all aspects of the information society (Kędzierski, 2010). Also, educational systems nowadays should put creating new knowledge as their focus, instead of the primary focus on acquisition of the existing knowledge. In short-term and long-term educational strategies introduction of mandatory use of ICT should be a priority.

11.6.3.2. E-work

ICT and Internet utilization in the working context is growing in importance in many professions. One of the reasons is that it enables certain activities to be performed outside the company's premises by maintaining online connections constantly open and active. Such technologies significantly expand the spectrum of working possibilities in companies which use them and, to a large degree, contribute to creation and maintaining useful contacts with corresponding business partners. Using ICT and the Internet for conducting business activities today links two terms: telework and e-work, where e-work is the general component. "Telework occurs when paid workers carry out all, or part, of their work away from their normal places of activity, usually from home, using information and communication technologies" (Johnston, Nolan, 2001, p. 12). The former definition was used in the research by IST (Information Society Technologies) aimed at developing indicators of e-work. Types of telework according to Empririca (2003, p. 11) are shown in Figure 6. E-work is usually defined as „any type of work which involves the digital processing of information and which uses a telecommunications link for receipt or delivery of the work to a remote employer or business client (Bates and Huws, 2002, p. 3). The previous studies conducted differ several types of e-work. Gareis (2002) distinguishes the following types of *e-work*: employees working in remote back-offices, multi-locational teleworking employees, home-based teleworking employees, remote call centre in company-owned back office (outside own region), employees working in telecentres, telecottages or other office premises owned by third parties, call centre employees in telecottages or telecentres. Types of outsourced *e-work* include: e-lancers, e-outsourcing within own region, e-outsourcing to other region in own country, e-outsourcing to companies in other countries, outsourced call-centre, and outsourced call-centre with telecoms link.

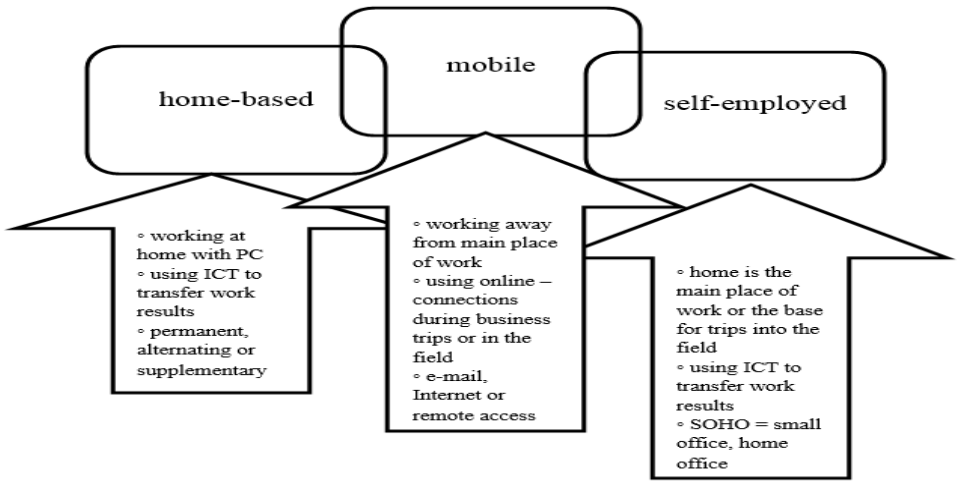


Figure 6. Types of telework
Source: Adjusted according to Empirica (2003, p. 11)

Types of supplied outsourced *e-work* services include: customer services, sales, software development and support, accounting and finance, management, training and human resources, design, editorial and creative services (Gareis, 2002, p. 206-208). Definitions and types of e-work and telework are subject to constant changes depending on the speed of new ICT development and Internet technologies, and the implementation of cutting-edge technologies in production and service of business processes. ICT and Internet technology, among other things, greatly help not only in the performance of work activities but also employment. etc. The majority of business and public organizations publish tenders for job vacancies through their websites or web pages and specialized portals (e.g. posao.hr, moj.posao.net...). On the other hand, workers applying for a job are expected to fill out electronic files and send emails. The request for labour and work is becoming more frequent due to less stability in employment relationships, dynamic changes in traditional and new sectors, diversification of career development and labour mobility. In this sense, ICT and the Internet can serve different purposes, for example offering websites for sophisticated job and candidate search engines, facilitating job-matching and job mobility for job seekers and employers, improving the functioning of labour markets, coordination and exchange of information, monitoring of local market trends, and online marketing employers and employees etc. In identifying and selecting items suitable for monitoring *e-work* in the context of *e-inclusion* has been taken into account the opportunities provided by the use of ICT and the Internet in employment.

Table 14. Items *E-work*

Category	ICT and quality of life
Attribute name	E-work
Items	1. In the last three months I have used ICT and the Internet to find information about employment. 2. In the last three months I have used ICT and the Internet to send job applications. 3. In the last three months I have used ICT and the Internet to log on employment mediation portals (e.g. posao.hr, moj.posao.net ...).
Definition and explanation	The items indicate usage of ICT and the Internet in different aspects of employment activities (finding information about employment, sending job applications, logging on for employment mediation portals)
Importance and value added	Indicators of the use of ICT for employment purposes are important because they provide information about the use of electronic labour markets and their effects on employment and labour market. The share of respondents which use ICT and the Internet as a tool for job seeking indicates extent to which ICT and the Internet are exploited in job matching of the labour market. This item is also important because young labour market participants today usually search for jobs and send job applications using ICT and the Internet. Usage of ICT and the Internet for job listing offers opportunities to improve the matching function of labour markets by simplifying the transfer of labour market data between enterprises/institutions who look for employees and those people who are looking for employment. Electronic labour markets are usually provided by private business organizations such as a private portals or job operators. E-work item is also of high relevance for the assessment of potential labour mobility since lack of knowledge of employment alternatives is one of the main constraints to geographical labour mobility. The relevant papers that present opportunities of ICT and the Internet to support the employment policy in EU countries are: "Job opportunities in the Information Society" (1998) and "Strategies for jobs in the Information Society" (2000), i2010 - European Information Society 2010 and The Europe 2020 Strategy – "A strategy for smart, sustainable and inclusive growth"(2010).
Sources of items	Adjusted according to SIBIS (2003).
Additional items	1. By using ICT and the Internet I can, in a simpler manner, make contact with potential employer. 2. I believe that, by using ICT and Internet, one can do more business activities in one day. 3. I believe that, by using ICT and the Internet, one may easily synchronize one's private and business life.

Source: made by the author

11.6.3.3. E-health

A lot of other tangible advantages that have been brought into people's lives by the expansion of ICT can be identified in the attribute *e-health*. They move from the possibilities of acquiring information on health by navigating through Internet, for communication with health care employees and family doctors (for obtaining diagnosis, opinions and prescriptions) via e-mail, with the possibility of checking up reservation and diagnostic examination, as well as direct consults with the doctor online (teleconsult), or even going through real surgeries, that is long distance treatment (telemedicine). In all given cases, the use of ICT enables considerable savings which can be made in the sense of providing health care services on one hand and significant transformation in treatment methods and monitoring disease in daily lives of users, on the other hand ICT and the Internet is helping provide various benefits in health care: reducing health care costs, increasing access to health information, enabling more effective diagnostic and treatment, improving the quality of health care, reducing the number of medical errors and increasing access to health care. At the present time in many countries national health authorities as well as public and commercial healthcare institutions provide health information and services to the citizens through various web sites and online portals. Further development trends in health care are going in the direction that more and more citizens who need health services will interact electronically.

The use of ICT and the Internet in health has led to different applications in various areas, such as *telemedicine*, *e-prescription* and *e-consultation*. The World Health Organization defines *telemedicine* as "delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" (WHO, 2010, p. 9). *E-consultation* is the use of electronic computing and communication technologies in medical consultation processes. *E-prescription* is a tool which serves in health care for generating and sending prescriptions electronically directly to a pharmacy from the health care institutions (Kierkegaard, 2013).

In Atlas of *eHealth country profiles* from 2011 the World Health Organization defines *e-health* as the use of ICT for health (WHO, 2011). According to Silber (2003) *e-health* can be defined as "application of information and communications technologies (ICT) across the whole range

of functions that affect health“ (Silber, 2003, p. 3). *E-health* is one complex and broad area including health records for professionals and patients, tele-health interventions, education, learning and research and involves various actors from governments physicians, patients, academics to health service organizations, and industries. All these actors have different roles and expectations, patients want better and more accessible health care, governments more efficient and less expensive health care and industries want to make business with the highest possible profit. According to the vision in which the patient has a central role, this is hard to achieve. *E-health* should be focused towards the empowerment of the patient. The European Commission in the action plan from 2004 related to *e-health* recognizes and lists the specific target groups that could be deprived of all the benefits offered by e-health such as lone parents of families, isolated communities, inner city communities, individuals with literacy and numeracy challenges, groups of immigrants, homeless persons, elderly persons and disabled persons. On the other hand, e-health can offer considerable advantages for the provision of health services to such individuals, groups, and communities (EC, 2004a). E-health projects should be user centric, in order to prevent the exclusion of certain group of people and prevent health care inequalities. This problem is particularly serious for some specific groups, for instance elderly people (Marschollek at all, 2007) *eHealth Action Plan 2012-2020 - Innovative healthcare for the 21st century* is focused on providing easy and equal access to quality healthcare for all citizens in any place and at any time in the European Union, at the same time, supports and emphasizes the importance of cross-border activities and encourages national and regional authorities, healthcare and social care professionals, industry, service providers, researchers and EU Institutions to closely work together. Its main operational objectives are (EC, 2012b, p. 6): achieving wider interoperability of eHealth services; supporting research, development and innovation in eHealth and wellbeing to address the lack of availability of user-friendly tools and services; facilitating uptake and ensuring wider deployment and promoting policy dialogue and international cooperation on *e-health* at global level. E-health is also the first of six markets with high economic and societal value defined in Lead Market Initiative for Europe. The document defines main objectives of e-health: improve legal certainty and consumer confidence, ensure protection of personal data in eHealth systems, enhance enforcement of consumer protection legislation by Member States for e-health products, improve cross-border reimbursement, support patient mobility, improve adaptation to needs, interoperability and cost-effectiveness of innovative solutions for public services and enhance e-health interoperability (EC, 2007, p. 3, 4). *The Digital Agenda for Europe* includes a number of actions and goals associated with *e-health*. In 2010, initiatives Digital Agenda for Europe

and Innovation Union were launched as part of the EU's "Europe 2020" strategy for smart, sustainable and inclusive growth (Giorgio, 2013; Cipriani, 2014).

Table 15. Items *E-health*

Category	ICT and quality of life
The attribute name	E-health
The items	1. In the last three months I have used ICT and Internet to find information about health services / improving my general health condition. 2. In the last three months I have used ICT and Internet to find information about / buy medicine. 3. In the last three months I have used ICT and the Internet to obtain a second opinion regarding diagnosis and health status for me, my friends, family members ... 4. In the last three months I have used the e–health care system to order specialist examination, surgeries... 5. I would recommend the use of e-health care to other users. 6. I believe that the use of e-health care system increases the quality of health care services, if compared to the alternative traditional ways. 7. I believe that I save time by using the e-health care, if compared to the traditional ways of obtaining services. 8. I believe that the use of e-health care is more cost acceptable, if compared to the traditional ways of obtaining services.
Definition and explanation	The items indicates usage ICT and Internet for health purposes and perceptions of respondents about the usefulness of e-health.
Importance and value added	ICT and the Internet is becoming an important source of health information and it is necessary to monitor and quantify the use of on-line information sources and e-health systems as well as user perceptions of the benefits that offers e-health. Items that give a report about on-line communication between patient and doctor or health institution are very important because can increase the efficiency and accessibility of health services, also can open new opportunities for patient to get second opinions and it is important for government and policy makers to monitor the speed at which this is evolving and according to user requirements working on continuous improvements. The items associated with searching for information about medicines and buying medicines through Internet are also important because on-line purchase of medicines is growing and it is an area of concern because of the potential for existing misuse and fraud. Information on trends and developments in this area is important for government and policy makers.
Sources of items	Adjusted according to SIBIS (2003)

Additional items	1. I am satisfied with the system of e-health care, which is used to order/obtain health services. 2. I will use the e-health care system to order on every occasion. 3. I believe that ICT and Internet should not be used for finding information concerning health and health services. 4. I think the anonymity of patients, when using e-health care system, is compromised. 5. I think that the quality of information related to health and health services on the Internet needs to be improved. 6. I think that the quality of information related to health and health services on the Internet is on a satisfactory level. 7. I think that correct health information can be found on the websites of the institute and non-profit organizations involved in the health care sector. 8. I think that correct health information can be found on websites and forums group for self-help. 9. I think that correct health information can be found on websites of hospitals. 10. I believe that correct health information can be found on websites of professional health care associations.

Source: the authors work

Creating indicators related to monitoring the use of e-health must be related to the concept of health and should reflect the large number of characteristics related to demographics, socio-economic status, age, education, income, etc. geographic location. However, since this research is focused exclusively on the e-health users, defined indicators will measure to what extent participants use ICT technologies and the Internet to obtain information for the maintenance of the desired health status (online consultation with doctor), the possibilities of obtaining medical services in healthcare institution, the possibilities of online ordering to obtain certain health services, users perception on which web sites they can get accurate and reliable information related to health and health services and attitudes related to the benefits associated with e-health services. It will also examine the opinion of users regarding the use of the traditional ways of getting health services by visiting the appropriate medical institution and with the help of ICT and Internet. Monitoring the use of other forms of e-health activity, such as telemedicine or telecare to the home, are not included.

11.6.3.4. E-government

In the countries where the *e-government* has taken hold, it is visible that the relations between public administration, state agencies and local authorities have significantly simplified and improved. Moreover, the quality of lives of citizens has improved as a result of timely provided relevant information concerning changing legal regulations, decrease in the number of procedures and time necessary for acquiring certain public services, a simplified approach to

certain services, for instance, paying taxes, filing tax return, issuing certificates, permits etc. *E-government* is also often viewed as an opportunity to cut down costs of public administration, speed up procedures and increase their efficiency (EC, 2012a). ICT and the Internet are, via e-government, intended to become the primary channel of public authorities for information dissemination, communications, and transactions. The problem that arises is that analyses of usage numbers and user structures indicate that digital exclusion related to *e-government* services is primarily a demand side rather than a supply side issue (Grönlund et al., 2007).

The initiative for implementation of *e-government* started in the mid-90s of the 20th century. Fang (2002) defined *e-government* as "a way have governments use the most innovative information and communication technologies, particularly web-based Internet applications, to provide citizens and businesses with more convenient access to government information and services, to improve the quality of the services and greater opportunities to participate in democratic institutions and processes" (Fang, 2002, p. 1). While, according to European Commission (2003), "e-government is about the use of ICT combined with organizational change and new skills in order to improve public services, democratic processes and public polices" (EC, 2003, p. 4).

Initial phase of e-government implementation was focused on the development of the ICT infrastructure, improving technical capabilities and training of human resources in the public service for the purpose of automating slow and traditional government practices. The second phase of the implementation e-government comprised little broader perspective which have included transformation the ways of presenting and provision of public services supported with ICT and the Internet.

Future phases, in many national economies, include implementation of public-private partnerships, which would mean involvement of mediators for public services. Examples of such good practices can be found in the UK called "Electronic Mixed Economy" also in Italy so called "Friendly Networks" ("Reti Amiche") in which public services are delivered through intermediaries from the private sector and voluntary associations, all with the aim of reducing government expenditures (Bekkers, 2006; OECD, 2009, p. 61).

Establishing *e-government* includes several stages according to Netchaeva (2002, p. 467, 468):

1.) *the first stage* - formation of different departmental and ministerial online sites;
2.) *the second stage* - federal and municipal sites become interactive;

3.) *the third stage* -users are given the opportunity to take part in forums and opinion polls;
4.) *the fourth stage* - the federal government and departments offer online services;
5.) *the fifth stage* - all departments and government organizations in the country are brought together in a unified government portal, which offers citizens an opportunity to take part in online discussions, comment on policy and legislation proposals and vote online.

At the present time global trends in e-government according to UN 2014 Survey indicate that there are wide disparities among regions and countries in their state of e-government and that the income level of a country is a general indicator of economic capacity and progress, which thus influences its e-government development. The UN 2014 Survey shows that Europe continues to lead with the highest regional E-Government Development Index (EGDI) followed by the Americas led by the United States of America. The leading nations in Europe include France, Netherlands, United Kingdom and Finland which are in the top ten. While Croatia according to the same survey takes 47. place which means a decrease compared to the year 2012 by 17 places when he ranked 30th place (UN, 2014, p. 4, 5, 34).

In the context of e-inclusion European Commission in "The European eGovernment Action Plan 2011-2015" supports the transition from current *e-government* to a new generation of open, flexible and collaborative *e-government* at local, regional, national and European levels which includes development of cross-border *e-government* services provided to citizens regardless of their country of origin. One of the main priorities of this action plan is user empowerment which means increasing the capacity of citizens to be proactive in society through the use of ICT and the Internet and provide easy access to public information, improve transparency and allow effective involvement of citizens in the policy-making process (EC, 2010c, p. 5, 6).

Table 16. Items *E-government*

Category	ICT and quality of life
The attribute name	E-government
The items	1. I believe that the filling-in and delivery of tax returns should be enabled by using ICT and the Internet. 2. I believe that requirements for issuance of passports, driving licenses, identity cards and other documents should be filled-in and submitted by using ICT and the Internet. 3. I believe that the requirements for the change of domicile / residence should be completed and submitted by using ICT and the Internet. 4. I believe that requirements for a birth certificate, the citizenship certificate, extract from the register of marriages should be filled-in and submitted by using ICT and the Internet. 5. I believe that requirements for a land registry, cadaster plan, building permits should be filled-in and submitted by using ICT and the Internet.
Definition and explanation	The items indicates citizen preference for on-line government services and it does not evaluate the redesign of administrative procedures which are usually necessary to improve the on-line delivery of public services.
Importance and value added	This items are important because it provides necessary information related to the demand side of e-government and correspond to a very important question that the creators of government electronic services should first set up when they start to create e-services. The items giving information related to the demand side of e-Government and shows the extent to which citizens are interested for redesign of public services into electronic services and for which services citizens believe that it would be the most appropriate. The research results related to these items will give a more complete picture of the general feeling of citizens towards e-government services, which can be very important for governments, because it will give them an impression how e-government services are perceived and which services should be further created, and those that are already created continue to retain and improve their quality. Government could derive the benefit by improving those services that are well received by citizens and that enjoy high usage. The role of governments is to create e-services, but it is also very important interest of citizens to use created services. It is therefore of great importance to determine the wishes of the citizens for the creation of certain government services. Citizens have a variety of options when it comes to interacting with government. Of critical importance is to understand which method they prefer and which means of communicating and interacting will be successful.

Sources of items	Adjusted according to SIBIS (2003)
Additional items	1. I believe that employment data should be available on the websites of public institutions. 2. I often use electronic services created by government institutions. 3. I don't use the public administration websites to submit the forms because I don't have enough knowledge and skills. 4. I don't use the public administration websites to submit the forms because I am worried about the safety and security of personal data. 5. Electronic services created by government institutions are not useful to me. 6. Electronic services created by government institutions accelerate getting the required services, as opposed to the traditional approach. 7. Electronic services created by government institutions reduce the number of errors made by public officials. 8. Electronic services created by government institutions enable easier communication with officials in public institutions in a more convenient location (at home, work ...). 9. In the last three months, I have used the website of the public administration in order to obtain relevant information. 10. In the last three months, I have used the website of public administration for submission of completed forms. 11. In the last three months, I have used the website of public administration to download official forms.

Source: the authors work

11.6.3.5. E-commerce, E-banking, E-entertainment and E-communication

Additional area in which *e-inclusion* can contribute to quality of life of users to a large degree is *e-commerce*. ICT and the Internet allow significant consumption benefits, such as finding information, ordering and payment for services and goods and that all customers can perform in the privacy from their home. Under condition that the problems concerning safety while paying online are solved, ICT and the Internet provides a series of possibilities for individuals to acquire products that are hardly accessible through conventional sales channels. Likewise, offers the possibility access to low-priced goods and services that previously might have been difficult to find at local stores. Online customers could make better financial decisions, because they have access to relevant information about various products and services provided by the companies that sell them, as well as from other customers since reviews written by real people

are available for almost any product or service. Those who lack access such online opportunities may sooner or later experience concrete economic disadvantages.

OECD report "Measuring the Information Economy" from 2002, *e-commerce* defined in the narrow and broad sense. In April 2009, OECD member countries endorsed their latest definition of *e-commerce*, revised the guidelines for interpreting the definition of *e-commerce* and encouraged countries to take such guidelines into account when developing indicators of *e-commerce*. The definition from April 2009 unifies the broad and narrow definitions of *e-commerce* into a single one. The 2009 definition of e-commerce is "An e-commerce transaction is the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. The goods or services are ordered by those methods, but the payment and the ultimate delivery of the goods or services do not have to be conducted online. One commerce transaction can be between enterprises, households, individuals, governments, and other public or private organizations" (OECD, 2011., p. 72). This definition is taken into account in the development of indicators of *e-commerce* in this study.

The most banking institutions in developed countries nowadays has a website that allows customers access to the majority of their services, such as paying bills, transferring funds, printing payment confirmation, and inquiring account reports. *E-banking* is one of the most successful services in e-commerce with an increasing number of users every year. As an example, Eurostat data for 28 EU countries indicate continuing growth in the number of users recent years, which in 2014 reached the level of 44.00%. According to Lee and Lee (2000) *e-banking* refers to the process or service that allows a bank customer to perform financial transactions via electronic media without necessarily requiring a visit to a banking institution. Exploratory study of Kam and Riquelme (2007) have shown that more services someone uses from an online banking provider, the more pleased they become at its ease of use in comparison to traditional banking. For a variety of other research it can be also concluded that electronic banking becomes primary alternative channel to traditional bank branches offering customers a number of advantages such as efficiency, convenience (Liao, Cheung, 2003), online trading systems that can be accessed 24 hours a day by any participant around the world (Felgran et all., 2001), cost and time savings, transparency of information, customized services tailored to customer needs (Wind, 2001) and prevent possible errors and security issues. The area in which e-inclusion plays a major role in improving the quality of life nowadays, especially for the younger population is entertainment, called *e-entertainment*. According to Ronchi (2009, p. 9) *e-entertainment* involves supplying digitized entertainment products and services which

entertaining the users in a variety of languages and in line with diverse cultures, supporting data transfer, interactive entertainment of synergy between analogue and digital platforms“. For satisfying the needs for entertainment and engage in hobbies, creation of ICT product and services, this area is mostly linked to private commercial sector and individual users which creating their own private entertainment content. The digital revolution was raised the quality of entertainment to a high level due to various possibilities that digital technology offers, especially for the reasons enabling consumers to participate in creating and sharing usually free of charge content for entertainment. Before the existence of ICT and the Internet, consumers could buy or borrow books, music and movies only in their local area. Today, users of ICT and the Internet can access such content regardless of time and place most often without any additional charge. What is the biggest advantage, created content in users home countries through ICT and the Internet becomes internationally available. Increasingly becoming the trend that music, books and movies is being created exclusively for distribution over ICT and the Internet (Castro, 2007). More than ever, younger and older population have opportunities for gaming. There are millions of games customized for young people, adults and youngest children usually also available online free of charge or for a small fee. Gaming platforms for example such as Fyrebug.com offering users variety of gaming animation, sound effects, and pictures for development their own customized games. Many opportunities at the international level today are offered to customers of ICT and the Internet from hearing the news and information from abroad to listen to Internet radio stations and watching various TV programs from around the world. Tracking of sports activities as a way of entertainment with the help of ICT and the Internet today is a lot more accessible and, what is the most important, for many users, live and on-demand and not limited only to domestic sports. Types of products and services in the field of e-entertainment that is most commonly used nowadays are on-line gaming, download movies, download music, music players, social networking (Twitter, YouTube, Instagram, Facebook), etc. (Benedetto, Correia, Luise, 2012). The analyzes and trends according to *Global entertainment and media outlook in the period of 2014-2018* shown that revenues from digital entertainment continuously growing and that by the 2018. 65% of global entertainment and media growth – almost two in every three extra dollars – will be from digital (PWC, 2014).

From the very beginning communication have essential role for human society. Earlier, most communication was carried out face to face, over the phone or through physical mail. Today ICT and the Internet innovations increase opportunities related to communication and these

technologies are in the process of becoming ubiquitous in this area. The "*e*" in *e-communication* stands for electronic, so the term e-communication as used here essentially refers to any form of ICT and the Internet mediated communication. The most commonly used Internet applications for the purpose of communication is email. The advantages offered by e-mail in relation to the traditional way of using postal services is: speed and simplicity of sending which enables almost synchronous communication, allowed users to break away from location-dependent communication, allows various kinds of attachments from textual content all the way to audio, picture, video or multimedia content, sending costs are very low. Most importantly, today the electronic mail can be accessed from almost every device there is an Internet connection. Communication channels are still constantly changing, other than just textual ways today's modern ICT and Internet technology allows direct and audio-visually communication in real time for free or very small fee, for example specialized programs such as Skype. The evolution of communication among other things, offers easy access to broad audience communication, forums, blogs, enable users to create their own digital communication objects. Access to mass communication enabled that new ICT and Internet technologies has created stronger connection between commerce, banking, entertainment and communication area.

Table 17. Items *E-commerce, E-banking, E-entertainment and E-communication*

Category	ICT and quality of life
The attribute name	E-commerce, E-banking, E-entertainment and E-communication
The items	1. In the last three months I have used ICT and Internet to find information about specific / desired products and services. 2. In the last three months I have used ICT and Internet to buy shoes and clothes, food, household supplies. 3. In the last three months I have used ICT and Internet to pay the bills, the products and services via e-banking. 4. I use ICT and the Internet to listen / download music. 5. I use ICT and the Internet to watch / download movies. 6. For communication via ICT and the Internet, I use e-mail. 7. For communication via ICT and Internet, I use social networks (Facebook, Twitter ...). 8. In the last three months I have used ICT and Internet to buy / book tickets (concerts, theatre, exhibitions). 9. I use ICT and the Internet to read online newspapers, magazines ... 10. I use ICT and the Internet to listen radio station. 11. I use ICT and the Internet to watch TV shows.

Definition and explanation	The items measure citizen frequency of use ICT and Internet as a tool for perform daily activities from on-line searching information and purchases to using e-banking and on-line entertainment and communication.
Importance of indicators	The item related to e-commerce measured frequency of purchase various products and services and is of high relevance for digital economy adoption. The indicator of Internet users conducting on-line banking is also of great relevance for digital economy adoption. When the user is confident in security features that supports online banking, this most often ultimately results in a much more frequent use also other types of transactions. The items measuring a frequency of usage ICT and Internet for communication is important because ability to communicate with others via the Internet is one of the skills of digital literacy and digital literacy is a central objective in the e-learning Action Plan in eEurope 2005 and one of priority of Digital Agenda for Europe and The Europe 2020 Strategy. A high level of skills in communicating by using e-mail and social networks indicates a high potential for exploiting communicative potential of the Internet. An increase in the share of respondents who *frequently* ore *very frequently* use ICT and Internet for communicating with others should be interpreted as an increase in the general level of digital literacy.
Sources of items	Adjusted according to EUROSTAT 2014, SIBIS (2003)
Additional items	1. I use ICT and the Internet to find information related to travel destinations and accommodation. 2. I use ICT and the Internet for payment of lottery games / betting. 3. In case of having no access to ICT and the Internet, I believe I would communicate less with family members, friends, relatives. 4. In the last three months I have used ICT and Internet to buy food, supplies. 5. In the last three months I have used ICT and Internet to buy shoes and clothes. 6. In the last three months I have used ICT and Internet to buy household supplies (furniture, toys…). 7. In the last three months I have used ICT and Internet to buy items for sport and recreation. 8. In the last three months I have used ICT and Internet to buy / book tickets (concerts, theatre, exhibitions). 9. In the last three months I have used ICT and Internet to buy electronic equipment. 10. In the last three months I have used ICT and Internet to buy computer software/video games or computer equipment.

	11. In the last three months I have used ICT and Internet to buy telecommunications services. 12. In the last three months I have used ICT and Internet to buy movies, music. 13. In the last three months I have used ICT and Internet to buy books, magazines, newspapers. 14. I buy products and services via ICT and Internet from local companies. 15. I buy products and services via ICT and Internet from companies across the European Union. 16. I buy products and services via ICT and Internet from companies all over the world. 17. In the last three months I have used ICT and Internet for money transfer.

Source: the authors work

11.6.3.6.E-culture

The use of ICT and the Internet in the area of culture has caused major changes, borders no longer exist and the culture and cultural events have now become accessible to all, and they also continuously are changing the methods of consumption of cultural products. Ubiquitous digitalization has enabled access and distribution a large amounts of cultural information to many users regardless of time and place. Individuals are available cultural heritage located in remote or difficult accessible museums through virtual museums. Finding literature or books of any desired area today, is facilitated through an online search of the library or digital library in which the book is available in digital form. Also, artworks of the biggest world renowned artists can be viewed and studied from home through digital galleries. Amongst other things, ICT and the Internet allows citizens mass access to different cultures, availability of information and dissemination of interesting facts and characteristics of different cultures. Summarizing all the above we come to the concept of e-culture. *E-culture* has many extensions together with the aforementioned, involving cultural activities such as painting, literature, poetry, dancing, music, theatre, etc. According to Ronchi (2009, p. 9) *e-culture* "involves preserving and presenting cultural heritage in line with the challenges of the future, exhibiting valuable cultural assets clearly and informatively using state-of-the-art technology". While the European Commission under the *e-culture* implies all processes of expression and reflection in the digital domain (EC, 2004d). Currently, there are already a large number of applications and tools as well as interactive information systems with user friendly navigation techniques, virtual reality

methods and various multimedia tools and services for the better presentation of the e-cultural material to the users. In the process of development cultural material particular attention should be paid to common citizens and especially to visually impaired individuals, in order to offer them equal access to cultural heritage information (Drigas, et al., 2008).

The European Commission over the years encourage and supports various projects related to development of e-culture, for example, the project '"Digital Heritage and Cultural Content" which aims at developing advanced digital library services, EPOCH network project with the aim of increasing the effectiveness of work at the interface between technology and the cultural heritage of human experience represented in monuments, sites and museums, BRICKS project having aims to integrate the existing digital resources into a common and shared "Digital Library", while respecting the European cultural diversity, Europeana.euwebsite (www.europeana.eu) which provides access to a wide range of digitized cultural heritage from across Europe and beyond, etc. (Loebbecke, Thaller, 2011; EC, 2011). E-culture is especially important for e-inclusion due to the fact that cultural heritage of each nation defines a nation and therefore should be disseminated to all, regardless of their age, gender, location, social status or disability.

Table 18. Items *E-culture*

Category	ICT and quality of life
The attribute name	E-culture
The items	1. I use ICT and the Internet to visit museums online. 2. I use ICT and the Internet to watch theatrical performances and concerts. 3. I use ICT and the Internet to read / download digital books.
Definition and explanation	The items measure citizen frequency of use ICT and Internet for activities related to culture.
Importance of indicators	The items which measure a frequency of usage ICT and Internet in area of culture are important, because an increase in the share of respondents who *frequently* ore *very frequently* use ICT and Internet to meet their needs related to the area of culture should be interpreted as an increase in the general level of digital literacy.
Sources of items	Adjusted according to EUROSTAT 2014, SIBIS (2003)

Source: the authors work

11.6.4. Attributes related to the role of ICT in empowerment

The last category of *e-inclusion*, *empowerment,* is not in any way connected to the former two categories and is not immediately recognizable in daily lives of citizens. In the context of *e-inclusion empowerment* relates to the innovative potential of ICT which is constantly developing. Due to this reason, the indicators for this category are rare and still in the process of defining. The concept *empowerment* is widely used in a variety of areas such as social community psychology, political theory, social work, education, women studies, and sociology but also in science, business and policy fields, with widely varying definitions. In a general sense, "refers to the ability of people to gain understanding and control over personal, social, economic, and political forces in order to take action to improve their life situations"(Israel, et al., 1994, p. 152). Empowerment is connected to capabilities of acquiring and using information and knowledge for making top-quality decisions for the individual as well as for the society in the whole. Modern ICT and Internet technology empower people on different levels, in particular on an individual level and on a collective level in a way that more effectively take control of their own lives, take an active part in the different spheres of society, engage and participate in various social interactions, establish new social groups with shared political, cultural or economic interests.

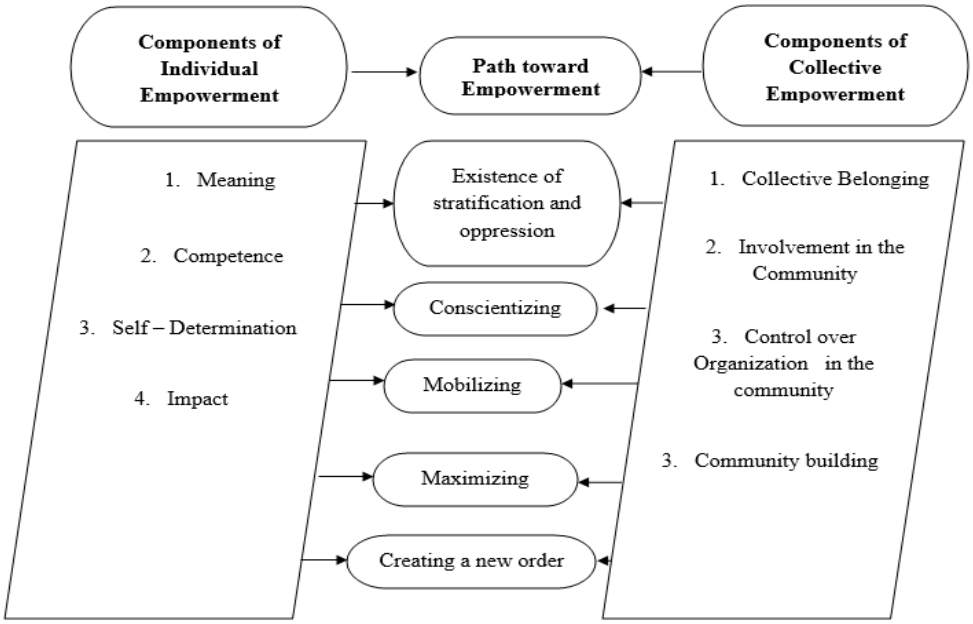


Figure 7. Paths toward and components of empowerment
Source: Adjusted according to Gellman and Turner 2013, p. 683.

The earlier figure presented the general steps that are related to the concept of *empowerment* at individual level and at the community level, but it can also be applied in the context of e-inclusion and the role of ICT and the Internet in empowerment of those individuals / groups / communities which are disadvantaged for any reason.

According to European Commission (2010) empowerment means increasing the capacity of citizens, businesses and other organizations to be proactive in society through the use of new technological tools. Such crucial role in those process have governments, because they should provide easy access to public information, improve transparency and allow effective involvement of citizens in the policy-making process (EC, 2010). Each choice results from interaction and mixing political, economic and social factors and due to this, the analysis and monitoring the phenomenon of e-inclusion and category empowerment cannot be completely considered without *networking*, *e-democracy*, *e-participation* and *contents creating*.

11.6.4.1. E-democracy

The attribute *e-democracy* refers to corresponding possibilities offered by ICT in order to alleviate a certain number of individuals and groups which are threatened by social exclusion. Democracy is one of the major component that influence on inclusion regardless the type of inclusion we observe. The underlying core principle of democracy is an informed and engaged citizen. In times of growing mistrust of political decision-making, citizens can be much simpler integrated through ICT and Internet in all phases of political decision-making process such as law-making, policy-making, and legislative process. Better inclusion of citizens in the policy-making process is expected to create more desirable policy, increase confidence and obtain much greater acceptance of policy from citizens (Macintosh, 2003). Today, ICT and the Internet tools offers citizens no longer has to be a passive actors in the creation of new political and social systems, but active participants proposing new alternatives based on their opinions. Various available social media platforms breaking down the barriers between citizens and government authorities both at a central and local level by overcoming traditional forms of interactions and gives opportunities to increase the number and different categories of individuals and groups potentially involved in the political processes. Online political participation of individuals differs in many ways from offline, for example different demographic and socio-economic as well as cultural factors matter less when participate in politics online. In this manner different categories of individuals and groups also become the

source of new information and ideas in democratic practices and creating a more diverse civil society.

There is still no agreement which term is appropriate for defining new model of democracy supported by ICT and the Internet. Wide range of terms and concepts by different researchers have been used, such as cyber democracy, electronic-democracy, e-democracy, digital democracy, teledemocracy, virtual democracy (Ogden, 1994; Hagen, 1997; Haugeand, Loader, 1999, Porebski, 2002). Hagen (1997) states that the usage of different terms arising from the use of different technologies, different form of democracy, and different mode of political participation. According to, Di Maria and Rizzo (2005, p. 78, 79). *e-democracy* "refers to the use of information and communication technology in the relationship between citizens and political/administrative bodies to encourage active and aware participation of citizens in the decision-making process and in political life, both at a central and a local level". The logic and purpose of e-democracy is to make political decision-making processes available whole new demographic of people at the same time and with reduced costs by taking into consideration the latest technology and communication trends (Curran and Singh, 2011).

E-democracy is based on two key preconditions (Prosser and Krimmer, 2004, p. 22): will of the citizens for e-participation which includes information acquisition and formation of an opinion and will of the citizens for e-voting in decision making process. According to Clif (2003) there are six components that construct the e-democracy model: political groups and social groups, private sector, media, government and e-citizens. As can be seen from the Figure 8 the most important component of the *e-democracy* model are citizens named *e-citizens*. *E-citizens* are individuals who use ICT and the Internet to participate in democratic processes. From the figure can also be observed that citizens can use ICT and the Internet to interact with various stakeholders which include government, political and social groups, media and private sectors in a way that with each other share information, ideas and opinions thereby developing a more transparent and open society.

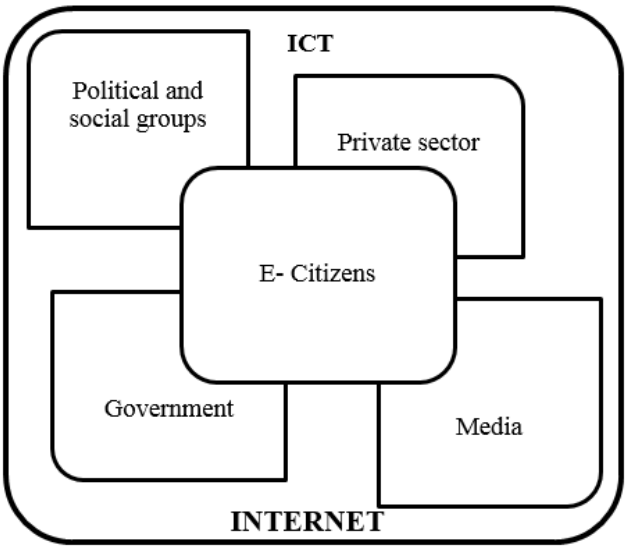


Figure 8. E-democracy Conceptual Model
Source: Adjusted according Clift, S.: E-Democracy, E-Governance and Public Net-Work. Publics.Net, 2003, p.3. downloads 17.04.2014.,
Available from: http://www.publicus.net/articles/edempublicnetwork.html.

Table 19. Items *E-democracy*

Category	Empowerment
The attribute name	E-democracy
The items	1. I believe that each Parliament and each session of leaders of local government should be accompanied by videoconference. 2. I believe that citizens should have the opportunity of voting in elections /participate in referendum electronically. 3. I believe that every municipal mayor or the mayor should communicate with citizens via e-mail or social networks. 4. With the help of ICT and the Internet, I find all documents and information regarding the enactment of law regulations, rules ... 5. I believe that, on the occasion of election for president / parliament / local and regional levels, the list of candidates should be available on websites with contact information for each candidate. 6. I believe that citizens with the help of ICT and the Internet should be able to find information about various social organizations / associations and their initiatives.

Definition and explanation of items	The items indicates citizen preference for tracking government activities and participation in decision-making processes on-line and availability of all relevant information and documents.
Importance of items	ICT and the Internet play a considerable role in encouraging democracy through increase participation of citizens in the policymaking process at the local and regional levels of government. This items are important because it provides necessary information related to the demand side of e-democracy and provide an answer to a very important question for those who are responsible for availability of information, "which channels of communication and receiving information citizens prefer?". This items are also interesting and important because it shows the extent to which citizens are interested in the redesign of ways to communicate with officials of public authorities as well as the ways of expression of their own will and opinion (vote in the referendum and parliamentary elections). Citizens have a variety of options when it comes to interacting with public authorities. Public authorities can derive benefits by improving their interaction with citizens. The research results related to these items will also give a more complete picture of the general feeling of citizens towards e-democracy.
Sources of indicators	creation of author
Additional items	1. In case of having no access to ICT and the Internet, I believe I would be less informed. 2. In case of having no access to ICT and the Internet, I would feel socially excluded. 3. I use ICT and the Internet to express my political views on the websites or social networks of public authorities. 4. I believe that before and after the sessions of political bodies (parliament, government, local and regional representative bodies), all documents (agendas, minutes, decisions) should be available on their official website.

Source: the authors work

The problem that still exists nowadays related to *e-democracy* and equal participation, is that many citizens do not have equal access to ICT and the Internet, also not all citizens have digital literacy and necessary skills to be effective users, in this case potentially significant role have active government *e-inclusion* policies.

11.6.4.2. E-participation

The basic goal of *e-participation* is promoting the improved access of citizens to all relevant information and services of public offices and promoting participation in public decision-making process which influences not only each individual, but the society as a whole. According to Sanford and Rose (2007) e-participation can be understood as technology-mediated interaction between the civil society sphere and the formal politics sphere, and between the civil society sphere and the administration sphere.

The fundamental driving force for *e-participation* is citizens willingness and needs for the use ICT and the Internet as a means of action and communication. ICT and the Internet as a tool play a significant role in empowering citizens/groups/communities and can increase inclusion in social and political processes as well as involve them and organize them in the information society (Fuchs et al., 2006). In other words, the area of action of the public sphere should not be restricted to only selected privileged citizens/groups/ communities or political institutions but should also involve a whole range of social activities and networks of citizens/groups/communities. According to Panopoulou et al. (2009) the most common participatory activities realized through ICT and the Internet tools are: Campaigning, including e-Petitioning, Community building / Collaborative e-environments, e-Consultation, Online deliberation, Information provision online, e-Polling and e-Voting. The possibility of participation in the public sphere largely depends on the extent to which public authorities and political institutions make information available, the form in which they present the information, the strategies they use to promote and perform their public services, and the manner in which they communicate and interact with different types of citizens/groups/ communities (Norris 2001).

The role of ICT and the Internet in promoting citizens participation through EUROPA Website (www.europa.eu.int) was first highlighted by European Commission in White Paper on Governance in which the Commission "proposes opening up the policy-making process to get more people and organizations involved in shaping and delivering EU policy and promotes greater openness, accountability and responsibility for all those involved (CEC, 2001b, p. 3, 11).

In order to make civil society more efficient and encourage participation of citizens who cannot attend a meeting at a specific place and time, many different types of *e-participation* tools was created. For instance, web-based public participation system, *Social Decision Support System*,

Deliberation on traditional threaded discussion forums, *Computer-Supported Argument Visualization*, *ArgooMap* etc. (Peng, 2001; Turoff et al., 2002; Elliman et al., 2007; Renton, Macintosh, 2007; Rinner et al., 2008). The importance of selecting the methods and tools of e-participation and their comparison presented Zissis, Lekkas and Papadopoulou (2009) in their research and suggest, that information systems for e-participation must be focused on meeting the needs of a wide and diversified users and that design teams interested in designing highly interactive information systems should consider making use for e-participation of decision making games, chat rooms, discussion forums, e-panels, e-deliberative forums and online communities. According to the United Nations Report "From E-government to E-inclusion" *e-participation* aims to achieve three main objectives (United Nations, 2005, p. 19, 20):

(1) *Increasing e-information* – necessary information is supplied to citizens via ICT channels in order to help them make informed choices, government websites offer information on policies and programs, budgets, laws and other documents of key public interest, and communication tools such as for example web forums, email lists, newsgroups, and chat rooms,

(2) *Enhancing e-consultation* – public authorities organizing public consultations online, which means that government website through e-consultation mechanisms and tools encourages citizens to participate in discussions, offers online real time discussion of public policy topics and also allows access to archived audio and video of public meetings,

(3) *Supporting e-decision* – evolving citizens directly in decision processes, which is reflected in the fact that government indicates that will take citizen input into decision-making process.

E-participation is a key concept in e-inclusion and in its broadest sense includes an active participation of citizens in the activities of various civil organizations, social clubs, neighborhood groups or social movements as well as engagement in formal and informal activities and procedures of governments by using ICT and the Internet, that was taken into consideration in process of creation indicators related to attribute e-participation.

Table 20. Items *E-participation*

Category	Empowerment
The attribute name	E-participation
The items	1. I asked for information from the public authorities via the Internet and I got a response. 2. With help of ICT and the Internet, I find all information related to work of the Government and public administration. 3. I follow and use educational content that public authorities publish on their websites (webinars, online courses, educational films, etc.). 4. I communicate directly to the officials of public authorities via e-mail. 5. I participate in public discussions related to the enactment of law regulations, rules etc. via ICT and the Internet.
Definition and explanation	The items indicates citizen frequency of use ICT and Internet for activities related to interaction of citizens and public authorities and participation of citizens' in decision-making processes.
Importance and value added	This items are important because it provides important information on the willingness of citizens to be part of the decision-making process and provide information which methods of participation citizens prefer and which one is the most desirable to them. This items are also interesting and important information because it shows the level of citizens participation. Citizens have a variety of options of participation in the social processes, movements and organizations. This suggests public authorities and other community organizations whether channel and ways for participation will be used and which means of communicating will be successful. The research results related to these items can community organizations and public authorities derive benefits by improving their interaction with citizens and will give a more complete picture of the general feeling and willingness of citizens to participate in decision-making processes and overall inclusion of citizens in working activities various community organizations.
Sources of indicators	Adjusted according to SIBIS (2003), creation of author
Additional items	1. With help of ICT and the Internet, I receive information about various community organizations and their initiatives. 2. With the help of ICT and the Internet, I become member and actively participate in various community organizations. 3. I use ICT and the Internet to express my political views on the websites or social networks of public authorities. 4. I proposed implementing some measures or activities to public authorities, which was accepted.

Source: the authors work

11.6.4.3. Social Computing

Nowadays, *social computing* have become increasingly popular among population which actively use ICT and the Internet and create new opportunities for user empowerment in different societal areas everyday life of people. *Social computing* offers increasingly complex and rich ways of interaction between people, from networking opportunities through to development and distribution of various types of content by social media applications.

According to the literature review social computing can be defined as open, web-based and user-friendly applications providing various opportunities such as the creation of content (blogs, wiki), social and professional networking and microblogging applications (Facebook, LinkedIn, Twitter, Doctors.net.uk) sharing of tastes and opinions (Amazon, eBay), data sharing websites where people upload, share, tag and annotate photos and videos and websites (Youtube, eMule) and collaborative websites (Connexions, Wikipedia) as well as online social gaming (Ala-Mutka et al., 2009, p. 15, 16).

The advantage of these applications is that they are usually user friendly and enable community-building activities as well as collaborative knowledge sharing. In the context of e-inclusion networking relates to the abilities of citizens in contemporary societies with help of ICT and the Internet create networks of relations based on various forms of affinities (political, cultural, religious etc.).

By using these networks (social / professional), the individuals confirm the process of building up identities and through them they satisfy their specific needs. Social networks such as Facebook or MySpace bring people together, enable users to share personal information, build, maintain and enhance relationships. Professional networks such as LinkedIn offer users the opportunity to network online and expand their professional network using their existing professional connections. While, creating contents is connected to the possibility that each individual can take part in information society either in the role of the producer or in the role of the consumer. In today's conditions the opportunity to produce the most various types of contents with help of ICT and Internet tools and applications, represents one of the most progressive aspects of ICT's utilization (expansion of blogs, forums, portals…).

Table 21. Items *Social Computing*

Category	Empowerment
The attribute name	Social Computing - Networking and User Created Content
The items	1. I upload self-created content to any website to be shared (text, photos, music, videos, software etc.). 2. I create and manage a profile on social networks (Facebook, Twitter ...). 3. I create or work on my own online journal or blog. 4. I create or work on my own website. 5. I create or work on websites or blogs for others, including friends, relatives, employers, groups I belong to... 6. I share my work online, such as my own artwork, photos, stories or videos. 7. I use forums to obtain information and share opinions. 8. I communicate via portals and read the comments.
Definition and explanation	The items indicates citizen frequency of use ICT and Internet for activities related to social networking and creation of e-content.
Importance and value added	Digital contents and networking are key of the quality of the information society and nowadays an integrated part in the daily lives of citizens. Potential of individuals and local communities to actively create content and networking will become much more important in the future. Upcoming younger generations so-called “digital natives“ have incorporated the content creation and networking in their everyday life. Digital natives creating a generation that will be able to develop these skills quite easily and apply them later in professional contexts. This is important since many public and private organizations are testing potential employees skills related to content creation and networking. A new generation of citizens is growing up and today's underage users and creators of digital content and social networks are the citizens of the information society tomorrow and future competent digitally literate employees and potential professionals in media industries. Their current involvement in content creation and networking is allowing them to develop digital skills that will be necessary in employment in the future. Their training today is of great importance since it will enable them to put their digital capacities into practice in their professional, social and civic environments. European Commission supported for many years e-content creation through eContent programme. The eContent programme was adopted by the European Council in December 2000 for a period of four years. The programme contributes to the third objective of the eEurope action plan: “to stimulate the use of the Internet”.

Sources of items	Adjusted according to SIBIS (2003), EUROSTAT 2014.
Additional items	1. I use storage space on the Internet to save documents, pictures, music, video or other files (e.g. Google Drive, Dropbox, Windows Skydrive, iCloud, Amazon Cloud Drive). 2. I visit friends' social network page. 3. I read and comment blogs. 4. I download contents (music, movies, photos…).

Source: the authors work

The overall growth in ICT and the Internet usage has been accompanied by a parallel steep growth in the volume of user created content. The emergence of social media applications and sites has contributed significantly to the increase in Internet use, as more and more people are becoming innovators, creators and disseminators by actively contributing with creating, sharing and uploading content. Le Borgne-Bachschmidt et al. (2008, p. 24, 179) created contents distinguished: personal content and a content elaborated in a way to tell a story to other people. Personal contents refers to content developed without editorial views for example private personal photos or video clips, political or social personal opinions. Whereas, story telling content refers to content developed with editorial views for example professional artistic expression, online photo album, integrating comments, music, etc.

The majority of users of all age groups feeling empowered when they engage in the process of creating various types of content and at the same time enjoys participating in the innovative and creative process. According to the ITU (2014) report more than 6 billion hours of video are being watched each month and more than 100 hours of video content are uploaded every minute on YouTube, the leading international video-file sharing site with services in 61 countries, which boasted more than 1 billion visitors a month in early 2014 (ITU, 2014, p. 7). The investments that people make in content creation and networking is important since eventually leads to positive benefits by creating a more connected and aware community.

12. CONCEPTUAL FRAMEWORK OF RESEARCH

In this research *e-inclusion* will be examined from *two* different perspectives. *The first perspective* is the analysis of the *e-inclusion* trends by designing a conceptual model, taking into consideration relevant identified elements encompassed by the available conceptual frameworks and models used in the existing research in this field. *The second perspective* is establishing differences in components of *e-inclusion* between subgroups of participants defined by demographic, social, economic and cultural variables. In the realization of research, the theoretical and empirical part was conducted separately and using both qualitative and quantitative research methods. In terms of its scope, this research represents a mezzo research comprising several population subsets since it will be performed in several counties in the Croatia.

12.1. METHODOLOGY OF THEORETICAL PART OF RESEARCH

During the theoretical part of research the initial key concepts that are related to the *e-inclusion* concept were identified, including *access* to ICT and the *use* of ICT as well as its *impact on the quality of life* of the individual, and individual *empowerment*. The *access* component comprises the following concepts: *affordability, material access and network and point of access*. The *usage* component comprises the following concepts: *intensity of use, skills, motivation, attitudes, social support or coercion and digital engagement.* The impact on the quality of life component comprises the following concepts: *e-education, e-health, e-government, digital economy (e-employment and labor, e-commerce, e-banking), e-culture and e-communication, e-entertainment.* The following concepts were identified as comprising the final component *empowerment: e-democracy, e-participation and social media.*

The lack which was manifested in all the models encountered during literature research, is the fact that none of them encompasses all the e-inclusion components identified in theory. Consequently, by using these models it is neither possible to grasp this multidimensional phenomenon in its entirety nor gain comprehensive insight into e-inclusion related trends. Within this research a new instrument (questionnaire) was therefore developed and used for collecting data and facts related to the e-inclusion.

12.2. PROPOSED GENERAL THEORETICAL CONCEPTUAL MODEL OF E-INCLUSION

Reviewing the literature theoretical conceptual model of *e-inclusion* is designed with all categories, attributes and items that have been identified in earlier presented studies of this area. The theoretical conceptual model of *e-inclusion* presented in Figure 9. consist of four latent variables on second level and twenty two latent variables on first level described in earlier chapters related to the conceptualization of the *e-inclusion* model. According to Mejovšek latent variables measure concepts that are abstract, complex, and cannot be directly observed by means of multiple items, they represent a certain linear combination of manifest variables (Mejovšek, 2008).

Latent variables second level in model is represented as circles or ovals. Latent variables first level are represented as rectangles. Error terms represent the unexplained variance wen path models are estimated. In the model are shown as circles connected to each latent variables first and second level. Each latent variables on the first level was measured with manifest variables respectively by indicators or items. Manifest variables are directly measured proxy variables that contain the raw data (Hair et al., 2014). Latent variables of first level represent the measurement part of the model, while latent variables of second level represent structural part of the model. Measurement model is an element of a path model which is composed of latent variables that display the relationships between the latent variables and the manifest variables items or indicators. Structural model displays the relationships only between latent variables.

Presented theoretical model for e-Inclusion consists of one exogenous latent variables and tree endogenous latent variables. Exogenous latent variables are those latent variables that explain other constructs in the model that do not have any structural path relationships pointing at them. Exogenous latent variables in present e-inclusion model represent a variables *access* and *use*. Endogenous latent variables are those latent variables that being explained in the model by other latent variables. In represent model endogenous latent variables are variables use, impact of ICT and Internet on quality of life and empowerment. As can be seen latent variable *use* is defined as exogenous and endogenous variable. As an endogenous variable is defined for the reason as it is explained with a latent variable *access*, as exogenous variable is defined by the fact that it explains the latent variables *impact of ICT and Internet on quality of life* and *empowerment*.

Measurement model consists of one formative and three reflective models. Formative measurement model is type of measurement model setup in which the direction of the arrows

is from the indicator variables to latent variables and indicating the assumption that the indicator variables cause the measurement of the latent variables and changes in the indicators determine changes in the value of the latent variable. Each indicator for a formative latent variable captures a specific aspect of the construct's domain. In the model of e-inclusion *access* is defined as a formative measurement model.

Reflective measurement model is a type of measurement model setup in which the direction of the arrows is from the latent variable to the indicator variables, indicating the assumption that the latent variable causes the measurement or covariation of the indicator variables. Reflective indicators are seen as functions of the latent construct, and changes in the latent construct are reflected in changes in the indicator (manifest) variables (Diamantopoulos, Riefler, and Roth 2008). In the proposed model as a reflective measurement models are defined models: *use, impact of ICT and Internet on quality of life* and *empowerment*.

Formative latent variables of the first level, which measures the latent variable of the second levels *access* are: *network, affordability and_availability, material access and point of access.* Reflective latent variables of the first level, which measures the latent variable of the second levels *use* are: *intensity of use, skills, network availability and quality, (availability, speed, and quality of network access, motivation, attitudes, social support/coercion and digital engagement.* Reflective latent variables of the first level, which measures the latent variable of the second levels *impact on the quality of life* are: *e-education, e-commerce, e-health, e-government, e-work, e-banking, e-culture and entertainment, e-communication*. Reflective latent variables of the first level, which measures the latent variable of the second levels *empowerment* are: *e-democracy, e-participation, content creation and networking*.

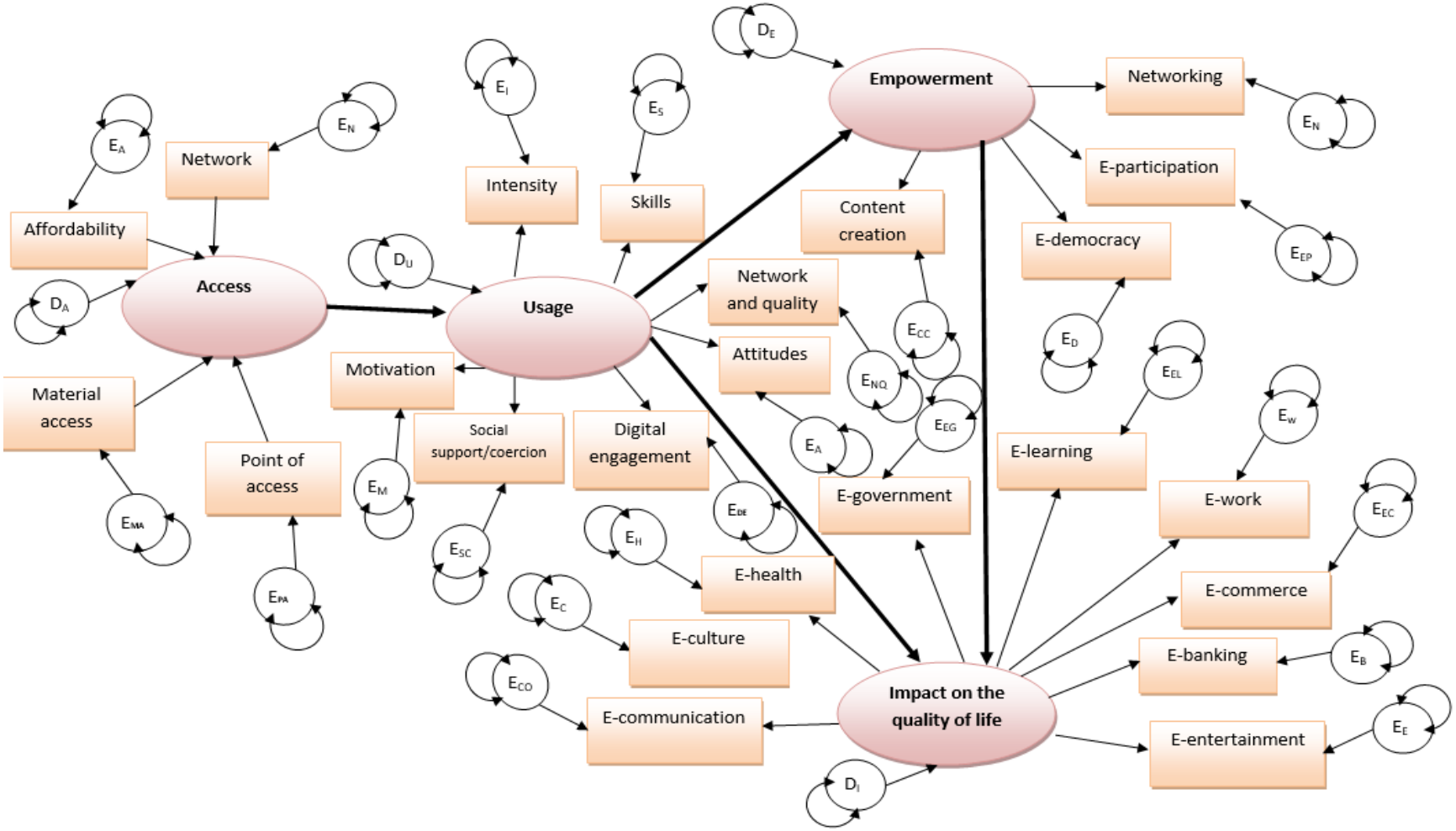


Figure 9. Proposed general theoretical conceptual model of e-inclusion
Source: made by the author

12.3. METHODOLOGY OF EMPIRICAL PART OF THE RESEARCH

The empirical part of the research was started with content validation of the measuring instrument. In content validation of the measuring instrument has participated a panel of experts carefully selected according to the experience they have gained as leaders or team members e-inclusion projects. To determine the content validity two indicators were calculating, Content Validity Ratio (CVR) and averaged value of relative importance. Content validity of measuring instrument refers to the determination the extent to which a specific set of items reflects a content domain. It is essential that item content capture the aspects of the phenomenon which is the subject of research. To confirm the content validity of the scales, the items must describe the concept about which generalizations are to be made. The first phase content validity process includes broader review of the relevant literature aimed at identifying appropriate items for possible inclusion in the measuring instrument. This phase ensured that the item content reflected the specific latent variable in which the researcher were interested. After identifying all relevant items and indicators for each latent variable Sterba et al. (2007) proposed a second phase which involves validation by experts in the field of research. This phase also served as a check that the items were representative of the relevant content the instrument was designed to measure. These steps increased the likelihood that relevant content was included thus supporting claims of content validity (for more detail about this method see: DeVellis, 2012, p. 59-61).

In the empirical part of research a pilot study was performed on a convenient sample. The self-administered online survey approach was the most appropriate. The main strengths of this method are respondent possibility of ensured anonymity, confidentiality and free expression and fair temporal response. Also, another important advantage of online survey approach is minimal cost compared to other methods. Among other data collection methods the chosen method is not without limitations but is appropriate because for this part of the study does not require a representative sample of respondents. The aim of the pilot study was collection of data and facts relating to e-inclusion for the purpose of conducting factor analysis. Factor analysis is helpful tool for investigate the relationship between items and indicators. The objective is to capture those features in the data that help better understand an issue of interest or to discover interesting new patterns among the relationships between items and indicators. Factor analysis was also used for transformation of a given set of items and indicators into a group of new attributes through linear

combinations of the original variables, and among others for reducing the number of items, indicators and attributes and to identify those items and indicators that are redundant. Using factor analysis an initial set of latent variables (attributes and categories) was defined, enabling for the conceptual model to be constructed only using the selected latent variables and manifest variables. The Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Bartlett's test of sphericity were examined to check that the requirements for factor extraction were met. Kaiser-Meyer-Olkin test of sampling adequacy represents the ratio of the squared correlation between variables to the squared partial correlation between variables. The KMO statistic varies between 0 and 1. A value of 0 indicates that the sum of partial correlations is large relative to the sum of correlations, indicating diffusion in the pattern of correlations. A value close to 1 indicates that patterns of correlations are relatively compact and so factor analysis should yield distinct and reliable factors. Kaiser (1974) recommends accepting values greater than 0.5 as barely acceptable. Value between 0,5 and 0,7 are mediocre, values between 0,7 and 0,8 are good, values between 0,8 and 0,9 are great and values above 0,9 are the most acceptable (for more see Hutcheson and Sofroniou, 1999). For the extraction of factor the factor analysis method here applied is ‘‘maximum likelihood’’ with orthogonal Varimax rotation method and Keiser normalization. The extraction method ranks detected components according to decreasing shares of explained variance: each of these components is the outcome of a linear combination of the initial variables through different factor scores. Orthogonal Varimax rotation method is chosen because this method tries to load a smaller number of variables highly onto each factor, resulting in more interpretable cluster of factors and also because in this study is expected the factors to be independent (more about factor analysis see Cureton, D'Agostino, 2009). For retention indicators and the items 0.4 of factor loading value was used because the sample size in the pilot study was approximately 200 respondents. Significance of a factor loading gives little indication of the substantive importance of a variable to a factor and depend on the sample size. According to Stevens (1992) table of critical values for sample size of 200 respondents factor loadings should be greater than 0,364 which explain around 16% of the variance in the variable. Also to assess the fit of the model the percentage of nonredundant residuals with absolute values grater then 0.05 was examined. The percentage of nonredundant residuals are computed between observed correlations and reproduced correlations based on the model. According to Field (2005) this percentage should be less than 50%. It is also necessary to measure the reliability of the measurement instrument in order to prove that its use in repeated measuring

would show equal measurement indicators. To approximate the reliability of an instrument its degree of internal consistency should be determined. This study employed Cronbach's Alpha reliability coefficient for measuring internal consistency of extracted factors. It is considered, for the instrument to have a satisfying reliability, if Cronbach's Alpha reliability coefficient is 0.70 or higher (Mejovšek, 2008). Initial operationalization of the core categories and attributes proved to be approximately well set according to previously researched and confirmed theoretic and empirical research. However, it should be noted that within each attribute indicators and items that were redundant or deviated from the expected measurement results have been detected. In the final version of the research instrument used in the main part of this research all such indicators and items have been corrected or left out.

The main part of survey was conducted on a representative sample in a way that the basic set/sample of respondents was first determined. In the formation of a representative sample has participated Croatian Bureau of Statistics. The population of main part of study comprise residents of the Varaždin County and Međimurje County aged over 18. Upon conducting the research and data collection, data analysis was performed. First descriptive statistical analysis was conducted to examine summary descriptions of quantitative variables distributions and thus verify the key assumptions concerning the justifiability of using multivariate methods.

For determine the adequacy of the previously designed theoretical conceptual model of e-inclusion, and assess parameters as well as for test the defined hypotheses partial least square –SEM method was used. This method is also intended to be used for confirmation and establishment a system of interrelations between dependent and independent variables previously set in accordance with the literature review, and explore relationship between components of e-inclusion model *empowerment* and *impact of ICT on quality of life*. The method based on partial least squares proved to be the most appropriate given the nature of research, characteristics of the collected data, the complexity of the model and sample size. This research is considered to be explorative because theory is less developed. Primary objective of applying structural modeling is prediction and explanation of target constructs. Partial least squares SEM method uses available data to estimate the path relationship in the model with the objective of minimizing the error terms of the endogenous constructs or maximize the R^2 values of the target endogenous constructs. One of the significant characteristics partial least square - SEM method is that works efficiently with small sample size

and complex models and does not require assumptions about data distributions, among others can easily handle reflective and formative measurement models. Another benefit of partial least squares - SEM is its ability to process nominal, ordinal, interval, and ratio scaled variables (more about partial least squares - SEM method see Hair et al., 2014; Haenlein, Kaplan, 2004; Reinartz et al., 2009).

After validation of the conceptual model collected data were also used for establishing differences in components of *e-inclusion* between subgroups of participants defined by demographic, social, economic and cultural variables. The most adequate method for that, analysis of variance (ANOVA) were used if the assumptions of homogeneity of variance are met, otherwise the Welch's test was used. Two different tests for the homogeneity of variance assumption are used Levene's test and Brown and Forsythe test. If a significant difference was found in the further analysis to identify significant differences between individual groups of participants various post-hoc comparisons methods was used. The Fisher LSD post-hoc comparisons method was used when the assumptions of homogeneity of variances were met and when the group of respondents were quite equal, Tukey – Kramer post hoc test was used when the assumptions of homogeneity of variances were met and when the group of respondents were unequal and Games-Howell post hoc test when the assumptions of homogeneity of variances were not met and when the group of respondents were unequal (more about analysis of variance and post-hoc tests see Scheffe, 1999, Howell, 2012). Finally, in order to additionally test the significance of the relationship between the latent variables *empowerment* and latent variables *impact on quality of life* correlation analysis was performed, used both, parametric method Pearson correlation and nonparametric method Spearman's rho (more about correlation analysis see Wilcox, 2010; Mitchell, Jolley, 2012).

12.4. DEVELOPMENT OF THE MEASURING INSTRUMENT

As a part of this research, a new research measuring instrument (a questionnaire) has been developed which was used for collecting data and facts connected with e-inclusion. After the final version of the instrument has been made, with help from experts, a content validation was performed with the aim to check the quality of the instrument through implementation of a series of quality guidelines provided by the experts. After content validation, a pilot survey was performed in order to reduce the number of attributes and manifest variables and thus enable a preliminary formation of a conceptual model that would contain only the most relevant components and improve the metric characteristics of the instrument.

The research instrument (questionnaire) of the pilot research was in digital on-line form whilst the research instrument (questionnaire) of the main part of the research was in digital and printed form. When designing the concept of the research instrument, the existing theoretical-conceptual hypothesis and new empirical research findings were taken into account. This resulted in a divide of the research instrument (questionnaire) in two parts. The first part was used to measure the relevant factors (demographic, economic, social and cultural) identified through research of literature as the ones that affect e-inclusion. Along with gender and age of the respondents, other indicators were used, such as household structure, marital status, work status, education level, disability, place of residence, financial status and the assessed level of household income in the last three years, membership in religious, political and non-profit organizations, knowledge of English and another foreign language in speaking and writing. In this part of the questionnaire, the respondents were asked to estimate the time when they first started using ICT and Internet technology, as well as to estimate how and where they acquired the most of their ICT and Internet skills. This part of the questionnaire ends with questions related to the kind of technology the respondents possess (desktop, laptop or a mobile device) and the type of Internet network they use (fixed or mobile broadband connection).

The second part of the questionnaire consists of indicators and items that represent manifest variables which were classified according to identified categories and attributes. These will later serve for keeping track of e-inclusion. The data collected with the second part of the research instrument (questionnaire) is connected to the basic categories of *e-inclusion*: *access*, *use* and *influence of ICT on the quality of life* and *empowerment*. Each identified attribute of the model was

measured with at least three manifest variables in the pilot study and in the main part of the research. The research instrument contained closed-ended questions with listed possible answers. The indicators and items were not formulated as open questions and the condition was to choose one of the offered answers to each question. Thus regarding questions measuring perception, the respondents were able to self-position themselves on a scale from 1 to 5, 1 being *strongly disagree* and 5 *strongly agree*. When answering questions for measuring the frequency of use, the respondents could choose options from 1 meaning *never* to 5 *very often*. Regarding self-assessment of ICT skills, the options ranged from 1 *very bad* to 5 *excellent* and for the time spent using ICT and the Internet according to certain location, they ranged from 1 *do not use* to 6 *more than 20 hours of use* per week. Indicators, particles and scales connected to the identified factors for keeping track of e- inclusion were developed with the help of conceptual or operational templates from earlier foreign research (sources: SIBIS, EUROSTAT, Helsper, ITU, OECD, UN). After the validation process, they have been modified and adjusted, with the help of a panel of experts from the field of e-inclusion and conducted factor analysis, to the needs of this research. The process of building the research instrument is shown in the following figure.

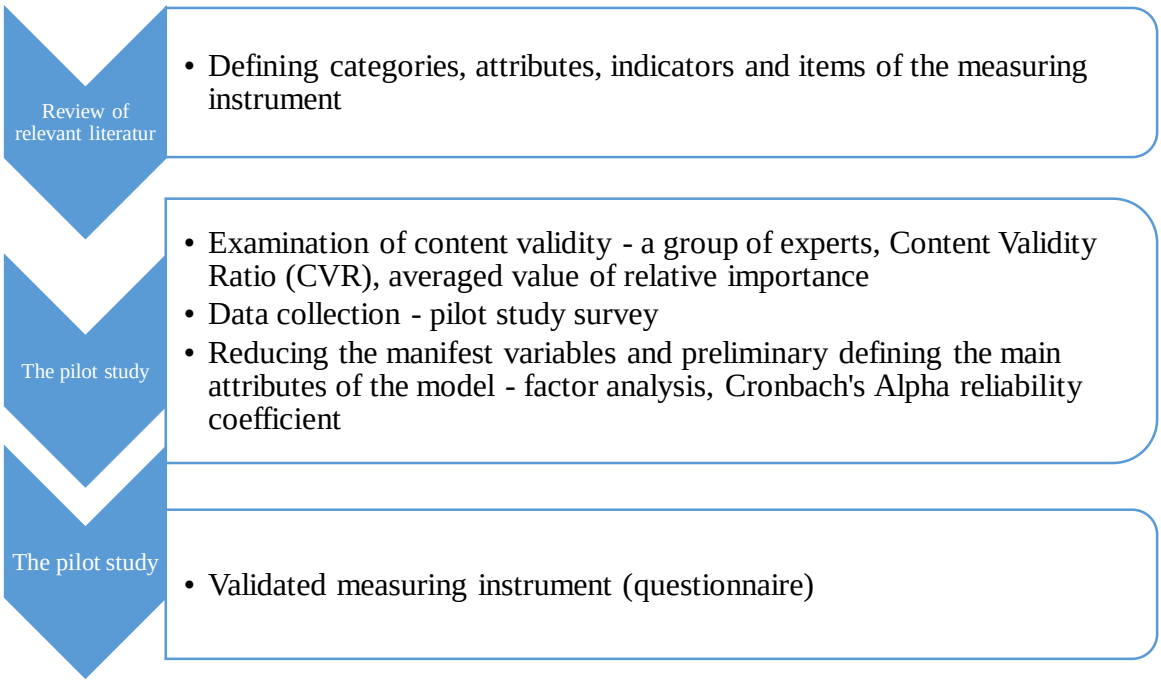


Figure 10. The process of construction of the measuring instrument
Source: made by the author

12.4.1. Population and sample of the pilot study

For the purpose of pilot study an online questionnaire was designed for data collection. For the designing the questionnaire and conduction of pilot survey an online application kwiksurveys (https://kwiksurveys.com) was used. The data collection period via an online survey lasted three months, i.e. from June to September 2014 on a convenience sample (friends, relatives and students…) using a non-parametric snowball sampling method (for more detail about this method see: Babbie, 2010). For dissemination of online questionnaire for pilot study Social network (Facebook), electronic mail and a e-learning system of Faculty of organization and informatics were used to contact potential respondents. Link on online questionnaire on the social network Facebook has been sent to 147 respondents (friends, relatives ..., 18+) with a request for filling out the questionnaire and to forward the questionnaire to other respondents (18+) with which they are connected on this or other social networks. System for e-Learning Faculty of Organization and Informatics Varaždin, for the purpose of the pilot survey was used in a way that the link to the questionnaire was placed on forum of courses Operations Research 1 and Operations Research 2 with the request that all students who want to, voluntarily fill out a questionnaire. A total of 331 respondents participated in the study but the number of valid questionnaires was 197, while the remaining 134 questionnaires were incompletely filled and thus discarded from further analysis. From the total number of respondents who correctly filled out the questionnaire (N=197) 52% were of female and 48% of male gender. The respondents were aged 18 to 74 years. By place of residence 41% of respondents were from rural areas and 59% from urban areas. Various other demographic, economic, social and cultural characteristics of the respondents are also presented in Table 22. The variables that are shown in Table 22. (e.g. demographic, economic, social and cultural characteristics of the respondents) are elaborated in previous chapters since they are identified as potentially relevant according to the existing research of respondents characteristics which proved to be significant for the e-inclusion.

In continuation of this study, the process of validation of the research instrument will be shown. Validation was conducted with the help of an expert panel and empirical indicators Content Validity Ratio (CVR) and average value of relative importance, and the results obtained via factor analysis.

Table 22. Demographic, economic, social and cultural characteristics of Pilot Study respondents

Household structure	**Percentage**	**Marital status**	**Percentage**
One-person household	6.0%	Single	61.0%
Adults without dependent children	23.0%	Married	30.0%
Single parent with one or more dependent children	7.0%	Partnered	6.0%
Two adults with one or more dependent children	58.0%	Divorced	1.0%
Other households with dependent children	6.0%	Widowed	2.0%
The level of income of the household in the last three years	**Percentage**	**Family assets situation**	**Percentage**
Increased	4.0%	Much worse than the majority	4.0%
Decreased	9.0%	Somewhat worse than the majority	9.0%
Stayed the same	67.5%	Neither better nor worse than the majority	67.5%
Do not know	18.0%	Somewhat better than the majority	18.0%
Decline to answer	1.5%	Much better than the majority	1.5%
Respondents' knowledge of English in speech and writing	**Percentage**	**When did you first start using the computer and the Internet?**	**Percentage**
Insufficient	8.0%	6 months ago or more	2.0%
Sufficient	13.0%	6-12 months ago	0.0%
Good	27.0%	1-2 years ago	0.5%
Very good	36.0%	2 years ago or more	86.3%
Excellent	16.0%	I do not know	11.2%
I am an active member of a religious organization.	**Percentage**	**I am an active member of a political party.**	**Percentage**
Yes	31,0%	Yes	6,1%
No	60,9%	No	90,9%
I refuse to answer	8,1%	I refuse to answer	3,0%
I am an active member of one / several non-profit organizations.	**Percentage**	**Disability**	**Percentage**
Yes	20,3%	Yes	1,5%
No	78,2%		
I refuse to answer	1,5%	No	98,5%
Level of education	**Percentage**	**Employment**	**Percentage**
Primary school	1.0%	Full-time employment	43.0%
Three-year vocational secondary school	4.0%	Part-time employment	3.0%
Four-year secondary school	46.0%	Part-time employment as the only source of income	0.5%
College	8.0%	Independent economic activity (craftsman, freelancer)	1.0%
Faculty	35.0%	Unemployed	7.0%
Specialization, Master's, Doctorate	6.0%	Student	44.0%
		Retired	1.5%

Source: made by the author

12.4.2. The content validity

Content validity was examined with the help of panel of experts and using two empirical indicators Content Validity Ratio (CVR) and average value of relative importance. A panel of experts was consisted from 12 experts from Croatia and Austria. The experts were chosen with regard to the experience gained as project managers or team members in e-inclusion projects and theoretical knowledge related to the concepts of e-inclusion. In qualitative content validity analysis, experts recommendations are adopted on observing grammar, using appropriate and correct words, applying correct and proper order of words in items and indicators. Total of 32 manifest variables are reformulated according to experts' recommendations after qualitative content validity analysis. For the calculation of the empirical indicators CVR and averaged value of relative importance, experts are requested to score each item from 1 to 3 in with a three-degree range of *1-Mandatory*, *2-Desired*, *3-Not important*. CVR value is computed for each item and indicator. The CVR can take on values between 1 and −1. In validating measuring instrument greater levels of content validity exist when larger numbers of experts agree that a particular item or indicator is *Mandatory* or *Desired*. Using these assumptions, adjusted formula developed by Lawshe (1975) for the calculation of CVR was used: $CVR = (N_e - N/2)/(N/2)$, in which the N_e is the number of experts indicating *Mandatory* or *Desired* and N is the total number of experts. The numeric referent value (Minimum value = 0.56, α=0.05) of content validity ratio (CVR) is determined by Lawshe table (1975, p. 568) for the twelve experts which participated in the study (more about content validity see in article Lawshe, 1975). In the first step for a total of 184 manifest variables, the Content Validity Ratio (CVR) and an averaged value of their relative importance is calculated. One manifest variable whose value of CVR indicator was less than 0.56, α=0.05 for the twelve experts, as well as manifest variable whose averaged value of their relative importance (three-degree range of *1-Mandatory*, *2-Desired*, *3-Not important*) was more than 2, were excluded from further development of the measuring instrument (questionnaire). The value of the indicator Content Validity Ratio (CVR) and an averaged value of relative importance of initial set manifest variables are summarized in the table 23. The greatest value of the indicator of content validity (CVR = 1.00) had a total of 36 items, 10 attributes and all 4 categories. A total of 67 manifest variables were excluded from further analysis because they did not meet the requirement content validity indicator (CVR>0.56). The second indicator that is taken into account in determining the content validity was averaged value of the relative importance. The lowest average value is determined for category

access $\overline{X}$ =1,10, $\overline{X}$ =1,00 for attribute *digital engagement* and $\overline{X}$ =1,08 for three manifest variables which implies that these manifest variables / attributes / categories are of extreme importance for monitoring *e-inclusion* according to opinion of expert in domain. A total of 22 manifest variables had the indicator value greater than $\overline{X}$ =2. These manifest variables characterized as manifest variables with relatively low significance and were excluded from further analysis.

As a result of content validity analysis using two empirical indicators the initial number of manifest variables was reduced from 184 on 117, number of attributes has been reduced by one attribute, while the number of categories remained the same. As one can notice from the Table 23, the attribute *affordability* is, according to theories, one of the influential attributes of the *access* category, and has been evaluated as necessary by the experts, but nevertheless the majority of items identified for these attributes have been evaluated as unnecessary, and thus this attribute was completely left out in the main part of the research.

Table 23. Results of the content validity of the initial set of manifest variables

Category	**CVR**	**Mean**
Access	1,00	1,10
Attribute	**CVR**	**Mean**
The material access and network	0,56	1,78
Indicators	**CVR**	**Mean**
1. I access the Internet and digital content via desktop computer.(*)	1,00	1,25
2. I access the Internet and digital content via portable computers (laptops, netbooks, tablet).(*)	1,00	1,33
3. I access the Internet and digital content via some of the mobile devices (mobile phone, smart phone, e-book reader).(*)	1,00	1,42
4. I access the Internet and digital content via a smart TV (Smart TV).(**)	0,33	2,00
5. I access the Internet and digital content via games consoles.(**)	0,27	2,00
6. I access the Internet via fixed broadband connections, (DSL, ADSL, VDSL, cable, optical fibre, satellite, public WiFi connections).(*)	1,00	1,16
7. I access the Internet via mobile broadband connections (via mobile phone network, at least 3G, e.g. UMTS, using (SIM) card or USB key, mobile phone or smart phone as modem).	0,83	1,33
8. I access the Internet via dial-up connection or normal telephone line or ISDN.(**)	0,09	1,91
9. I access the Internet via mobile narrow band connection (less than 3G, e.g. 2G+/GPRS used by mobile phone or smart phone or modem in laptop).(**)	0,33	1,75
10. I am satisfied with the quality of the network connection.(*)	0,83	1,66
11. I am satisfied with the speed of the network connection.(*)	1,00	1,25
12. By increasing the speed and quality of access to electronic content on the Internet, I would spend more time online. (*)	0,67	1,75
13. I am satisfied with the availability of Internet network connection. (*)	0,83	1,50
14. I am satisfied with the offer of Internet network connection. (**)	0,27	2,09

Attribute	CVR	Mean
Affordability	0,80	1,50
Items	**CVR**	**Mean**
15. The costs of acquiring and maintaining ICT are too high.(*)	0,64	1,82
16. The cost of subscription for Internet connection is too high.(**)	0,45	2,00
17. The cost of subscriptions for Internet connection is acceptable.(**)	0,45	1,91
18. The costs of acquiring and maintaining ICT are acceptable.(**)	0,40	1,90
Attribute	**CVR**	**Mean**
Point of access	0,80	1,50
Indicators	**CVR**	**Mean**
19. I access ICT and Internet connection at home.	1,00	1,60
20. I access ICT and Internet connection at the workplace.	1,00	1,08
21. I access ICT and Internet connection at the faculty or other educational institution.	0,83	1,42
22. I access ICT and Internet connection at a public place where access is free.(*).	0,83	1,33
23. I access ICT and Internet connection at other places where you have to pay for access.	0,64	1,55
24. I access ICT and Internet connection at neighbours, friends, relatives ...(**)	0,17	2,08

Category	CVR	Mean
Use	1,00	1,10
Attribute	**CVR**	**Mean**
Intensity of use	0,64	1,45
Items	**CVR**	**Mean**
25. How much time do you spend in a week using ICT and the Internet at home?	0,82	1,36
26. How much time do you spend in a week using ICT and the Internet at the workplace?	0,82	1,45
27. How much time do you spend in a week using ICT and the Internet in any of the educational institutions?	0,64	1,82
28. How much time do you spend in a week using ICT and the Internet public places where access to and use is paid for?(**)	0,46	1,91
29. How much time do you spend in a week using ICT and the Internet in public places where access to and use is not paid for?(*)	0,82	1,82
30. How much time do you spend in a week using ICT and the Internet at neighbours, friends, relatives ...?(**)	-0,09	2,46
Attribute	**CVR**	**Mean**
Skills	1,00	1,27
Items	**CVR**	**Mean**
31. How would you evaluate your knowledge of using the Internet search engines (Google, Yahoo ...)?	1,00	1,33
32. How would you evaluate your knowledge of using e-mail for the purpose of communication?(*)	1,00	1,08
33. How would you evaluate your knowledge of compressing (or zipping) files?(**)	0,50	2,17

34. How would you evaluate your knowledge of transferring files between computer and other devices (from digital camera or from/to mobile phone, mp3/mp4 player)?	1,00	1,83
35. How would you evaluate your knowledge of creating electronic presentations by using presentation software (e.g. slides), including e.g. images, sound, video or charts?(*)	0,83	1,58
36. How would you evaluate your knowledge of installing a new or replacing an old operating system?(**)	0,00	2,50
37. How would you evaluate your knowledge of writing a computer program using a specialised programming language?(**)	0,17	2,17
38. How would you evaluate your knowledge of the use of ICT and the Internet to download and install the software tools on the computer?	0,83	1,67
39. How would you evaluate your knowledge of networking by using ICTs and the Internet via for example social networks (Facebook, Twitter, Instagram ...)?	1,00	1,50
40. How would you evaluate your knowledge of using specialized programs for communication via Internet (e.g. Skype)?	0,83	1,58
41. How would you evaluate your knowledge of using forums for the exchange of information?	0,83	1,50
42. How would you evaluate your knowledge of using chat rooms for communication (Messenger, IRC)?	0,67	1,92
43. How would you evaluate your knowledge of making a chart in a spreadsheet (Excel, Lotus)?(*)	0,67	1,75
Attribute	**CVR**	**Mean**
Motivation/Attitudes	1,00	1,30
Items	**CVR**	**Mean**
44. I consider the use of ICT and the Internet to be useful.(*)	0,67	1,33
45. The use of ICT and the Internet is simple for me.	0,67	1,42
46. By using ICT and Internet I acquire important information that help me make better decisions.	0,67	1,50
47. I consider the use of ICT and Internet to be fun.(**)	0,50	1,67
48. I consider the use of ICT and the Internet to be frustrating.(**)	0	2,08

49. I enjoy using ICT and the Internet for private purposes.(**)	0,33	1,92
50. I avoid using ICT and the Internet for business and private purposes as much as possible.(**)	-0,17	2,33
51. I'm worried about the Internet security and manipulation of my personal data.	0,83	1,33
52. I'm worried about the privacy and confidentiality of my personal data on the Internet.	0,57	1,67
53. I avoid the use of e-services due to concerns about the ability to manipulate my personal data.	0,57	1,58
54. I have come across illegal/inappropriate contents while using ICT and the Internet.(**)	0,27	2,00
Attribute	**CVR**	**Mean**
Social support / coercion	1,00	1,60
Items	**CVR**	**Mean**
55. I have support from relatives and family members to use ICT and the Internet.(*)	0,83	1,92
56. I have a lot of help from friends relatives and family members in solving problems related to the use of ICT and the Internet.(**)	0,50	2,08
57. I have a lot of help from colleagues at work / faculty / in the association in solving problems related to the use of ICT and the Internet.(*).	0,67	1,83
58. I have support from friends to use ICT and the Internet.(*).	0,83	1,83
59. I have a lot of help from in solving problems related to the use of ICT and the Internet. (**)	0,50	2,00
60. I have support from colleagues at work / faculty / in the association to use ICT and the Internet.(*)	0,67	1,83
61. I am forced to use ICT and Internet for business / educational / legal obligations.(*)	0,67	1,58

Attribute	CVR	Mean
Digital engagement	1,00	1,00
Items	**CVR**	**Mean**
62. In the last three months I have used ICT and Internet to search for information (news, health).	1,00	1,08
63. In the last three months I have used ICT and Internet for learning purposes (educational materials, employment opportunities, training courses).	1,00	1,25
64. In the last three months I have used ICT and Internet for communication (e-mail, text messaging, chat, forum).	1,00	1,08
65. In the last three months I have used ICT and Internet for social networking (Facebook, Twitter, YouTube).	1,00	1,08
66. In the last three months I have used ICT and Internet for leisure activities (hobbies, travel).	0,83	1,33
67. In the last three months I have used ICT and Internet for entertainment (computer games, music, movies, theatre).	1,00	1,25
68. In the last three months I have used ICT and Internet for commercial activities (buying / selling of products and services, searching for information about products and services, comparing products and services).	1,00	1,25
69. In the last three months I have used ICT and Internet for financial activities (banking, investment activities).	1,00	1,25
70. In the last three months I have used ICT and Internet for participation in civic activities (signing petitions, voting - non-political, participation in discussions).	0,67	1,58
71. In the last three months I have used ICT and Internet for participation in political activities (contacting politicians, participation in political parties).	0,67	1,67
72. The use of ICT and Internet has become my daily routine.(*)	0,83	1,33

Category	CVR	Mean
Impact on quality of life	1,00	1,18
Attribute	**CVR**	**Mean**
E-learning	1,00	1,09
Items	**CVR**	**Mean**
73. I use ICT and Internet to attend educational courses.(*)	0,83	1,42
74. I use ICT and the Internet to find information about educational courses.(*)	0,83	1,50
75. I use ICT and the Internet to access and download materials for education / training.(*)	0,83	1,25
76. Computer and Web-educational courses should have an important role in education.(**)	0,33	1,83
77. Web-based learning programs should replace lectures and exercises.(**)	-0,17	2,33
78. E-learning should not be anything more than distribution of educational materials via the Internet.(**)	0,00	2,25
Attribute	**CVR**	**Mean**
DIGITAL ECONOMY (E-commerce, E-banking, E-employment)	1,00	1,00
Items	**CVR**	**Mean**
79. In the last three months I have used ICT and Internet to find information about specific / desired products and services.	0,83	1,17
80. In the last three months I have used ICT and Internet to buy food, supplies. (**)	0,50	1,58
81. In the last three months I have used ICT and Internet to buy shoes and clothes.(**)	0,33	1,75

82. In the last three months I have used ICT and Internet to buy household supplies (furniture, toys…). (**)	0,17	1,92
83. In the last three months I have used ICT and Internet to buy items for sport and recreation.(**)	0,17	1,92
84. In the last three months I have used ICT and Internet to buy / book tickets (concerts, theatre, exhibitions).(*)	0,67	1,58
85. In the last three months I have used ICT and Internet to buy electronic equipment.(**)	0,50	1,70
86. In the last three months I have used ICT and Internet to buy computer software/video games or computer equipment.(**)	0,33	1,83
87. In the last three months I have used ICT and Internet to buy telecommunications services.(**)	0,33	1,83
88. In the last three months I have used ICT and Internet to buy movies, music.(**)	0,33	1,75
89. In the last three months I have used ICT and Internet to buy books, magazines, newspapers.(**)	0,33	1,75
90. I buy products and services via ICT and Internet from local companies.(**)	0,00	2,17
91. I buy products and services via ICT and Internet from companies across the European Union.(**)	0,00	2,25
92. I buy products and services via ICT and Internet from companies all over the world.(**)	0,17	2,25
93. In the last three months I have used ICT and the Internet to find information about banking products and services.(**)	0,33	1,75
94. In the last three months I have used ICT and Internet to pay the bills, the products and services via e-banking.	0,67	1,42
95. In the last three months I have used ICT and Internet for money transfer.(**)	0,50	1,75
96. In the last three months I have used ICT and Internet for investing in investment funds.(**)	0,50	1,75
97. In the last three months I have used ICT and the Internet to find information about employment.	1,00	1,33
98. In the last three months I have used ICT and the Internet to send job applications.(*)	1,00	1,42
99. By using ICT and the Internet, I can, in a simpler manner, make contact with potential employer.(**)	0,33	1,92

100. I believe that, by using ICT and Internet, one can do more business activities in one day.(**)	0,50	1,83
101. I believe that, by using ICT and the Internet, one may easily synchronize one's private and business life.	0,67	1,58
102. I believe that the implementation of work at a distance (Telework) increases labour autonomy.(*)	0,67	1,75
103. I believe that the implementation of work at a distance (Telework) increases labour productivity.(**)	-0,09	2,46
Attribute	**CVR**	**Mean**
E-health	1,00	1,00
Items	**CVR**	**Mean**
104. In the last three months I have used ICT and Internet to find information about health services / improving my general health condition.	1,00	1,33
105. In the last three months I have used ICT and Internet to find information about / buy medicine.	0,83	1,42
106. In the last three months I have used ICT and the Internet to obtain a second opinion regarding diagnosis and health status for me, my friends, family members ...	0,67	1,58
107. In the last three months I have used the e–health system to order specialist examination, surgeries...	0,82	1,55
108. I would recommend the use of e-health to other users.(*)	0,64	1,73
109. I will use the e-health system to order on every occasion.(**)	0,45	1,91
110. I believe that the use of e-health system increases the quality of health care services, if compared to the alternative traditional ways.	0,83	1,83
111. I believe that I save time by using the e-health care, if compared to the traditional ways of obtaining services.	0,64	1,82
112. I believe that the use of e-health care is more cost acceptable, if compared to the traditional ways of obtaining services.	0,64	1,82
113. I believe that ICT and Internet should not be used for finding information concerning health and health services.(**)	0,27	2,00
114. I think the anonymity of patients, when using e-health care system, is compromised.	0,83	1,58

115. I think that the quality of information related to health and health services on the Internet needs to be improved.(**)	0,45	1,83
116. I think that the quality of information related to health and health services on the Internet is on a satisfactory level.(*)	0,63	1,91
117. I think that correct health information can be found on the websites of the institute and non-profit organizations involved in the health care sector.(**)	0,40	1,90
118. I think that correct health information can be found on websites and forums group for self-help.(**)	0,27	2,00
119. I think that correct health information can be found on websites of hospitals.(**)	0,45	1,91
120. I believe that correct health information can be found on websites of professional health care associations.(**)	0,45	1,91
Attribute	**CVR**	**Mean**
E-government	1,00	1,00
Items	**CVR**	**Mean**
121. I believe that the filling-in and delivery of tax returns should be enabled by using ICT and the Internet.	0,83	1,25
122. I believe that employment data should be available on the websites of public institutions.(**)	0,50	1,83
123. I believe that requirements for issuance of passports, driving licenses, identity cards and other documents should be filled-in and submitted by using ICT and the Internet.	1,00	1,25
124. I believe that the requirements for the change of domicile / residence should be completed and submitted by using ICT and the Internet.	1,00	1,25
125. I often use electronic services created by government institutions.	1,00	1,33
126. I don't use the public administration websites to submit the forms because I don't have enough knowledge and skills.(**)	0,27	1,91
127. I don't use the public administration websites to submit the forms because I am worried about the safety and security of personal data.(**)	0,45	1,73
128. Electronic services created by government institutions are not useful to me.(**)	0,50	1,67
129. Electronic servicescreatedbygovernmentinstitutionsaccelerategettingtherequiredservices, as opposed to the traditional approach.	0,67	1,67

130. Electronic services created by government institutions reduce the number of errors made by public officials.(**)	0,45	1,82
131. Electronic services created by government institutions enable easier communication with officials in public institutions in a more convenient location (at home, work ...).	1,00	1,42
132. Electronic services created by government institutions are too complicated for me to use.(**)	0,45	1,73
133. In the last three months, I have used the website of the public administration in order to obtain relevant information.	0,67	1,50
134. In the last three months, I have used the website of public administration for submission of completed forms.(**)	0,50	1,75
135. In the last three months, I have used the website of public administration to download official forms.(**)	0,50	1,75
Attribute	**CVR**	**Mean**
E-culture, E-entertainment and E-communication	1,00	1,27
Items	**CVR**	**Mean**
136. I use ICT and the Internet to find information related to travel destinations and accommodation. (*)	1,00	1,25
137. I use ICT and the Internet to play / download games.(**)	0,33	1,75
138. I use ICT and the Internet to listen / download music.	1,00	1,33
139. I use ICT and the Internet to watch / download movies.	0,67	1,50
140. I use ICT and the Internet to read online newspapers, magazines....	1,00	1,25
141. I use ICT and the Internet to read / download digital books.	1,00	1,33
142. I use ICT and the Internet to visit museums online.	0,67	1,67
143. I use ICT and the Internet to watch theatrical performances.(*)	0,67	1,67
144. I use ICT and the Internet to watch concerts (classical / fun music).(**)	0,50	1,75

145. I use ICT and the Internet for payment of lottery games / betting.	0,67	1,75
146. For communication via ICT and the Internet, I use e-mail.	0,67	1,42
147. For communication via ICT and Internet, I use specialized software (Skype, ...).(**)	0,50	1,67
148. For communication via ICT and Internet, I use social networks (Facebook, Twitter ...).	0,67	1,50
149. For communication via ICT and Internet, I use chat-room.(**)	0,33	1,83
150. In case of having no access to ICT and the Internet, I believe I would communicate less with family members, friends, relatives ...(**)	0,50	1,83

Category	CVR	Mean
Empowerment	1,00	1,18
Attribute	**CVR**	**Mean**
E-democracy and E-participation	1,00	1,09
Items	**CVR**	**Mean**
151. In case of having no access to ICT and the Internet, I believe I would be less informed.	0,67	1,50
152. In case of having no access to ICT and the Internet, I would feel socially excluded.	0,67	1,67
153. I asked for information from the public authorities via the Internet and I got a response.	0,83	1,58
154. I use ICT and the Internet to express my political views on the websites or social networks of public authorities.(**)	0,50	1,92
155. I proposed implementing some measures or activities to public authorities, which was accepted.(**)	0,46	2,09
156. With help of ICT and the Internet, I find all information related to work of the Government and public administration.	0,83	1,67
157. I follow and use educational content that public authorities publish on their websites (webinars, online courses, educational films, etc.).	0,67	1,75
158. I communicate directly to the officials of public authorities via e-mail.	0,83	1,42
159. I communicate directly to the officials of public authorities via social networks (Facebook, Twitter ...).	0,83	1,42
160. I participate in public discussions related to the enactment of law regulations, rules etc. via ICT and the Internet.	1,00	1,58
161. I believe that each Parliament and Government session should be accompanied by videoconference.(*)	1,00	1,58
162. I believe that each session of leaders of local government should be accompanied by videoconference. (*)	0,83	1,67

163. I believe that citizens should have the opportunity of voting in elections electronically.	1,00	1,25
164. I believe that citizens should have the opportunity to participate in referendum electronically.(*)	0,83	1,42
165. I believe that every official executive authority should have their own website on which they communicate with citizens.(**)	0,50	1,75
166. I believe that every municipal mayor or the mayor should communicate with citizens on websites or social networks.	0,83	1,42
167. With the help of ICT and the Internet, I find all documents and information regarding the enactment of law regulations, rules ...	0,83	1,50
168. I believe that, on the occasion of election for president / parliament / local and regional levels, the list of candidates should be available on websites with contact information for each candidate.(*)	1,00	1,36
169. With the help of ICT and the Internet, I exchange my own political and social views and opinions in a simpler way.	0,63	1,72
170. I believe that before and after the sessions of political bodies (parliament, government, local and regional representative bodies), all documents (agendas, minutes, decisions) should be available on their official website.	1,00	1,36
171. With help of ICT and the Internet, I receive information about various community organizations and their initiatives.(*)	1,00	1,36
172. With the help of ICT and the Internet, I become member and actively participate in various community organizations.	0,82	1,55
Attribute	**CVR**	**Mean**
Social computing - content creation, networking	0,82	1,27
Items	**CVR**	**Mean**
173. I upload self-created content to any website to be shared (text, photos, music, videos, software etc.).	0,80	1,50
174. I create or work on my own online journal or blog.	0,80	1,50
175. I create or work on my own website.	1,00	1,40
176. I create or work on websites or blogs for others, including friends, relatives, employers, groups I belong to...	0,80	1,50
177. I share my work online, such as my own artwork, photos, stories or videos.	0,80	1,50

178. I use forums to obtain information and share opinions.	1,00	1,40
179. I communicate via portals and read the comments.	0,82	1,64
180. I read and comment blogs.(**)	0,45	1,82
181. I download contents (music, movies, photos…).(**)	0,45	1,91
182. I create and manage a profile on social networks (Facebook, Twitter ...).	1,00	1,27
183. I visit friends' social network page.	0,82	1,64
184. I use storage space on the Internet to save documents, pictures, music, video or other files (e.g. Google Drive, Dropbox, Windows Skydrive, iCloud, Amazon Cloud Drive).	1,00	1,55

(*) manifest variables that are reformulating according to experts' recommendations after qualitative content validity analysis

(**) manifest variables excluded from the final version of the measuring instrument (CVR≥0,56; Mean<2)

Source: made by the author

After analyzing the content validity, in order to additionally reduce the number of manifest variables and for preliminary determination the number of attributes for categories *use*, *the impact of ICT on the quality of life* and *empowerment* of the remaining set of manifest variables, factor analysis was performed. It is important to note, that for the set of indicators category *access* after the content validity has not conducted factor analysis, since there was no need for reducing the number of indicators. According to experts' recommendations, indicators that are retained after content validity analysis well describe each defined attribute and if remove any of the remaining indicators the logic and completeness of attributes would be undermine. Results of factor analyzes and the value of Cronbach's Alpha reliability coefficient for the category *access, usage, ICT and quality of life* and *empowerment* are presented in the following section.

12.4.3. Results of factor analysis and cronbach's alpha reliability coefficient for category *usage*

In order to determine whether the partial correlation of the variables was small for category *usage*, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's Chi-square test of sphericity before conducting the factor analysis was used. As depicted in Table 24. the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO = 0.872) and Bartlett's test of sphericity ($\chi 2$ = 1797.768, df = 171, p = .000) both confirmed that the data satisfied the requirements for carrying out ''maximum likelihood'' factor analysis. Also to assess the fit of the model the percentage of nonredundant residuals with absolute values grater then 0.05 was examined. The percentage of nonredundant residuals are computed between observed correlations and reproduced correlations based on the model. According to Field (2005) this percentage should be less than 50%. For this model there are 26 (15.00%) nonredundant residuals greater than 0.05, which means that the model well represents real data.

Table 24. Kaiser–Meyer–Olkin and Bartlett's test of sphericity

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		0,872
Bartlett's test of sphericity	Approx.-Chi-Square	1797,768
	df	171
	Sig.	,000

Source: made by the author

Table 25. Results of factor analysis and Cronbach's Alpha reliability coefficient for category *usage*

Code	FACTOR 1	Explained total variance%	34,666	CRONBACH ALPHA
		Factor loadings		
US4	How would you evaluate your knowledge of creating electronic presentations by using presentation software (e.g. slides), including e.g. images, sound, video or charts (i.e. Power Point).	0,873		0,918
US5	How would you evaluate your knowledge of the use of ICT and the Internet to download and install the software tools on the computer.	0,819		
U-S-7	How would you evaluate your knowledge of using specialized programs for communication via Internet (e.g. Skype).	0,765		
US10	How would you evaluate your knowledge of making a chart in a spreadsheet (Excel, Lotus).	0,753		
US9	How would you evaluate your knowledge of using chat rooms for communication (Messenger, IRC...).	0,713		
US1	How would you evaluate your knowledge of using the Internet search engines (Google, Yahoo ...).	0,691		
US8	How would you evaluate your knowledge of using forums for the exchange of information.	0,684		

Code	FACTOR 2	Explained total variance%	12.405	CRONBACH ALPHA
		Factor loadings		
USSC4	I have support from colleagues at work / faculty / in the association to use ICT and the Internet.	0,804		0,779
USSC2	I have support from relatives and family members to use ICT and the Internet.	0,788		
USSC3	I have support from friends to use ICT and the Internet.	0,713		
USSC5	I am forced to use ICT and Internet for business / educational / legal obligations.	0,410		
Code	FACTOR 3	Explained total variance%	10.021	CRONBACH ALPHA
		Factor loadings		
UDE5	In the last three months I have used ICT and Internet for leisure activities (hobbies, travel).	0,704		0,756
UDE6	In the last three months I have used ICT and Internet for entertainment (computer games, music, movies, theatre).	0,641		
UDE1	In the last three months I have used ICT and Internet to search for information (news, health).	0,605		
UDE2	In the last three months I have used ICT and Internet for learning purposes (educational materials, employment opportunities, training courses).	0,478		
UDE11	The use of ICT and Internet has become my daily routine.	0,411		

Code	FACTOR 4	Explained total variance%	6.458	CRONBACH ALPHA
		Factor loadings		
UMA1	I consider the use of ICT and the Internet to be useful.	0,642		0,748
UMA3	By using ICT and Internet I acquire important information that help me make better decisions.	0,614		
UMA2	The use of ICT and the Internet is simple for me.	0,590		

Source: made by the author

The final ‘‘maximum likelihood’’ factor analysis with orthogonal Varimax rotation and Keiser normalization uncovered 4 distinct factors (Table 25) for category *usage*. They accounted for 63.55% of the sample variance and the number of manifest variables for category *use* was reduced from 36 to 19.

12.4.4. Results of factor analysis and cronbach's alpha reliability coefficient for category *Impact of ICT on quality of life*

For category *Impact of ICT on quality of life* as shown in Table 26. the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO = 0.755) and Bartlett’s test of sphericity ($\chi 2$ = 2237,524, df = 300, p = .000) confirmed also that the data satisfied the requirements for carrying out ‘‘maximum likelihood’’ factor analysis. The percentage of nonredundant residuals that are greater than 0.05 for model *Impact of ICT on quality of life* are 10 (3.00%) which means that the model well represents real data.

Table 26. Kaiser–Meyer–Olkin and Bartlett’s test of sphericity

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		0,755
Bartlett’s test of sphericity	Approx.-Chi-Square	2237,524
	df	300
	Sig.	,000

Source: made by the author

Table 27. Results of factor analysis and Cronbach's Alpha reliability coefficient for category ICT and quality of life

Code	FACTOR 1	Explained total variance%	21,125	CRONBACH ALPHA
		Factor loadings		
IQLEL2	I use ICT and the Internet to find information about learning courses.	0,860		0,823
IQLEL1	I use ICT and Internet to attend learning courses.	0,822		
IQLEL3	I use ICT and the Internet to access and download materials for education / training.	0,683		
IQLECEC5	I use ICT and the Internet to read / download digital books.	0,423		
Code	FACTOR 2	Explained total variance%	12,319	CRONBACH ALPHA
		Factor loadings		
IQLEH2	In the last three months I have used ICT and Internet to find information about / buy medicine.	0,854		0,822
IQLEH1	In the last three months I have used ICT and Internet to find information about health services / improving my general health condition.	0,732		
IQLEH3	In the last three months I have used ICT and the Internet to obtain a second opinion regarding diagnosis and health status for me, my friends, family members ...	0,660		
IQLEH4	In the last three months I have used the e–health care system to order specialist examination, surgeries...	0,502		

Code	FACTOR 3	Explained total variance%	11,698	CRONBACH ALPHA
		Factor loadings		
IQLEG2	I believe that requirements for issuance of passports, driving licenses, identity cards and other documents should be filled-in and submitted by using ICT and the Internet.	0,888		0,878
IQLEG3	I believe that the requirements for the change of domicile / residence should be completed and submitted by using ICT and the Internet.	0,807		
IQLEG1	I believe that the filling-in and delivery of tax returns should be enabled by using ICT and the Internet.	0,738		
Code	FACTOR 4	Explained total variance%	6,627	CRONBACH ALPHA
		Factor loadings		
IQLEH7	I believe that I save time by using the e-health, if compared to the traditional ways of obtaining services.	0,861		0,835
IQLEH8	I believe that the use of e-health is more cost acceptable, if compared to the traditional ways of obtaining services.	0,797		
IQLEH5	I would recommend the use of e-health to other users.	0,639		
Code	FACTOR 5	Explained total variance%	6,204	CRONBACH ALPHA
		Factor loadings		
IQLECEC6	I use ICT and the Internet to visit museums online.	0,785		0,753
IQLECEC7	I use ICT and the Internet to watch theatrical performances.	0,758		
IQLDE2	In the last three months I have used ICT and Internet to buy / book tickets (concerts, theatre, exhibitions).	0,549		

Code	FACTOR 6	Explained total variance%	5,345	CRONBACH ALPHA
		Factor loadings		
IQLECEC2	I use ICT and the Internet to listen / download music.	0,887		0,704
IQLECEC3	I use ICT and the Internet to watch / download movies.	0,757		
IQLECEC10	For communication via ICT and Internet, I use social networks (Facebook, Twitter ...).	0,418		
Code	FACTOR 7	Explained total variance%	5,172	CRONBACH ALPHA
		Factor loadings		
IQLDE4	In the last three months I have used ICT and the Internet to find information about employment.	0,906		0,801
IQLDE5	In the last three months I have used ICT and the Internet to send job applications.	0,710		
Code	FACTOR 8	Explained total variance%	4,852	CRONBACH ALPHA
		Factor loadings		
IQLDE3	In the last three months I have used ICT and Internet to pay the bills, the products and services via e-banking.	0,710		0,625
IQLDE1	In the last three months I have used ICT and Internet to find information about specific / desired products and services.	0,469		
IQLECEC9	For communication via ICT and the Internet, I use e-mail.	0,462		

Source: made by the author

The final ‘‘maximum likelihood’’ factor analysis with orthogonal Varimax rotation and Keiser normalization uncovered 8 distinct factors (Table 27) for category *ICT and quality of life*. They

accounted for 73.34% of the sample variance and the number of manifest variables for category *ICT and quality of life* was reduced from 37 to 25.

12.4.5 Results of factor analysis and cronbach's alpha reliability coefficient for category *empowerment*

For category *empowerment* also the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO = 0.819) and Bartlett's test of sphericity ($\chi 2$ = 1333.251, df = 153, p = .000), both confirmed that the data satisfied the requirements for carrying out ''maximum likelihood'' factor analysis. The percentage of nonredundant residuals that are greater than 0.05 for these model are 25 (16.00%) which means that the model also well represents real data.

Table 28. Kaiser–Meyer–Olkin and Bartlett's test of sphericity

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		0,819
Bartlett's test of sphericity	Approx.-Chi-Square	1333,251
	df	153
	Sig.	,000

Source: made by the author

Table 29. Results of factor analysis and Cronbach's Alpha reliability coefficient for category empowerment

Code	FACTOR 1	Explained total variance%	28,438	CRONBACH ALPHA
		Factor loadings		
EEDP15	I believe that, on the occasion of election for president / parliament / local and regional levels, the list of candidates should be available on websites with contact information for each candidate.	0,843		0,814
EEDP13	I believe that every municipal mayor or the mayor should communicate with citizens via e-mail or social networks.	0,830		
EEDP10	I believe that each Parliament and each session of leaders of local	0,653		

	government should be accompanied by videoconference.			
EEDP18	With help of ICT and the Internet, I receive information about various community organizations and their initiatives.	0,570		
EEDP12	I believe that citizens should have the opportunity of voting in elections /participate in referendum electronically.	0,557		
EEDP14	With the help of ICT and the Internet, I find all documents and information regarding the enactment of law regulations, rules ...	0,487		
Code	FACTOR 2	Explained total variance%	15,247	CRONBACH ALPHA
		Factor loadings		
EEDP6	I communicate directly to the officials of public authorities via e-mail.	0,747		0,847
EEDP8	I participate in public discussions related to the enactment of law regulations, rules etc. via ICT and the Internet.	0,718		
EEDP5	I follow and use educational content that public authorities publish on their websites (webinars, online courses, educational films, etc.).	0,690		
EEDP3	I asked for information from the public authorities via the Internet and I got a response.	0,655		
EEDP4	With help of ICT and the Internet, I find all information related to work of the Government and public administration.	0,654		

Code	FACTOR 3	Explained total variance%	10,019	CRONBACH ALPHA
		Factor loadings		
ESM5	I share my work online, such as my own artwork, photos, stories or videos.	0,690		0,747
ESM1	I upload self-created content to any website to be shared (text, photos, music, videos, software etc.).	0,602		
ESM7	I communicate via portals and read the comments.	0,584		
ESM6	I use forums to obtain information and share opinions.	0,526		
Code	FACTOR 4	Explained total variance%	6.337	CRONBACH ALPHA
		Factor loadings		
ESM3	I create or work on my own website.	0,816		0,726
ESM4	I create or work on websites or blogs for others, including friends, relatives, employers, groups I belong to...	0,576		
ESM2	I create or work on my own online journal or blog.	0,441		

Source: made by the author

The final ‘‘maximum likelihood’’ factor analysis with orthogonal Varimax rotation and Keiser normalization uncovered 4 distinct factors (Table 29) for category *empowerment*. They accounted for 60.04% of the sample variance and the number of manifest variables for category ICT and quality of life was reduced from 29 to 18.

As Cronbach α coefficients for all factors in all categories are higher than 0.700 except for eighth extracted factor category of ICT and the quality of life, the alpha value of which is 0.625, what is considered as acceptable by certain authors, one can rely on the measurement instrument and its measurement results.

12.5. VALIDATION OF THE CONCEPTUAL MODEL

A description of the procedure of creating the sample of the main part of the research, developed with the help of the Croatian Bureau of Statistics, will also be provided. As a part of the research process, fieldwork will be described in detail, and the structure of the achieved sample according to defined stratums as well as the response of the respondents will be presented. Finally, the respondents' main reasons for rejecting participation will be accounted for.

12.5.1. Population and Sample of the Study

As framework for the sample choice for the implementation of the main part of the research, the data bank (list) of all the addresses in Varaždin and Međimurje Counties has been isolated from the Statistics Regional Registry of the State Statistics Bureau. This framework contains 65,534 addresses from Varaždin County and 41,390 addresses from Međimurje County. The framework has been stratified with regard to the county, type of community (town or district) and the size of the community (number of inhabitants according to the List from 2011).

Table 30. Research sample

Code of stratum	The number of settlements in the stratum	Number of residents	Number of addresses in the sample
0511	78	18206	63
0512	25	17418	60
0513	10	23328	81
0514	1	38839	134
0521	141	31335	108
0522	33	23569	81
0523	14	23256	80
2011	7	2276	8
2012	10	6493	22
2013	9	18026	62
2014	1	15147	52
2021	62	15517	54
2022	22	16025	55
2023	20	40320	139
TOTAL	433	289755	999

Source: State Statistics Bureau

With regard to the size, communities have been divided in groups as follows:

communities with less than 500 inhabitants (group mark '1'),

communities with 500 to 999 inhabitants (group mark '2'),

communities with 1,000 to 9,999 inhabitants (group mark '3'), and

communities with 10,000 inhabitants or more (group mark '4').

Within the framework for the sample choice, a variable for the mark stratum has been added. The first two places within this mark represent the county's code (e.g. '05' – Varaždin or '20' – Međimurje), the third place represents the mark for the type of the community (e.g. '1' – town or '2' – district), and the last, fourth place, represents an already defined mark for the size of the community. Proportional to the number of inhabitants in each stratum, the size of the sample per stratum has been determined. Total size of the sample is 999 addresses.

The sample of addresses in each stratum has been chosen systematically. Prior to selection, the addresses were sorted with regard to the registry number of the district and the registry number of the community. There can be multiple households on one chosen address.

12.5.2. Data Collection Procedure and Response Rate

Fieldwork for the research of e-inclusion of the north-east part of Croatia was conducted via face-to-face oral interviews during December 2014 and January 2015. The survey was financed with means of support of the University of Zagreb under guidance of Assistant Professor Renata Mekovec, PhD and associates Full Professor Goran Bubaš, PhD and a.o.univ.prof. Alexander Prosser, PhD.

The research was conducted on a representative sample of adults in Varaždin County and Međimurje County according to a defined address sample taken from the Census of Population, Households and Dwellings in the Croatia in 2011. The number of adults (18+) who participated in the survey and have properly filled out the questionnaire is 427. The procedure anticipated up to two visits per household, if the interviewers did not find anyone at home or the respondents were not able to participate at the given moment. The interviewing was conducted by eleven qualified interviewers. All of them were individually trained for the task and were informed about the topic of the research as well as the specific characteristics of the answers in certain parts of the questionnaire. These instructions were also given in printed form.

Each interviewer also got a form with addresses of the households which were chosen randomly for the purpose of the research (the method of choice is described in the previous chapter). The form contained a free column in which the interviewers noted the number of respondents in the household and the number of people who rejected to participate. Other comments were also recorded in this column, for example, if the object registered by the Census was no longer there or was adapted into a business object. The interview for each household lasted between 30 and 40 minutes and they were conducted every day of the week, according to the possibilities of each interviewer.

Before conducting the interview, the respondents were briefly acquainted with the basic reasons for conducting the research, its goals and topic, the interview procedure and voluntary nature of participation in the survey. Data confidentiality and source anonymity were guaranteed, as well as the use of the data exclusively for scientific purposes. The examines were politely asked to be as sincere and as objective as possible when answering the interview questions in order to enable the most credible research results. The interviewers' work after the conducted research was checked via telephone chose structure of the realised sample according to the predefined stratums is shown in Table 31.

Table 31. The structure of the realized sample under defined stratums

Code of stratum	**0511**	**0512**	**0513**	**0514**	**0521**	**0522**	**0523**	**2011**	**2012**	**2013**	**2014**	**2021**	**2022**	**2023**	**SUM**
Realised sample	**6**	**10**	**35**	**34**	**14**	**17**	**24**	**4**	**8**	**60**	**40**	**14**	**17**	**144**	**427**

Source: made by the author

The table demonstrates an imbalance in respondents' responses regarding the defined stratums, especially the strata connected to Varaždin County, whilst the response in Međimurje County was somewhat better. According to the allegations of the interviewers in Varaždin County, participation in the survey was declined for a number of reasons which can be related to the characteristics of the respondents and the survey itself (the subject and the duration). To the most of the respondents the subject of the survey was interesting and acceptable but the time length of the survey was the crucial factor for denial (about 30 to 40 minutes). Characteristics of the respondents who declined to participate in the survey, as accounted for by the interviewers, were unfriendliness, intolerance,

hostile behaviour towards the interviewers. However, as mentioned, in most cases the reason was the lack of time. Among the reasons for declining participation in the survey, characteristics of the interviewers should also be included counted their proficiency, helpfulness, performance, appearance, ability to motivate respondents to participate in the study as well as gaining the trust of respondents.

According to survey forms it was established that, from the total number of addresses, 51.10% of the targeted respondents agreed to participate in the survey, whilst 48.90% declined for the reasons previously mentioned. This rate of response is in accordance with the expectations regarding the subject and the time length of the survey, as well as because of the limited time in which the research had to be conducted due to external factors.

12.5.3. Analysis of data

After result analysis and description of the basic demographic, economic, social and cultural characteristics of the respondents and analysis of infrastructural indicators related to ICT and internet technologies, in continuation of the study e-inclusion of the population of North-west Croatia will be presented. It will be described according to all indicators and particles included in the validated research instrument. With the help of Analysis of Variance (ANOVA) method and *post hoc* tests, all significant differences between the subgroups of respondents according to identified factors which affect e-inclusion. The validation process will also be presented and described in detail using Partial Least Squares Structural Equation Modeling (PLS-SEM). The same chapter also bring empirically tested relation between two identified latent components of e-inclusion: *empowerment* and *Impact of ICT on quality of life*. The study ends with a conclusion and a discussion, limitations to research and indications for further research.

12.5.3.1. Demographic, social, economic and cultural characteristics of the sample

In continuation of this study, basic demographic, social, economic and cultural characteristics of the respondents who participated in the main part of the research will be presented, along with the infrastructure component which includes questions connected to owning information and communication technology and Internet network as the necessary precondition for e-inclusion. As these characteristics were, through literature search, identified as the main influencing factors on e-inclusion, they will be described in more detail.

In total, 427 respondents participated voluntary in the research and have completely filled out the questionnaire. Out of the total number of respondents, according to *gender*, 242 (56.67%) were females and 185 (43.33%) males. Age of the respondents is shown in Graph 16 the graph shows a balanced sample regarding age of the respondents. The smallest portion of participants in the survey are participants older than 75 years (8.5%), and the biggest portion consists of participants between 45 and 54 years (17.81%). While according to *Place of residence* 116 respondents (27.17% of the total number) said they lived in urban city area, 83 (19.44%) in suburban city area and the remaining 228 (53.39%) live in rural area which makes obvious the fact that urban and rural area, according to population number, are equally represented in the sample.

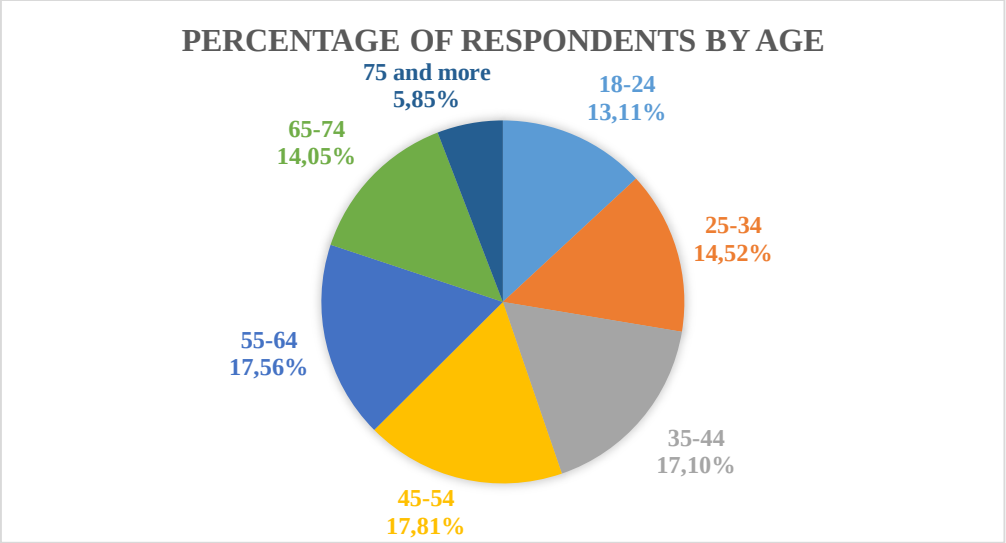


Chart 16. Percentage of respondents by age
Source: made by the author

According to *household structure* shown in Table 32, it is obvious that the most represented group is the one with *two adults with one or more dependent children* (36.77%), and the least represented are the ones who declared themselves as *single parent with one or more dependent children* (2.81%).

Table 32. Household structure

Household structure	Number of respondents	Percentage of respondents
One-person household	28	6,56
Adults without dependent children	98	22,95%
Single parent with one or more dependent children	12	2,81%
Two adults with one or more dependent children	157	36,77%
One to two adults who live with their father and / or mother	31	7,26%
Other households with dependent children	77	18,03%
Other households without dependent children	24	5,62%
Total	427	100%

Source: made by the author

According to marital status, (Chart 17), the majority of participants declared to be married, in total 263 (61.59%) whilst the smallest portion consists of those who live with a partner but are not married (2.58%).

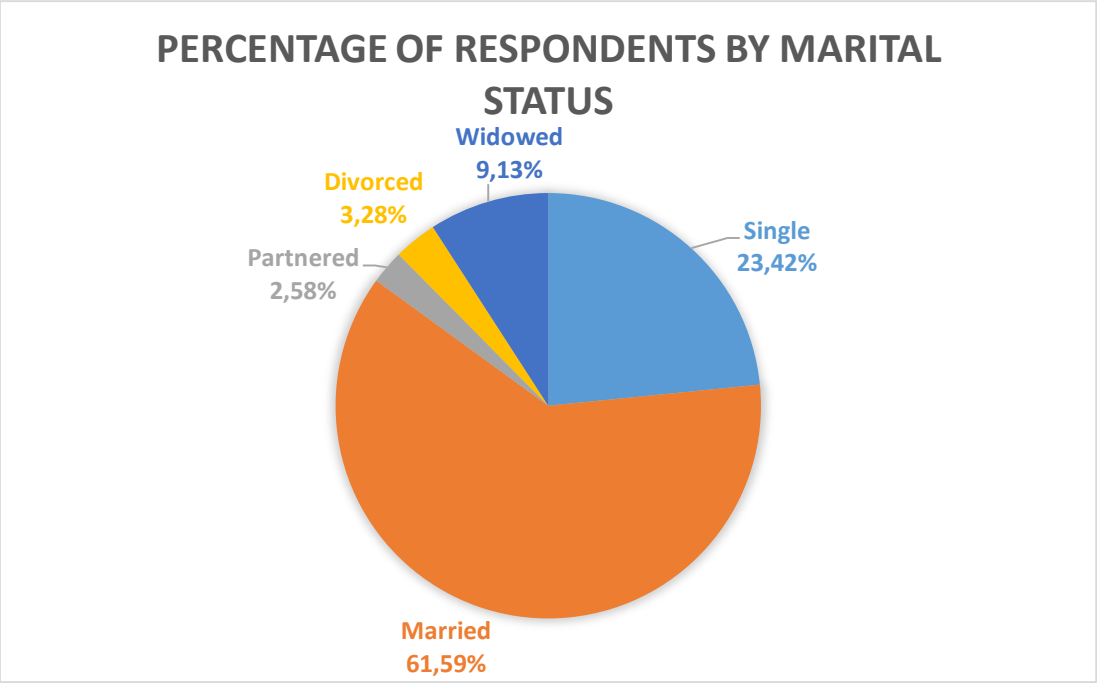


Chart 17. Marital status of respondents
Source: made by the author

Work status and education level are shown in Table 33. from which it can be seen that according to work status, the majority of the respondents are full-time employees (46.84%), and only a minority (0.94%) declared to be part-time employees (part-time job being the only source of income). The table also shows that a significant number of retired persons participated in the study (31.15%). According to education level, only one respondent declared to have *Specialization, Master's, Doctorate* (0.23%) whilst the majority of respondents has craft, the profession for a period of three years.

Table 33. Employment status and respondents level of education

Employment status	Number of respondents	Percentage of respondents
Employed – full time	200	46,84%
Employed - part time	15	3,51%
Part-time work as an only source of income	4	0,94%
Independent economic activity (craftsman, free professions)	5	1,17%
Unemployed	44	10,30%
Student	26	6,09%
Retired	133	31,15%
Total	427	100,00%
Level of education	Number of respondents	Percentage of respondents
No education	0	0,0%
Incomplete primary school	19	4,45%
Primary school	37	8,67%
Craft, the profession for a period of three years	91	21,31%
High school for a period of four years	168	39,34%
College	61	14,29%
Faculty	50	11,71%
Specialization, Master's, Doctorate	1	0,23%
Total	427	100,00%

Source: made by the author

From Table 34. it can be seen that, according to self-estimate of the respondents, the majority evaluated financial status of their family as *neither better nor worse than the majority* (72.83%), while only 1.17% evaluated their status as *much better than the majority* and the same percentage of people evaluated it as *much worse than the majority*. The table also shows that, according to

their own estimate, the majority of the respondents has the same level of income in the past three years (54.56%), whilst only a minority declared their income has increased (10.54%).

Table 34. The level of income of the household in the last three years and family assets situation of respondents

The level of income of the household in the last three years	Number of respondents	Percentage of respondents	Family assets situation	Number of respondents	Percentage of respondents
Increased	45	10,54%	Much worse than the majority	5	1,17%
Decreased	83	19,44%	Somewhat worse than the majority	52	12,18%
Stayed the same	233	54,56%	Neither better nor worse than the majority	311	72,83%
Do not know	48	11,24%	Somewhat better than the majority	54	12,65%
Decline to answer	18	4,22%	Much better than the majority	5	1,17%
Total	427	100%	Total	427	100%

Source: made by the author

Membership in organizations, either religious, political or non-profit, has proved to be a significant factor affection e-inclusion thus the questionnaire contained questions examining this component as well. Table 35. shows statements of the respondents regarding cultural factors. The results show that over 50% of the respondents are not active members of a religious organization, whilst 8.67% did not want to make a statement. The table also shows that almost 90% of the respondents are not active members of a political party and that 86.42% of the respondent who were involved in the survey is not included in a non-profit organization.

Table 35. Membership of religious, political or non-profit organization of respondents

Membership of religious, political or non-profit organization of respondents		Number of respondents	Percentage of respondents
I am an active member of a religious organization.	Yes	153	35,83%
	No	237	55,50%
	I refuse to answer	37	8,67%
I am an active member of a political party.	Yes	30	7,03%
	No	381	89,22%
	I refuse to answer	16	3,75%
I am an active member of one / several non-profit organizations.	Yes	43	10,07%
	No	369	86,42%
	I refuse to answer	15	3,51%
	Excellent	7	1,64%
Total		427	100%

Source: made by the author

According to research in mentioned in Chapter related to cultural factors, regarding e-inclusion, it was concluded that knowledge of a foreign language, especially English, significantly influences e-inclusion because the majority of digital content which is approached by an average Internet user nowadays is in English. The results are given in Table 36. and show that only 15.93% of respondents declared to have very good or excellent knowledge of English in speaking as well as in writing, whilst the majority of the respondents, 142 of them (33.25%), declared they *do not use* English neither in speech nor in writing. Regarding other foreign languages (German, French, Russian...), 7.03% of the respondents has excellent knowledge whilst 123 respondents (28.80%) declared they do not have any knowledge of other foreign languages.

Form Chart 18. it can be seen that most respondents declared, according to their own judgemenent, to not have any form of physical impairment while 32 (7.50%) respondents declared being physically impaired. 3.28% of all respondents stated they have partial disability while 1.41 of respondents refused to answer this question.

Table 36. Evaluation of knowledge of respondents of English or other foreign languages in speech and writing

Knowledge of English in speech and writing	Number of respondents	Percentage of respondents	Knowledge of another language in speech and writing (German, French, Russian ...)	Number of respondents	Percentage of respondents
I do not know	142	33,25%	I do not know	123	28,80
Very insufficient	53	12,41%	Very insufficient	68	15,93
Insufficient	65	15,22%	Insufficient	103	24,12
Good	99	23,19%	Good	103	24,12
Very good	52	12,18%	Very good	23	5,39
Excellent	16	3,75%	Excellent	7	1,64
Total	427	100%	**Total**	427	100%

Source: made by the author

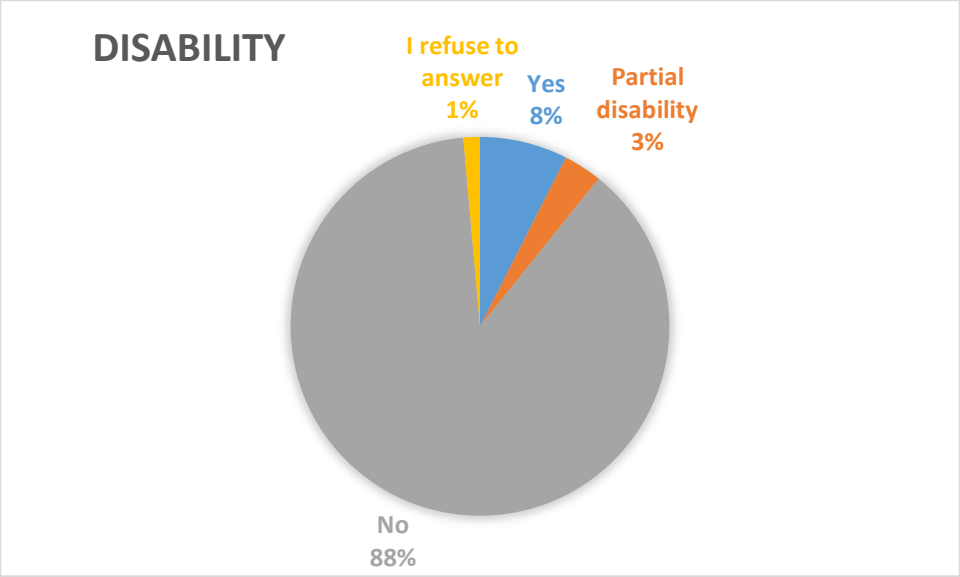


Chart 18. Respondents assessment of their own disability
Source: made by the author

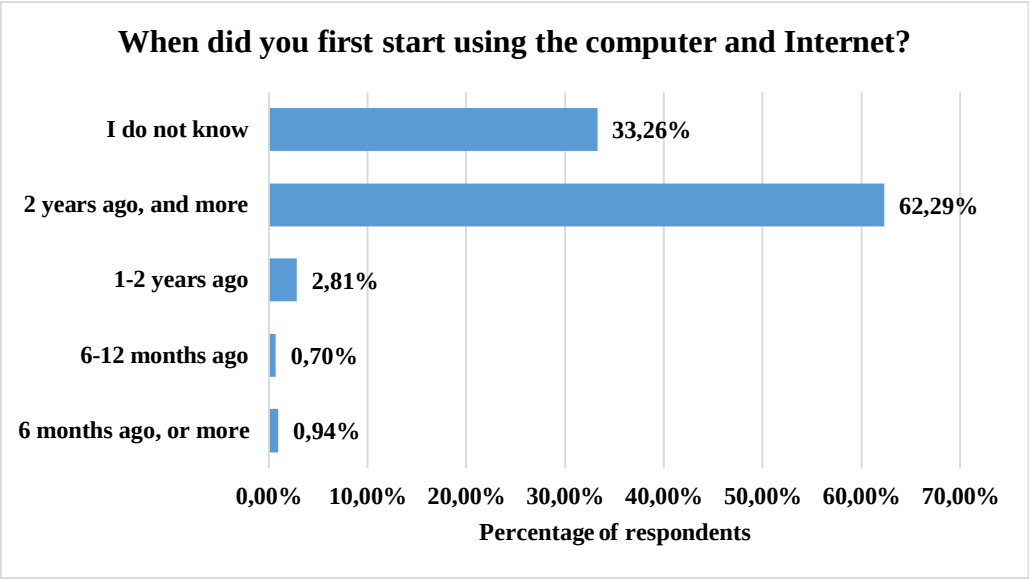


Chart 19. The length of computer and Internet use
Source: made by the author

According to place and support in gaining most of their knowledge related to ICT and Internet technology, most respondents stated that it has acquired independently at home 40.28%, with the help of colleagues 19.44%, on courses paid by the employer 2.11%, on self-paying courses 0.47%, while in the Internet café and cybercafé most ICT and Internet skills gained 0.23%. The results show low involvement of government and public institutions such as public libraries in fostering e-inclusion. This was expected bearing in mind that until the present day Croatia has no developed strategy for e-inclusion. Thus only respondents a small portion of the interviewed population stated that they acquired majority of their ICT and Internet skills via government sponsored courses (0.47%), in educational institutions such as schools (8.43%) or faculties (3.28%), while in contrast to other neighboring countries (Hungary, Austria, Slovenia... see Appendix 3), obviously public library in the northwestern part of Croatian were not engaged in the offer programs for citizens in the adoption of ICT and Internet skills because no one stated that he was in that institution gained that kind of skills. The surprising information is that more than 25% of respondents 108 of the total (N = 427) stated that they do not have the necessary skills to use ICT and the Internet.

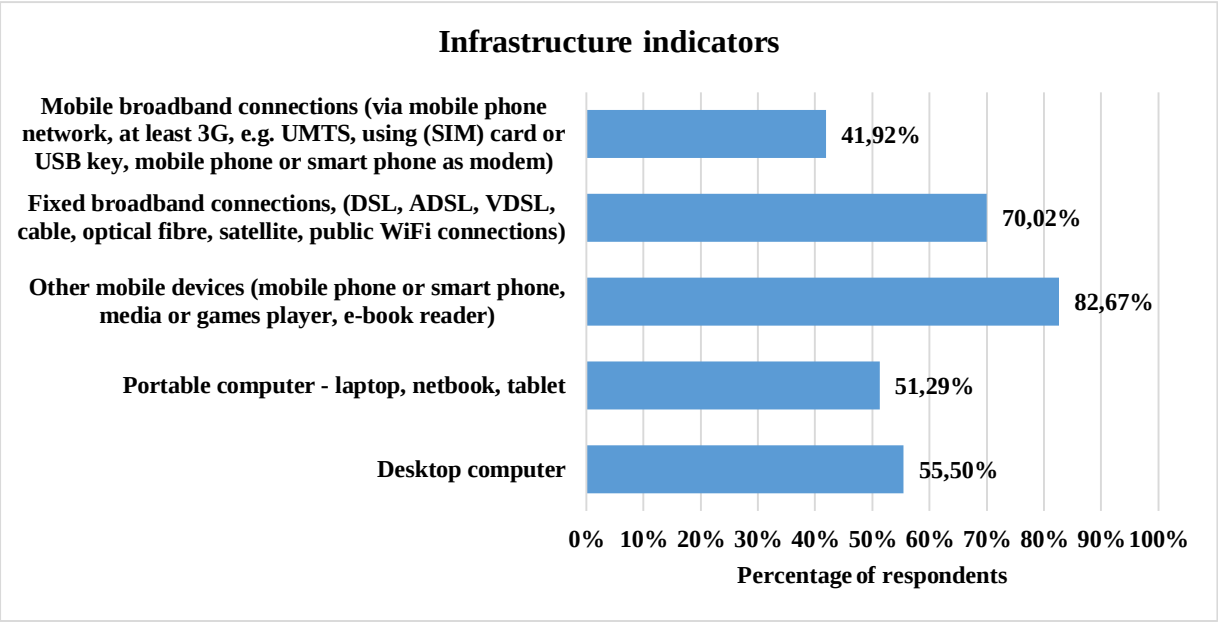


Chart 20. Infrastructure indicators
Source: made by the author

Infrastructural indicators regarding possession of ICT are shown in Chart 20 which demonstrates that more than 50% of all respondents stated they own a desktop, 51.29% possess a laptop, and the majority, 353 of the total number of respondents (N=427) owns a mobile device of some sort. Fixed Internet network is used at home by 70.02% of respondents, and mobile network 179 (41.92%).

12.5.3.2. Descriptive statistical analysis and results of analysis of variance (ANOVA)

The results of the conducted fieldwork will also be descriptively presented in accordance with all the categories and attributes identified in the e-inclusion model. Among other things, a detailed empirical overview of the established significant difference in components of e-inclusion between subgroups of participants defined by demographic, social, economic and cultural variables will be presented.

12.5.3.2.1. Descriptive statistical analysis and results of analysis of variance (ANOVA) for category access

A latent category of *access* in the model of e-inclusion comprises attributes of *material access, network, satisfaction with network and point of access*. According to the results of the survey conducted in North-west Croatia (Međimurje County and Varaždin County) presented in Table 48. in Appendix 1., only 29.35% ($\overline{X}$ =2.41 σ =1.51) of the respondents accesses the Internet and digital contents often and very often via desktop, 33.96% ($\overline{X}$ =2.49, σ =1.65) respondents access them via portable computers (laptops, netbooks, tablets) while 34.89% ($\overline{X}$ =2.47 σ =1.63) access it via different mobile devices. Regarding Internet access via a fixed network, it is accessed *frequently* and v*ery frequently* by 46.13% ($\overline{X}$ =2.92 σ =1.60) of respondents, while via a mobile network the percentage is noticeably lower, i.e. 30.45% ($\overline{X}$ =2.28, σ =1.57) of all respondents. Inquiry into user perception of the satisfaction with Internet network, according to the results shown in Table 48 of Appendix 1, less than 50% of the respondents is satisfied with the quality (41.45%, $\overline{X}$ =3.25, σ =0.95) and availability (44.96%, $\overline{X}$ =3.34, σ =0.96) of Internet connection. Related to the location to which ICT and the Internet are accessed most *frequently*, as expected, 52.23% ($\overline{X}$ =3.13, σ =1.60) of respondents stated they access it *very frequently* form home, 25.06% ($\overline{X}$ =2.11, σ =1.49) from workplace and only 7.51% ($\overline{X}$ =1.40, σ =0.99) from a public institution where the access is free of charge. This empirically confirmed the before mentioned lack of involvement of the public institutions and state/government support in e-inclusion and the absence of positive results of inclusion of each interested individual in information society in terms of inciting the citizens and including those citizens which are in a less favorable position or disempowered or for any other reason cannot afford either the material component of ICT or Internet access. All of this is the result of non-existence of e-inclusion strategy ate the highest state

levels which belongs to the jurisdiction of the Ministry of Public Administration, a part of which Administration for e-Croatia operates. This is also visible from the defined scope of work available on the pages of the Central State Administrative Office in which there is no mention of any engagement aimed towards projects of active involvement of all citizens, and especially those disempowered, in information society.

In latent category of *access*, significant differences according to demographic factors were noticed in relation to *age*, *household structure* and *marital status* (Appendix 2). A surprising revelation is that regarding *gender* (Appendix 2, Table 49), in the access category, empirically no significant difference was confirmed, which is not the case in numerous previous studies (van Dijk, 2006; Helsper, 2007, 2008; Hargittai, 2010). Hence according to age groups (Appendix 2, Table 50), significant differences are noticed between age groups 18-44 and 45-75 and higher. Thus, for example, in age group 18-24, more than 28% of respondents stated thy *frequently* or very *frequently* access the Internet and digital content via mobile devices (mobile phone, smart phone, e-book reader), unlike 9.40% of those aged 55-64. In age group 65-74 not even one respondent stated they *frequently* or *very frequently* access the Internet and online digital content via mobile devices. Regarding household structure (Appendix 2, Table 54), the results are similar to those of previously conducted empirical studies described in Chapter 11.4.1. A significant difference is noticed between one-person households and households in which all members are adults and households with financially supported children. Thus Internet access via a fixed network in households with all adult members is used *frequently* and *very frequently* in 21.5% of cases, while in households with children the rate is 69.4%. Marital status is another differentiating factor between those who declared themselves as being married and single, and those who stated they were widowed and other categories (*single, married, partnered, divorced*; see Appendix 2, Table 58).

As for economic factors for *access* category, significant differences according to *employment*, *the level of income* and *family assets situation* have been empirically confirmed. According to variable family assets situation, significant differences are visible in all defined categories (see Appendix 2, Table 66). More than 52% of respondents who described their situation as *nether better nor worse than the majority* approach ICT and the Internet from home *frequently* and *very frequently* in contrast to 30.80% of those who described their situation as *somewhat worse than the majority*.

Regarding employment status of the respondents, there is a significant difference between those who declared being students and retired and all other categories (full-time employed, part-time employed and unemployed, see Appendix 2, Table 62). According to the respondents estimates regarding decrease and increase of their income level in the last three years, significant differences are also noticed among all categories of respondents (see Appendix 2, Table 70). 42.10% of those who declared their income *stayed the same* approach ICT and the Internet form home *frequently* and *very frequently*, 59.00% of those whose income *decreased* and 80.00% of those whose income *increased* do the same.

According to cultural indicators, there is a significant difference in *access* category which is empirically confirmed according to *membership in religious organisations* (see Appendix 2, Table 76) and *knowledge of English in speech and writing* (see Appendix 2, Table 79). Those who declared poor knowledge of English (I do not know, very insufficient and Insufficient) differ significantly from those who assessed their knowledge of English as *good*, *very good* and *excellent*. Thus, for example, 84.60% of those who have *very good* knowledge of English access ICT and the Internet from home *frequently* and *very frequently* and 87.60% of those who have excellent knowledge in contrast to 17.60% of those who declared not knowing English nor in speech nor in writing.

Regarding cultural factor *membership in the political party* and *membership in the one/several non-profit organizations* (Appendix 2, Table 77), no significant differences have been confirmed.
Education level, *disability* and *place of residence* have been identified as significant among social factors for approach category. Among these, *education level* and *disability* have been empirically confirmed (see Appendix 2, Table 83, Table 87). Variable *place of residence* (urban, suburban, rural) for approach category was not significant (see Appendix 2, Table 74) which proves that urban and rural areas in Croatia have the necessary infrastructure of almost the same quality and hence regardless of location respondents can realise Internet access via available networks with the exception of hardly approachable remote areas outside this survey and thus conclusions about those parts are not drawn in this study.

In level of education significant differences are confirmed among all categories, except between categories *college* and *faculty* of highly educated respondents (see Appendix 2, Table 83). For example, 10.80% of those with primary school education level approach ICT and the Internet from home *frequently* and *very frequently*, 37.40% of those with a three-year secondary vocational education, 57.20% of those with high school and 77.10% of those with a college education and 80.00% of those with faculty education.

For variable disability (see Appendix 2, Table 87), significant differences have been empirically proven between persons who have declared as impaired and those who are not. 56.6% of respondents with no physical disability access ICT and the Internet from home as opposed to only 12.6% of those with a form of physical disability.

12.5.3.2.2. Descriptive statistical analysis and results of analysis of variance (ANOVA) for category use

For latent category *use*, the following attributes have been identified as significant theoretically and empirically: *intensity of use, skills, motivation/attitudes, social support/coercion* and *digital engagement*. The frequency of use of ICT and the Internet measured in hours per week and accessed from home of respondents from Varaždin County and Međimurje County is shown in Chart 21.

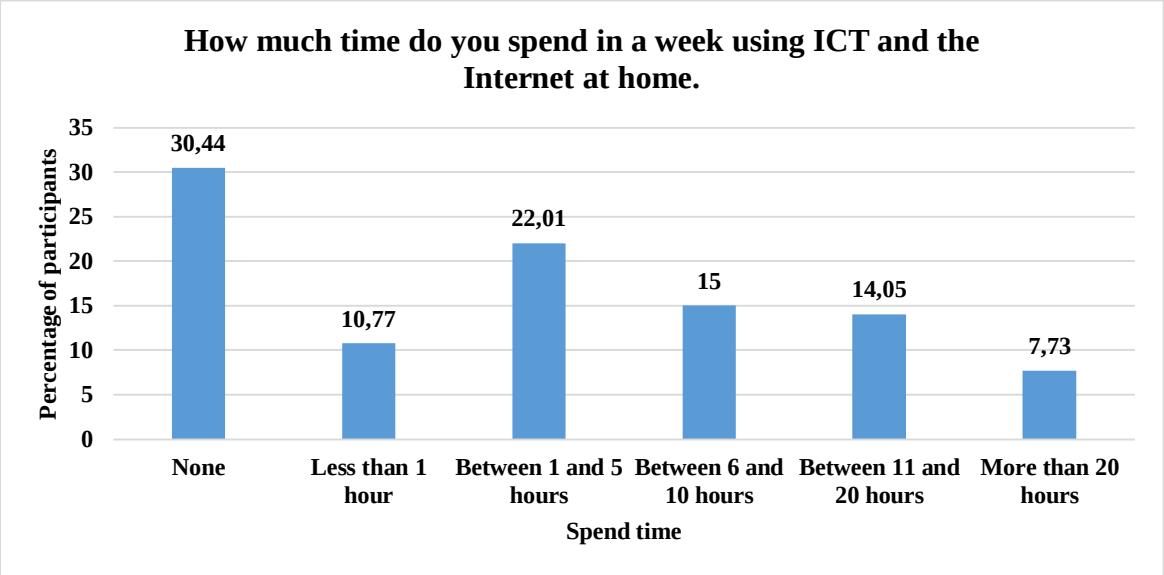


Chart 21. Frequency of use ICT and Internet at home
Source: made by the author

It can be seen from the graph that more than 40% of the total number of respondents (N=427) does not use ICT and the Internet or uses them less than an hour a week while 22.01% use it between one and five hours. Only 7.73% use ICT and the Internet more than 20 hours a week. 36.00% of all examines who are full-time employed does not use ICT and the Internet at workplace while 15.10% declared they use it more than 20 hours a week. From the results in Appendix 2 it can also be seen that public places with a free ICT and Internet access do not play a significant role as more than 65% of the respondents stated that they *do not use* it for access during the week.

Self-assessment of skills by the respondents for using ICT and the Internet is presented in Table 48. in Appendix 1. It shows that the majority of respondents, 53.40% of them ($\overline{X}$ =3.20, σ =1.58) rated the claim "How would you evaluate your knowledge of using the Internet search engines (Google, Yahoo ...)?" as *very good* and *excellen*t. The results also show that the majority of respondents has poor knowledge of editing and text processing tools, data analysis tools and slide show presentation programmes. 43.81% of all respondents ($\overline{X}$ =2.80, σ =1.48) evaluated their skills in using editing and text processing tools (e.g. Word) as *very poor* and *poor*, 56.20% them ($\overline{X}$ =2.48, σ =1.42) evaluated the same their skills in using spread sheets (Excel, Lotus...), and 58.31% ($\overline{X}$ =2.40, σ =1.44) in using presentation programmes. Similar self-assessments, in which more than 50% of respondents stated that their knowledge is very poor or poor were also made for the following activities: downloading and installing programmes (56.67%, $\overline{X}$ =2.40, σ =1.45), communicating via specialised tools (e.g. Skype) (54.56%, $\overline{X}$ =2.46, σ =1.50), using discussion boards for exchanging information (58.08%, $\overline{X}$ =2.34, σ =1.42) and using chat rooms for communication (58.08%, $\overline{X}$ =2.39, σ =1.51).

Analysing the results of respondents' perception in relation to items for expressing attitudes about usefulness, ease of use and importance of ICT and the Internet in making decisions, which are integral components of attribute *Motivation/Attitudes*, a positive perception can be noticed. 75.65% ($\overline{X}$ =4.04, σ =0.92) of the total number of respondents *agrees* and *strongly agrees* with the claim "I consider the use of ICT and the Internet to be useful." while more than 50% ($\overline{X}$ =3.48, σ =1.15) of them *agrees* and *strongly agrees* with the claims "The use of ICT and the Internet is simple for me." and "By using ICT and Internet I acquire important information that help me make

better decisions.“ Social support from family members, friends and co-workers has proved to be one of the motivating relevant factors related to all components of e-inclusion regarding approach and use of ICT and the Internet, as well as in using ICT with the aim of improving the quality of life and their part in strengthening individuals/groups/communities which is described in more detail in Chapter 11.6.2.4. According to the results shown in Table 48. of Appendix 1., the respondents have stated that the support of family members and relatives is most important to them (56.44%, $\overline{X}$ =3.50, σ =1.20), friends (54.10%, ($\overline{X}$ =3.47, σ =1.21), while the support of co-workers is considerably less important (37.94%, $\overline{X}$ =2.75, σ =1.41). 31.39% of all respondents ($\overline{X}$ =2.75, σ =1.41) *agreed* with the claim they have to use ICT and the Internet because of work, education or legal compulsion.

Attribute *digital engagement* is a very important indicator which purports activities which users can carry out, i.e. it purports the purposes for which ICT and the Internet are used and answers the question if the use of new technologies has become their daily routine and life need. The wider the specter of activities for which the user uses ICT and the Internet, the more positive effect on e-inclusion and the bigger the possibility that the user will faster and more easily accept and use upcoming innovations related to the development of new ICT and Internet technologies. Research results related to this attribute show a mediocre level of digital engagement of respondents included in this research, bearing in mind the total number (N=427) less than 50% stated that the use of ICT and the Internet is their daily routine, while 32.79% stated that it “has not at all become daily routine“. ICT and the Internet is mostly used for information search which was stated by 49.65% ($\overline{X}$ =3.01, σ =1.53) as being done *frequently* or *very frequently*, while a little less than 36% stated they use it for pursuing their leisure activities and hobbies ($\overline{X}$ =2.66, σ =1.51) as well as entertainment ($\overline{X}$ =2.68, σ =1.56). As many as 76.12% ($\overline{X}$ =2.18, σ =1.45) of all respondents stated they *not at all* to *rarely* or *rarely* use ICT and the Internet for educational purposes.

In *use* category, related to *demographic factors* which are identified as significant for e-inclusion, considerable differences were confirmed according to *gender, marital status, age group and household structure* (see Appendix 2). Thus, for example, according to *household structure* (see Appendix 2 Table 55), the results show that the frequency of use of ICT and the Internet from home is higher in households with financially supported children. In households with adult children,

80.60% of the respondents use ICT and the Internet a*t least an hour per week and up to over twenty hours per week* and 79.00% of those with two or more dependent children do the same in contrast to 36.70% of respondents without dependent children and 21.40% of those who live in a one-person household. Regarding *digital engagement*, ICT and the Internet is used for information search *frequently or very frequently* by 68.20% of all respondents which claimed to live in a household with supported children, as opposed to all-adults households in which the Internet is used by half as many respondents (30.60%). According to *marital status* (see Appendix 2 Table 59), the frequency of ICT and Internet use at home in the range from at least one to over twenty hours per week differs significantly, which is visible from the results: 70.00% of those who declared themselves as *single*, 51.40% of those who are *married* and 5.10% of those who are *widowed* use the Internet at least one to over twenty hours a week. According to age, significant differences in *use* have been established among nearly all age groups except between age groups 18-24 and 25-34. In the age group 18-34, on average 49.80% stated they use ICT and the Internet at least and hour a week to over 20 hours a week, in age group 35-54 65%, in age group 55-64 29.4% while in age group 65-74 only 15% of respondents. Compared to digital engagement, daily routine *frequent* and *very frequent* use of ICT and the Internet has: 39.20% of respondents in age group 18-34, 40.35% in age group 35-54, 16% in age group 55-64 while in age group 65-74 only 3.30% of all respondents. Positive perception of usefulness of ICT and the Internet is more present in age group 18-54 in which 77.90% of respondents *agrees* or *agrees completely* with the statement "I consider the use of ICT and the Internet to be useful" in contrast to age group 55-74 in which 58.65% of respondents *agrees* or *completely agrees* with the statement. Regarding computer using skills, such as "knowledge of using software for writing and text editing" in range from *moderately good* to *excellent*, self-assessment in age group 18-54 was over 50.00%, in age group 55-64 33.30% of respondents, and in age group 65-74 20.00% while age group 75 and over only 4.00%. While, for example, self-assessment from *moderately good* to *excellent* in "knowledge of using specialized programs for communication via Internet" in age group 18-44 was over 40.00% of respondents, age group 45-54 27.60% of respondents, age group 55-64 16.00%, age group 65-74 11.70% while age group 75 and over, again, only 4.00% of respondents.

Related to *economic indicators* in *use* category, differences according to variables *employment*, *the level of income* and *family assets situation* (see Appendix 2) have been empirically confirmed.

Significant differences in relation to *employment variable* (see Appendix 2, Table 63) between respondents which stated they are employed and those who stated they are studying, and also between those who are employed and those retired, while significant differences in category *use* between the employed and unemployed have not been confirmed. While according to variables *the level of income and family assets situation* significant variables have been empirically confirmed between each category (see Appendix 2 Table 71 and Table 67). According to level of household income, the frequency of ICT and Internet use at home ranging from one to over 20 hours per week differs significantly among respondents who declared they have the same or decreased income level for the past three years (more than 50%) and those whose income increased. 50.00% of those in the first category use ICT and the Internet at least an hour to over twenty hours a week, while the same goes for 84.40% of those in the latter category. Regarding *digital engagement* and the claim that „ICT and Internet use has become a daily routine", 41.55% of respondents who declared their income level has stayed the same or has decreased in the last three years have agreed, in contrast to 73.40% of those whose income level has increased.

In category *use*, related to *cultural factors* which affect e-inclusion, only variable *knowledge of English in speech and writing* (see Appendix 2, Table 80) has proved to be significant, whilst variables membership in political, religious or non-profit organisations have not proved to be significant (see Appendix 2, Table 76 and Table 77). Thus 88.50% of respondents who stated that their knowledge of English in speech and writing is *very good* have frequency of ICT and Internet use at home in duration of at least one hour to over 20 hours a week and 100.00% of those with *excellen*t knowledge of English. In contrast, 19.70% of those who have no knowledge of English in speech or nor in writing use ICT and the Internet with the same frequency.

For social variable *place of residence* (see Appendix 2, Table 74) in category *use*, as with previous category *access*, no significant differences have been confirmed between urban and rural areas. However, a difference has been proven with variables connected with *education level* (see Appendix 2, Table 74) between all levels except between respondents with have high education levels (college and faculty) and those who have not finished primary school and those with only a primary school education. In variable *physical disability*, a significant difference has been proven between those who stated they have no disability and those who are physically disabled (see

Appendix 2, Table 88). The frequency of ICT and Internet use *from at least an hour to more than 20 hours a week* according to education level is shown in Chart 22.

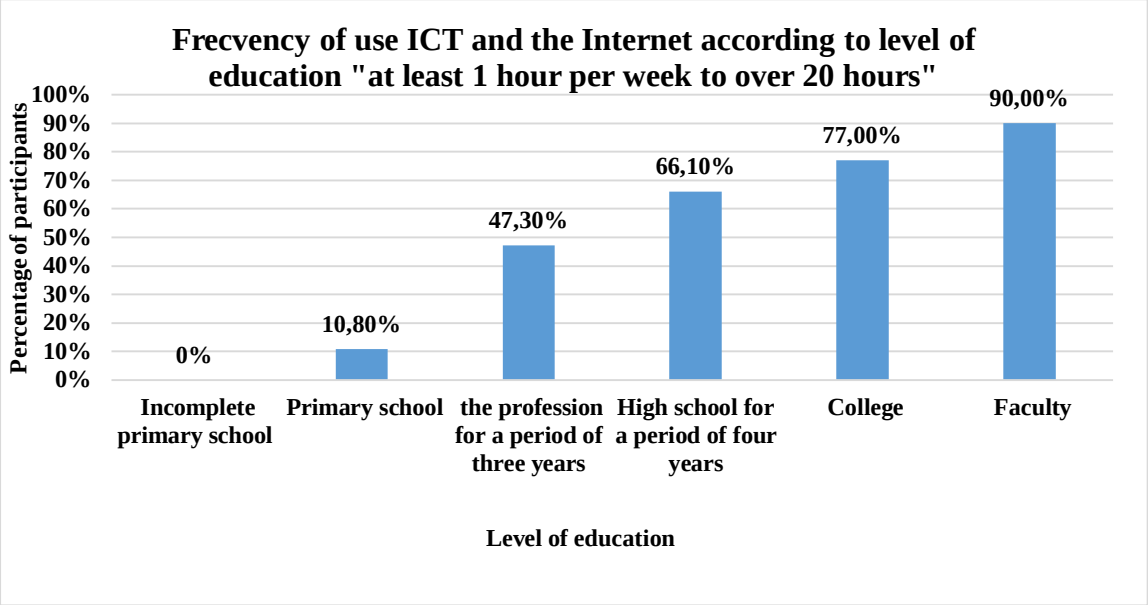


Chart 22. Frequency of use ICT and the Internet according to level of education
Source: made by the author

Previous chart clearly shows how education level influences acceptability and use of new technologies. These results were expected considering numerous previously conducted research which reached the same conclusion.

Regarding digital engagement and variable "use of ICT and the Internet has become a daily routine", 12.50% of physically disabled respondents agreed with the statement while 48.50% of those without physical disability opted the same.

12.5.3.2.3. Descriptive statistical analysis and results of analysis of variance (ANOVA) for category impact of ICT and the Internet on quality of life

For latent category *impact of ICT and the Internet on quality of life*, in total six attributes connected with the use of e-services have been identified: e-*learning, e-work, digital economy (e-commerce, e-banking, e-communication and e-entertainment), e-health, e-government* and *e-culture*.

The results connected to attribute *e-learning* (see Appendix 1, Table 48) show that respondents who participated in the survey use ICT and the Internet fairly little for educational purposes. Thus only 11.24% of the respondents opted for the claim they use ICT and the Internet *frequently* or *very frequently* to search for information on education courses and only 7.03% attends online courses using ICT and the Internet. More than 60% of all respondents declared they do *not at all* use ICT and the Internet for information search ($\overline{X}$ =1.75, σ =1.15) or attending education courses ($\overline{X}$ =1.58, σ =0.98). 15.68% stated they *frequently* or *very frequently* use ICT and the Internet to access and download educational material while 72.84% admitted to *not ever* doing it or doing it *very rarely* ($\overline{X}$ =1.87, σ =1.26). A surprising result is that students cannot be segregated from this category. The results show that as much as 69.20% of them *do not use* or *rarely* use ICT and the Internet to attend education courses. 30.70% of students who participated in the research *frequently* or *very frequently* use ICT and the Internet to find information on education courses while the same frequency rate is confirmed in access and download "materials for education/training" by 50.00% of them.

A very low frequency use is also noticed in use of ICT and the Internet from employment purposes. In the previous three months, only 13.82% of respondents *frequently* or *very frequently* used ICT and the Internet to search for information on employment while 68.38% ($\overline{X}$ =1.73, σ =1.00) did not use it at all for this purpose. Only 7.26% of respondents *frequently* or *very frequently* used ICT and the Internet for sending job applications in the same period while 86.42% *did not use* it at all or used it *rarely* ($\overline{X}$ =1.46, σ =1.26). While 9.60% of respondents *frequently* or *very frequently* used employment websites for finding a job, 85.95% of the total number of respondents has *never used* it. The results also show that those who stated that they are unemployed see the role of ICT and the Internet in job search as not very important. From the total number of those unemployed (N=44), 40.09% stated that they *frequently* or *very frequently* used ICT and the Internet for job search last three months, 22.70% sent online job applications and 29.60% used employment websites.

For attribute *digital economy* of which e-*commerce, e-banking, e-communication* and *e-entertainment* are integral parts, the respondents expressed the highest frequency rate for information search on desired products and services 36.77% ($\overline{X}$ =2.66, σ =1.44) from the total number stated they use ICT and the Internet *frequently* or *very frequently* for this purpose, and

43.33% ($\overline{X}$ =2.79, σ =1.61) use it for reading "online newspapers, magazines…" The results demonstrate that the respondents do not prefer online shopping using ICT and the Internet as 78.46% ($\overline{X}$ =2.23, σ =1.34) of respondents does *not do it at all* or does it *very rarely*. These results are in concordance with EUROSAT data for year 2014 which are shown in Chapter 8. of this study.

Regarding e-banking, a slight deviation from the EUROSTAT data base has been detected. According to EURO, in 2014, 19% of respondents stated they use Internet banking while in this study 4.45% declared they use it *very rarely*, 5.85% *rarely*, 16.63% *frequently* and 14.32% *very frequently* while 58.78% of the total number of respondents does *not use it at all* ($\overline{X}$ =2.23, σ =1.57). For entertainment purposes, such as "listening or downloading music" *frequently* or *very frequently* ICT i the Internet use 34.66% of respondents ($\overline{X}$ =2.54, σ =1.57), for "watch / download movies" 28.57% ($\overline{X}$ =2.35, σ =1.55) respondents, "listen radio station" 13.58% ($\overline{X}$ =1.91, σ =1.22), while for "watch TV shows" total of 14.99% ($\overline{X}$ =1.92, σ =1.28). As many as 54.10% (of respondents stated they *do not use* or use ICT and the Internet *very rarely* for e-mail for communication while 60.66% (use social networks (e.g. Facebook, Twitter...). A little over 30.00% of respondents stated they use ICT and the Internet *frequently* or *very frequently* to communicate via e-mail or social networks. Of all the listed activities, the one for which ICT and the Internet are the least used is shopping or booking tickets online for shows and concerts. Only 7.50% of respondents stated they use that *frequently* or *very frequently*.

In Croatia, e-health system exists (Has been existing) for a number of years but the frequency of use of ICT and the Internet for this purpose, according to the results, is quite low. Thus, for example, only 5.39% of respondents *frequently* or *very frequently* used ICT and the Internet for making appointments for a specialist check-up or a surgery while 78.92% has *never used* it for this at all ($\overline{X}$ =1.64, σ =0.92). Of all the respondents, only 12.88% of them *frequently* or *very frequently* used ICT and the Internet for consulting a doctor or asking for a second opinion for themselves or somebody else while 76.11% has *never used* these services or has *rarely* used them ($\overline{X}$ =1.75, σ =1.17).

Regarding information search via ICT and the Internet to improve their health, 17.57% of respondents has used it *frequently* or *very frequently* while 56.44% has *never used* it for this purpose. Also, a very small number of respondents use ICT and the Internet for information search

on medication or medication purchase – only 12.18% of respondents stated they do it *frequently* or *very frequently*.

Usefulness of *e-health* was perceived as neither positive nor negative by more than 50.00% of the respondents which can be explained by the aforementioned low frequency of usage of the service. However, 36.30% of all respondents *agree* or *strongly agree* that e-health increases the quality of health services ($\overline{X}$ =3.27, σ =0.96), 38.18% of respondents believe that e-health saves time in relation to traditional ways of receiving the service ($\overline{X}$ =3.31, σ =1.01), and 38.40% stated they *agree* or *strongly agree* it is more cost efficient ($\overline{X}$ =3.33, σ =0.98).

Examining the attitudes related to attribute *e-government* about the need for creating new e-services, the results show that the majority of respondents has positive attitudes. Thus 62.06% ($\overline{X}$ =3.73, σ =1.06) of respondents *agree* or *strongly agree* with the claim "I believe that the filling-in and delivery of tax returns should be enabled by using ICT and the Internet.", while 64.42% ($\overline{X}$ =3.78, σ =1.12) thinks "that requirements for issuance of passports, driving licenses, identity cards and other documents should be filled-in and submitted by using ICT and the Internet". Similar number of respondents (65. 81%, $\overline{X}$ =3.81, σ =1.10) *agree* or *strongly agree* that application in a change of residence should be made possible via the use of ICT and the Internet. Also, 64.63% of respondents ($\overline{X}$ =3.80, σ =1.10) have a positive attitude about the claim "I believe that requirements for a birth certificate, the citizenship certificate, extract from the register of marriages should be filled-in and submitted by using ICT and the Internet.", as well as 66.98% ($\overline{X}$ =3.88, σ =1.06) who think ICT and the Internet should also be used "for filled-in and submitted requirements for a land registry, cadastre plan and building permits". The Croatian Government in collaboration with the Ministry of Public Administration has made efforts regarding this matter. In 2007 the first Croatian e-government portal was launched under the title "My Government" (Moja uprava). Shortly after, project e-citizen was launched of which the main purpose was to build "a central government website which consolidates all information and e-services created by the government in one place. A newly redesigned Croatian central government portal was introduced in June 2014. It encompasses three main groups of information. The first group of information is related to public administration (named "My government", or "Moja uprava"). The information in the second group is related to the e-citizen system (entitled "e-Citizens", or "e-Građani"). The e-citizen system, along with the central government portal (that is, its public part) also includes the access to personal user

accounts of citizens as well as the national identification and authentication system (NIAS). The main element of the e-citizen system is a personal user box that enables access to electronic services provided by the public administration and receiving personal messages from public administration institutions and bodies. Currently, citizens have access to 20 different e-services. Finally, the third group of information provided on the Croatian government portal refers to the Croatian government, ministries, government institutions and bodies (Žajdela Hrustek, Mekovec, Bubaš, 2015). According to information available on the aforementioned website, development of new e-government e-services are planned as well as connecting all government and non-government public institutions with the purpose of enabling a better flow of information and bolstering communication between state institutions and public affairs representative bodies with the citizens and to increase transparency in work of these institutions and bodies.

E-culture is the last identified attribute in category *impact of ICT and the Internet on quality of life*. The results for this attribute show that the respondents who participated in this survey barely use ICT and the Internet to, for example, "to visit museums online" because 93.92% of them ($\overline{X}$ =1.23, σ =0.06) stated they *do not use* or use *very rarely* for this purpose. Fairly the same percentage of respondents (89.93%, $\overline{X}$ =1.32, σ =0.77) stated the same for the claim "I use ICT and the Internet to watch theatrical performances". Only 8.90% of respondents *frequently* or *very frequently* use ICT and the Internet for reading and downloading digital books while 64.87% of the total number of respondents ($\overline{X}$ =1.67, σ =1.09) does not use it at all for this purpose.

In latent category *impact of ICT and the Internet on quality of life*, significant differences according to *demographic indicators* have been noticed according to *age, household structure* and *marital status*, while for the variable *gender* in this category, the same as in access category, no significant differences were confirmed which is not the case in numerous previous studies conducted (see Appendix 2).

Regarding age structure for the category *Impact of ICT and the Internet on quality of life* significant differences have been confirmed between age groups 18-54 and from 54 above (see Appendix 2 Table 52). Thus e-mail for communication purposes is used by 28.33% of the respondents in age group 18-54. 16.00% in age group 55-64 and only 3.00% of respondents in age group 65 and above.

Similar results occur with e-banking. 25.60% of respondents in the age group 48-54 use e-banking *frequently* or *very frequently*, 16.00% in age group 55-64 and only 4.2% of respondents in age group 65 and above. According to household structure, as with previously analysed categories, significant differences have been noticed between households with financially supported children and all-adults or single-person households (see Appendix 2, Table 55)

ICT and the Internet is used for information search on desired products and services *frequently* or *very frequently* by 52.20% of respondents who live in *households with one or more dependent children* in contrast to *one-person households* in which the same claim was supported by only 17.90% of respondents and 18.30% of those respondents who live in *all-adults households*. *Households with dependent children* also more frequently use ICT and the Internet for entertainment purposes and to pursue leisure activities. Thus 60.50% of respondents with dependent children *frequently* or *very frequently* use ICT and the Internet for reading online newspapers while only 14.30% of respondents who live in one-person household and 24.40% of respondents who live in *adults without dependent children* households do the same.

According to *marital status* (see Appendix 2, Table 60), significant differences occur between *married* respondents and those who are *single*, as well as between those who are *widowed* and all other marital-status categories (*married, single, partnered, divorced*). Hence for the purpose of communication, e-mail is used *frequently* or *very frequently* by 68.00% of the respondents who are *single*, 31.90% of those who are *married*, while not one respondent who stated to be *widowed* uses e-mail *frequently* or *very frequently*; moreover, 94.90% of those who belong to the latter category have stated they *do not use* it at all.

Regarding entertainment and leisure activities such as "listen/download music", 72.00% of *single* respondents do these activities *frequently* or *very frequently* in contrast to 24.70% of *married* respondents and *not even one widowed* respondent. As with the previous claim, more than 90.00% of *widowed r*espondents does not use ICT and the Internet for listening/downloading music at all.

Considering economic factors for category *impact of ICT and the Internet on quality of life*, significant differences according *to employment, the level of income* have been empirically confirmed while for variable *family assets situation* no significant difference has been empirically confirmed (Appendix 2). For variable *employment* (Appendix 2, Table 64) significant differences

have been empirically confirmed between categories of respondents who are *full-time employed* and *students* and *retired* and between those who are *part-time employed* and *students*, as well as between the *unemployed* and *students* and *retired*. For example, e-banking is used *frequently* or *very frequently* by 45.00% of *full-time employed* respondents. 36.00% of *students* and 10.50% of those who stated they were *retired*. 53.50% of *full-time employed* respondents *frequently* or *very frequently* use e-mail for communication, 84.60% of *students*, 38.60% of those *unemployed*, and only 6.00% of *retired*. 35.50% of *full-time employed* respondents *frequently* or *very frequently* use ICT and the Internet for entertainment purposes, such as "watch/download movies", 96.10% of students, 34.10%, of *unemployed* and only 3.80% of those who are *retired*.

With regard to *household income level in the past three years* (Appendix 2, Table 72), a significant difference for category *impact of ICT and the Internet on quality of life* has been confirmed for all income levels (*increased*, *decreased*, *stayed the same*) except for the category of respondents who stated that they *do not know* whether their income level has changed and those who stated their income level has *decreased*.

Information search about the desired products and services using ICT and the Internet is preferred by the respondents who stated their income level has *increased*. 71.10% of such respondents has stated they *frequently* or *very frequently* search for product/service information as well as 40.90% of those whose income level has *decreased*. These activities are least preferred by those who declared their income level *has stayed the same* (22.30%).

Regarding online shopping for household supplies, 13.30% of those whose income *has stayed the same* does it *frequently* or *very frequently* together with 53.30% of those whose income had been *increased* and 21.70% of those whose income had *decreased*.

Among cultural variables in category *impact of ICT and the Internet on quality of life*, significant difference has been confirmed in aspect *knowledge of English in speech and writing* (see Appendix 2, Table 81), while no significant difference has been confirmed according to *membership in the political party*, *membership in the one/several non-profit organizations* and *membership in the religious organization* (see Appendix 2, Table 76-78).

For the variable *knowledge of English in speech and writing* significant differences have been confirmed between all groups except between those who stated their knowledge of English is *very*

poor and *poor* in speech and in writing and those who stated their knowledge of English is *good* or *very good*. Thus 10.60% of those who have *no knowledge of English frequently* or *very frequently* use ICT and the Internet to search for information, 28.30% of those with *very poor* knowledge 26.20% of those with *poor* knowledge, 59.60% of those with good knowledge, 73.10% of those with very good knowledge and 81.30% of those with excellent knowledge.

When it comes to entertainment such as reading *online newspapers, magazines*, only 13.40% of those who stated they *have no knowledge of English* do it *frequently* or *very frequently* in contrast to 81.20% of those with *excellent* knowledge of English in speech and in writing.

Regarding *social factors* for the category *impact of ICT and the Internet on quality of life*, the following variables have been identified as significant: *education level, physical disability* and *place of residence*. Between these, a significant difference has been proven between *education level* and *physical disability* (see Appendix 2 Table 85 and Table 89). Regarding *place of residence* (urban, suburban, rural), no significant differences have been noticed (see Appendix 2, Table 74) For the variable *education level*, a significant difference has occurred between *all levels of education* except between respondents with *high education level* (college and faculty) and between those with *only primary school education* and those who *did not finish primary school education* (see Appendix 2, Table 85).

As a means of communication, e-mail is used *frequently* or *very frequently* by 78.05% of respondents with *college or faculty education*, 37.50% of those with *high school education*, 15.40% of those with a *three-year secondary vocational education* and 2.7% of those with *only primary school*. Those with *no formal education* (or who did not finish primary school education) *do not use* e-mail for communication purposes.

Regarding e-banking, 57.50% of respondents with *high education degree* (college and faculty) use it *frequently* or *very frequently*, 31.60% of those with *four-year secondary education*, 13.20% of those *with a three-year secondary education*, 5.4% of those *with primary school education* while those who *did not finish primary school education* do nor use e-banking services.

The same situation is found regarding the creation of e-government services – the higher the education level, the more positive the attitude. Thus 88.00% of respondents with f*aculty* and 77.10% of respondents with *college education agree* or *strongly agree* with the statement "I believe

that the requirements for the change of domicile / residence should be completed and submitted by using ICT and the Internet.", 72.60% of respondents with a *four-year high school education*, 55.00% of those *with a three-year secondary education*, 32.40% of respondents with *primary school education* and 26.30% of those *who did not finish primary school education*.

In the frame of *physical disability* variable, a significant difference has been proven between those who with and those *without a physical disability* (see Appendix 2, Table 89). Using ICT and the Internet for information search on desired products and services is used *frequently* or *very frequently* by only 12.50% of respondents who stated *they were physically impaired* in contrast to 39.80% of those *who have no physical impairment*. E-mail, as a means of communication, is preferred by people with *no physical impairment* as 42.60% of them use it *frequently* or *very frequently* while only 9.40% of *physically disabled r*espondents do the same.

The use of ICT and the Internet for entertainment purposes is also preferred by those respondents with *no physical impairment*. 37.80% of respondents who are *not physically impaired frequently* or *very frequently* use ICT and the Internet for *listening/downloading music* while only 6.30% of those *physically impaired* do the same. The same situation occurs with *watching/downloading movies*: 31.50% of respondents who are *not physically disabled* do it *frequently* or *very frequently* and only 3.10% of those *with a physical disability*.

Regarding the perception of usefulness of e-health system, a slightly more positive attitude is taken by those respondents who stated they *have no physical disability*. Thus the claim "I believe that the use of e-health system increases the quality of health care services, if compared to the alternative traditional ways" was *agreed* with (*agree* or *strongly agree*) by 38.40% of those who *have no physical impairment* and 21.90% of those *physically disabled*. Also, ICT and the Internet are used for information search on health services and improvement of one's health status more frequently by respondents with *no physical disability*. 17.90% of those respondents confirmed they *frequently* or *very frequently* use ICT and the Internet for this purpose while only 3.10% of respondents with a *physical disability* confirmed the same.

12.5.3.2.4. Descriptive statistical analysis and results of analysis of variance (ANOVA) for category empowerment

The latent category *empowerment* is crucial for e-inclusion. In this study, it has been empirically proven it is connected to and has an effect on the latent category *impact of ICT and the Internet on quality of life*. However, this category has been least researched and most of the manifest variables has been created by the author of this study. Theoretically defined and empirically confirmed attributes that describe the category *empowermen*t are *e-participation, e-democracy* and *social computing* which consists of separate attributes networking and content creation. At the moment, research on the *empowerment* is still in its early stages and very rare. In Croatia, according to the knowledge of the author of this study, not a single relevant scientific research has been carried out or published regarding this category and attributes that describe it. This especially applies to attributes connected with *e-participation* and *e-democracy*.

Manifest variables of the attribute *e-participation* were used in an attempt to examine the frequency of ICT and Internet use with the purpose of including citizens in different processes of public and political activities, communication between public authorities and citizens and active involvement of citizens in decision-making processes. Research results show a very low level of the use of ICT and the Internet for the aforementioned purposes. Thus only 4.45% of the respondents declared they *frequently* or *very frequently* used of ICT and the Internet to access information from public authorities, 88.76% stated they had *never used* or used *very rarely* for this purpose ($\overline{X}$ =1.40, σ =0.86). Of all the respondents, 5.85% stated they use ICT and the Internet to search for information related to functioning and work of the government and public administration while 71.44% had *never* practiced this type of information search ($\overline{X}$ =1.51, σ =0.92).

Of all the respondents, 3.74% *frequently* or *very frequently* use online digital education materials (webinars, online courses, educational films, etc.) which are published by the government institutions while 75.18% of all respondents had *never used* it. The majority of the respondents does also not prefer e-mail communication with the public authorities as 97.89% of all respondents had stated doing it *not at all* or *rarely*.

Similar results have been confirmed for the claim “I participate in public discussions related to the enactment of law regulations, rules etc. via ICT and the Internet” for which 97.65% all respondents

had stated they do not participate or participate *rarely* or *very rarely*. This can also be the result of a difficult socio-economic situation in which the majority of Croatian citizens is distrustful towards the work of the present as well as previous governments which have constantly been ignoring social problems and showing social insensitivity towards the most sensitive and vulnerable social groups in their attempts to satisfy formal regulations of the EU while disrespecting the voice and the needs of their own citizens.

In this study, *e-democracy*, within the frame of *empowerment* category, is related to examination of the attitudes of citizens about the use of ICT and the Internet as a medium for transferring information connected with the work of the government (videoconference), giving a choice to practice their citizens' rights regarding election or referendum voting online as well as providing all relevant information about election candidates in a digital form.

One of the key components of *e-democracy* is communication between public local authorities and citizens via the Internet which also enables citizens to participate in decision-making processes at the level of local government. Transparency of the work of the government is very important and thus a prompt availability of public documents and information about the work of government institutions related to enactment and regulation policies is of extreme importance in which ICT and the Internet can play a very important role.

The work of non-government organisations, their promotion as well as execution of their initiatives today would be unthinkable without the active use of ICT and the Internet. The results of the research connected with the attribute *e-democracy* (see Appendix 1, Table 48) show that attitudes of the citizens who participated in this research are divided regarding some of previously mentioned issues. This can be explained with the fact that in Croatia, some of these affairs have not yet fully developed. Such is the case with online election and referendum voting. Thus the claim that each parliament and public authority session should be made public via video conference is supported by less than 50.00% of respondents, 37.23% have no attitude regarding the matter while 22.95% does *not agree* with the claim ($\overline{X}$ =3.21, σ =1.15). In addition, 47.31% of respondents *agrees* that citizens should be able to vote online in elections and referendums, 23.65% *does not agree* while 29.04% *does not have an attitude* regarding the affair ($\overline{X}$ =3.32, σ =1.21).

Communication of public local authorities with citizens via websites or social networks is supported by more than 55.00% of the respondents ($\overline{X}$ =3.54, σ =1.09). The results connected with claims regarding the access of information in digital form on websites which can, to a great extent, contribute to transparency of the work of the government and social organisations, a positive attitude of the respondents is apparent. Thus 70.49% of the respondents ($\overline{X}$ =3.89, σ =0.91) *agree* or *strongly agree* with the claim that they can find all documents and information connected with enactment and regulation policies. Almost the same result (70.49%, $\overline{X}$ =3.89, σ =0.96) was reached regarding the claim "I believe that, on the occasion of election for president / parliament / local and regional levels, the list of candidates should be available on websites with contact information for each candidate". The respondents have also shown interest in gaining information on various social organisations and their initiatives using ICT and the Internet given that 69.31% of all respondents stated they *agree* or *strongly agree* with the claim they gain information about these organisations this way.

Representation *social computing* is nowadays globally widespread. Networking, creating digital content as well as their sharing via different social networks are unavoidable activities of a growing number of people. Hence a need has occurred to create an attribute within the category *empowerment* which is related with the frequency of the use of certain activities regarding *social computing*. From the conducted research (see Appendix 1, Table 48) it can be see that regardless of the growing global trend of using social networks, online discussion sites and web portals, in Croatia it is not the case. The results show that 60.42% of the total number of respondents stated that they did not create and do not edit their social network profile while only 26.7% of respondents stated they do it *frequently* or *very frequently* ($\overline{X}$ =2.14, σ =1.56). Upload of their digitally created content is done *frequently* or *very frequently* by 12.18% of respondents while 67.44% ($\overline{X}$ =1.74, σ =1.21) stated they *do not do it at all*. Using online discussion boards as well as communication portals and searching for and sharing information are also not common activities of the majority of the respondents given that, on both claims, more than 75.00% of respondents has declared they either *do not use* it, or use *rarely*.

Regarding the creation of blogs and web pages for themselves or someone else, the results are even less favorable. From the total number of respondents, only 2.35% stated they *frequently* or *very frequently* create and edit their "online journal or blog", while 92.50% stated they do it *very rarely*

or *never* ($\overline{x}$ =1.25, σ =0.72). From the total number, 4.45% respondents ($\overline{x}$ =1.26, σ =0,70) stated they *frequently* or *very frequently* create and edit their own web page and 3.47% ($\overline{x}$ =1.22, σ =0.70) admitted doing it for their friends and relatives while more than 90.00% of the respondents stated for both claims they do these activities *very rarely* or *never*.

In latent category *empowerment* significant differences according to *demographic indicators* have been confirmed according to *household structure, age structure, gender and marital status* (see Appendix 2). Regarding *household structure* (see Appendix 2, Table 57), significant differences has been confirmed between respondents who stated they live as a *household with two adults and dependent children* and *two adults without dependent children*, while between the rest of the groups no significant difference has been empirically confirmed. Examining the frequency of social networking in households with *two adults and dependent children*, 34.40% of such respondents agreed they *frequently* or *very frequently* create and manage a profile on social networks (Facebook, Twitter ...)" while in households without dependent children only 15.30% of respondents do the same. 32.50% of respondents who live in households with dependent children communicates and read comments on portals *frequently* or *very frequently* in contrast to 10.20% of respondents who live in all-adults households. In the former group, 27.40% of respondents *frequently* or *very frequently* use online discussion boards for obtaining or sharing information as well as only 12.20% of respondents in the latter group.

According to marital status (see Appendix 2, Table 61), significant differences have been established between respondents who declared they were *married, single* and *widowed*. 16.00% of respondents who stated they were *single frequently* or *very frequently* create and edit their profile on social networks, while 64.00% of those *single* confirmed doing the same and none of those who are *widowed*. Using online discussion boards is also more represented with those who are *single* as 38.00% of them use forums *frequently* or *very frequently* together with 18.20% of those who are *married* and only 2.60% of those who are *widowed*, although the frequency of the latter, if at all, is reported as *very rarely*. 44.00% of those who are *single frequently* or *very frequently* communicates and reads web portals, the same as 20.10% of those who are *married*. The situation with those who are *widowed* is the same as in previous case: 2.60% of them read and communicate via web portals while the rest of the group does *not do it at all*.

In category *empowerment*, according to age groups, a significant difference has been empirically confirmed between those aged 18-24 against all other age groups aged 35 to over 75, age group 25-34 with age groups 55 to over 75, for age group 45-54 with age groups 55-75 and above significant differences have not been confirmed (see Appendix 2, Table 53).

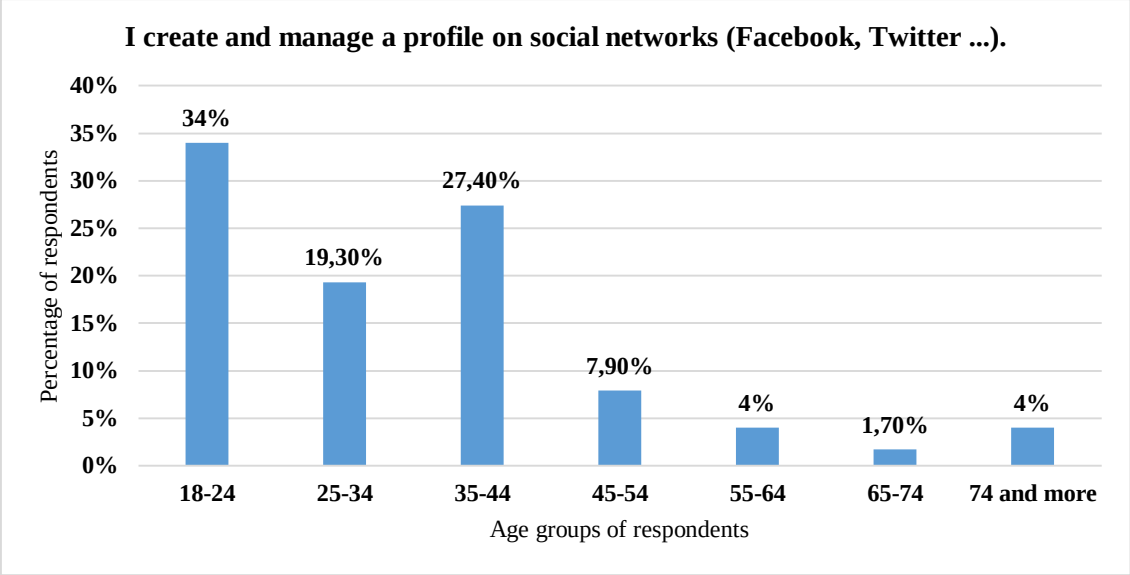


Chart 23. Frequency of use social networks by age of respondents
Source: made by the author

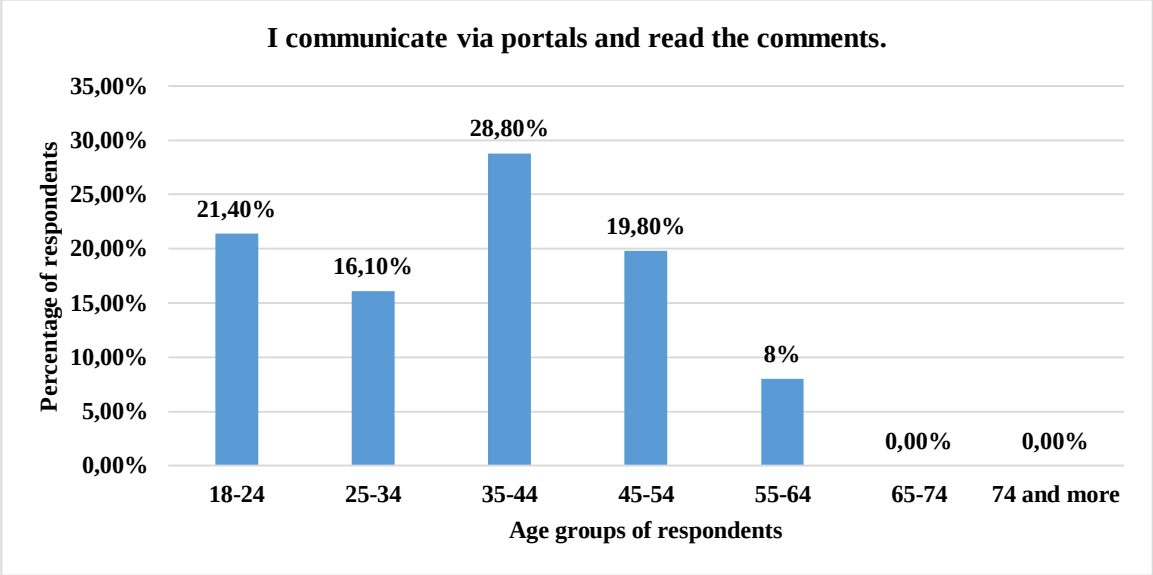


Chart 24. Frequency of use portals by age of respondents
Source: made by the author

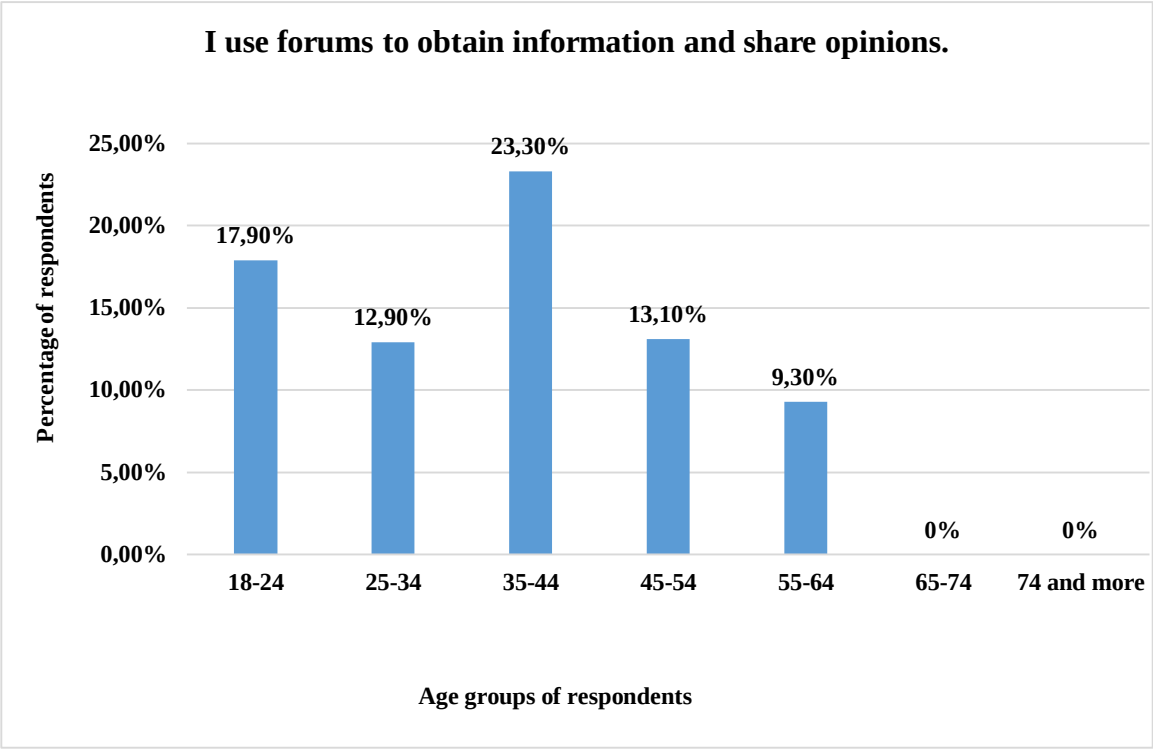


Chart 25. Frequency of use forums by age of respondents
Source: made by the author

High frequencies (*often* and *very often*) of using social networks is shown in Chart 23. The graph clearly demonstrates that younger generations of respondents use social networks more frequently than age groups 45 to above 75. Charts 24. and 25. show equal results for the use of online discussion boards and web portals.

With respect to *economic factors* for the category *empowerment*, significant differences have been empirically confirmed according to *employment, the level of income* and *family assets situation* (Appendix 2). For the variable *employment* (Appendix 2, Table 65), significant differences have been empirically confirmed between those who are *full time employed* and *students* and *pensioners* and also between those who are *part-time employed* and *students* and between the *unemployed* and *students* and *retired* people. Analysing the attitudes of respondents regarding the attribute *e-democracy* according to *status of employment*, 54.60% of those who are *unemployed*, 53.00% of those who are *employed-full time*, 65.40% of those who declared themselves as *student* and only 30.80% of *retired* respondents *agree* or *strongly agree* that *opportunity of voting in elections*

/participate in referendum electronically should be enabled. Regarding communication of local authorities with the citizens via websites or social networks, 65.90% of *unemployed*, 62.00% of those *employed full time*, 61.60% of *student* population and only 42.10% of *retired* respondents *agree* or *strongly agree* that this is a necessity.

According to *household income in the last three years* (see Appendix 2, Table 73), significant differences in the category *empowerment* have been empirically confirmed between all groups except between those who stated *I do not know* and those whose income was *decreased* and *increased*. According to the variable *family assets situation* (see Appendix 2, Table 69), a significant difference has been empirically confirmed between respondents who stated their status is *something worse than the majority* and those who stated they are *something better than the majority*, and the group of respondents who stated their property status is *nether better nor worse than the majority* and those who stated their status is *something better than the majority*. 15.40% of those whose property status is *something worse than the majority* has created and *frequently* or *very frequently* edits their profile on social networks in contrast to 35.20% of those whose property status is *something better than the majority*. In order to obtain information and share opinions, 31.50% of those who stated their property status is *something better than the majority*, *frequently* or *very frequently* use online discussion boards, 21.50% of those whose situation is *nether better nor worse than the majority* and 13.50% of respondents who stated their property status is *something worse than the majority*.

Regarding *cultural indicators*, a significant difference in category *empowermen*t, has been empirically confirmed according to variables *knowledge of English in speech and writing*, *membership in the religious organization* as well as with variables *membership in the one/several non-profit organizations* (see Appendix 2, Table 82, Table 76 and Table 78) while for *membership in the political party* no significant difference has been confirmed (see Appendix 2, Table 77). High frequencies (*frequently* or *very frequently*) of social networking and the use of forums and portals according to self-estimate on knowledge of English of the respondents is presented in Chart 26, 27, 28.

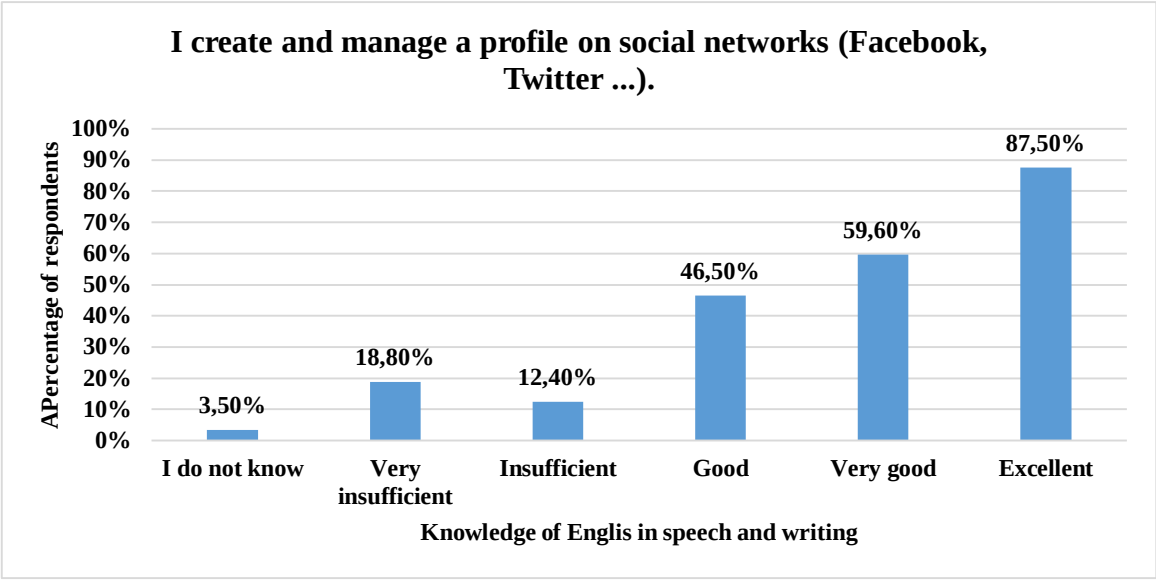


Chart 26. Frequency of use social networks by respondents knowledge of English in speech and writing
Source: made by the author

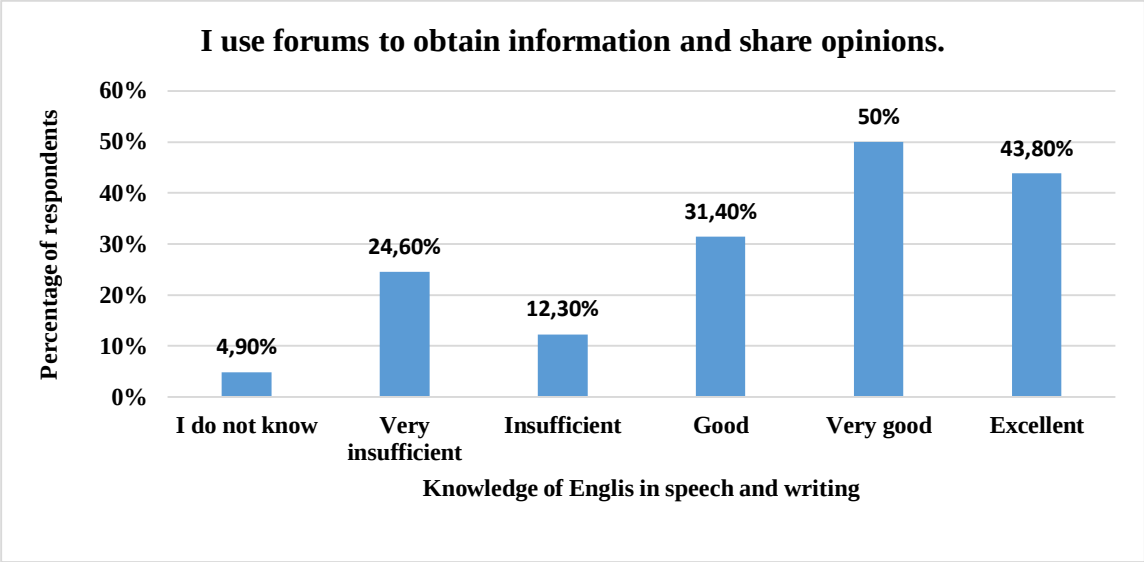


Chart 27. Frequency of use forums by respondents knowledge of English in speech and writing
Source: made by the author

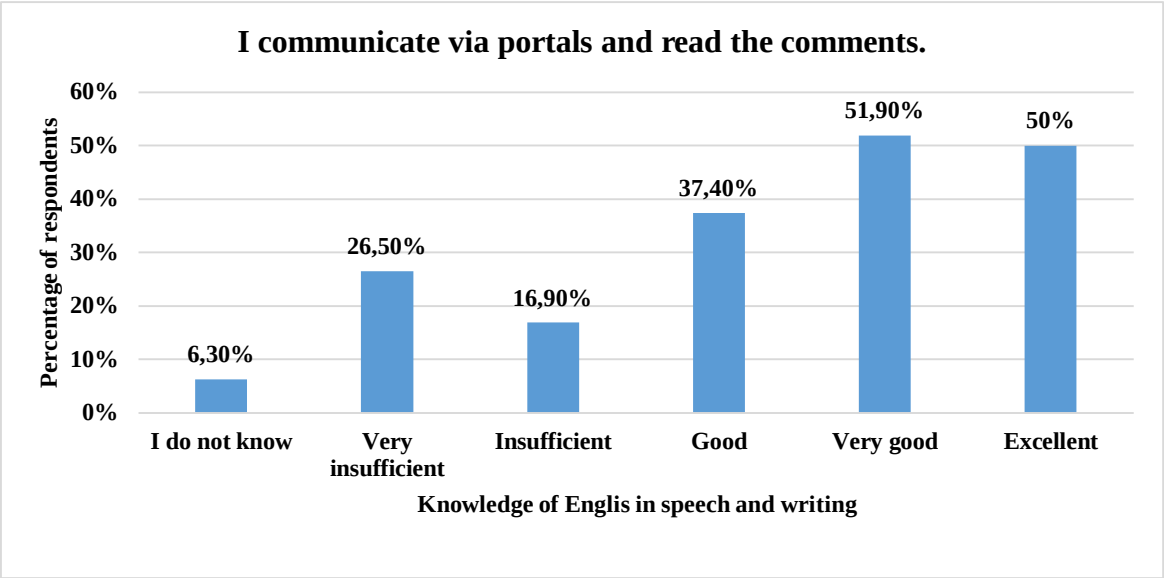


Chart 28. Frequency of use portals by respondents knowledge of English in speech and writing
Source: made by the author

The charts clearly demonstrate that knowledge of English in speech and writing affects new ways of connecting, communicating, searching for and sharing information, i.e. accepting new technologies in carrying out everyday private and business activities with the help of ICT and the Internet. Significant differences regarding previously mentioned purposes have also been empirically confirmed for variables of *membership in religious* and *other profit and non-profit organisations*. Thus according to frequency of use, a medium difference has occurred between respondents who *are not active members of any religious organisation* among which 32.10% *frequently* or *very frequently* create and manage a profile on social networks (Facebook, Twitter ...) in contrast to 20.30% of *active members of religious organisations* who participated in the study that do the same.

According to *social factors* for the category *empowerment* for which significant variables are *education level, physical disability and place of residence*, significant differences occur among all mentioned variables (see Appendix 2). For the variable *education level* (see Appendix 2, Table 86), a significant difference has been empirically confirmed between *all education levels* except between those respondents who stated they have a *high school education* and those with a *college degree* and those who stated they *finished or did not finish primary school*. Significant differences can also been seen in graphical display with charts 29, 30 and 31 which show the frequency of the

use of social networks, forums and web portals among respondents who stated they f*requently* or *very frequently* use the aforementioned.

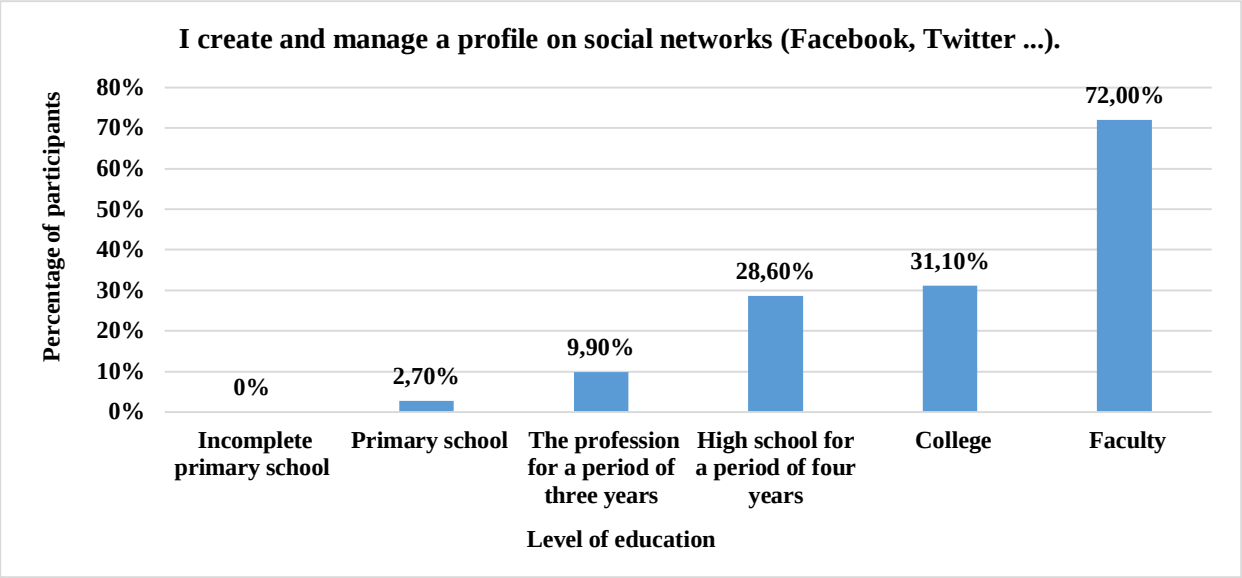


Chart 29. Frequency of use social networks by respondents level of education
Source: made by the author

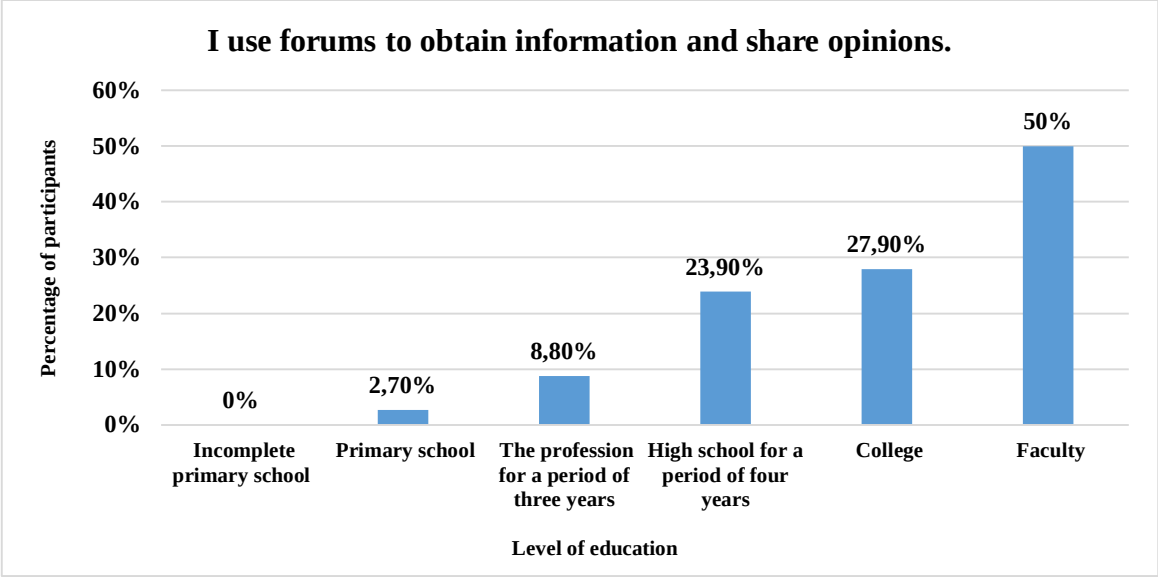


Chart 30. Frequency of use forums by respondents level of education
Source: made by the author

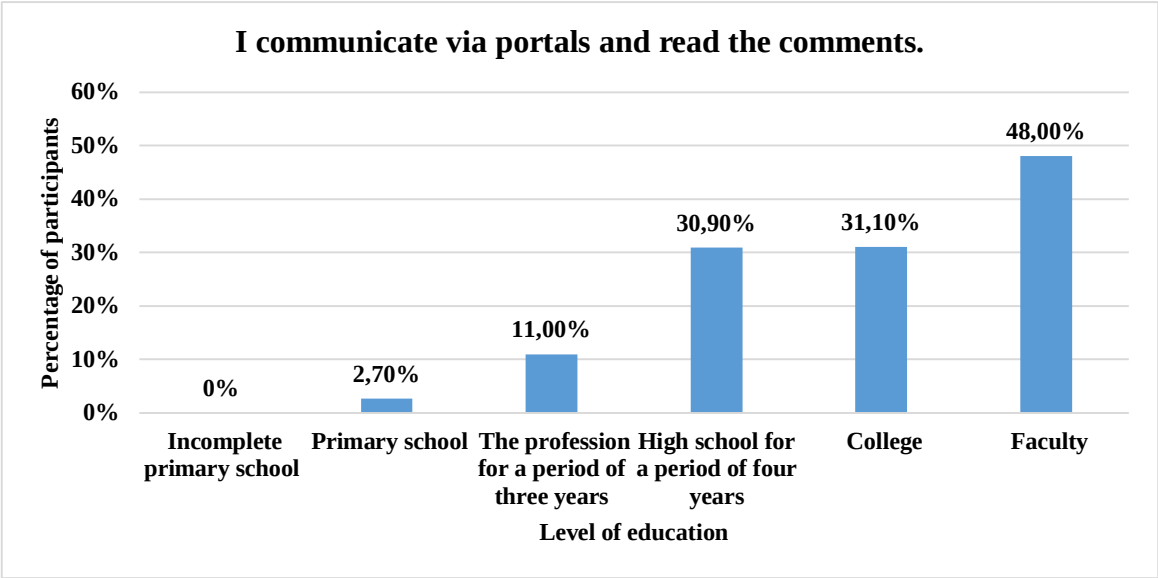


Chart 31. Frequency of use portals by respondents level of education
Source: made by the author

In the category *empowerment* significant differences has also been empirically proved regarding *physical disability* (see Appendix 2, Table 90). Among those who *have no physical disability*, 28.80% of respondents stated they *frequently* or *very frequently* "create and manage a profile on social networks" while only 9.40% of those *who are physically impaired* do the same. Similar are the results of the use of forums (23.00%; 6.30%) and web portals (26.10%; 6.30%) in communication and sharing information.

12.5.4. Validation of the model with PLS-SEM and hypotheses testing

The following chapter is final and represents one of the key chapters of this work, because it describes and displays a validation of the defined conceptual theoretical model of e-inclusion. Validation of the model is displayed in such manner that it first shows the validation of measurement models (formative and reflective) and after that the validation of structural model of e-inclusion.

As it was mentioned in the chapter *Description of methodology of research*, for validation of the model a structural equation modelling partial least squares (PLS) technique was used. PLS-SEM is a causal modeling regression-based technique aimed at maximizing the explained variance of the dependent latent variable and uses available data to estimate the path relationships in the model with the objective of minimizing the residual variance of the endogenous variables. PLS-SEM is

primary used to develop theories in exploratory research. The variance PLS-SEM algorithm was developed by Wold (1975) and this technique facilitates testing of the measurement model and the structural model simultaneously. The basic PLS‑SEM algorithm follows a two-stage approach, in first step iteratively approximates the parameters of the measurement model while in its second step estimates standardized partial regression coefficients in the structural model (more about the PLS algorithm sees Hair et al., 2014, p. 75-83). In this study for all calculation the Smart PLS program was used.

12.5.4.1. Evaluation of formative measurement model access

Evaluation of formative measurement models starts with establishing content validity before collecting the data and empirically evaluating formatively measured constructs. Theoretical rationale and expert opinion play important role in the evaluation of formative models. This requires ensuring the formative indicators capture all facets of latent variable. This step was made with the help of experts and described in detail in earlier chapter of this study. At the indicator level, the question arises whether indicator indeed contributes to forming the model in accordance with its intended contents. In evaluation of formative measurement model the first step involves assessing the formative measurement model's convergent validity by correlating the formatively measured latent variable with a reflective latent variable. The second step requires examine collinearity among the indicators, and the third step includes examining the statistical significance and relevance of the formative indicators. Convergent validity is the extent to which a measure correlates positively with other measures of the same construct. One has to use the formatively measured construct as an exogenous latent variable predicting an endogenous latent variable operationalized through one or more reflective indicators. The strength of the path coefficient linking the two latent variables is indicative of validity of the designated set of formative indicators. According to Chin (1998) value of 0.90 or at least 0.80 and above is desired for path between formative and reflective latent variables, which translates into an R^2 value of 0.81 or at least 0.64.

High correlations are not expected between items in formative measurement models. High levels of collinearity between formative indicators are a crucial issue because they have an impact on the estimation of weights and their statistical significance. To assess the level of collinearity in this study the variance inflation factor (VIF) and tolerance is computed. A tolerance value of 0.20 or

lower and a VIF value of 5 and higher respectively indicate a potential collinearity problem (more about variance inflation factor (VIF) and tolerance see Hair et al. p. 124-126).

For evaluating the contribution of formative indicator another important criterion is value of outer weight. The outer weight is the result of multiple regression with the latent variable scores as the dependent variable and the formative indicators as the independent variables. The values of the outer weights can be compared with each other and can therefore be used to determine each indicator's relative contribution to construct, or its relative importance. To determine which indicators truly contribute to forming the latent variable it must be tested if the outer weights in formative measurement models are significantly different from zero by means of the bootstrapping procedure (more about bootstrapping procedure se Hair et al., 2014, p. 130-136). In bootstrapping, subsamples are randomly drawn from the original set of data. Each subsample is then used to estimate the model. The parameter estimates indicator weights estimated from the subsamples are used to derive standard errors for the estimates and that enables that *t* values cane be calculated to assess each indicator weight's significance. When the size of the empirical t value is above 1.96 can be assume that the path coefficient is significantly different from zero at a significance level of 5 % ($\alpha = 0.05$; two-tailed test), for significance level of 1% ($\alpha = 0.01$; two-tailed test), and 10% ($\alpha = 0.10$; two-tailed test) critical (theoretical) t values are 2.57 and 1.65, respectively. To asses formative indicators relevance also is important to consider about a formative indicator's absolute contribution to its construct. The absolute contribution is given by the formative indicators outer loading. When an indicator's outer weight is nonsignificant but its outer loading is high (i.e., above 0.50), the indicator should be interpreted as absolutely important but not as relatively important.

12.5.4.1.1. Results for formative measurement model evaluation for access

With the aim to evaluate formative measurement model as a first step the convergent validity was carried out. For this purpose, a new model has been created, the formatively measured latent variable *access* was correlating with reflective latent variable *use*. As cane be see from Figure 11. this analysis yield a path coefficient of 0.915, which translates into an R^2 value of 0.838. According to (Chin, 1998) magnitude of 0.900 or at least 0.800 and above is desired, those proving support for the formative construct's convergent validity.

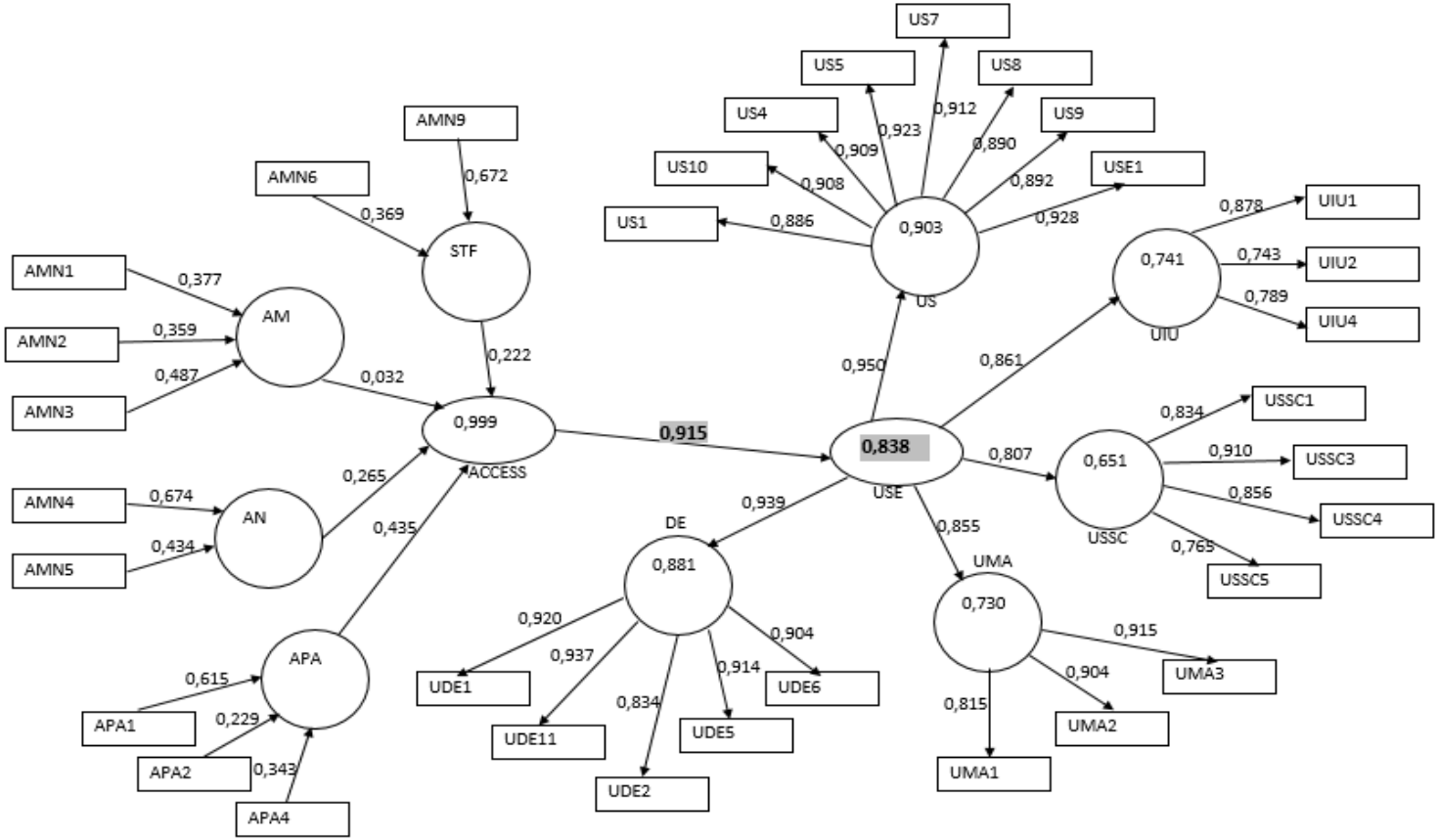


Figure 11. Redundancy analysis for convergent validity assessment
Source: made by the author

To assess the level of collinearity the tolerance and variance inflation factor (VIF) was compute. The results are presentment in the Table 37. the highest VIF value is 3.236 for manifest variable AMN6 and AMN9. Hence, VIF values are uniformly below the threshold value of 5, cane be therefore concluded, that collinearity does not reach critical levels in any of the formative latent variable.

Table 37. Collinearity assessment formative measurement using tolerance and VIF

Latent variable of second level „Access“											
Latent variable of second level											
Material access			**Network**			**Satisfaction with network**			**Point of access**		
Indicators	**TOL**	**VIF**	**Indicators**	**TOL**	**VIF**	**Indicators**	**TOL**	**VIF**	**Indicators**	**TOL**	**VIF**
AMN1	0,822	1,217	AMN4	0,626	1,597	AMN6	0,309	3,236	APA1	0,604	1,656
AMN2	0,493	2,028	AMN5	0,626	1,597	AMN9	0,309	3,236	APA2	0,721	1,387
AMN3	0,453	2,208							APA4	0,624	1,603

Source: made by the author

As a next step of formative measurement model evaluation the outer weights for their significance and relevance for latent variable of first and second level was analyze. Looking at the significance levels from Table 38. and Table 39. it can be concluded that all formative latent variable on first and also on second level are significant. Those indicators which are shown in Table 38. was retain in the formative latent variable *access*.

Table 38. Outer weights significance testing results for latent variable of first level

Latent variable of first level	**Indicators**	**Outer Weights (Outer Loadings)**	**t Value**	**Significance Level**	**p Value**
Material access	AMN1	0,464 (0,754)	12,306	***	0,000
	AMN2	0,400 (0,819)	8,347	***	0,000
	AMN3	0,377 (0,857)	7,022	***	0,000
Network	AMN4	0,749 (0,962)	23,624	***	0,000
	AMN5	0,348 (0,806)	8,993	***	0,000
Satisfaction with network	AMN6	0,357 (0,925)	2,071	*	0,038
	AMN9	0,684 (0,980)	4,208	***	0,000
Point of access	APA1	0,702 (0,951)	19,978	***	0,000
	APA2	0,218 (0,670)	5,718	***	0,000
	APA4	0,247 (0,753)	5,957	***	0,000

*p<0.05; **p<0.01, ***p<0.001

Source: made by the author

Table 39. Outer weights significance testing results latent variable of second level

Latent variable of second level	Latent variable of second level	Sample Mean	Standard Deviation	Standard Error	t Value	Significance Level	p Value
Access	**Material access**	0,347	0,0057	0,006	60,770	***	0,000
	Network	0,236	0,0037	0,004	64,418	***	0,000
	Satisfaction with network	0,337	0,0047	0,005	71,504	***	0,000
	Point of access	0,221	0,0076	0,008	29,283	***	0,000

*p<0.05; **p<0.01, ***p<0.001

Source: made by the author

It is important to note that in the validation of measuring formative latent variable *access*, two of the indicators proved to be redundant. The first indicator concerning the latent formative variable of the first level "Satisfaction with network", the claim "I am satisfied with the speed of the network connection" (AMN7) has higher intercorrelation with indicators AMN6 (0.830) and AMN9 (0.828). Equally redundant was the indicator of the latent variable of the first level *access* linked to latent formative variable of the second level *point of access*, the claim "I access ICT and Internet connection at the faculty or other educational institution." (APA3) have higher intercorrelation with indicators APA1 (0.582) and APA4 (0.524). As in previous case when the final parameter estimates are computed in the last stage of the algorithm, outer weight of indicators APA1, APA2 and APA4 was positive, whereas the outer weight of APA3 was negative. To avoid multicolinearity, both indicators were removed in the final version of e-inclusion model.

12.5.4.2. Evaluation of reflective measurement models

Reflective measurement models' validity assessment focuses on their internal consistency, reliability and validity. The specific measures include the composite reliability as a means to assess the internal consistency reliability, convergent validity and discriminant validity. In this study internal consistency reliability was tested using two indices: the composite reliability (CR) and Cronbach's alpha (α). Cronbach's alpha (α) provides an estimate of the reliability based on the intercorrelations of the observed indicator variables. The alpha coefficient provides the lowest expected reliability estimation. On the other hand, the composite reliability (CR) includes the actual item loadings and therefore offers better estimate of internal consistency. The composite reliability varies between 0 and 1, higher values indicating higher levels of reliability. It is considered, to have a satisfying reliability, if both coefficient composite reliability (CR) and Cronbach's α is 0,707 or

higher (Hair et al., 2011). Convergent validity is the extent to which a measure correlates positively with alternative measures of the same latent variable. The items that are measures of specific latent variable should converge or share a high proportion of variance. To establish convergent validity in this study the value of outer loading and the average variance extracted (AVE) was calculated. High outer loadings on latent variable indicate that associated indicators or item have much in common, which is captured by the construct this characteristic is called as indicator reliability. All indicators' outer loading should be statistically significant. The square of a standardized indicator's outer loading, referred to as the communality of an item. According to Hair et al. (2014) rule of thumb is that the standardized outer loading should be 0.708 or higher. Indicators with outer loading between 0.40 and 0.70 should be considered for removal from the scale only wen deleting the indicator leads to an increase in the composite reliability. Another consideration in consideration in the decision of whether to remove an indicator with outer loadings between 0.40 and 0.70 is the extent to which its removal affects content validity. Indicators with weaker outer loadings are sometimes retained on the basis of their contribution to content validity by recommendation of experts of domain (Hair et al., 2010). According to Hair, Ringle and Sarstedt (2011) indicators with outer loadings below should always be eliminated from the scale. Average variance extracted (AVE) is a common measure to establish convergent validity on the construct level. This criterion is defined as the grand mean value of the squared loadings of the indicators associated with the construct. The AVE is equivalent to the communality of a construct. An AVE value of 0.50 or higher indicates that, on average, the latent variable explains more than half of the variance of its indicators, in opposite when AVE value is less than 0.50 that indicates that, on average, more error remains in the items than the variance explained by the latent variable (Bagozzi 1991). Discriminant validity is the extent to which a latent variable is truly distinct from other latent variable by empirical standards. Establishing discriminant validity implies that a latent variable is unique and captures phenomena not represented by other latent variable in the model. In this study discriminant validity was evaluated with two measures: the cross loadings and the Fornell-Larcker criterion. The indicators/items should load higher on their respective latent variable than on the other latent variables in the model, therefore an indicator/items outer loading on the associated latent variable should be greater than all of its loadings on other constructs. The Fornell-Larcker criterion is more conservative approach, it compares the square root of the AVE values with the latent variable correlations. According to the Fornell-Larcker criterion the square root of the AVE

of each latent variable should be greater than its highest correlation with any other latent variable in the model (Fornell and Larcker 1981).

12.5.4.2.1. Results for reflective measurement model evaluation criteria

To establish convergent validity, the value outer loading for each indicator, commonly called indicator reliability, was checked in the first step. As it was previously mentioned earlier in the chapter, the acceptable value of outer loading for each indicator was 0.708 or more. As it can be perceived in the Figure 12, all outer loading for manifest variables were above critical value (0.708), except outer loading concerning three manifest variables. The first two manifest variables measure latent reflective variable of the first level, the *e-democracy*, and refer to the claims "I believe that each Parliament and each session of leaders of local government should be accompanied by videoconference." (0.648) and "I believe that citizens should have the opportunity of voting in elections /participate in referendum electronically" (0.688). According to Prosser and Krimmer, (2004), the basic component of *e-democracy* is electronic voting as well as transparency of the governments work. Considering that they were within critical values from 0.40 to 0.70, as well as because both of the manifested variables were assessed by experts in the domain as compulsory, both variables were kept in the model. Also, outer loading of the latent variable *digital economy* concerning the use of *e-banking* (0.684) also does not reach critical value of 0,708, but because it was also assessed by most of the experts from the domain as compulsory it was decided that that manifest variable is also kept in the model. Concerning the review of convergent validity of latent variables of the first level in Figure 13. it is clear that the outer loading of all reflective latent variables of the first level reach critical value of 0.708, except the latent variable of the first level, *e-democracy* (0.521) concerning reflective latent variable of the second level *empowerment*, and *e-health – perception* (0.522) and *e-government* (0.571) concerning the reflective latent variable of the second level *impact on quality of life*. Also, these latent variables of the first level were assessed by experts as very significant for measuring the latent variable of the second level *impact on quality of life*, as in the previous case, they were not under the critical value level for rejection (0.40 and less), therefore it was decided that they would be kept in the model.

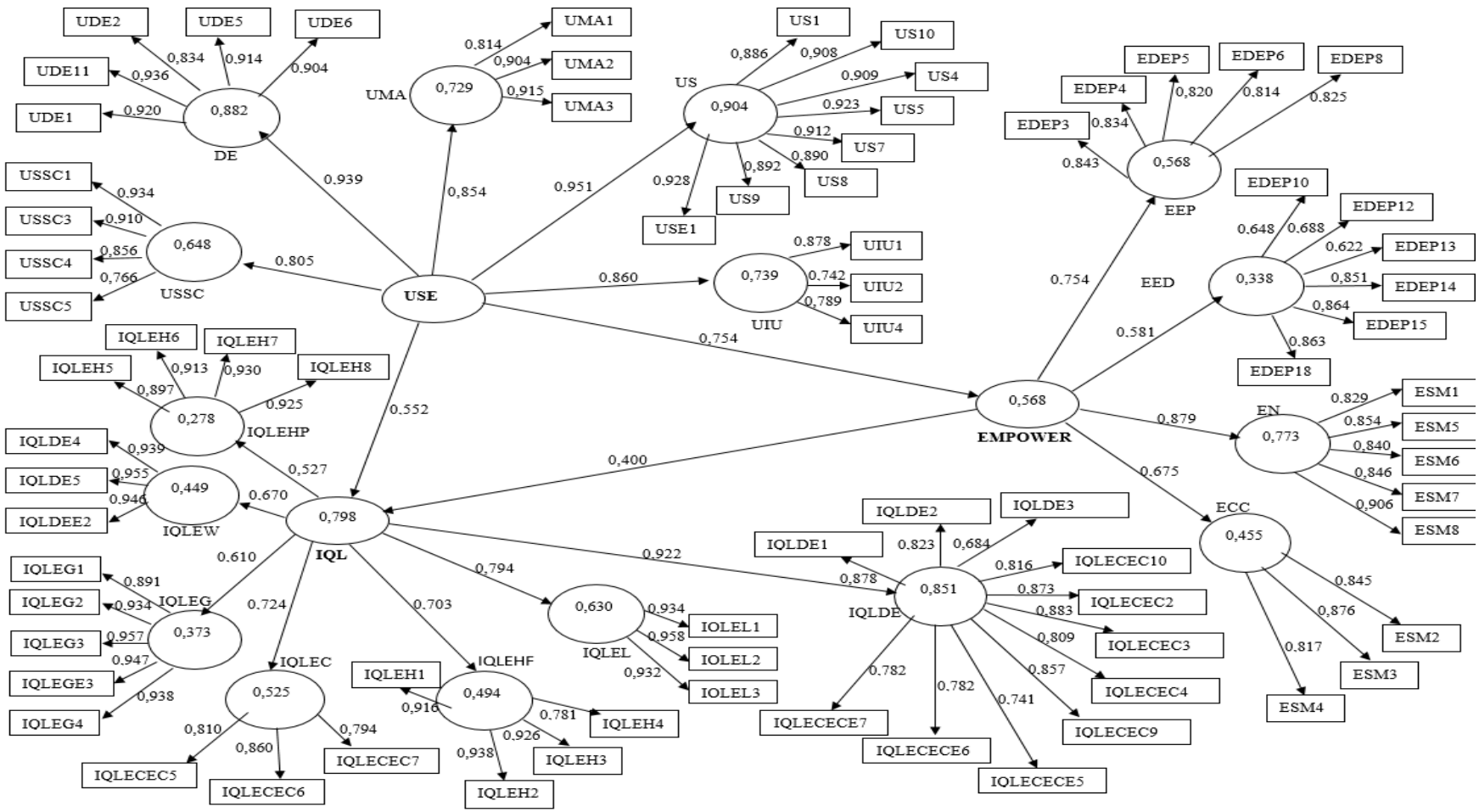


Figure 12. Results of convergent validity of manifest variables
Source: made by the author

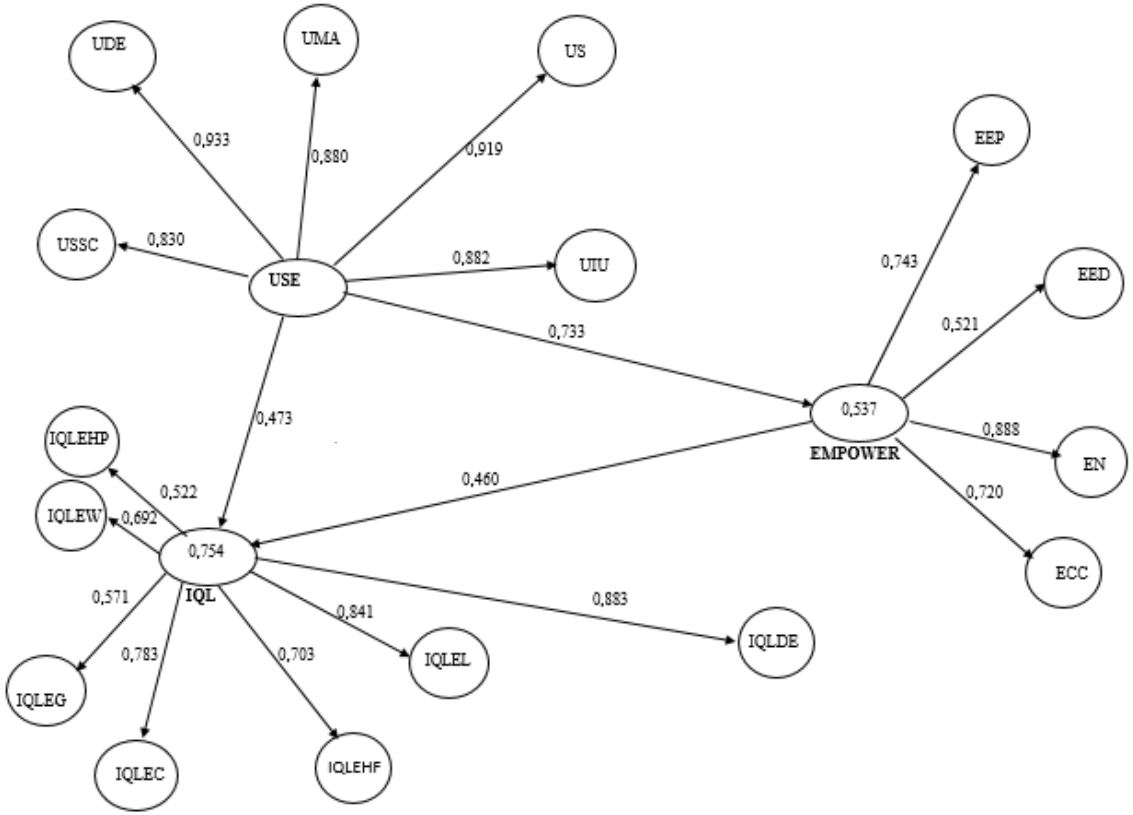


Figure 13. Results convergent validity of latent variables of the first level
Source: made by the author

Table 40. Convergent validity and internal consistency of latent variables

Reflective latent variable			
Latent variable first level	Composite reliability (ρ_c)	Cronbach's α	Average variance extracted (AVE)
Intensity of use	0,846	0,730	0,649
Skills	0,973	0,969	0,821
Motivation/Attitudes	0,910	0,853	0,773
Social support / coercion	0,907	0,863	0,710
Digital engagement	0,956	0,943	0,814
E-learning	0,959	0,936	0,886
E-work	0,963	0,942	0,896
Digital economy	0,956	0,948	0,662
E-health - frequency	0,940	0,914	0,796
E-health - perception	0,954	0,936	0,839
E-government	0,972	0,963	0,872
E-culture	0,862	0,763	0,676
E-participation	0,916	0,885	0,684
E-democracy	0,910	0,880	0,631
Social computing - networking	0,932	0,908	0,731
Social computing - content creation	0,883	0,802	0,716
Latent variable second level	Composite reliability (ρ_c)	Cronbach's α	Average variance extracted (AVE)
Use	0,950	0,934	0,791
Impact on quality of life	0,882	0,844	0,525
Empowerment	0,815	0,697	0,532

*Referent values; α, $\rho_c \geq 0.707$; AVE ≥ 0.500

Source: made by the author

Internal consistency reliability of latent variables first and second level was tested using two indices: Cronbach's alpha (α) and the composite reliability (ρ_c). As can be seen in Table 40, estimated values were above the recommended thresholds of 0.707 for both composite reliability and Cronbach's α for all latent variable first level , except for latent variable second level

empowerment, the alpha value of which is 0.697, what is considered as acceptable by certain authors. Convergent validity was examined using the average variance extracted (AVE). An AVE value of 0.50 and higher means that the shared variance between a latent variable and its manifest variables is larger than the variance of the measurement error and is therefore considered acceptable. Data provided in Table 40. indicate that all latent variables have met this criterion for booth latent variable first level, as well as latent variable second level.

Table 41 to Table 44 represents results of discriminant validity which is defined as an extent of dissimilarity among latent variables in measurement model. Discriminant validity was evaluated with two measures: the cross loadings and the Fornell-Larcker criterion. The first measure postulates that manifest variables should load higher on their respective latent variable than on the other latent variables in the model. Table 41 clearly illustrates that loadings of all manifest variables with their associated latent variables of first level are higher than their loadings with all remaining latent variables of first level which indicates that the model has met the first measure of discriminant validity for latent variable of first level. Also Table 43 shows that loadings of all latent variable of first level with their associated latent variables of second level are higher than their loadings with all remaining latent variables of second level which indicates that the model has also met the first measure of discriminant validity for latent variable of second level. As was previously mentioned according to the Fornell-Larcker criterion, the square root of the AVE of each latent variable should be greater than its highest correlation with any other latent variable in the model. As depicted in Table 42 for latent variable on first level and Table 44 for latent variable of second level diagonal elements are greater than off-diagonal elements, i.e., correlations between a particular construct and all other constructs. Each latent variable shares more variance with its assigned manifest variables than with other latent variables in the model, it is apparent that the results satisfy the requirement, which confirms the discriminant validity of the model. All the aforementioned results consequently, suggest adequate reliability and validity of the measurement model.

Table 41. Standardized factor loadings and cross loadings of manifest variables

	DE	ECC	EED	EEP	EN	IQLDE	IQLEC	IQLEG	IQLEHF	IQLEHP	IQLEL	IQLEW	UIU	UMA	US	USSC
EDEP10	0,177	0,099	**0,648**	0,218	0,176	0,208	0,162	0,275	0,196	0,266	0,191	0,147	0,154	0,200	0,149	0,166
EDEP12	0,326	0,129	**0,688**	0,212	0,292	0,295	0,177	0,423	0,193	0,379	0,225	0,208	0,271	0,351	0,278	0,231
EDEP13	0,276	0,145	**0,822**	0,218	0,269	0,284	0,159	0,400	0,199	0,328	0,235	0,195	0,227	0,335	0,236	0,260
EDEP14	0,320	0,122	**0,851**	0,144	0,270	0,315	0,208	0,493	0,254	0,375	0,214	0,129	0,250	0,377	0,286	0,322
EDEP15	0,292	0,134	**0,864**	0,164	0,263	0,293	0,186	0,494	0,211	0,369	0,245	0,112	0,224	0,342	0,252	0,272
EDEP18	0,365	0,183	**0,863**	0,204	0,326	0,361	0,250	0,472	0,246	0,352	0,301	0,204	0,289	0,360	0,346	0,315
EDEP3	0,421	0,326	0,234	**0,843**	0,415	0,472	0,500	0,226	0,419	0,287	0,472	0,311	0,299	0,342	0,387	0,334
EDEP4	0,470	0,309	0,291	**0,834**	0,441	0,505	0,465	0,236	0,400	0,283	0,539	0,306	0,391	0,393	0,465	0,351
EDEP5	0,481	0,362	0,214	**0,820**	0,473	0,503	0,571	0,198	0,359	0,188	0,592	0,314	0,353	0,362	0,460	0,319
EDEP6	0,295	0,334	0,102	**0,814**	0,381	0,346	0,490	0,116	0,315	0,118	0,391	0,340	0,225	0,194	0,289	0,174
EDEP8	0,292	0,353	0,142	**0,825**	0,387	0,342	0,507	0,136	0,297	0,171	0,400	0,359	0,222	0,189	0,285	0,176
ESM1	0,613	0,607	0,254	0,518	**0,829**	0,645	0,573	0,263	0,322	0,203	0,567	0,419	0,513	0,458	0,633	0,377
ESM2	0,337	**0,845**	0,110	0,350	0,506	0,357	0,458	0,087	0,177	0,072	0,427	0,157	0,305	0,222	0,374	0,182
ESM3	0,368	**0,876**	0,177	0,363	0,527	0,398	0,463	0,109	0,189	0,102	0,437	0,197	0,322	0,266	0,417	0,210
ESM4	0,296	**0,817**	0,150	0,317	0,418	0,322	0,399	0,069	0,219	-0,006	0,393	0,226	0,274	0,211	0,332	0,199
ESM5	0,617	0,526	0,253	0,421	**0,855**	0,688	0,497	0,276	0,330	0,212	0,572	0,412	0,538	0,448	0,623	0,413
ESM6	0,731	0,414	0,291	0,427	**0,840**	0,725	0,530	0,368	0,436	0,281	0,521	0,423	0,642	0,591	0,705	0,536
ESM7	0,748	0,405	0,349	0,404	**0,846**	0,729	0,512	0,415	0,481	0,331	0,538	0,425	0,632	0,627	0,715	0,548
ESM8	0,709	0,496	0,304	0,403	**0,905**	0,778	0,531	0,325	0,311	0,181	0,563	0,457	0,647	0,537	0,730	0,491
IQLDE1	0,863	0,298	0,343	0,435	0,704	**0,878**	0,504	0,465	0,477	0,348	0,577	0,480	0,749	0,712	0,782	0,677
IQLDE2	0,752	0,265	0,307	0,469	0,680	**0,823**	0,454	0,402	0,513	0,306	0,521	0,471	0,631	0,581	0,679	0,534
IQLDE3	0,629	0,275	0,212	0,448	0,525	**0,684**	0,480	0,383	0,362	0,247	0,519	0,395	0,577	0,542	0,601	0,507
IQLDE4	0,560	0,223	0,248	0,351	0,513	0,573	0,408	0,307	0,418	0,233	0,529	**0,939**	0,399	0,379	0,475	0,372
IQLDE5	0,472	0,209	0,174	0,385	0,465	0,507	0,416	0,256	0,402	0,186	0,542	**0,955**	0,326	0,321	0,414	0,291
IQLDEE2	0,459	0,212	0,170	0,380	0,438	0,492	0,419	0,235	0,485	0,174	0,531	**0,945**	0,292	0,277	0,385	0,279
IQLECEC10	0,741	0,422	0,318	0,397	0,825	**0,816**	0,527	0,366	0,331	0,199	0,584	0,454	0,653	0,573	0,733	0,520
IQLECEC2	0,822	0,356	0,328	0,375	0,731	**0,873**	0,519	0,370	0,467	0,226	0,541	0,484	0,726	0,649	0,748	0,578
IQLECEC3	0,778	0,393	0,312	0,406	0,767	**0,883**	0,581	0,349	0,461	0,205	0,592	0,485	0,703	0,605	0,744	0,548
IQLECEC4	0,790	0,278	0,353	0,364	0,641	0,809	0,462	0,437	0,499	0,291	0,472	0,366	0,730	0,653	0,694	0,631
IQLECEC5	0,618	0,506	0,267	0,498	0,600	0,638	**0,811**	0,278	0,322	0,267	0,798	0,399	0,539	0,448	0,630	0,452
IQLECEC6	0,388	0,418	0,139	0,584	0,478	0,482	**0,860**	0,158	0,319	0,181	0,496	0,342	0,338	0,257	0,373	0,309

	DE	ECC	EED	EEP	EN	IQLDE	IQLEC	IQLEG	IQLEHF	IQLEHP	IQLEL	IQLEW	UIU	UMA	US	USSC
IQLECEC7	0,379	0,335	0,169	0,427	0,417	0,477	**0,794**	0,157	0,385	0,179	0,424	0,326	0,311	0,258	0,352	0,257
IQLECEC9	0,787	0,376	0,320	0,462	0,709	**0,857**	0,573	0,418	0,481	0,302	0,625	0,414	0,769	0,681	0,775	0,638
IQLECECE5	0,606	0,335	0,279	0,485	0,635	**0,741**	0,583	0,330	0,484	0,267	0,572	0,506	0,489	0,432	0,555	0,451
IQLECECE6	0,636	0,369	0,297	0,453	0,596	**0,782**	0,586	0,301	0,470	0,252	0,554	0,458	0,575	0,501	0,598	0,434
IQLECECE7	0,612	0,448	0,257	0,455	0,629	**0,782**	0,644	0,274	0,499	0,192	0,579	0,456	0,539	0,469	0,580	0,426
IQLEG1	0,431	0,050	0,485	0,186	0,331	0,426	0,212	**0,891**	0,281	0,443	0,302	0,254	0,345	0,466	0,378	0,374
IQLEG2	0,456	0,085	0,481	0,190	0,377	0,429	0,235	**0,934**	0,290	0,449	0,321	0,267	0,386	0,444	0,418	0,394
IQLEG3	0,467	0,098	0,504	0,214	0,373	0,444	0,240	**0,957**	0,269	0,408	0,316	0,274	0,368	0,485	0,414	0,373
IQLEGE3	0,425	0,097	0,527	0,190	0,330	0,401	0,215	**0,947**	0,255	0,456	0,287	0,248	0,334	0,453	0,378	0,327
IQLEGE4	0,464	0,160	0,535	0,263	0,381	0,439	0,261	**0,938**	0,275	0,410	0,337	0,273	0,355	0,475	0,415	0,351
IQLEH1	0,585	0,218	0,282	0,433	0,460	0,609	0,436	0,318	**0,916**	0,435	0,508	0,447	0,490	0,472	0,470	0,425
IQLEH2	0,490	0,208	0,244	0,340	0,397	0,510	0,336	0,260	**0,938**	0,398	0,390	0,397	0,421	0,416	0,391	0,394
IQLEH3	0,504	0,205	0,259	0,399	0,386	0,500	0,356	0,250	**0,926**	0,411	0,404	0,456	0,351	0,404	0,380	0,369
IQLEH4	0,341	0,186	0,176	0,383	0,301	0,364	0,343	0,203	**0,781**	0,347	0,337	0,324	0,260	0,254	0,264	0,265
IQLEH5	0,310	0,071	0,371	0,238	0,267	0,287	0,246	0,373	0,439	**0,897**	0,261	0,186	0,271	0,383	0,283	0,278
IQLEH6	0,295	0,049	0,406	0,260	0,253	0,269	0,231	0,437	0,349	**0,913**	0,274	0,196	0,258	0,396	0,292	0,296
IQLEH7	0,369	0,047	0,425	0,222	0,283	0,344	0,248	0,431	0,456	**0,930**	0,283	0,215	0,328	0,443	0,332	0,361
IQLEH8	0,282	0,089	0,396	0,223	0,225	0,258	0,230	0,458	0,390	**0,925**	0,270	0,171	0,241	0,361	0,268	0,304
IQLEL1	0,593	0,436	0,236	0,551	0,565	0,603	0,651	0,302	0,429	0,300	**0,934**	0,506	0,499	0,430	0,585	0,379
IQLEL2	0,647	0,493	0,269	0,567	0,607	0,658	0,697	0,315	0,463	0,252	**0,958**	0,576	0,509	0,444	0,613	0,422
IQLEL3	0,672	0,468	0,337	0,530	0,651	0,673	0,692	0,329	0,421	0,289	**0,932**	0,509	0,536	0,487	0,665	0,460
UDE1	**0,920**	0,306	0,339	0,409	0,683	0,828	0,487	0,480	0,532	0,352	0,570	0,457	0,735	0,756	0,783	0,692
UDE11	**0,937**	0,340	0,388	0,424	0,756	0,847	0,512	0,456	0,490	0,323	0,595	0,425	0,782	0,795	0,821	0,714
UDE2	**0,834**	0,406	0,316	0,492	0,728	0,767	0,589	0,398	0,473	0,289	0,768	0,582	0,586	0,595	0,746	0,545
UDE5	**0,914**	0,378	0,337	0,447	0,719	0,802	0,519	0,424	0,498	0,309	0,588	0,467	0,653	0,702	0,753	0,598
UDE6	**0,904**	0,366	0,303	0,398	0,721	0,808	0,520	0,407	0,476	0,278	0,556	0,463	0,679	0,686	0,763	0,591
UIU1	0,804	0,337	0,310	0,327	0,676	0,791	0,475	0,398	0,485	0,304	0,528	0,400	**0,878**	0,694	0,755	0,610
UIU2	0,462	0,217	0,237	0,334	0,391	0,500	0,397	0,279	0,284	0,267	0,396	0,154	**0,743**	0,472	0,511	0,550
UIU4	0,526	0,292	0,164	0,222	0,575	0,603	0,319	0,228	0,245	0,147	0,379	0,277	**0,789**	0,475	0,626	0,449
UMA1	0,539	0,164	0,359	0,190	0,414	0,470	0,223	0,404	0,251	0,372	0,293	0,164	0,497	**0,814**	0,512	0,539
UMA2	0,796	0,292	0,345	0,389	0,646	0,748	0,446	0,449	0,445	0,357	0,510	0,395	0,705	**0,904**	0,755	0,702

	DE	ECC	EED	EEP	EN	IQLDE	IQLEC	IQLEG	IQLEHF	IQLEHP	IQLEL	IQLEW	UIU	UMA	US	USSC
UMA3	0,706	0,255	0,402	0,351	0,548	0,639	0,369	0,458	0,440	0,420	0,440	0,319	0,603	**0,915**	0,625	0,662
US1	0,856	0,333	0,329	0,379	0,705	0,802	0,467	0,446	0,431	0,297	0,544	0,425	0,764	0,766	**0,886**	0,682
US10	0,739	0,397	0,285	0,402	0,648	0,722	0,504	0,369	0,338	0,282	0,597	0,353	0,700	0,653	**0,909**	0,570
US4	0,765	0,402	0,302	0,424	0,721	0,763	0,538	0,365	0,400	0,302	0,612	0,396	0,709	0,620	**0,909**	0,589
US5	0,734	0,418	0,285	0,446	0,686	0,719	0,504	0,363	0,283	0,265	0,573	0,364	0,719	0,637	**0,923**	0,580
US7	0,766	0,434	0,276	0,403	0,749	0,762	0,528	0,366	0,386	0,283	0,605	0,390	0,730	0,655	**0,912**	0,583
US8	0,770	0,457	0,299	0,454	0,781	0,759	0,571	0,407	0,434	0,297	0,640	0,448	0,681	0,624	**0,890**	0,591
US9	0,768	0,422	0,269	0,388	0,778	0,755	0,497	0,347	0,422	0,282	0,600	0,442	0,694	0,621	**0,892**	0,532
USE1	0,808	0,364	0,345	0,448	0,707	0,798	0,526	0,442	0,417	0,321	0,618	0,443	0,762	0,695	**0,928**	0,656
USSC1	0,567	0,141	0,322	0,241	0,430	0,521	0,294	0,372	0,372	0,289	0,315	0,266	0,502	0,658	0,507	**0,834**
USSC3	0,662	0,202	0,323	0,251	0,509	0,606	0,348	0,350	0,404	0,302	0,377	0,294	0,581	0,688	0,622	**0,910**
USSC4	0,550	0,206	0,247	0,274	0,447	0,556	0,391	0,252	0,304	0,249	0,390	0,279	0,583	0,559	0,546	**0,856**
USSC5	0,569	0,236	0,227	0,362	0,469	0,560	0,407	0,341	0,306	0,305	0,427	0,285	0,586	0,542	0,548	**0,766**

Source: made by the author

Table 42. Discriminant validity of latent variable on first level - the Fornell-Larcker criterion

	DE	ECC	EED	EEP	EN	IQLDE	IQLEC	IQLEG	IQLEHF	IQLEHP	IQLEL	IQLEW	UIU	UMA	US	USSC
DE	**0,903**															
ECC	0,396	**0,846**														
EED	0,374	0,173	**0,794**													
EEP	0,479	0,407	0,242	**0,827**												
EN	0,799	0,574	0,339	0,509	**0,855**											
IQLDE	0,899	0,426	0,373	0,529	0,834	**0,814**										
IQLEC	0,580	0,521	0,242	0,613	0,619	0,660	**0,822**									
IQLEG	0,481	0,105	0,542	0,224	0,384	0,458	0,250	**0,934**								
IQLEHF	0,547	0,229	0,274	0,436	0,438	0,565	0,414	0,293	**0,892**							
IQLEHP	0,344	0,070	0,436	0,257	0,281	0,318	0,261	0,463	0,448	**0,916**						
IQLEL	0,678	0,496	0,299	0,584	0,646	0,686	0,723	0,335	0,465	0,297	**0,941**					
IQLEW	0,527	0,227	0,210	0,392	0,500	0,555	0,438	0,282	0,459	0,210	0,564	**0,946**				
UIU	0,765	0,356	0,301	0,364	0,694	0,801	0,498	0,383	0,435	0,301	0,547	0,360	**0,805**			
UMA	0,786	0,276	0,417	0,363	0,621	0,718	0,405	0,498	0,442	0,433	0,482	0,346	0,694	**0,879**		
US	0,857	0,444	0,330	0,461	0,796	0,840	0,570	0,429	0,430	0,322	0,660	0,450	0,795	0,729	**0,906**	
USSC	0,699	0,233	0,333	0,333	0,552	0,667	0,426	0,390	0,413	0,340	0,447	0,334	0,668	0,728	0,661	**0,843**

Source: made by the author

Table 43. Standardized factor loadings and cross loadings of latent variable on first level

	EMPOWER	IQL	USE
EN	**0,888**	0,770	0,787
US	0,738	0,767	**0,919**
EED	**0,521**	0,424	0,380
EEP	**0,743**	0,621	0,454
UDE	0,741	0,834	**0,933**
UIU	0,623	0,691	**0,882**
UMA	0,596	0,666	**0,880**
ECC	**0,720**	0,449	0,391
USSC	0,523	0,612	**0,830**
IQLDE	0,783	**0,883**	0,890
IQLEC	0,701	**0,783**	0,564
IQLEG	0,421	**0,571**	0,491
IQLEL	0,711	**0,841**	0,643
IQLEW	0,480	**0,692**	0,461
IQLEHF	0,484	**0,703**	0,512
IQLEHP	0,342	**0,522**	0,388

Source: made by the author

Table 44. Discriminant validity of latent variable on second level - the Fornell-Larcker criterion

Latent variable on second level	EMPOWERMENT	IQL	USE
EMPOWERMENT	**0,730**		
IQL	0,807	**0,724**	
USE	0,733	0,810	**0,889**

Source: made by the author

12.5.4.3. Structural Model of e-inclusion

In order to identify latent variable that contribute to *e-inclusion* and relationship between them the research model that present latent variable and assumed theoretical relationship based on theory and logic with hypotheses is developed and presented in Figure 14. As cane be seen from Figure 14 the first latent variable *access* is independent and a starting point because it is the main prerequisite for *e-inclusion*. Latent variable *access* is defined as formative and in the context of e-inclusion *access* is related to ICT in terms of physical and material access, as well

as access to the Internet which is a necessary condition for the use of ICT. Between latent variables *access* and latent variables *use* a positive relationship is assumed. Latent variable *use* is also another equally important variable because it is a prerequisite for *individual empowerment* and *impact on individual quality of life*. Latent variable *use* is defined as reflective and in the context of e-inclusion refers to the use of ICT and the Internet and the possibilities and desires that individuals use technology they have access to. Since the latent variable *u*se presents a precondition for latent variables *empowerment* and *impact of ICT and the Internet on the quality of life of individuals*, between the latent variables *use* and latent variables *empowerment* and *impact of ICT and the Internet on the quality of life* have also assumed a positive relationship. Latent variables *empowerment* and *impact of ICT and the Internet on the quality of life* are also defined as reflective variables. Reflective latent variable *impact on quality of life* in the context of e-inclusion can be identified several areas: economic area, educational area, employment and labour area, health area, government interaction, cultural, communicative and entertainment area which is intended to measure through the supply and demand of e-services. Reflective latent variable *empowerment* in the context of *e-inclusion* means increasing the capacity of citizens, businesses and other organisations to be pro-active in society through the use of new technological tools. *Empowerment* also means that governments should provide easy access to public information, improve transparency and allow effective involvement of citizens and businesses in the policy making process. As the last relationship that has been established and wants to be additionally investigate in this study is relationship between latent variables *empowerment* and latent variables *impact on quality of life* and it was assumed positive relationship from latent variables *empowerment* toward latent variables *impact on quality of life.* As this relationship has not yet been empirically tested, empirical evidence of the existence of this relationship represents a specific scientific contribution of this study. According to the previously described established relationship between latent variables following four hypotheses that constitute the proposed research model was defined:

H_{11} Latent variables *access* positively influence latent variables *use*.

H_{12} Latent variables *use* positively influence latent variables *empowerment*.

H_{13} Latent variables *use* positively influence latent variables *impact on quality of life*.

H_{14} Latent variables *empowerment* positively influence latent variables *impact on quality of life.*

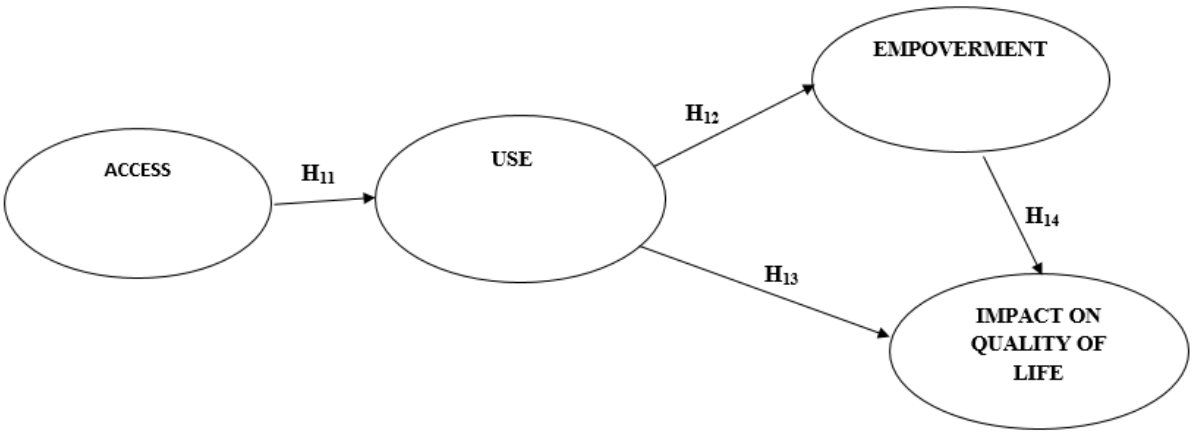


Figure 14. Research model
Source: made by the author

In the continuation results the evaluation of the proposed *structural model of e-inclusion* are presented.

12.5.4.3.1. Evaluation of the Structural Model

After having determined the adequacy of the measurement models, the quality of structural model was explored by means of endogenous latent variables' determination coefficient, the key criteria for assessing the structural model in PLS-SEM are the significance of the path coefficients, the level of the R^2 values, the f^2 effect size, the predictive relevance (Q^2), and the q^2 effect size. R^2 measures in PLS-SEM is primary evaluation criteria because the goal of the prediction-oriented PLS‑SEM approach is to explain the endogenous latent variables' variance, consequently the key target constructs' level of R^2 should be high. The R^2 value ranges from 0 to 1, higher levels of R^2 indicating higher levels of predictive accuracy. The judgment of what R^2 level is acceptable significantly depends on the specific research discipline (Colton, Bower; 2002). According to Hair et al. (2014, p. 175) R^2 values of 0.75, 0.50, or 0.25 for endogenous latent variables in the structural model can, as a rule of thumb, be described as substantial, moderate, or weak, respectively. To evaluate whether the omitted construct has a substantive impact on the endogenous construct change in the R2 value when a specified exogenous construct is omitted from the model can be used. This measure is referred to as effect size (f^2). The effect size (f^2) refers to the change in the endogenous latent variable's determination coefficient. Values for f^2 of 0.02, 0.15, or 0.35 indicate that exogenous latent variable has small,

medium, or large influence on endogenous latent variable, respectively (for more about effect size see Hair at.al, 2014, p. 177-178).

In order to explore model's predictive relevance the non-parametric Stone's and Geisser's cross-validated redundancy measure Q^2 was used. Stone–Geisser's Q^2 postulates that the model must be able to adequately predict each endogenous latent construct's indicators (Geisser 1974; Stone 1974). The Q^2 value in this study is obtained by using a blindfolding procedure for a certain omission distance D (for more about blindfolding procedure see Hair et al., 2014, p. 178-180). If an endogenous construct's cross-validated redundancy measure value (i.e., Q^2) for a certain endogenous latent variable is larger than zero, its explanatory latent constructs exhibit predictive relevance. Changes in Q^2 reflect the exogenous latent variables' relative impact (q^2) in predicting the observed measures of an endogenous latent variable. According to Henseler et al., q^2 values of 0.02, 0.15, or 0.35 signify weak, moderate, or substantial predictive relevance of a certain exogenous latent variable.

With an objective to examine the hypothesized associations among latent variables in the research framework, the evaluation of path coefficients' goodness was carried out. The individual path coefficients of the PLS structural model can be interpreted as standardized beta coefficients of ordinary least squares regressions. The significance of path coefficients was tested by means of asymptotic one-tailed t-statistics derived from a bootstrapping resampling procedure (for more about bootstrapping resampling procedure see Hair et al, 2014, p. 130-136). The number of bootstrap samples was 5.000 while the number of cases was equal to the sample size (N=427).

12.5.4.3.1.1. Results for Structural Model evaluation criteria

Figure 15. presents the results of estimated coefficients and their significance in the research model, graphical representation includes standardized path coefficients, t values, and variance explained for each equation in the hypothesized model. As cane be see from Figure 15. values determination coefficient R2 structural part of the model of e-inclusion range from a minimum of 0,552 to 0,809 maximum. As in the previous chapter was mentioned according to Hair et al. (2014, p. 175) R^2 values of 0.75, 0.50, or 0.25 for endogenous latent variables in the structural model can, as a rule of thumb, be described as substantial, moderate, or weak, respectively.

Table 45. Results of testing the hypotheses, effect size, and predictive validity of Structural Model

Hypotheses	**β**	**t-value**	**p-value**	**Supported**	**f^2**	**q^2**
H_{11}. ACCESS → USE	0,899	87,0169	***	Yes	4,249	4,126
H_{12}.USE→ EMPOWERMENT	0,742	40,7994	***	Yes	1,231	1,216
H_{13}. USE → IMPACT ON QUALITY OF LIFE	0,563	16,5805	***	Yes	0,669	0,621
H_{14}. EMPOWERMENT→IMPACT ON QUALITY OF LIFE	0,385	10,0075	***	Yes	0,312	0,284

* p <0.05, ** p < 0.01, *** p< 0.001

Source: made by the author

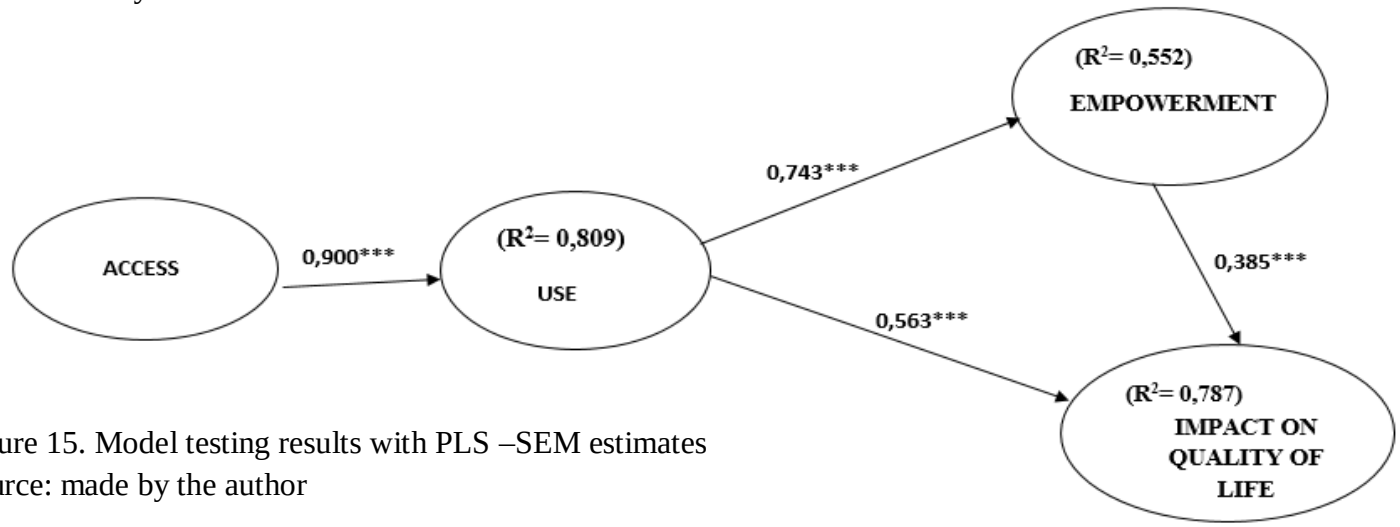


Figure 15. Model testing results with PLS –SEM estimates

Source: made by the author

In the proposed empirically validated model 80.90% of variance in latent variable use was explained latent variable access, 55.20% of variance in empowerment was accounted for by latent variable use, while 78.70% of variance in latent variable *impact on quality of life* was explained by two use and latent variables *empowerment*. Considering the set forth, predictors of *use* and *impact on quality of life* have substantial explanatory power whereas predictor of latent variable empowerment have moderate explanatory power. From previous results it can be seen that all R^2 values are greater than from recommended value of 0.1 (Falk and Miller,1992) therefore, it was appropriate to examine the significance of the path associated with predicted variables.

With an objective to examine the hypothesized associations among latent variables in the research framework, the evaluation of path coefficients' goodness was carried out. The significance of path coefficients was tested by means of asymptotic one-tailed t-statistics derived from a bootstrapping resampling procedure. The number of bootstrap samples was 5.000 while the number of cases was equal to the sample size (N=427).

Results of hypotheses testing are shown Table 45. Consistent with the expectation it was found that latent variable access ($\beta = 0.899$, $p < 0.001$) significantly contribute to the latent variable *use* and has the largest total effect (0.899) thus providing support for H_{11}. Data analysis also revealed that *use* ($\beta = 0.7428$, $p < 0.001$) significantly affect on latent variables *empowerment* and have total effect 0.743, thereby supporting hypotheses $H1_{2,}$ results also show that latent variable *access* have indirect effect (0.668) on *empowerment* via the mediating latent variable *use*.

The results also indicate that latent variable *use* ($\beta = 0.5635$, $p < 0.001$) were found to have significant impact on *impact on quality of life* and second largest total effect (0.849) that demonstrating support for hypotheses H_{13}. The results also show a large indirect effect latent variable *access* (0.764) on endogenous latent variable *impact on quality of life*, which is also consistent with the expectation considering that is *access* with the *use* one of the basic prerequisite for the *impact on quality of life* and the *empowerment* of individuals through ICT and Internet technologies. Finally, it appeared that latent variable *empowerment* ($\beta = 0{,}385$, $p < 0.001$) have significant impact on latent variable *impact on quality of life* with total effect 0.3846 thus confirming the hypothesis H_{14}.

The effect size (f^2) refers to the change in the endogenous latent variable's determination coefficient. As has been mentioned the previous chapter values for f^2 of 0.02, 0.15, or 0.35 indicate that exogenous latent variable has small, medium, or large influence on endogenous latent variable, respectively. As reported in the sixth column of Table 45, *access* strongly affects (f^2 = 4.249) *use* whereas *use* also strongly affects (f^2 = 1.231) on endogenous latent variable *empowerment*. While *use* (f^2 = 0.669) has strongly influence on *impact on quality of life*. Finally, the effect of *empowerment* on *impact on quality of life* turned out to be medium (f^2 = 0.312).

The predictive validity of exogenous latent variables was explored by means of the non-parametric Stone's and Geisser's cross-validated redundancy measure Q^2. As was mentioned previously q^2 values of 0.02, 0.15, or 0.35 signify weak, moderate, or substantial predictive relevance of a certain exogenous latent variable.

Considering the data presented in the last column of Table 45, exogenous latent variable access has substantial relevance (q^2 = 4.126) in predicting endogenous latent variable *use* while *use* has also substantial relevance (q^2 = 1.216) in predicting endogenous latent variable *empowerment*. In addition, *use* have substantial relevance (q2 = 0.621) in predicting *impact on quality of life*. Finally, the relevance of endogenous latent variable *empowerment* (q2 = 0.284) in predicting endogenous latent variable *impact on quality of life* have moderate relevance. As shown in Table 45, values of f^2 and q^2 which indicate effect size and predictive validity of *access* and *use* and also *use* and *empowerment* are higher than 1. This is because latent variable *access* as well as latent variable *use* have only one predictor, they serve as single predictors of endogenous variables the are related to.

In order to additionally test the significance of the relationship between the latent variables *empowerment* and latent variables *impact on quality of life* correlation analysis was performed, used both, parametric method Pearson correlation and nonparametric method Spearman's rho. Both methods have given similar results. From the results of both performed analysis can be concluded that there was a positive correlation between latent variable impact on quality of life and latent variables empowerment (Pearson correlation r = 0.814, n = 427, p = 0.000; Spearman's rho r = 0.822, n = 427, p = 0.000).

Table 46. The results of correlation analysis using Pearson correlation method between latent variable *impact on quality of life* and latent variables *empowerment*

Correlations		
Pearson correlation	Impact on quality of life	Empowerment
Impact on quality of life	1	0,814**
Sig. (2-tailed)		0,000
N	427	427
Empowerment	0,814**	1
Sig. (2-tailed)	0,000	
N	427	427
** Correlation is significant at the 0.01 level (2-tailed).		

Source: made by the author

Table 47. The results of correlation analysis using Spearman's rho correlation method between latent variable *impact on quality of life* and latent variables *empowerment*

Correlations		
Spearman's rho correlation	Impact on quality of life	Empowerment
Impact on quality of life	1	0,822**
Sig. (2-tailed)		0,000
N	427	427
Empowerment	0,822**	1
Sig. (2-tailed)	0,000	
N	427	427
** Correlation is significant at the 0.01 level (2-tailed).		

Source: made by the author

By using verification of significant correlation of relationship between the latent variable *empowerment* and the latent variable *impact of ICT and the Internet on the quality of life*, one can interpret that, when and if individuals / groups / communities use ICT and the Internet with purpose of participating, networking and taking part in the processes of decision making, they will probably also use the e-services with purpose of improving one's quality of life.

After the empirical validation of the measurement part and the structural part of the model and the confirmation of the significance of relationship, final multivariate model of e-inclusion consists of 4 latent variables second level (category) and 20 latent variables (attributes) on first level that measure latent variables second level (categories), and from 84 manifest variables which directly measure latent variables on the first level (attributes). Identified latent variables of the first level of multidimensional model of e-inclusion (categories) are: *access, use, impact on quality of life and empowerment*. The latent variable of second level *access* measure latent variables of the first level: material access, network, satisfaction with network and point of access. The latent variable of second level *use* measure latent variables of the first level: *intensity of use, skills, motivation/attitudes, social support / coercion, digital engagement*. The latent variable of second

level *impact on quality of life* measure latent variables of the first level: *e-learning, e-work, digital economy, e-health - frequency, e-health - perception, e-government and e-culture.* Finally latent variable of second level *impact on quality of life* measure latent variables of the first level: *e-participation, e-democracy, social computing - networking and social computing - content creation.*

13. AN ABRIDGED RESUME ON THE RESEARCH CONDUCTED, CONCLUSIONS AND RECOMMENDATIONS

Globalization of production, accelerated development and transpher of the new technologies, interaction regardless of geographical position or the time zone via information and communication technologies (ICT) and the Internet, accelerated and continuing expansion of digital market and mobile communications instigate the creation of the new and more efficient models of structures concerning organization and other social structures. The given examples clearly demonstrate that ICT and the Internet have come among the most important starters of growth and development, as well as of society altogether. Today, in times of great social and economic crises, the governments need to get significantly involved in order to overcome such crises in the shortest time period possible. One of the key roles of governments of all national economies should be constant work on defining and implementing such strategies whose primary goal is the implementation and use of ICT and the Internet in all spheres, economical as well as social. Over the last couple of years one has realized that government and non-government institutions of national as well as Croatia's economies take significant steps in order to provide citizens with possibilities of exploiting numerous advantages which are enabled by the use of ICT and the Internet. Nevertheless, alongside with all efforts being made, research has shown that each individual cannot equally benefit from all the advantages offered by ICT and the Internet, due to economical, geographical and other limiting factors. Thus, monitoring of movements of expansion and use, as well as identifying the target groups which are deprived of all rights, according to which the aims of these strategies should be defined and implemented has become very significant for the bearers of economical politics in the country and for those charged with creating strategies in the area of ICT and the Internet. Research alone connected to the creation of this doctor's thesis has begun with gathering relevant literature relevant to monitoring the movements of ICT and the Internet by using relevant and accessible data base such as Emerald Insight, Science Direct, Springer Link, Google Scholar, and Web of Science. With a more detailed inspection and analysis of accessible scientific and expert

research, it has been established that earlier phases of monitoring the ICT and the Internet expansion are focused solely on establishing the so-called digital divide“, i.e. the divide between the groups with and those without access to the most contemporary information and communication technologies, which is described in detail in chapter 9.1.

Further research has been focused on establishing the readiness of private business organizations as well as government and non-government institutions for the implementation of ICT and the Internet by creating a series of indicators and models, which resulted with the term *e-readiness*. Due to growing complexity, such concepts, the so-called *binary models*, *digital divide* and *e-readiness*, which explore this phenomenon by using only two aspects, they do not ignore only the rest of models, but they also ignore all the remaining existing, but not established differences. Moreover, regarding the fact that with time numerous research have confirmed the great connection between using ICT and the Internet and social inclusion/exclusion (more details about this in chapter 11.2.), such complex phenomenon regards also an approach with more aspects, thus further research has stated the term e-inclusion as the more appropriate one. According to European Commission, e-inclusion relates solely to information society, i.e. information society for all“. European consultative group says that e-inclusion, in its essence, represents social inclusion of individuals in information society, which results with the fact that the access level and the level of using ICT represents a significant prerequisite for strengthening individual capabilities of individuals for the participation in the most various spheres of social and business areas. European Commission has, within the last ten years, given great importance to the development and implementation of strategies of e-inclusion for all member countries of European Union, which Croatia has also become since July 1, 2013. The proof of this is a series of declarations and strategies connected to this process on the level of European Union, which is described in more details in chapter 8. A growing number of information significant for the lives of all individuals today are accessible in digital format via ICT and the Internet, thus one asks a question on what happens to the individuals who, for whatever reason, do not have access to ICT and the Internet, that is necessary skills for their use. In case there is a vast majority of such individuals, one creates the so-called *computerized country*, but not the information society. This is the reason which led to conclusion that it would be of great benefit to explore the current state of e-inclusion in districts/regions in Croatia, with regard to the fact that such research has not been conducted yet. The necessity for the implementation of such research was reflected in the fact that Croatia has not

got the completed national strategy of e-inclusion, and that in 2010, alongside with Macedonia, Lichtenstein and Iceland, it was one of future member countries which has not submitted the report on e-inclusion. By studying relevant and accessible literature in the area of e-inclusion, one has noticed a series of defects, and among them the most important ones are: insufficient operationalization of this term which results in problem of an insufficient number of identified indicators, as well as data gathered, while the existing developed models and conceptual frameworks do not comprise all aspects of e-inclusion. The great majority of them, as well as along with previously mentioned models of digital divide and e-readiness, focus solely on measuring access and use of ICT, which is insufficient for monitoring such a complex phenomenon. The result is that movements and changes, as well as efficiency of conducted politics related to this constantly growing phenomenon, can only be partly explained and monitored. In order to remove this defect, one has come to an idea of creating a multi-perspective, multi-methodological and multi-dimensional approach in monitoring e-inclusion by developing an universally general model of e-inclusion which will contain all relevant categories, attributes and indicators which will enable gathering data with the purpose of establishing the current state. The multi-perspective approach enables gathering data which relate to factors which have influence on e-inclusion (economical, demographical, social, cultural); multi-methodological access which demands the use of a series of qualitative and quantitative techniques and tools would contribute to creating a data bank which would also reflect all eventual changes and possibilities of creating necessary analyses for monitoring the current state, as well as identifying potential target groups to which the aims of e-inclusion strategies should be directed. Defining the multi-dimensional model of e-inclusion would provide useful data to creators of the national strategy and politics connected to e-inclusion and provide with accurate and detailed assessment of development movements of information society. In the endeavor of creating a measurement instrument with help of which one will gather all relevant data, one has set off to identifying principally relevant categories followed by attributes, indicators and particles related to the term of *e-inclusion*. As the most important categories related to the term of *e-inclusion*, one includes *access to ICT and the Internet*, *use of ICT and the Internet and impact on the quality of life of the individual* and *individual empowerment*. The identified attributes constituting the *access* component are: *material access and network*, *affordability* and *point of access*. The category of *use* comprises following concepts: *intensity of use*, *skills*, *motivation attitudes*, *social support or coercion* and *digital engagement*. The attributes *e-learning*,

e-health, e-government, digital economy (*e-employment and labour, e-commerce, e-banking, e-entertainment, e-communication*), and *e-culture* form part of category *impact of ICT and the Internet on the quality of life*. For the last category, *empowerment*, one has identified the following concepts: *e-democracy and e-participation* and *Social Computing*, which includes *User Created Content and networking*. Among the rest, it was also necessary to identify all relevant *demographic, social, economical* and *cultural factors* with influence on *e-inclusion*. Among the *demographic* and *cultural factors*, one has separated the following: *age, gender, household structure, language, knowledge, traditions, skills, digital literacy, membership in organizations (religious, political, non-profit) and ethnicity*. The identified *social* and *economical factors* are: *employment, income level, family assets situation, level of education, geographical location, place of residence* and *disability*. Defining all relevant categories, attributes, as well as influential factors has enabled the identification of all relevant indicators and items, the base of which was previous research, and regarding some categories, especially the category of *empowerment*, one has not found the indicators. The author has individually and with mentor's recommendation created the indicators and items of monitoring. After a detailed conceptualization of the term *e-inclusion*, it became possible to create the initial theoretically conceptual general model of e-inclusion. By defining models one has restored connections between main categories and attributes and hereby created structural and measuring part of the model presented in chapter 12.2. The *access* category has been defined as a formative latent variable, while all other categories (*use, the impact of ICT on the quality of life* and *empowerment*) have been defined as reflective latent variables. The presumed connections between latent variables in the general conceptual model of e-inclusion have been established in a way that the latent variable *access* is a necessary prerequisite which positively influences the latent variable *use*, then the latent variable *use* is a necessary prerequisite and positively influences the latent variable *empowerment* and *the impact of ICT and the Internet on the quality of life.* Among the rest, in the complex of validation of such a set up theoretically-conceptual framework, one wished to examine the existence of a connection between the latent variable *empowerment* and the latent variable *the impact of ICT and the Internet on the quality of life*, therefore there is a presupposed positive connection from the latent variable *empowerment* to the latent variable *the impact of ICT and the Internet on the quality of life*. After theoretically identifying all the main categories and attributes of e-inclusion and defining the initial theoretical conceptual model, the definition of *e-inclusion* for the requirement of this research has been

provided. *"E-inclusion can be defined as inclusion of individuals/groups/communities in the information society in the way that everyone has equal opportunities of access and use of ICT and the Internet with the purpose of improving one's quality of life and actively participating in creating new social and technological systems."* For the purpose of validating the defined theoretical conceptual model of e-inclusion and verifying defined established connections between latent variables, in the step further one has created the measuring instrument (questionnaire). The initially created instrument had two parts. The first part contained indicators connected to demographic, economical, social and cultural variables and it had 19 questions. The second part contained indicators and items representing manifest variables which were sorted according to identified categories and attributes which will serve for monitoring e-inclusion and in its initial version it contained 184 questions. The measuring instrument contained questions of a closed type with multiple-choice questions with numerating and it offered answers of intensity and for each question there was the condition of choosing only one possible answer. The initial version of a measuring instrument was then validated according to its content by carefully elected experts in the field of e-inclusion. There were entirely twelve experts who took part in content validation. According to all recommendations given by the experts, one has executed qualitative improvement of indicators and items in the sense of changing sentence constructions, grammar, combining one or multiple indicators into one, separating certain indicators etc., there were 32 indicators re-formed all together. By using quantitative analysis of content validity and with help of two empirical indicators, Content Validity Ration (CVR) and averaged value of relative importance, number of indicators was reduced to 117, while number of attributes was reduced only by one. The experts taking part in the validation did not consider the attribute *affordability*, as well as indicators related to it to be influential and significant for the description and measuring the latent *access* category. Content validity was prerequisite for creating the measuring instrument for the pilot research. The pilot research was conducted on an convenience sample of respondents in an age group of 18 or older (friends, relatives, family members, students, fellow-employees) by using non-parametric snowball sampling method. Data gathering for pilot research lasted from mid-June to mid-September 2014. An online questionnaire was created for the purpose of pilot research which was sent via social network (Facebook), e-mails and e-learning system of Faculty of Organizations and Informatics Varaždin to potential respondents. All potential respondents were politely asked to fill out the questionnaire, but also to forward the same questionnaire to other potential respondents of

age groups of 18 or more, acting at one's best judgement. 331 respondents took part in the pilot research, but only 197 respondents filled out the questionnaire completely and without making mistakes, hence that number of respondents was taken into consideration in further data processing. In order to additionally reduce the number of manifest variables, the redundant variables were identified and removed and in order to initially empirically determine latent variables of the first and second level, the multi-variant method of factor analysis was used. After conducting factor analysis, the number of manifest variables was reduced by 26. Prior to final creation of the measuring instrument (questionnaire) and conducting the main part of research, the reliability of the measuring instrument was measured based on internal consistency of Cronbach α coefficient for each initially identified latent category of the first level. All Cronbach α coefficients were satisfying (Cronbach $\alpha > 0.70$), which ensures the reliability of the measuring instrument, that is one can expect the same or similar measuring indicators while applying the same measuring instrument. Implementation of the main part of research was executed on a representative sample of Croatian citizens of age in Međimurje and Varaždin districts in December 2014 and January 2015. National Statistics Bureau of Croatia was hired to create the sample, research was financed with means of support of the University of Zagreb under guidance of Assistant Professor Renata Mekovec, PhD and associates Full Professor Goran Bubaš and a.o.univ.prof. Alexander Prosser PhD. Eleven qualified poll-takers were hired for the implementation of the questionnaire. There were 427 respondents who took part voluntarily; 286 from Međimurje district and 141 from Varaždin district. After gathering, making entries and additionally checking the entered data, one started with data analysis. Primarily with descriptive data analysis, then with analyzing significant differences between subgroups of respondents according to identified demographic, social, economical and cultural variables, with help of analysis variance method (ANOVA) and post-hoc comparisons methods. The analysis ended with validating measuring and structural model and testing the established hypotheses with help of structural modelling method, based on structural equation modelling partial least squares (PLS) technique, which confirmed the first hypothesis. While validating the measuring part of model, the validation was conducted especially for the formatively defined construct *access* and especially for reflectively defined constructs *use*, *impact of ICT and the Internet on the quality of life* and *empowerment*. After convergent validity was confirmed, collinearity among indicators and significance and relevance of outer weights of formative construct *access* tested and composite reliability, indicator reliability, convergent and

discriminant validity of reflective constructs confirmed, one started validating the structural part of the model. By validating the structural part of the model, one confirmed the significance of all established connections within the model, the positive connection between latent category *access* and latent category *use*, during which one has established that latent category *access* explains 80.09% of variance of latent category *use*. Positive connection between latent category *use* and latent category *empowerment* was confirmed and it was also confirmed that category *use* explains 55.20% of variance category *empowerment*. Moreover, positive connection between latent category *use* was confirmed, as well as latent category *empowerment* with latent category *impact of ICT and the Internet on the quality of life* with an explained variance of 78.70%. By substantiating the existence of a positive connection between latent category *empowerment* and latent category *impact of ICT and the Internet on the quality of life* by using the structural equation modelling partial least squares (PLS) technique, as well as additionally conducted correlation analysis, the result was the confirmation of the thirdly set hypothesis. One can use the analysis of results of the main part of research and possibly come to basic conclusions and provide answers for research questions asked at the beginning of this study and connected to access and use of ICT and the Internet, impact of ICT and the Internet on the quality of life, as well as to the role of the ICT and the Internet in empowering individuals/groups/communities and identifying target groups that need special attention in the process of creating further strategies connected to e-inclusion. Results connected to the category *access* indicate the satisfying structure of ICT and the Internet network access. 50.00% of respondents declared themselves that they own a desktop, 51.29% own a laptop, but most of them, no less than 353 (82.67%) of the total number (N=427) own some sort of mobile devices with possible Internet access. 70.02% of respondents have a fixed Internet network at home, and mobile connection is most *frequently* used by 179 of respondents, i.e. 41.92%. Nevertheless, regardless of having access made possible, only somewhat over 30% of respondents declared that they use these devices often or very often in order to access digital contents, while over 55.00%of respondents out of the total number (N=427) declared that they *do not use* these devices or on very rare occasions, in order to access digital contents. Perception of satisfaction of respondents by the quality of Internet network, as well as accessibility of Internet network has shown itself to be mediocre, regarding the fact that less than 50.00% of respondents declared themselves as being satisfied. Frequency of access according to place of access indicate dominance of access from home, merely over 25.00% of respondents access ICT and the Internet

often i.e. *very often* in their place of work, while the minimal access is from public institutions with cost-free access. Significant differences among the subgroups of respondents within the category access have been identified according to demographic variables according to age, household structure and marital status. Significant difference has not been confirmed only according to variable gender in category *access*. According to economical factors for the category of *access*, significant differences have been empirically confirmed according to *employment, the level of income* and *family asset situation*. According to *cultural* indicators, significant difference in category of *access* has been empirically confirmed according to *membership in a religious organization* and *knowledge of English in speech and writing*. With *cultural* variables in *access* category, no significant difference was confirmed according to *membership in a political party* and *membership in one/several non-profit organizations* (see Appendix 2). According to social factors for *access* category, significant difference was empirically proved with the *level of education* and *disability*, while the *place of residence* (urban, suburban, rural) did not demonstrate itself as significant. In order to increase ICT and the Internet access from home, many European countries, such as Poland, Romania, Belgium, Slovakia, Portugal, Great Britain, Greece, Italy and Germany have offered special privileges for ICT purchases for households with lower income, the disabled, pensioners, students (see Appendix 3). In category of *use*, according to *intensity of use*, data analysis shows that the greatest intensity of use is from home, while, like with the access category, the minimal intensity of use is in public institutions where access and use are cost-free. This is so because such places in public institutions mainly do not exist in Croatian urban and rural areas. According to personal experience of the author herself, even in public urban and rural libraries, even though one is a member, one has not got the right to access ICT and the Internet free of charge; the rule is that every hour of time spent online is being charged. Unlike other European countries, such as Spain, Latvia, Belgium, Cyprus, Bulgaria, Hungaria, Poland, Lithuania, Portugal, Germany and Austria, a series of public places have been open, in urban as well as in rural areas, where cost-free ICT and the Internet access is enabled (see Appendix 3). In the question about skills, according to one's own personal evaluation, a feeble level of knowledge of working on computer has been noticed, which is connected to equally feeble *digital engagement*, i.e. frequency of using ICT and the Internet for various business and private activities.

It is a surprising fact that more than 25% of the respondents, 108 of the total number (N=427) stated that they do not have the necessary skills for ICT and Internet usage. The reason for this lies within

the Croatian education system, which, for example, still does not have Computer Science as an obligatory subject, but as extracurricular, and there is a lack of free courses which would allow all citizens to acquire the necessary skills in ICT and Internet usage. Examples of other countries of the European Union show the opposite, as in countries like Estonia, Ireland, Lithuania, Austria, Czech Republic, Poland, Latvia, Italy, etc. (see Appendix 3), which had a range of different projects in which free courses were organised for all citizens interested in raising the level of their digital literacy. The respondents' perception of the usefulness of the ICT and the Internet proved to be positive, since more than 75.00% of the respondents *agreed* with it. Considering the issue of support and help in using ICT and the Internet, most respondents stated that they have the support of their family members and relatives. In the category of *use* concerning *demographic* factors, which are identified as significant for e-inclusion, considerable differences in *gender, marital status, age structure* and *the structure of household* were empirically confirmed. Concerning economic indicators in the *use* category, differences were empirically confirmed in factors: *employment, the level of income and family assets situation*, while in *cultural* factors which have an influence on e-inclusion, only the variable *knowledge of English in speech and writing* was proven to be significant. In variables like *membership in political party, membership in religious organization* and *membership in one or more non-profit organization* they did not prove to be significant. For social variable *place of residence* in the *use* category, as in former *acces*s category, no significant difference between urban and rural areas was proved, but it was proved in variables concerning the *level of education* and the variable of *disability*. For the category *impact of ICT and the Internet on the quality of life* attributes connected to the use of e-services were identified. The analysis of the results of attribute *e-learning, e-work, e-health and e-culture* showed that the respondents which participated in the research use ICT and the Internet for the above mentioned purposes in a very small extent, which can be attributed to the lack of skills necessary for ICT and the Internet usage. For the attribute of *digital economy*, in which *e-commerce, e-banking, e-communication and e-entertainment* are included, the highest frequency of use the respondents expressed was for the claim about finding information about the desired products and services. From the results concerning shopping products and services in web shops, it is clear that the respondents do not prefer it, because 78.00% of them stated that they do not do that at all, or do it sparsely, and the results of the research almost entirely correspond to the data of EUROSTAT for the year 2014., which are displayed in the 8. chapter of this work. Concerning the use of *e-banking*,

an insignificant difference from the data of EUROSTAT data base is evident, where in 2014. 19% of the respondents stated that they use Internet banking, while in this research 4.45% stated that they use it *very rarely*, 5.85% use it *rarely*, 16.63% *frequently*, 14.32% use it *very frequently* and 58.78% *do not use* it at all. For entertainment, a medium usage frequency is noted (34.66% of the respondents use ICT and the Internet for listening/downloading music *frequently* or *very frequently*, 28.57% of them use it for watching/downloading movies, while less than 15.00% of the overall number of the respondents use it for listening to radio stations and watching TV shows). Communication via ICT and the Internet also was not pronounced in most of the respondents, for example, 54.10% of the respondents use communication via e-mail *very rarely*, while 60.66% use social networks (such as Facebook, Twitter, etc.). The least used activities of ICT and the Internet that were offered were shopping and reservation of tickets for concerts or theatre shows, because only 7.50% of the respondents stated that they do that *frequently* or *very frequently*. Concerning the perception of usefulness of *e-health*, the results show that almost more than 50.00% of the respondents have neither positive, neither negative opinion, or do not have an opinion, and that can be explained with the previously mentioned frequency of usage. Analysis of the attitudes about the attribute *e-government* concerning the needs for creating new e-services proved to be positive in most respondents, from which it can be concluded that the respondents are mostly interested in creating new e-government services, which is, by the information published in central e-portal, a long term plan of the division for e-Croatia which operates within the Ministry of Governance. In the category *impact of ICT and the Internet on quality of life*, significant *demographic* differences are noted in *age structure*, *structure of the household*, and *marital status*, while for the variable *gender* in this category, as in the category *access*, an empirical difference was not confirmed. According to the *economic* factors in the category *impact of ICT and the Internet on quality of life*, significant differences for *employment* and the *level of income* were confirmed, while for the variable *family assets situation*, a significant difference was not empirically confirmed. According to the *cultural* indicators, a significant difference in the category *impact of ICT and the Internet on quality of life* was confirmed, and also according to the category *knowledge of English in speech and writing* (see Appendix 2). In *cultural* factors there was no significant difference in *membership in the political party*, *membership in the one/several non-profit organizations a*nd *membership in the religious organization*. According to the *social* factors in the category *impact of ICT and the Internet on quality of life*, for which the following are considerable: the level of *education*,

disability and the *place of residence*, a significant difference was empirically proven with the *level of education* and *disability* (see Appendix 2), while the *place of residence* (urban, suburban, rural) was not proven to be significant. The attribute *e-participation* in the category *empowerment* was used to test the frequency of usage of ICT and the Internet in the purpose of active involvement of the citizens in different processes of public and political activity, communication of citizens with public authorities, and active involvement of the citizens in the processes of decision making. Results acquired by this research indicate a very low level of use of ICT and the Internet in the above mentioned purposes, which is in accordance with the results of e-Participation Index by which Croatia, in the period from 2012. to 2014, fell from 53. position to 97. among 193 countries.[2] Results of this research concerning the attribute *e-democracy* whose items indicate citizen preference for tracking government activities and participation in decision-making processes on-line and availability of all relevant information and documents, show that the citizens, according to certain claims, do not express neither positive, nor negative attitude, while according to other, they mostly have a positive attitude concerning ICT and the Internet usage. That can be explained by the fact that certain e-services have not even started to be used, such as the ability to vote electronically on elections and on referendums. For example, the claim that every parliament assembly, or the assembly of public authorities should be available on videoconference, is supported by less than 50.00% of the respondents, while 37.23% of them do not have an attitude about that. The interest of more than 55.00% of the respondents is evident in the communication of the local authorities with citizens via websites or social networks. From the results concerning the claims which refer to the availability of information in digital form on web sites, a clearly positive attitude of the respondents is evident. More than 70.00% of the respondents stated that they *agree* or *strongly agree* to finding all documents and information online concerning the legislation as well as for the claim "I believe that, on the occasion of election for president/parliament/local and regional levels, the list of candidates should be available on websites with contact information for each candidate." The respondents were also interested in gaining information about different social organisations and their initiatives through ICT and the Internet, considering that 69.31% of the total number of respondents declared as *agree* or *strongly agree* with the claim to gain all desired information in that manner. Regarding the attributes networking and User Created Content, the results show that no matter the growing trend of using social

[2] http://unpan3.un.org/egovkb/Portals/egovkb/Documents/un/2014-Survey/E-Gov_Complete_Survey-2014.pdf

networks, forums, portals in the world, results in Croatia show exactly the opposite, more than 60.00% of the total number of respondents stated that they did not create or update their profile on social networks, only 12.18% of them upload their digitally created content *frequently* or *very frequently*, while more than 65.00% stated that they do not do that at all. Using forums as well as portals for communication, searching and sharing information is also not frequent in large majority of respondents considering that for both claims more than 75.00% of the respondents stated that they *do not use* them, or use them *seldom*. As for creating blogs, web pages for oneself or for others is concerned, results show that the respondents almost do not do that kind of actions at all, because of the total number of the respondents, only 2.35% stated that they create and moderate their own online journal or blog *frequently* or *very frequently*, only 4.45% stated that they created and moderate their web page *frequently* or *very frequently*, or that only 3.74% of them do that for their friends or relatives. In the category *empowerment* significant differences in accordance with demographic indicators are noted in the structure of a household, age structure, gender and marital status. According to the economic factors in the category *empowerment*, significant differences were empirically confirmed in accordance with *employment, the level of income* as well as for the variable *family assets situation*. According to *cultural* indicators, a significant difference in the category *empowerment* was empirically confirmed in variables *knowledge of English in speech and writing*, *membership in the religious organization* as well as in variable *membership in the one/several non-profit organizations*, while in variable *membership in the political party* a significant difference was not confirmed. According to social factors of the category *empowerment*, for which significantly identified variables are: *the level of education*, *disability* and *place of residence*, a significant difference was empirically confirmed for all these variables. From the short summary of the results of the main part of the research, previously identified significant differences in components of e-inclusion between subgroups of the respondents according to *demographic, social, economic* and *cultural* variables were empirically proved, by which the other hypothesis was empirically confirmed. Accordingly, it can be concluded that the results of the conducted analysis confirm the importance of *demographic, economic, cultural* and *social* factors for acceptance and use, as well as perception and attitudes concerning ICT and the Internet, the use of e-services and active participation of the individuals/groups/communities in all aspects of information society, and that digital divide still exists. In strategies concerning e-involvement, according to empirically proved significant differences, targeted groups on which emphasis should

be put that are identified for *demographic* factors are age groups (of citizens) above 55 years of *age,* according to the *structure of household,* single member households as well as households without supported children, while according to *marital status* a group of respondents that especially stand out are the one that stated themselves as widowed. According to *economic* factors for the variable *employment* that is the group of respondents (citizens) which declared themselves as retired. Considering the *level of income*, those are the citizens that stated that their income has remained the same or that it has decreased, and for the variable *family assets situation*, those are the groups that declared that their asset situation is worse than the majority. According to the *cultural* indicators, in all of the components a significant difference between the respondents in variable *knowledge of English in speech and writing* was noted, and the age groups are persons that do not know, or know very little English in speech and writing. According to *social* factors, the age groups are those with disability, while for the variable the *level of education* are groups of citizens without totally completed primary education, ones with primary education and with completed high school that lasted three years. The conducted research can be of great help to the creators of the strategy concerning e-inclusion, because it displays results in relation to a broad spectre of categories and attributes concerning e-inclusion as well as critical factors which have a huge influence on active participation of individuals/groups/communities in all segments of information society. Recommendations that could be derived from the data analysis obtained by conducting the main part of the research are expressed first in creating, and then in implementing the strategy of e-inclusion according to all guidelines which were, through the series of strategies, proposed by the European Commission (strategies of the European Commission concerning e-inclusion are described in more detail in chapter 11.1.). One of the main aims of the strategy should be establishing, as in urban, so in rural and hardly accessible areas, easily accessible and free of charge access to ICT and the Internet for all citizens by the model of many countries members of the European Union (see Appendix 3). To increase the level of digital literacy of citizens it is advisable to organize and conduct free workshops for all interested citizens. To simplify administrative procedures concerning public services it is advisable that almost all public services that are given by public authorities are created as simple and easily applicable electronic services adjusted to special needs persons in one central portal and in public places meant for that purpose, where users which, for any reason, do not have access to ICT and the Internet, or do not have the knowledge of using them, can, with expert assistance, perform all the activities such as, for

example, obtaining personal documents, registering and paying tax, registering a company or a craft, register a vehicle etc., for free. Besides that, a support and motivation of citizens is needed for using electronic services via promotion through traditional media such as newspapers, public television, posters. To increase the level of access and the use of ICT and the Internet at home, by the example of other countries of the European Union, there is a need for active participation in the expenses on a national and local level, providing for those groups that are the most threatened, such as: retired people, people with disability, households with low assets, unemployed, students, primary and secondary school students. To promote all the advantages offered by ICT and the Internet, as well as the growing digital market in the sense of employment, greater profit and more favourable and simpler availability and buying products on global world market. To support and motivate citizens for greater social interaction by networking through the most different social, business and research networks. To enable citizens and encourage them for active participation in as many processes of decision making as possible, as on national levels so on local levels of the government, with the assistance of ICT and the Internet. To enable citizens the access to all information concerning the legislation, regulations… in digital form to increase transparency of activities, as of national, so of local levels of government. To participate in encouragement of individuals/groups/communities in creating new knowledge, acquiring new knowledge and skills, and sharing knowledge through free accesses of formal and informal learning through available e-learning courses, webinars and professionally made digital material for self-education. To promote all the advantages and encourage the use of e-health system in the purpose of primarily prevention of diseases, that is easier and simpler availability of the health service for all diseased. To enable providing as well as participating in the expenses of provision of so called *assistive technologies* for the diseased, that is people with invalidity in the purpose of improving the quality of their lives. It is important to note that the created and empirically validated general model of e-inclusion is applicable and suitable for research, not only in Croatia, but in other countries, especially countries members of the European Union, because the identification of main categories, attributes and indicators was based mostly on the relevant literature published by the European Commission. And to conclude, it is important to emphasize that during the selection of the subject for doctoral dissertation, a contemplation was made about the question whether as a scientist and a researcher in the field of social studies one should be a *neutral observer* with the main focus solely on the describing and explaining complex realities and to stop there, or select a subject and conduct a

research which would investigate existing concrete problems, give adequate recommendations and therefore assist those that are able to and carry the responsibility for solving them.

14. LIMITATIONS OF THE STUDY AND IMPLICATIONS FOR FURTHER RESEARCH

There are several limitations of the conducted and described research in this doctoral dissertation which should be taken into consideration. First limitation is connected to the sample of the respondents of the main part of the research which consists exclusively to the respondents from two very similar districts in the northwest area of Croatia (Međimurje and Varaždin district) and that in that sample, hardly accessible areas which do not have the same level of infrastructure which allows access to the Internet, were not included. Therefore, in the further researches with the existing validated instrument of measurement, the intention is to conduct a research on a greater number of respondents, in such a way to encompass larger and more diverse number of areas in Croatia as well as some other countries members of The European Union, if possible. The age group of the respondents were adult citizens which includes respondents of the younger generation of so called "*digital natives*", therefore, concerning e-inclusion of the younger generations, no conclusions can be made. The most important reason for not including people younger than 18 years of age into the research were certain claims in which respondents were asked their opinion on activities juveniles are forbid to conduct by the law, such as claims concerning e-banking or e-government. The intention of further research should be to adjust the existing model to younger age groups of the respondents, such as primary school age as well as high school age, to examine e-inclusion of the mentioned population and to identify key factors of acceptance and the use of ICT and the Internet, and the possible obstacles which can affect individuals of those groups to not become a part of information society. One of the obstacles which should also be noted is the exclusion of the attribute *e-accessibility* which is of great importance for e-inclusion, and it refers to technical preconditions which have to be satisfied so specific groups of people with, for example, cognitive, olfactory or any other disadvantage, could equally and actively participate, with the assistance of ICT and the Internet, in all spheres of public, social and politic life. In further researches, the intention is to adjust the existing model in such manner that it can test e-inclusion, and that the key factors of acceptance and the use of ICT and the Internet and those groups can be

identified. As a limitation of the research, with everything mentioned, it should be emphasized that the identified latent categories of the first and the second level as well as confirmed links between latent categories with the use of nonparametric methods of structural modelling (PLS-SEM) have to be taken with caution while generalizing the findings and evaluating contributions, as conceptual, so empirical, at least until they are additionally confirmed by reviews in newer research which are intended to be conducted on a larger sample of the respondents, including not only respondents from Croatia, but form other countries also. That refers especially to identified latent categories as well as to those relationship which still do not have a clear and theoretically founded background. The reason for this is that the suggested conceptual model does not have a solid theoretical system, but is constructed with the help of many theories, concepts and empirically confirmed postulates, which were obtained with detail review and analysis of relevant researches, studies and strategies connected to the concepts of *digital divide* and *e-readiness*. Considering that this research is about a very complex model, numerous relationship between latent categories of the first as well as second level were not investigated. Further research would attempt to explore the possible relationship between attributes especially for each latent category of the first level. Also, the aim of further research is to create previously suggested modifications of the model for specific targeted groups of the respondents, but, doing so, try not to analyse and validate metric characteristics of newly constructed models which would consist of different set of assumed connections.

REFERENCES

1. Acemoglu, D. (2002). Technical change, inequality, and the labor market. *Journal of Economic Literature*. Vol. 40(1), 7–72.
2. Agarwal, R., Animesh, A., Prasad, K. (2009) Research Note-Social Interactions and the "Digital Divide": Explaining Variations in Internet Use. *Information Systems Research*. Vol. 20(2), 277-294.
3. Ajzen, I., Fishbein, M. (1980*) Understanding Attitudes and Predicting Social Behavior*. Prentice Hall, Englewood Cliffs.
4. Ajzen, I. (1985) *From intentions to actions: a theory of planned behavior*. In: Kuhl, J.; Beckmann, J., Action-Control: From Cognition to Behavior. Springer, Heidelberg, 11–39.
5. Ajzen, I. (1991) The theory of planned behavior. *Organ. Behav. HumanDecis. Process*. Vol. 50, 179 –211.
6. Akaslan, D., Law, E. L. C. (1012) *Analysing the Relationship between ICT Experience and Attitude toward E-Learning.* In 21st Century Learning for 21st Century Skills. Springer, Berlin, Heidelberg, 365-370.
7. Ala-Mutka, K., Broster, D., Cachia, R., Centeno, C., Feijóo, Haché, A., Kluzer, S., Lindmark, S., Lusoli, W., Misuraca, G., Pascu, C., Punie, Y. & Valverde, J.A. (2009). *The impact of social computing on the EU information society and economy*. JRC Scientific and Technical Report EUR, 24063., Luxembourg: Office for Official Publication of the European Communities.
8. Al-Hajri, S., Tatnall, A. (2008) Adoption of internet technology by the banking industry inOman; a study informed by the australian experience. *J. Electron. Commer. Organ*. Vol. 6, 20–36.
9. Ali, A., H. (2011) The Power of Social Media in Developing Nations: New Tools for Closing the Global Digital Divide and Beyond. *Harvard Human Rights Journal*, Vol. 24, 185-219.
10. Alkhalaf, S., Nguyen, A. T., Drew, S., Jones, V. (2013). *Measuring the information quality of e-learning systems in KSA: attitudes and perceptions of learners.* In Robot Intelligence Technology and Applications, Springer, Berlin, Heidelberg, 787-791.
11. Al-Maghrabi, T.; Dennis, C. (2010) Driving online shopping: spending and behavioral differences among women in Saudi Arabia. *Int. J. Bus. Sci. Appl. Manag.* Vol. 5, 30–47.
12. Al-Somali, S. A., Gholami, R., Clegg, B. (2009). An investigation into the acceptance of online banking in Saudi Arabia. *Technovation*, Vol. *29*(2), 130-141.
13. Amichai-Hamburger, Y., Furnham, A. (2007)The positive net. *Computers in Human Behavior*, Vol. 23(2), 1033-1045.
14. Anderson, B., Tracey, K., Digital Living (2001) The Impact (or Otherwise) of the Internet on Everyday Life. *American Behavioral Scientist*, Vol. 45(3), 456–475.
15. Asian Pacific Economic Corporation (APEC). (2000). E-commerce readiness assessment guide. Hong Kong: Author. Available from: http://www.ecommerce.gov/apec/ [11.09.2014.]

16. Asian Pacific Economic Corporation (APEC), (2000), "APEC Readiness Initiative". Available from: http://www.ecommerce.gov/apec/docs/readiness_guide_files/readiness _guide_5.pdf [11.09.2014]
17. Association of Southeast Asian Nations (ASEAN). (2001). E-ASEAN readiness assessment. Available from: http://www.unpan1.un.org. [11.09.2014.]
18. Atkinson, A., Marlier, E., Nolan, B. (2004) Indicators and Targets for Social Inclusion in the European Union, *JCMS 2004*, Vol. 42(1), 47–75. Available from: http://eucenter.wisc.edu/OMC/Papers/Protection/atkinsonetal.pdf [16.12.2013.]
19. Azari, R., Pick, J.B. (2005) Technology and society: socioeconomic influences on technological sectors for United States counties, *International Journal of Information Management*, Vol. 25, 21–37.
20. Babbie, E. (2010) *The Practice of Social Research*, Cengage Learning. Inc.
21. Balka, E., Smith, R. (2000) *Women work and computerization*. Boston, Kluwer.
22. Bagozzi, R. P. (1991) Further thoughts on the validity of measures of elation, gladness, and joy. *JPSP*. Vol. 61(1), 98–104.
23. Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
24. Bankole, F. O., Shirazi, F., Brown, I. (2011) Investigating the impact of ICT investments on human development. *The Electronic Journal of Information Systems in Developing Countries*. Vol. 48(8), 1-19.
25. Barzilai-Nahon, K., Barzilai, G. (2005) Cultured technology: The Internet and religious fundamentalism. *The Information Society*. Vol. 21(1), 25–40.
26. Basu, S., Fernald, J. (2006) Information and Communications Technology as a General-Purpose Technology: Evidence from U.S Industry Data, Federal Reserve Bank of San Francisco. Available from:http://www.frbsf.org/publications/economics/papers/2006/ wp06-29k.pdf [11.03.2013.]
27. Bates, P., Huws, U. (2002) Modeling eWork in Europe, Estimates, models, forecasts from the EMERGENCE project, The Institute for employment studies. Available from: http://www.employmentstudies.co.uk/pdflibrary/388.pdf [05.03.2015.]
28. Baliamoune-Lutz, M. (2003). An analysis of the determinants and effects of ICT diffusion in developing countries. *Information Technology for development*. Vol. 10(3), 151-169.
29. Becker, J., Niehaves, B., Bergener, P., Räckers, M. (2008) Digital Divide in eGovernment: The eInclusion Gap Model, *Electronic Government*. *Lecture Notes in Computer Science*. Vol. 5184, 231-242.
30. Bekkers, V. J. J. M. (2006). The UK's Electronic Mixed Economy of Public Service Delivery: A Preliminary Evaluation. *Information and Communication Technology and Public Innovation: Assessing the ICT-driven Modernization of Public Administration*, Vol. 12, 192.
31. Benedetto, S., Correia, L. M., & Luise, M. (2012). *The Newcom++ Vision Book*. Springer, , Berlin, Heidelberg.
32. Bentivegna, S., Guerrieri, P. (2010) Analysis of e-Inclusion impact resulting from advanced R&D based on economic modelling in relation to innovation capacity, capital formation, productivity, and empowerment. European Commission. Available from: http://ec. europa.

eu/information_society/activities/einclusion/library/studies/docs/composite_index.pdf [04.05.2013.]
33. Belanger, F., & Carter, L. (2006) The Effects of the Digital Divide on E-Government: An Emperical Evaluation. In System Sciences, 2006. HICSS'06. Proceedings of the 39th Annual Hawaii International Conference on (Vol. 4, pp. 81c-81c). IEEE.
34. Bell, P., Reddy, P., Rainie, L. (2004) Rural areas and the Internet. Washington. *DC: Pew Internet & American Life Project*, 7-37.
35. Bianchi, A., Barrios, S., Cabrera, M., Cachia, R., Compañó, R., Malanowski, N., Centeno, C. (2006). Revisiting eInclusion: From vision to action. Institute for Prospective Technological Studies, European Commission, Seville.
36. Billon, M., Ezcurra, R., Lera-López, F. (2008) The Spatial Distribution of the Internet in the European Union: Does Geographical Proximity Matter?. *European Planning Studies* Vol. 16(1), 119–142.
37. Binde, J. (2005) Towards knowledge societies: UNESCO World Report. Paris: UNESCO Publishing.
38. Bjekić, D., Obradović, S., Vučetić, M., Bojović, M. (2014). E-teacher in Inclusive e-education for Students with Specific Learning Disabilities. *Procedia-Social and Behavioral Sciences*. Vol. 128, 128-133.
39. Bloom, N., Sadun, R., & Van Reenen, J. M. (2007) *Americans Do I.T. Better: US Multinationals and the Productivity Miracle*. SSRN eLibrary.
40. Bradbrook, G., Fisher, J. (2004) *Digital Equality: Reviewing Digital Inclusion Activity and Mapping the Way Forwards.* London: CitizensOnline.
41. Bradshaw, J., Kemp, P., Baldwin, S., Rowe, A. (2004). The drivers of social exclusion. *London: Social Exclusion Unit.*
42. Brainin, E., Bar-Lev, S. (2005) The social construction of Internet use among parents and teachers and its relation to teenagers' digital literacy. *In: Annual Meeting of The American Sociological Association*, Philadelphia. 1–17.
43. Brandtzæg, P. B., Heim, J., Karahasanovic, A. (2011) Understanding the newdigital divide: A typology of internet users in Europe. *International Journalof Human Computer Studies*. Vol. 69(3), 123–138.
44. Bresnahan, T. F. and Trajtenberg, M., 1995. General purpose technologies: engines of growth.Journal of Econometrics 65, 83-108.
45. Bresnahan, T. F., Brynjolfsson, E. and Hitt, L.M. (2002) Information technology, workplace organisation, and the demand for skilled Labour: firm-level evidence. *Quarterly Journal of Economics.* Vol. 112(1), 339-376.
46. Brey, P. (2006) Evaluating the Social and Cultural Implications of the Internet. *ACM SIGCAS Computers and Society - Special print issue of ACM SIGCAS Computers and Society: selection of best papers 2004-2006*, Vol. 36(3), 41-48.
47. Brown, S. A., Venkatesh, V. (2005) Model of adoption of technology in households: A baseline model test and extension incorporating household life cycle. *MIS Quarterly*. Vol. 29(3), 399–426.
48. Peters, T. (2001) Comparison of e-readiness assessment models. Washington DC: Bridges. Org. Available from: www.bridges.org/ereadiness/report.org. [16.09.2014.]

49. Brosnan, M., Lee, W. (1998) A cross cultural comparison of gender differences in computer attitudes and anxiety: the UK and Hong Kong. *Computers in Human Behavior*. Vol. 14(4), 559–577.
50. Brynjolfsson, E., Hitt, L. M. (2003). Computing productivity: Firm-level evidence. *Review of economics and statistics*. Vol. 85(4), 793-808.
51. Brynjolfsson, E., Saunders, A. (2010) *Wired for Innovation: How Information Technology Is Reshaping the Economy*. MIT Press, Cambridge, Massachusetts.
52. Buckingham, D. (2005) *The media literacy of children and young people.* A review of the research literature. London: OFCOM.
53. Buente,W., Robbin, A. (2008) Trends in internet information behavior 2000–2004. *Journal of the American Society for Information Science and Technology*. Vol. 59(1), 1743–1760.
54. Bui, T. X., Sankaran, S., Sebastian, I. M. (2003) A framework for measuring nationale-readiness. *International Journal of Electronic Business*. Vol. 1, 3–22.
55. Calabro, A., Contini, E., Leporini, B. (2009) Book4All: A Tool to Make an e-Book More Accessible to Students with Vision/Visual-Impairments. Usability for e-Inclusion. *Lecture Notes in Computer Science.* Vol. 5889, 236-248.
56. Calvani, A., Fini, A., Ranieri, M., Picci, P. (2012) Are young generations in secondary school digitally competent? A study on Italian teenagers. *Computers & Education*. Vol. 58, 797–807.
57. Castells, M. (2001) *The Internet galaxy: reflections on the Internet, Business and Society*. Oxford University Press.
58. Castro, D. (2007) "Internet Radio and Copyright Royalties: Reforming a Broken System," The Information Technology and Innovation Foundation, Washington, D.C. Available from: www.itif.org/files/InternetRadio.pdf [11.03.2015.]
59. Ceccobelli, M., Gitto, S., Mancuso, P. (2012). ICT capital and labour productivity growth: A non-parametric analysis of 14 OECD countries. *Telecommunications Policy*. Vol. 36(4), 282-292.
60. Celino, I., Cerizza, D., Cesarini, M., Della Valle, E., De Paoli, F., Estublier, J., Zhao, G. (2010). *SEEMP: a networked marketplace for employment services.* In Semantic Technologies for E-Government. Springer, Berlin, Heidelberg.
61. Centre for Economic and Social Inclusion (2002) Social Inclusion. Available from: http://www.cesi.org.uk/kbdocs/socinc.doc [01.10.2013.]
62. Center for International Development (CID) (2000) Readiness for the networked world, a guide for developing countries. Cambridge, MA: Harvard University. Available from: http://www.cid.harvard.edu/ciditg [16.09.2014.]
63. Center for International Development (CID) (2002) Community E-Readiness Assessment. Harvard University. Available from:http://www.readinessguide.org [16.09.2014.]
64. Chakraborty, J., Bosman, M., M. (2005) Measuring the digital divide in the United States: Race, income, and personal computer ownership. *The Professional Geographer*, Vol. 57(3), 395-410.
65. Chalamandaris, A., Raptis, S Tsiakoulis, P., Karabetsos, S. (2009) Enhancing Accessibility of Web Content for the Print-Impaired and Blind People. Usability for e-Inclusion. *Lecture Notes in Computer Science.* Vol. 5889, 249-263.

66. Chen, W., Wellman, B. (2003) Charting and bridging digital divides:Comparing socio-economic, gender, life stage and rural-urban Internet access and use in eight countries. *AMD Global Consumer Advisory Board (GSAB)*.
67. Chinn, M., and Fairlie, R. (2003) The determinants of the global digital divide: A cross-country analysis of computer and Internet penetration. Santa Cruz Center for International Economics, Universityof California, Santa Cruz, Working Paper.
68. Chin, W. W. (1998) The partial least squares aproach to structural equation modeling. *Modern Methods for Business Research*, Mahwah: Erlbaum, 295-358.
69. Choucri, N., Maugis, V., Madnick, S., Siegel, M., Gillet, S., O'Donnel, S., et al. (2003) *E-readiness for what?* Cambridge: MIT. Available from: http://papers.ssrn.com/sol3/ papers. cfm?abstract id 1/4 535762 [17.09.2014.]
70. CID (2000). "Readiness for the Networked world: A Guide for the developing Countries", Available from: http://www.readinessguide.org [20.10.2013]
71. Cilesiz, S. (2004) Internet cafe´ s: bridges of the digital divide. *Paper presented at the Society for Information Technology and Teacher Education International Conference*. Atlanta, GA, USA.
72. Cipriani, G. (2014). *EU Support to eHealth and Cost-Benefits. In eHealth, Care and Quality of Life*, Springer, Milan, 89-112.
73. Clift, S. (2003) E-Democracy, E-Governance and Public Net-Work. *Publicus .Net.* Available from: http://www.opensourcejahrbuch.de/Archiv/2006/abstracts/kapitel_04 /abstracts/2004/pdfs/IV-5-Clift.pdf [17.04.2014.]
74. Codagnone, C., Cilli, V., Biagi, F., Foley, P., De Luca, A. (2009) Vienna Study on Inclusive Innovation for Growth and Cohesion: Modelling and demonstrating the impact of eInclusion.Available from:http://ec.europa.eu/information_society/activities/einclusion /library/studies/docs/eco_report.pdf [04.05.2013]
75. Cohen, J. (1988) *Statistical power analysis for the behavioral sciences.* Lawrence Erlbaum Associates, Hillsdale.
76. Colton, J. A., Bower, K. M. (2002). Some misconceptions about R2. EXTRAOrdinary Sense, *International Society of Six Sigma Professionals Newsletter*, Vol. 3(2), 20-22.
77. Commision of the European Communities. (1999) *Communication on a Commission Initiative for the Special European Council of Lisbon*, 23 and 24 March 2000. Available from: http://aei.pitt.edu/3532/1/3532.pdf [16.07.2013]
78. Computer Systems Policy Project (CSPP) (1998). Readiness guide for living in the networked world. Available from://www.cspp.org [22.03.2014]
79. Commission of the European Communities (2001a). *Draft Joint Report on Social Inclusion.* Communication from the Commission. 565 final.
80. Commission of the European Communities (2001b). *European Governance: A white paper.* COM(2001). 428 final, Brussels, 25 July. Available on http://ec.europa. eu/governance/white_paper/en.pdf [23.03.2014]

81. Commission of the European Communities (2002). *e-Europe 2005: An information society for all-an action.* Plan presented at the Seville European Council, Lisbon from 21–22 June 2000. Available from: http://www.etsi.org/WebSite/document/aboutETSI/EC_ Communications/eEurope2005_actionPlan.pdf [16.07.2013.]
82. Commission of the European Communities (2006). *Ministerial Declaration*. 11. June 2006, Riga, Latvia. Available from: http://ec.europa.eu/information_society/events/ict_riga_ 2006/doc/declaration_riga.pdf [27.11.2012.]
83. Commission of the European Communities (2005a). *eInclusion revisited: The Local Dimension of the Information Society*. Available from: http://www.ifap.ru/library/book151.pdf [16.07.2013.]
84. Commission of the European Communities (2005b). *i2010 – A European Information Society for growth and employment*. Available from: http://eurlex.europa.eu/LexUriServ/
85. LexUriServ.do?uri=COM:2005:0229:FIN:EN:PDF [16.07.2013.]
86. Commission of the European Communities (2007a). *e-Skills for the 21st century:fostering competitiveness, growth and jobs*. Available from: http://eurlex.europa.eu/LexUriServ/
87. LexUriServ.do?uri=COM:2007:0496:FIN:EN:PF. [10.05.2014.]
88. Commission of the European Communities (2007b). *Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*, A Lead Market Initiative for Europe, Brussels, 21.12.2007SEC(2007). Available from: http://www.cep.eu/Analysen_ KOM/KOM_2007_860_Leitmarktinitiative/sec_2007__1729.pdf [06.03.2015.]
89. Conroy M., Feezell, J. T., Guerrero, M. (2012) Facebook and political engagement: A study of online political group membership and offline political engagement. *Computers in Human Behavior*. Vol. 28, 1535–1546.
90. Crespi, G., Criscuolo, C., Haskel, J. (2007). Information Technology, Organizational Change and Productivity Growth: Evidence from U.K. Firms. *CEP Discussion Paper*, No. 783.
91. CSPP (1998). The CSPP Readiness Guide: For Living in the Net worked World. Available from: http://206.183.2.91/projects/readiness/assessments.htm [16.09.2014.]
92. Cullen, J., Hadjivassiliou, K., Junge, K., Fischer, T. (2007) Status of eInclusion measurement, analysis and approaches for improvement. Topic Report.
93. Cultural Access Group (2001). Ethnicity in the electronic age: Lookingat the Internet through a multicultural lens. Los Angeles, CA: AccessWorldwide Communication Reports. Available from: http://www.accesscag.com/pdf/internet%20report% 20v.%205.pdf [17.09.2013.]
94. Cushman, M., and Klecun, E. (2006) How can (non)users engage with technology:Bringing in the digitally excluded. LSE Working paper.
95. Cureton, E., E., D'Agostino, R., B. (2009) *Factor analysis: an applied approach*. Psychology Press, New York.
96. Curran, T., Singh, R. (2011). E-democracy as the future face of democracy: a case study of the 2011 Irish elections. *European View.* Vol. 10(1), 25-31.

97. Czaja, S., Sharit, J. (1998) Age Differences in Attitudes Toward Computers. *J Gerontol B Psychol. Sci. Soc. Sci.* Vol. 53(5), 329-340.
98. Daveri, F. (2002) The New Economy in Europe, 1992-2001. *Oxford Review of Economic Policy*. Vol. 18(3), 345–362.
99. Daveri, F. (2004) Why Is There a Productivity Problem in Europe? Bruxelles: CEPS. Working Document, No. 205.
100. Davis, F.D. (1986) *Technology Acceptance Model for EmpiricallyTestingNewEnd-User Information Systems: Theory and Results*. MIT, Boston.
101. Davis, F.D. (1989) Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Q*. Vol. 13(3), 319–340.
102. De Haan, J., Huysmans, F., Steyaert, J. (2002) At Home in a Digital World: Acquiring Digital Skills between Home and School. The Hague: Social and Cultural Planning Agency.
103. De Haan, J. (2004) Theorizing the digital divide. *Paper presented at the Conference Papers Annual Meeting of The American Sociological Association, 2004 AnnualMeeting*, San Francisco.
104. Demunter, C. (2002) The Digital Divide in Europe. Statistics in focus, Eurostat, 2005. Department for Education and Skills, Get on with it. Available from:http://www. dfes.gov.uk [22.07.2014.]
105. Department of Trade and Industry, U.K. DTI. (1999) Moving Into the Information Age: Regional Benchmarking Study. Department of Trade and Industry. London: HMSO. Available from: www.dti.gov.uk [12.09.2014]
106. Department of Trade and Industry, U.K. (DTI) (2002) Business in the information age: international benchmarking study. London: Department of Trade and Industry. Available from: www.dti.gov.uk [12.09.2014]
107. De Vellis, R. F. (2012) *Scale development: theory and applications*. Sage Publications, London.
108. Dewan, S., Riggins, F.J. (2005) The Digital Divide: Current and Future Research Directions. *Journal of the Association for the Information Systems*. Vol. 6(12), 298-337.
109. Diamantopoulos, A. (2006) "Formative vs. Reflective Indicators in Measure Development: Does the Choice of Indicators Matter?". *British Journal of Management*, Vol. 13(4), 263–282.
110. Didi, A., LaRose, R. (2006) Getting hooked on news: Uses and gratifications and the formation of news habits among college students in an internet environment. *Journal of Broadcasting & Electronic Media*. Vol. 50(2), 193–210.
111. DiMaggio, P., Hargittai, E. (2001) From the 'digital divide' to 'digital inequality': Studying Internet use as penetration increase (Working Paper 19). Princeton, NJ: Center for Artsand Cultural Policy Studies, Woodrow Wilson School, Princeton University. Available from: http://www.princeton.edu/wartspol/workpap/WP15%20%20 DiMaggio%2BHargittai.pdf [16.07.2013.]

112. DiMaggio, P., Hargittai, E., Celeste, C., Shafer, S. (2004) Digital inequality: From unequal access to differentiated use. *In Social inequality. New York: Russell Sage Foundation.* 355–400.
113. Digital Inclusion Team. (2007) The digital inclusion landscape in England: Delivering social impact through information and communications technology. London: Digital Inclusion Team.
114. Digital Inclusion Initiative (2000) Assessing the economic benefits of digital inclusion. Available from: http://www.digitalinclusion.net.au/sites/www.digitalinclusion.net.au/files/Assessing the economic benefits of digital inclusion.pdf [17.07.2013.]
115. Di Maria, E., Rizzo, L. S. (2005). E-democracy: The participation of citizens and new forms of the decision-making process. *In On Line Citizenship.* Springer US. 71-106.
116. DiNardo, J., Pischke, J. (1997) The Returns to Computer Use Revisited: Have Pencils Changed the Wage Structure Too?. *The Quarterly Journal of Economics*. Vol. 112(1), 291–303.
117. Dispensa, G., 1997. Use logistic regression with customer satisfaction data. *Marketing News*. January 6, p.13.
118. Doms, M., Jarmin, R., Klimek, S. (2004) Information technology investment and firm performance in US retail trade. *Economic Innovation and New Technologies*. Vol. 13(7), 595–613.
119. Donnermeyer, F. J. (2003) Digital divide evidence in four rural towns. *IT & Society*. Vol. 1(4), 107–117.
120. Drever, A. I., Hoffmeister, O. (2008) Immigrants and social networks in a job-scarce environment: The case of Germany. *International Migration Review.* Vol. 42(2), p. 425-448.
121. Drigas, A., Koukianakis, L., & Glentzes, J. (2008). An E-Culture Environment for Common Citizens and Visually Impaired Individuals. *In The Open Knowlege Society. A Computer Science and Information Systems Manifesto*. Springer Berlin Heidelberg. 641-648.
122. Durndell, A., Thomson, K. (1997) Gender and computing: a decade of change?. *Computers and Education*. Vol. 28(1), 1–9.
123. Durndell, A., Cameron, C., Knox, A., Stocks, R., Haag, Z. (1997) Gender and computing: west and east Europe. *Computers in Human Behavior*. Vol. 13(2), 269–280.
124. Dyck, J., L., Smither, J., A. (1994) Age differences in computer anxiety: the role of computer experience, gender, and education. *Journal of Educational Computing Research*. Vol. 10(3). 239-248.
125. Dyson, E., Release 2.0 (1997*) A Design for Living in the Digital Age*. Broadway Books. New York.
126. Eccles, A., Damodaran, L., Olphert, W., Hardill, I., Gilhooly, M. (2013). Assistive Technologies: Ethical Practice, Ethical Research, and Quality of Life. *In Technologies for Active Aging*). Springer US. 47-68.
127. Economist Intelligence Unit (EIU). (2002). The 2002 e-readiness rankings. NewYork. Available from:http://www.westerncape.gov.za/text/2004/2/

ereadiness_2002.pdf. [16.09.2014.]
128. Economist Intelligence Unit (EIU). (2003). The 2003 e-readiness rankings. New York. Available from: http://unpan1.un.org/intradoc/groups/public/documents/apcity/ unpan010006.pdf [16.09.2014.]
129. eInclusion@EU (2004) *Strengthening eInclusion & eAccessibility across Europe, Analytic framework - eInclusion and eAccessibility priority issues*. October, 2004, IST-502553. Available from: http://www.empirica.com/themen/einclusion/documents/ eInclusion_Analytic-framework.pdf [10.02.2015.]
130. eInclusion@EU. (2007). *Strengthening eInclusion and eAccessibility across Europe*. Final Project Report. Deliverable D6.3. Revised Final Version.
131. Elliman, T., Macintosh, A.,Irani, Z. (2007). A model building tool to support group deliberation (eDelib): a research note. *International Journal of Cases on Electronic Commerce (IJCEC)*. Vol. 3(3), 33-44.
132. Ess, C., Sudweeks, F. (2005) Culture and Computer-Mediated Communication: Toward New Understandings. *Journal of Computer-Mediated Communication*. Vol. 11(1), 179–191.
133. Empirica Gmbh. (2001). E-Europe Benchmarking Framework. Bruxelles. Available from: http://www.sibis-eu.org. [16.09.2014.]
134. Empirica Gmbh. (2003). Benchmarking Work, Employment and Skills in the Information Society in Europe and the US, SIBIS Report, Brussels: Commission of the European Communities.
135. Empirica Gmbh. (2006). Benchmarking in a Policy Perspective. Report No. 5. eInclusion. December 2006.
136. Entorf, H., Gollac, M., Kramarz, F. (1999). New technologies, wages, and worker selection. *Journal of Labor Economics*. Vol. 17(3), 464–491.
137. Epodoi, R. M. (2003) Women in the information society: Bridging the gap. *UN Chronicle*. Vol. 40(4), 36-36.
138. Epractice.eu. (2010). eInclusion factsheet—The United Kingdom. Available from: http://www.epractice.eu/files/eInclusion%20in%20UK-July%202010-2.0_0.pdf [15.06.2013.]
139. European Commission (EC). (2003). *Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, The Role of eGovernment for Europe's Future*. Brussels, 26.9.2003, COM(2003) 567 final. Available from: http://eurlex.europa.eu/ LexUriServ/LexUriServ.do?uri=COM:2003:0567:FIN:EN:PDF [09.03.2015.]
140. European Commission (2004a). *e-Health—making healthcare better for European citizens: An action plan for a European e-Health area*. COM (2004) 356 final. Brussels. 30 April, 2004.
141. European Commission (EC) (2004b). *e-Skills for Europe: Towards 2010 and Beyond, synthesis report of the European e-Skills Forum*. Available from: ///D:/ Download/ EskillForum.pdf [22.07.2014.]

142. European Commission (EC) (2004c). *eInclusion@EU: Strengthening eInclusion&eAccessibility across Europe: Analytic framework-eInclusion and eAccessibility priority issues*. Available from: http://www.empirica.com/themen/ einclusion/documents/eInclusion_Analytic-framework.pdf [10.08.2013.]
143. European Commission (EC) (2004d). *Digital Culture. Access to and preservation of cultural heritage*. Brussels.
144. European Commission (EC) (2006*). i2010 –First Annual Report on the European Information society.* Available from: http://eurlex.europa.eu/LexUriServ/site/en/com/ 2006/com2006_0215en01.pdf [10.03.2013.]
145. European Commission (EC) (2009a). *Europe's Digital Competitiveness Report.Volume 1: i2010 - Annual Information Society Report 2009 Benchmarking i2010:Trends and main achievements*. COM(2009) 390.
146. European Commission (EC) (2009b). *Commission earmarks €1bn for investment in broadband—Frequently asked questions. Press release*. MEMO/09/35. Brussels, 28 January 2009. Available from: http://europa.eu/rapid/pressReleasesAction.do? reference=MEMO/09/35 [10.03.2013.]
147. European Commission (EC) (2010a). *The Europe 2020 Strategy , "A strategy for smart, sustainable and inclusive growth"*. Available from: http://ec.europa.eu/eu2020/pdf/ COMPLE EN BARROSO 20007 Europ EN version.pdf [16.07.2013.]
148. European Commission (EC) (2010b). *A digital agenda for Europe.* COM (2010) 245 final. Brussels.
149. European Commission (EC) (2010c). *Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, The European eGovernment Action Plan 2011-2015, Harnessing ICT to promote smart, sustainable & innovative Government*. Brussels, 15 December 2010, COM(2010) 743.
150. European Commission (EC) (2011). *Commission Recommendation on the digitisation and online accessibility of cultural material and digital preservation*. Brussels. 27.10.2011. 7579 final. Available from:https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/en_4.pdf [12.03.2015.]
151. European Commission (EC) (2012a). An overview of the eGovernment and eInclusion situation in Europe. Available from: http://www.epractice.eu/en/factsheets/ [16.07.2013.]
152. European Commission (EC) (2012b). *Communication from the European Commission to the European Parliament, the Council, the EuropeanEconomic and Social Committee and the Committee of the Regions eHealth Action Plan 2012-2020 - Innovative healthcare for the 21st century*. Brussels. 6.12.2012COM(2012) 736 final.
153. European Commission (2015a) The Digital Economy and Society Index (DESI). Available from: https://ec.europa.eu/digital-agenda/en/desi#_ftn1, http://digital-agenda-data.eu/datasets/desi/indicators, http://www.digitalplan.gov.gr/resource-api/dipla/ content Object/DESI_annex_table_structure_EU_data/content [26.06.2015.]

154. European Commission (2015b) ICT 2015 Innovate, Connect, Transform. Available from: https://ec.europa.eu/digital-agenda/ict2015-innovate-connect-transform-lisbon-20-22-october-2015 [26.06.2015]
155. EUROSTAT. (2014) European Union survey on ICT usage in households and by individuals. Eurostat Model Questionnaire (version 3.4). Available from:https://circabc. europa.eu/sd/a/9d890128-8925-4b8a-9dba3e9281de3759/Questionnaire%20HH% 202014_v3.4.pdf [11.04.2014.]
156. European Parliament (2000). *Lisbon European Council 23 and 24 March*. Presidency Conclusions. Available from: http://www.europarl.europa.eu/summits/ lis1_en.htm [16.07.2013.]
157. Faggio, G., Salvanes, K., Van Reenen, J. (2007) The Evolution of Inequality in Productivity and Wages: Panel Data Evidence. *CEP Discussion Paper*, No. 821.
158. Falk, R. F., Miller, N. B. (1992). A primer for soft modeling. *University of Akron Press.*
159. Fang, Z. (2002). E-government in digital era: concept, practice, and development. *International journal of the Computer, the Internet and management*. Vol. 10(2), 1-22.
160. Felgran, S. D., Novos, I. E., Collardin, M. (2001). Banking: An anatomy of an e-transition. *Int'l Tax Rev.*, 12, 41.
161. Ferro, E., Helbig, N. C., Gil-Garcia, J. R. (2011) The role of IT literacy in defining digital divide policy needs. *Government Information Quarterly*. Vol. 28(1), 3–10.
162. Field, A. (2005). *Discovering Statistics using SPSS: and sex, drugs and rock 'n'roll*. Sage Publications. London, UK.
163. Fishbein, M.; Ajzen, I.: Belief (1975) *Attitude, Intention, and Behavior: An Introduction to Theory and Research.* AddisonWesley, Reading.
164. Fisk, M.J., Rudel, D. (2013) Telehealth and Service Delivery in the Home: Care, Support and the Importance of User Autonomy. *eHealth: Legal, Ethical and Governance Challenges*. 211-225.
165. Flores, C. (2003) Measuring the relationship between ICT use andincome inequality in Chile. Texas: University of Texas Inequality Project, Working Paper.
166. Foulger, D., (2001) Seven Bridges over the global digital divide. *IAMCR & ICA Symposium on Digital Divide*, Austin, TX. Available from: http://evolutionarymedia. com/papers/digitalDivide.htm [13.08.2013.]
167. Fornefeld, M., Delaunay, G., Elixmann, D. (2008) The impact of broadband on growth and productivity. A study on behalf of the European Commission (DG Information Society and Media). Germany: MICUS Management Consulting GmbH. Available from: http://ec.europa.eu/information_society/eeurope/i2010/ docs/ benchmarking/broadband_impact_2008.pdf [22.07.2014.]
168. Fornell, C. L., Larcker, D.F. (1981) Evaluating structural equation models with unobservable variables and measurement error. Journal of marketing research, Vol. 18(1), 39–50.
169. Freeman, R. B. (2002) The labour market in the new information economy. *Oxford Review of Economic Policy*, Vol. 18(3), 288–305.

170. Friedberg, L. (2003)The impact of technological change on older workers: Evidence from data on computer use. *Industrial & Labor Relations Review.* Vol. 56(3), 511–529.
171. Fuchs, C., Bernhaupt, R., Hartwig, C., Kramer, M., A., Maier Rabler, U. (2006) Broadening eParticipation: Rethinking ICTsand Participation, ICT&S Center, Research Paper No. 2, Available from: http://icts.uni-salzburg.at/media/pdf/pdf1131.pdf [16.03.2015.]
172. Gaddi, A. V., Capello, F. (2014). *The Debate Over eHealth. In eHealth, Care and Quality of Life* Springer, Milan, 1-13.
173. Galton, F. (1888), Corelations and their measurements, chiefly form Anthropmetric data. *Proc. Royal Society,* Vol. 45, 135-140.
174. Gareis, K. (2002) SIBIS – Workpackage 2: Topic research and indicator development, Work, employment & skills. Available from: http://www.sibis-eu.org/files /D2-2/SIBIS_WP2_work_employment_skills.pdf [10.04.2013.]
175. Gareis, K., Lamp, H. (2007) WP2: Indicators on Transformative Use of ICT– D2.1 Indicator Stocktaking Report –, 2007., Benchmarking and Fostering Transformative Use of ICT in EU Region. Available from:http://www.transform-eu.org/publications/ docum ents /D2.1.pdf [02.03.2015.]
176. Gellman, M.D., Turner, J.R. (2013) *Encyclopedia of Behavioral Medicine*. Springer Science+Business Media. New York.
177. Geisser, S. (1975) The predictive sample reuse method with applications. *Journal of the American Statistical Association.* Vol. 70(350), 320–328.
178. GeoSINC International (2002) e-Readiness Guide, How to Develop and Implement a Nationale-Readiness Action Plan in Developing Countries. Available from:http://www.ict4d.dk/uploads/general/E-readiness-Guide.pdf [10.09.2014.]
179. Gholami, R. at. all. (2010) Is ICT the Key to Development?. *Journal of Global Information Technology*. Vol. 18(1) 66-83.
180. Giorgio, F. (2013) European eHealth Governance Initiative: A New Way Forward. *In eHealth: Legal, Ethical and Governance Challenges.* Springer. Berlin, Heidelberg, 371-385.
181. Goldenberg, M. (2006) Employer investment in workplace learning in Canada. How we are doing. Why it matters. What the key issues are. How we can do better. *Council on Learning.* Ottawa, Canada.
182. Goldin, C., Katz, L., F.. (2008) *The Race between Education and Technology.* MA: Harvard University Press, Cambridge.
183. Gordon, R. J. (2004). Why was Europe Left at the Station When America's Productivity Locomotive Departed?. *National Bureau of Economic Research Working Paper Series*. No. 10661.
184. Goslee, S. (1998) Losing ground bit by bit: Low-income commun Information Age. Available from:http://www.benton.org [13.03.2014.]
185. Grönlund, A., Hatakka, M., Ask, A. (2007). *Inclusion in the e-service society– investigating administrative literacy requirements for using e-services.* In Electronic government. Springer, Berlin, Heidelberg, 216-227.

186. Guerrieri, P. A. O. L. O., Padoan, P. C. (2007) Modelling ICT as a general purpose technology. Evaluation. Available from:http://www.coleurope.eu/content/ publications/pdf/Collegium2035.pdf [10.03.2013.]
187. Haenlein, M., Kaplan, A.M. (2004) A beginner's guide to partial least squares analysis. *Understanding Statistics.* Vol. 3(4), 283-297.
188. Hagen, M. (1997). A typology of electronic democracy. Available from: http://www. unigiessen. de/fb03/vinci/labore/netz/hag_en. Htm [20.05.2014.].
189. Hair Jr., J.F., Black, W.C., Babin, B.J., Anderson, R.E. (2009) *Multivariate Data Analysis*, 7th edn. Prentice Hall, Englewood Cliffs.
190. Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014) A primer on partial least squares structural equation modeling (PLS-SEM). Sage Publications, London, UK.
191. Hanna, N. K. (2011). An ICT-Transformed Government and Society. *In Transforming Government and Building the Information Society*, Springer, New York,1-25.
192. Hanafizadeh, M. R., Saghaei, A., Hanafizadeh, P. (2009) An index for cross-countryanalysis of ICT infrastructure and access. *Telecommunications Policy*, Vol. 33(7), 385–405.
193. Hardey, M., Loader, B. (2009) The Informatization of Welfare: Older People and the Role of Digital Services. *British Journal of Social Work*. Vol. 39, 657–669.
194. Hargittai, E. (2010) Digital na(t)ives? Variation in internet skills and usesamong members of the 'Net generation'. *Sociological Inquiry*,. Vol. 80(1), 92–113.
195. Harris, K., (2000) "Everyone gets hooked": Exploring ICTs in Low-Income Neighbourhoods. Community Development Foundation. London.
196. Harris, K. Dudley, M., P. (2000). Many First Steps. Interim report to theDTI and DfEE Learning Centre Boards. London: Community Development Foundation.
197. Hargittai, E. (2002) Second-level digital divide: Differences in people's online skills. *First Monday* Vol. 7(4). Available from: http://firstmonday.org /htbin/ cgiwrap/ bin/ojs/index.php/fm/article/view/942/864 [15.04.2014.]
198. Hargittai, E. (2005) Survey measures of web-oriented digital literacy. *Social Science Computer Review.* Vol. 23(3), 371–379.
199. Hasebrink, U., Livingstone, S., Haddon, L. (2008) Comparing children's onlineopportunities and risks across Europe: Cross-national comparisons for EU KidsOnline. London: EU Kids Online (Deliverable D3.2). Available from:https://lirias.kuleuven.be/bitstream/123456789/200382/1/ReportD3-2CrossnationalComparisonFINAL4.pdf [13.02.2015.]
200. Hartman, A., Sifonis, J. G., Kador, J. (2000) *Net ready: Strategies for success in the e-economy.* McGraw-Hill. New York. USA.
201. Hatlevik E. O., Christophersen, A.K. (2013) Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers & Education*. Vol. 63, 240–247.
202. Hauge, B., Loader, B. (1999) *Digital Democracy. Discourse and Decision Making in the Information Age*. NY: Routledge. New York. USA.
203. Heeley, M., Damodaran, L. (2009) *Digital inclusion: a review of international policy and practice.* Loughborough University Press.

204. Heim, J., Brandtzæg, P. B., Kaare, B. H., Endestad, T., Torgersen, L. (2007) Children's usage of media technologies and psychosocial factors. *New Media and Society*. Vol. 9(3), 425–454.
205. Helsper, E., J. (2007) *Internet use by vulnerable teenagers: Social inclusion, selfconfidence and group identity*. Unpublished PhD, London School of Economics and Political Science, London.
206. Helsper, E. J. (2008) Digital Inclusion: An Analysis of Social Disadvantage and the Information Society. *Communities and Local Government Publications*.
207. Helsper, E. J. (2009) The aging internet: Choice and exclusion from digital services of the elderly. *Working with Older People*. Vol. 13(4), 28–33.
208. Helsper, E., J. Eynon, R. (2010) Digital natives. Where is the evidence?. *British Educational Research Journal*. Vol.36(3), 503–520.
209. Helsper, E., J. (2012) A corresponding fields model of the links between digital and social exclusion. *Communication Theory*. Vol. 22(4), 403–426.
210. Helsper, E. J., Eynon, R. (2013) Distinct skill pathways to digital engagement. *European Journal of Communication*. Vol. 28(6), 696-713.
211. Hempell, T. (2005) What's spurious, what's real? Measuring the productivity impacts of ICT at the firm-level. *Empirical Economics*. Vol. 30(2), 427–464.
212. Henseler, J. Ringle, C.M., Sinkovics, R.R. (2009) The use of partial least squares path modeling in international marketing. *Advances in International Marketing*. Vol. 20, 277-319
213. Hilbert, M. (2010) When is cheap, cheap enough to bridge the digital divide? Modeling income related structural challenges of technology diffusion in Latin America. *World Development*. Vol. 38(5), 756-770.
214. Hongladarom (1999) S. Global Culture, Local Cultures and the Internet: The Thai Example. *Ai & Society*. Vol. 13(4), 389-401.
215. Howell, D. (2012) *Statistical methods for psychology*. Cengage Learning. Belmont. USA.
216. Hsieh, J. P. A., Rai, A., Keil, M. (2008) Understanding digital inequality: Comparing continued use behavioral models of the socio-economically advantaged and disadvantaged. *MIS Quarterly*, Vol. 32(1), 97-126.
217. Huang, C. H., & Huang, Y. T. (2011) A New Approach to Achieve e-Inclusion with ICT Education in Rural Taiwan. *In Education and Management* Springer, Berlin, Heidelberg, 260-268.
218. Huesing, T., and Selhofer, H. (2002) The Digital Divide Index - A Measure of Social Inequalities in the Adoptioon of ICT, *European Conference on Information Systems (ECIS, 2002), Proceedings. Paper*. Available from:http://aisel.aisnet.org/ ecis2002/35 [20.08.2013.]
219. Hutcheson, G. Sofroniou N. (1999) *The multivariate social scientist*. Sage. London.

220. Hyytinen, A., Pajarinen, M. (2005). Financing of technology-intensive small businesses: some evidence on the uniqueness of the ICT sector. *Information Economics and Policy*. 1Vol. 7(1), 115-132.
221. Indjikian, R., Siegel, D., S. (2005) The impact of investment in IT on economic performance: Implications for developing countries. *World Development*. Vol. 33(5), 681-700.
222. Inklaar, R., O'Mahony, M., Timmer, M. (2005) ICT and Europe's productivity performance: Industry-level growth account comparisions with the United States. *Review of Income and Wealth*. Vol. 51(4), 505–536.
223. Inklaar, R., Timmer, M. P., van Ark, B. (2007) Mind the gap! International comparisons of productivity in services and goods production. *German Economic Review*. Vol. 8(2), 281–307.
224. Inklaar, R., Timmer, M. P., van Ark, B. (2008) Market services productivity across Europe and the US. *Economic Policy*. Vol. 53, 140–194.
225. International Telecommunication Union (ITU) (2002) World Telecommunication Development Report: Reinventing Telecoms. Available from:http://www.itu.int/ITU-D/ict/publications/wtdr_02/material/WTDR02-Sum_E.pdf [14.05.2013.]
226. International Telecommunication Union (ITU) (2003) ITU digital access index: world's first global ICT ranking. Available from:http://www.itu.int/newsarchive/ pressreleases/2003/30.html [14.05.2013.]
227. International Telecommunication Union (ITU) (2005) Measuring digital opportunity. Paper presented at the WSIS Thematic Meeting on Multi- Stakeholder Partnerships for Bridging the Digital Divide. Available from: http://www. itu.int/itu wsis/2005/DOI%20V2.pdf [14.05.2013.]
228. International Telecommunication Union (ITU), Orbicom (2005) From the Digital Divide to Digital Opportunities, Measurnig Infostates for Development. Available from: http://www.orbicom.ca/upload/files/research_projects/from_the_digital.pdf [02.05.2013.]
229. Isaila, N., Social inclusion in the context of informational society, Procedia - Social and Behavioral Sciences, Vol. 46, 2012., p. 1006 – 1009.
230. Israel, B. A., Checkoway, B., Schulz, A., & Zimmerman, M. (1994). Health education and community empowerment: conceptualizing and measuring perceptions of individual, organizational, and community control. *Health Education & Behavior*. Vol. 21(2), 149-170.
231. Jalava, J., Pohjola, M. (2008). The roles of electricity and ICT in economic growth: Case Finland. *Explorations in Economic History*. Vol. 45(3), 270-287.
232. Johnston, P., Nolan, J. (2001) Status Report on New Ways to Work in the Knowledge Economy. *Information society technologies*. Available from: ftp://ftp.cordis.europa.eu/pub/ist/docs/ka2/ework2001.pdf [04.03.2015]
233. Joi, A. L. (2004) Bridging the digital divide: some initiatives in Brazil. *Electronic Government an International Journal*. Vol. 1(3), 300-315.

234. Jorgenson, D. W., Ho, M. S., Stiroh, K. J. (2008) A Retrospective Look at the U.S. Productivity Growth Resurgence. *Journal of Economic Perspectives*. Vol. 22(1), 3–24.
235. Judge, S., Puckett, K., Bell, S. M. (2006) Closing the digital divide: update from the early childhood longitudinal study. *Journal of Educational Research*. Vol. 100(1), 52–60.
236. Jutla, D., Bodorik, P., Dhaliwal, J. (2002, January). Government support for the e-readiness of small and medium sized enterprises. In System Sciences, 2002. HICSS. *Proceedings of the 35th Annual Hawaii International Conference on*, 11.
237. Kalichman, S. C., Weinhardt, L., Benotsch, E., DiFonzo, K., Luke, W.,Austin, J. (2002) Internet access and Internet use for health information among people living with HIV-AIDS. *Patient Education and Counseling Patient Educ. Couns*. Vol. 46(2) 109–116.
238. Kam, B. H., Riquelme, H. (2007). An Exploratory Study of Length and Frequency of Internet Banking Usage. *JTAER*, Vol. 2(1), 76-85.
239. Kaplan, D. (2005). E-inclusion: New challenges and Policy Recommendations: eEurope Advisory Group - Working Group 2 e-Inclusion: Final report Available from: http://www.epractice.eu/files/media/media_764.pdf [05.03.2013.]
240. Kedzierska, B. (2010) University as an Environment for Shaping Key Teachers' Competence for Knowledge Society. *In Key Competencies in the Knowledge Society*. Springer, Berlin, Heidelberg, 193-199.
241. Kennedy, T., Wellman, B., Klement, K. (2003) Gendering the digital divide. *IT & Society*, Vol. 1(5), 1–25.
242. Khuong, M. V.(2011) ICT as a source of economic growth in the information age: Empirical evidence from the 1996–2005 period. *Telecommunications Policy*. No. 35, 357–372.
243. Kiel, J. (2005) The digital divide: Internet and e-mail use by the elderly. *Informatics for Health and Social Care*. Vol. 30(1), 19-23.
244. Kierkegaard, P. (2013). E-prescription across Europe. *Health and Technology*. Vol. 3(3), 205-219.
245. Kidd, D., Lee, E. S., Rosenberg (2005) T., Digital Inclusion: Working Both Sides of the Equation, Available from: http://asci.researchhub.ssrc.org/mediahub/publications/Kidd,Lee,Rosenberg_Digital%20Inclusion.pdf [20.07.2013.]
246. Kirkman, G. S., Osorio, C. A., Sachs, J. D. (2002) The Networked Readiness Index: Measuring the preparedness of nations for the networked world. In The global information technology report 2001– 2002: Readiness for the networked world. Oxford: Oxford University Press. 10–29, Available from: http://www.cid.harvard.edu/cr/gitrr 030202.html [20.09.2014.]
247. Kleis, L., Chwelos, P., Ramirez, R. and Cockburn, I. (2012) Information technology and intangible output: The impact of IT investment on innovation productivity. *Information Systems Research.* Vol. 23(1), 42-59.
248. Kotler, P., Armstrong, G., Saunders, J., Wong, V. (2001) *Principles of marketing.* 3rd edn.Veronica, Prentice Hall.
249. Kretschmer, T. (2012) Information and communication technologies and productivity growth: a survey of the literature. *OECD Digital Economy Papers*. No. 195, OECD Publishing, Paris.

250. Krueger, A. B. (1993) How Computers Have Changed the Wage Structure – Evidence from Microdata, 1984-1989. *Quarterly Journal of Economics*. Vol. 108(1), 33–60.
251. Korupp, S.E., Szydlik, M. (2005) Causes and Trends of the Digital Divide. *European SociologicalReview.* Vol. 21(4), 409–422.
252. Kozma, R. B. (2005) National policies that connect ICT-based education reform to economic and social development. *An Interdisciplinary Journal on Humans in ICT Environments*. Vol. 1(2), 117-156.
253. Law, N. (2009) Mathematics and science teachers' pedagogical orientations and their use of ICT in teaching. *Education and Information Technologies*. Vol. 14(4), 309-323.
254. Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel psychology*. Vol. 28(4), 563-575., Available from: http://www.bwgriffin.com/gsu/courses/edur9131/content/Lawshe_content_valdity.pdf [07.8.2014.]
255. Li, Y., Ranieri, M. (2010) Are 'digital natives' really digitally competent? A study on Chinese teenagers. *British Journal of Educational Technology*. Vol. 41(6), 1029–1042.
256. Li, Y., Ranieri, M. (2013) Educational and social correlates of the digital divide for rural and urban children: A study on primary school students in a provincial city of China. *Computers & Education.* Vol. 60, 197–209.
257. Liao, Z., Cheung, M. T. (2003) Challenges to Internet e-banking. *Communications of the ACM* , Vol. 46(12), 248-250.
258. Livingstone, Sonia and Haddon, Leslie and Görzig, Anke and Ólafsson, Kjartan (2011) Risks and safety on the internet: the perspective of European children: full findings and policy implications from the EU Kids Online survey of 9-16 year olds and their parents in 25 countries. EU Kids Online, Deliverable D4. EU Kids Online Network, London, UK.
259. Leung, L. (2004) Net-generation attributes and seductive properties of the Internet as predictors of online activities and Internet addiction. *Cyber Psychology & Behavior*. Vol. 7(3), 333-348.
260. Levitas, R. (2005) *The Inclusive Society?. Social Exclusion and New Labour*. second edition. Palgrave Macmillan.
261. Livingstone, Sonia (2003) The changing nature and uses of media literacy. *Media@LSE electronic working papers*, 4. Media@lse, London School of Economics and Political Science, London, UK.
262. Loader1, B. D., Hardey, M., Keeble, L. (2008) Health informatics for older people: a review of ICT facilitated integrated care for older people. *International Journal of Social Welfare*. Vol. 17(1), 46–53.
263. Loebbecke, C., Thaller, M. (2011). Digitization as an it response to the preservation of europe's cultural heritage. *In Emerging Themes in Information Systems and Organization Studies.* Physica-Verlag HD, 359-372.
264. Losh, S. C. (2004). Gender, educational, and occupational digital gaps 1983-2002. *Social Science Computer Review.* Vol. 22(2), 152-166.
265. Macintosh, A. (2003) Using information and communication technologies to enhance citizen engagement in the policy process. In Promises and Problems of e-Democracy: Challenges of Citizen Online Engagement. OECD, Paris, 19–142.
266. Madon, S., The Internet and socio-economic development: exploring the interaction, Information Technology & People, Vol. 13 No. 2, 2000., p. 85-101.

267. Mancinelli, E. (2008) e-Inclusion in the Information Society, Information Society From Theory to Political Practice. Available from: http://www.ittk.hu/netis/doc/NETIS_Course_Book_English.pdf [07.01.2013.]
268. Malina, A., Macintosh, A. (2003) *"Bridging the Digital Divide – Development in Scotland," in eTransformation in Governance: New Directions in Government and Politics.* Idea Group Publishing, USA.
269. Maliranta, M., Rouvinen, P. (2004) ICT and Business Productivity: Finnish Micro-Level Evidence. *In OECD (Ed.), The Economic Impact of ICT: Measurement, Evidence and Implications.* OECD, Paris.
270. Marschollek, M., Mix, S., Wolf, K. H., Effertz, B., Haux, R., Steinhagen-Thiessen, E. (2007) ICT-based health information services for elderly people: past experiences, current trends, and future strategies. *Informatics for Health and Social Care*. Vol. 32(4), 251-261.
271. Martin, S., P., Robinson, J., P. (2007) The income digital divide: Trends and predictions for levels of Internet use. *Social problems*. Vol. 54(1), 1-22.
272. Martin, W.J., and McKeown, S.F. (1993) "The potential of information and telecommunications technologies for rural development." *The Information Society*. Vol. 9(2), 145-156.
273. Martinengo, C., Curatelli F. (2009) Improving Cognitive Abilities and e-Inclusion in Children with Cerebral Palsy. HCI and Usability for e-Inclusion. *Lecture Notes in Computer Science*. Vol. 5889, 55-68.
274. McConnell International (2000) Risk E-Business: Seizing the Opportunity of Global E-Readiness. Available from: http://mcconnellinternational.com/readiness/default.cfm. [07.09.2014.]
275. McConnell International, World Information Technology and Services Alliance (WITSA) (2001) Ready? Net.Go!, Partnerships Leading the Global Economy. Available from: www.mcconnellinternational.com [07.09.2014.]
276. McLaren, J., Zappala, G. (2002) The "Digital divide" amongfinancially disadvantaged families in Australia. *First Monday*. Vol. 7(11), Available from: http://www.firstmonday.org/issues/issue7 11/mclaren/index.html [09.08.2013.]
277. McQuillan, H. (2000) "Eircom Ennis Information Age Town: A ConnectedCommunity," Report for the Ennis Information Age Town. Available from: www.ennis.ie. [18.10.2014.]
278. McQuillan, H. (2001) "Ennis Information Age Town: Virtuality Rooted in Reality,"Digital Cities II: Computational and Sociological Approaches. *Second Kyoto Workshop on Digital Cities. Lecture Notes in Computer Science*. Springer.
279. Mejovšek, M. (2008) *Metode znanstvenog istraživanja u društvenim i humanističkim znanostima.* Naklada Slap, Zagreb, Hrvatska.
280. Menou, M. J., Taylor, R. D. (2006) A grand challenge: Measuring information societies. *The Information Society An International Journal*. Vol. 22(5), 261–267.

281. Meyer, I., Muller, S., Kubitscheke, L. (2006) eInclusion – Towards aCoherent European Policy to Social Inequalities in the Information Society. Available from: http://www.empirica.com/themen/einclusion/documents/Meyer-Muller-ea_ eInclusion_ eChallenges-2006.pdf [07.01.2013.]
282. Milas, G. (2005) *Istraživačke metode u psihologiji i drugim društvenim znanostima*. Naklada Slap. Jastrebarsko, Hrvatska.
283. Mills, B.F., and B.E. Whitacre. (2003) Understanding the non-metropolitan–metropolitan digital divide. *Growth and Change.* Vol. 34(2), 219–243.
284. Ministerial Symposium (2003) Towards an Inclusive Information Society in Europe": Ministerial Declaration on eInclusion. Available from: http://www.eu2003.gr/ en/articles/2003/4/11/2502/ [16.07.2013.]
285. Mitchell, M., Jolley, J. (2012). *Research design explained.* Cengage Learning.
286. Miyagawa, T., Kim, Y. (2007) Measuring Organization Capital in Japan: An Empirical Assessment Using Firm-Level Data. *CEP Discussion Paper*. No. 817.
287. Molina, A. (2001) The Digital divide: The Need for a Social Movement. Available from: http://www.einclusionsite.org/documentation/molina-socmov_en.pdf [16.12.2013.]
288. Molnár, S. (2003). The explanation frame of the digital divide. *Proceedings of the Summer School. Risks and Challenges of the Network Society*, 4-8.
289. Mordini, E., Wright, D., De Hert, P., Mantovani, E., Wadhwa, K. R., Thestrup, J., Van Steendam, G. (2009) Ethics, e-Inclusion and ageing. *Studies in Ethics, Law, and Technology*. Vol. 3(1), Available from: http://www.researchgate.ne t/profile/Emilio_ Mor dini/publication/40823126_Ethics_eInclusion_and_Ageing/links/02bfe511e76cc0c58900 0000.pdf [26.10.2013.]
290. Mort, M., Roberts, C., Pols, J., Domenech, M., Moser, I. (2013) Ethical implications of home telecare for older people: a framework derived from a multisited participative study. *Health Expectation Health Expect.* Vol. 18(3), 438-49
291. Mosaic (1998)"An Internet Diffusion Framework". *Communications of the ACM*. Vol. 41(10), 21-26, Available from:http://mosaic.unohama.edu/gdi.html [07.09.2014.]
292. Mossberger, K., Tolbert, C. and McNeal, R.S. (2008) *Digital citizenship : the internet, society, and participation*, MIT Press. USA.
293. Mumtaz, S. (2001) Children's enjoyment and perception of computer use in the home and the school. *Computers & Education*. Vol. 36(4) 347–362.
294. Mutula, S. M., van Brakel, P. (2006) An evaluation of e-readiness assessment tools with respect to information access: Towards an integrated information rich tool. *International Journal of Information Management.*Vol. 26, 212–223.
295. Nashab, E. H. (2009) The Effect of ICT on Economic Growth: Further Evidence. *International Bulletin of Business Administration*. No. 5, 46-56.
296. National Telecommunications and Information Administration (NTIA) (1998) Falling Through the Net II: New Data on the Digital Divide. Available from: http://www. ntia.doc.gov/ntiahome/net2; http://www.ntia.doc.gov/files/ntia/publications/ falling-through-net-ii.pdf [17.08.2014.]
297. Netchaeva, I. (2002). E-Government and E-Democracy A Comparison of Opportunities in the North and South. *International Communication Gazette*. Vol. 64(5), 467-477.

298. Nie, N. H, Hillygus, S. D. and L. Erbring (2002) "Internet Use, Interpersonal Relations, and Sociability in The Internet". *In: B. Wellman and C. Haythornthwaite (eds). Everyday Life*. Oxford: Blackwell.
299. Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. Cambridge University Press. London. UK.
300. Nurmela, J., Parjo, L. and Sirkiä T. (2004) From Citizen to eCitizen. Results from Statistical Surveysabout Finns Use of ICT 1996-2005, 2004.. *Reviews 2006/3, Helsinki: Statistics Finland.*
301. Ogden, M. (1994). Politics in the Parallel Universe. Is There a Future for Cyberdemocracy?. *Futures*. Vol. 26, 713-29.
302. Osatuyi, B. (2013) Information sharing on social media sites. *Computers in Human Behavior*. Vol. 29, 2622–2631.
303. OECD (2001) Understanding the digital divide. Paris: OECD. Available from: http://www.oecd.org/dataoecd/38/57/1888451.pdf [17.07.2013.]
304. OECD (2009) Organisation for Economic Co-operation and Development, E-Government Studies Rethinking E-Government Services: User-Centred Approaches. OECD Publishing.
305. OECD (2011) Guide to Measuring the Information Society 2011, OECD Publishing. Available from: http://unstats.un.org/unsd/EconStatKB/ Attachment546.aspx [17.07.2013.]
306. OECD (2014) Measuring the Digital Economy: A New Perspective, OECD Publishing. Available from: http://www.keepeek.com/Digital-Asset-Management/oecd/science-and-technology/measuring-the-digital-economy_9789264221796-en#page1 [15.03.2015]
307. Ofcom (2006) Media literacy audit: Report on media literacy in the nations and regions. London: Ofcom.
308. Oliner, S. D., Sichel, D. E. (2000) The resurgence of growth in the late 1990s: Is information technology the story?. *Journal of Economic Perspectives*. Vol. 14(3), 3–22.
309. Oliner, S. D., Sichel, D. E. (2002) Information technology and productivity: Where are we now and where are we going?. *Federal Reserve Bank of Atlanta Economic Review*. Vol. 3, 1–13.
310. Panopoulou, E., Tambouris, E.,Tarabanis, K. (2009). eParticipation initiatives: How is Europe progressing. *European Journal of ePractice*, Vol. 7, 15-26.
311. Pautasso, E., Ferro, E., Raguseo, E. (2011) Understanding eInclusion gaps across European regions: A benchmarking analysis. I*n Information Society (i-Society), 2011 International Conference, IEEE*, 279-286.
312. Pénard, T., Poussing, N., Suire, R. (2013). Does the Internet make people happier?. *The Journal of Socio-Economics*. 46, 105-116.
313. Paterson, A. (2011) Skills for the IT Services Industry in Latecomer Countries. *Procedia Engineering*. 8, 177-181.
314. Peng, Z- R. (2001) Internet GIS for public participation. *Environment and Planning*. 28(6), 889-906.
315. Pereira, G. C., , Rocha, M., C., F., Poplin, A. (2012) e-Participation: Social Media and the Public Space. *B. Murgante et al. (Eds.): ICCSA 2012, Part I, LNCS 7333*. Springer-Verlag Berlin Heidelberg, 491–501.

316. Perry, J., Beyer, S., Francism J., Holmes, P. (2010) *Ethical issues in the use of telecare.* Social Care Institute for Excellence. London.
317. Pilat, D. (2004) The Economic Impacts of ICT–What have we learned thus far. *In Conference on the Economics of Communication Technologies.* Mannheim, Alemania. Available from: http://ftp.zew.de/pub/zew-docs/div/IKT04/Paper_Pilat.pdf [02.02.2015.]
318. Popova, I., Popov, O., Dalin, R. (2005) ICT Knowledge 4 ICT Diffusion. Information and Communication Technologies and the Knowledge Economy. 2, 792-799.
319. Porebski, L. (2002). Three faces of electronic democracy. *ECIS 2002 Proceedings*. 95, 1218-1227.
320. Power, A.,Wilson, W. J. (2000) Social exclusion and the future of cities. London: Centre for Analysis of Social Exclusion London School of Economics. Available from: http://eprints.lse.ac.uk/6470/1/Social_Exclusion_and_the_Future_of_Cities.pdf. [13.04.2014.]
321. Pricewaterhouse Coopers (2009) Champion for Digital Inclusion The Economic Case for Digital Inclusion. Available from: http://www.parliamentandinternet. org.uk/ uploads/Final_report.pdf [17.07.2013.]
322. Prosser, A., Krimmer, R. (2004). The Dimensions of Electronic Voting Technology, Law, Politics and Society. *Proceedings: Electronic Voting in Europe.* 47, 21-28.
323. PWC (2014) Global entertainment and media outlook 2014-2018, Annual Global CEO Survey. Available from: http://www.pwc.com/gx/en/global-entertainment-media-out look/data-insights.jhtml [11.03.2015.]
324. Quibria, M. G., Shamsun N. Tschang, A., T., Reyes-Macasaquit, M. (2002) Digital divide: Determinants and policies with special reference to Asia. *Economics and Research Department. Working Paper No. 27*.
325. Reinartz, W.J., Haenlein, M., Henseler, J. (2009) An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Market Research.*Vol. 26 (4), 332-344.
326. Rencher, A.C. (2002) *Methods of Multivariate Analysis*. John Wiley & Sons. USA.
327. Renton, A., Macintosh, A. (2007) Computer-supported argument maps as a policy memory. *The Information Society*. Vol. 23(2), 125-133.
328. Resta, P., Laferriere, T. (2008) Issues and challenges related to digital equity. *In J. Voogt, & G. Knezek (Eds.), International Handbook of Information Technology in Primary and Secondary Education*. New York: Springer, 765–778.
329. Rheingold, H. (2000) *The Virtual Community: Homesteading on the Electronic Frontier*. revised edition. Cambridge: MIT Press.
330. Rinner, C., Keßler, C., Andrulis, S. (2008) The use of Web 2.0 concepts to support deliberation in spatial decision-making. Computers. *Environment and Urban Systems*. Vol. 32(5), 386-395.
331. Robinson, J., P., Dimaggio, P., and Hargittai, E. (2003) New socialsurvey perspectives on the digital divide. *IT & Society*. Vol. 1(5), 1–22.
332. Rodríguez, E. P. G., Domingo, M. G., Ribera, J. P., Hill, M. A., Jardí, L. S. (2006) Usability for all: Towards improving the e-learning experience for visually impaired users. *In Computers Helping People with Special Needs.* Springer, Berlin Heidelberg, 1313-1317.
333. Rogers, E. (1983) *Diffusion of Innovation.* The Free Press, New York.

334. Rojas, V., Straubhaar, J., Roychowdhury, D., Okur, O. (2004) Communities, cultural capital and thedigital divide. *In: Bucy E, Newhagen J (eds) Media access: social and psychologicaldimensions of new technology use.* Lea, London, p. 107–130.
335. Ronchi, A. M. (2009). *eCulture: cultural content in the digital age.* Springer Science & Business Media. New York, USA.
336. Salinas, A., Sa´nchez, J. (2009) Digital inclusion in Chile: Internet in rural schools. *International Journal of Educational Development*. Vol. 29, 573–582.
337. Sathye, M. (1999) Adoption of internet banking by Australian consumers: an empirical investigation. *International Journal of Bank Marketing*. Vol. 17(7) 324-34.
338. Sanford, C., Rose, J. (2007). Characterizing eParticipation. *International Journal of Information Management*. Vol. 27(6), 406-421.
339. Savidis, A., Stephanidis, C. (2005) Developing inclusive e-learning and e-entertainment to effectively accommodate learning difficulties. *ACM SIGACCESS Accessibility and Computing*. Vol. (83), 42-54.
340. Savidis, A., Grammenos, D., Stephanidis, C. (2006). Developing inclusive e-learning systems. *Universal Access in the Information Society*. Vol. 5(1), 51-72.
341. Scheffe, H. (1999) *The analysis of variance.* Vol. 72. John Wiley & Sons. New York, USA.
342. Schement, J., R. (2003) Measuring what Jefferson knew and de Tocqueville saw: libraries as bridges across the digital divide. *IT & Society 1*. Vol. 4, 118–125.
343. Sciadas, G. (2003) Monitoring the Digital Divide and beyond. Orbicom. Available from: http://www.orbicom.ca/upload/files/research_projects/2003_dd_pdf_en.pdf [02.05.2013.]
344. Schumacher, P., Morahan-Martin, J. (2001) Gender, internet and computer attitudes and experiences. *Computers in Human Behavior.* 17, 95–110.
345. Shih, C.-F., Venkatesh, A. (2004) Beyond Adoption: Development and Application of a Use-Diffusion Model. *Journal of Marketing*. 68(1), 59-72.
346. Slevin, J.,The internet and society, Malden, MA: Polity, 2000.
347. Selwyn, N. (2004a) Reconsidering political and popular understanding of the digital divide. *New Media & Society*. Vol. 6, 341–362.
348. Selwyn, N. (2004b) The information aged: A qualitative study of older adults; use of information and communications technology. *Journal of Aging Studies*. Vol. 18, 369–384.
349. Selwyn, N. (2006) Digital division or digital decision? A study of non-users and low-users of computers. *Poetics*. 34(4), 273-292.
350. Selwyn, N., Facer, K. (2007) Beyond the digital divide Rethinking digital inclusion for the 21st century. Available from: http://archive.futurelab.org.uk/ resources/ documents/ opening_education/Digital_Divide.pdf [20.07.2013.]
351. Shklovski, I., Kiesler, S. and Kraut R. (2006) "The Internet and Social Interaction: A Meta-analysis and Critique of Studies, 1995-2003". *In: Kraut, Robert, Brynin, M., and Sara Kiesler (eds), Computers, Phones, and the Internet: The Social Impact of Information Technology.* Oxford University Press.

352. Sicherl, P. (2003) Different statistical measures provide different perspectiveson digital divide. *6th ESA Conference*, Available from: http://www.sicenter.si/pub/Sicherl Digital divide Murcia.pdf [08.07.2013.]
353. Siegel, M., Haghseta, F. O'Donnell, S. (2002) '*E-readiness framework and tools: goals and approach'*. MIT Center for E-Business Talk.
354. Silber, D. (2003). *The case for eHealth.* European Institute of Public Administration.
355. Social Exclusion Unit (SEU) (2005) Inclusion through innovation: Tackling social exclusion through new technologies. *Final Report. London: Office of the Deputy Prime Minister*.
356. Solomon, G. (2002) Digital equity: it's not just about access anymore.*Technology & Learning*. Vol. 22(9), 22–26.
357. Statistical Indicators Benchmarking the Information Society (SIBIS) (2003) Benchmarking Social Inclusion in the Information Society in Europe and the US. Available from: http://www.eurosfaire.prd.fr/ist/documents/pdf/6-Benchmarking_Social_Inclusion_in_the_Information_Society.pdf [23.12.2013.]
358. Steyaert, J., Gould, N. (2009) Social work and the changing face of the digital divide. *British Journal of Social Work.* Vol. 39(4), 740–753.
359. Stevens, J. P. (1992) *Applied multivariate statistics for the social sciences.* Routledge.
360. Steyaert, J. (2010) Where the worlds of e-inclusion and evidence-based practice meet. *Journal of Social Intervention: Theory and Practice*.Vol. 19(4), 19–30.
361. Stone, M. (1974) Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society*. Vol. 36(2), 111–133.
362. Sussman, N., Tyson, D. (2000) Sex and power: gender differences in computer mediated interactions.*Computers in Human Behavior*. Vol. 16(4), 381–394.
363. Sutton, R. (1991) Equity and computers in school: a decade of research. *Review of Educational Research*. Vol. 61(4), 475–503.
364. Svendsen, L., P., Mondahl, E., M. (2013) How social-media enhancedlearning platforms supportstudents in taking responsibilityfor their own learning. *Journal of Applied Research in HigherEducation*. Vol. 5(2), 261-272.
365. Tapscott, D., Ticoll, D. Lowi, A. (2000) *Digital Capital – Harnessing the Power of Business Webs.* Harvard Business School Press, Boston, US.
366. Tas, E. M. (2011) ICT education for development – a case study. *Procedia Computer Science*. 3, 507–512.
367. ten Brummelhuis, A., Kuiper, E. (2008) Driving forces for ICT in learning. *In International handbook of information technology in primary and secondary education* Springer, US, 97-111.
368. The European Council on 23-24 March 2001 in Stockholm. Available from:http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.ann-r1.en1.html [16.07.2013.]
369. Timmer, L. P., Van Ark, B. (2005) Does information and communication technology drive EU-US productivity growth differentials? *Oxford Economic Papers*. Vol. 57(4), 693–716.

370. Torkzadeh, G., Koufteros, X. (1994) Factoral validity of a computer self efficacy scale and the impact of computer training. *Educational and Psychological Measurement*. Vol. 54(3), 813–921.
371. Turkle, S. (1995) *Life on the Screen: Identity in the Age of the Internet.* Simon & Schuster, New York, US.
372. Turoff, M., Hiltz, S. R., Cho, H. K., Li, Z., Wang, Y. (2002) Social decision support systems (SDSS). *In System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference.* 81-90.
373. UK online centres (2008) Economic benefits of digital inclusion: building the evidence. UK Department for Culture, Media and Sport and Department for Business, Enterprise and Regulatory Reform. (2009). Digital Britain: The interim report. The Stationery Office, January 2009. Available from: http://www.culture.gov.uk/reference_ library/media _releases/5783.aspx [08.10.2014.]
374. United Nations Statistical Commission (UNSC) (2007) Report of the Partnership on Measuring Information and Communication Technologies for Development: information and communication technology statistics. Available from: http://unstats.un. org/unsd/statcom/doc07/2007-5e-ict.pdf [20.09.2014.]
375. United Nations (2005) UN Global E-government Readiness Report 2005, From E-government to E-inclusion, New York, Available from: http://unpan1.un.org/intradoc/ groups/public/documents/un/unpan021888.pdf [03.10.2012.]
376. United Nations (2014) E-government Survey (UNDESA). E-Government for the Future We Want. Available from:http://unpan3.un.org/egovkb/Portals/egovkb/Documents/ un/2014-Survey/E-Gov_Complete_Survey-2014.pdf [11.02.2015.]
377. Valeri L., Cremonini, L. (2001) SIBIS – Workpackage 2: Topic research and indicator development, Topic Report No.3: Trust and Security.
378. Van Dijk, J. (1999) *The network society. Social aspects of new media.*Thousand Oaks. CA: Sage. London. UK.
379. Van Dijk, J. A.G.M. (2005) *The Deepening Divide. Inequality in the Information Society*. Thousand Oaks. CA: Sage. London. UK.
380. Van Dijk, J. (2006) "Digital divide research, achievements and shortcomings". *Poetics.* Vol.34(4-5), 221-235.
381. Van Dijk, J., Pieterson, W., Ebbers, W., Van Deursen, A. (2007) eServices for Citizens: TheDutch Usage Case. *In: Wimmer, M.A., Scholl, J., Grönlund, Å. (eds.) EGOV 2007. LNCS*. Springer, Heidelberg, 4656, 155–166.
382. Van Ark, B., Inklaar, R., McGuckin, R.H. (2003) The Contribution of ICT-Producing and ICT-Using Industries to Productivity Growth: A Comparison of Canada, Europe and the United States. *International Productivity Monitor*. No. 6, 56-63.
383. Van Ark, B. (2002) Measuring the new economy: An international comparative perspective. *Review of Income and Wealth*. Vol. (1), 1–14.
384. Van Ark, B., O'Mahony, M., Timmer, M. P. (2008) The productivity gap between Europe and the United States: Trends and causes. *Journal of Economic Perspectives*. Vol. 22(1), 25–44.
385. Van Ark, B., Inklaar, R., McGuckin, R. H. (2003) 'Changing gear': Productivity, ICT and service industries in Europe and the United States. *Industrial Dynamics of the New Digital Economy*. 56–99.
386. Venkatesh, V., Davis, F. (2000) A theoretical extension of the technology aceptance model: four longitudinal field studies. *Manag. Sci*. Vol. 46, 186–204.

387. Venkatesh, V., Morris, M., Davis, G., Davis, F. (2003) User acceptance of information technology: Toward a unified view. *MIS Quarterly*. Vol. 27(3), 425–478.
388. Venkatesh, V.; Bala, H. (2008) Technology acceptance model 3 and a research agenda on interventions. *Decis. Sci*. Vol. 39, 273–315.
389. Verdegem, P. (2011) Social media for digital and social inclusion: Challengesfor information society 2.0 research & policies. *Journal for a GlobalSustainable Information Society*. Vol. 9(1), 28–38.
390. Verhaagen, D. (2005) *Parenting the millennium generation: guiding our children born between 1982 and 2000*. Westport, CT: Praeger Publishers. USA.
391. Vicente, M. R., López, A. J. (2006) Patterns of ICT diffusion across the European Union. *Economics Letters*. Vol. 93(1), 45-51.
392. Viherä, M., L., Nurmela, J. (2001) Communication capability as an intrinsic determinant for information age. *Futures*. Vol. 33(3), 245-265.
393. Volman, M., van Eck, E. (2001) Gender equity and information technology in education: the second decade. *Review of Educational Research*. Vol. 71(4), 613–634.
394. Volman, M., van Eck, E., Heemskerk, I., Kuiper, E. (2005) New technologies, new differences. Gender and ethnic differences in pupils' use of ICT in primary and secondary education. *Computers & Education*. Vol. 45(1), 35-55.
395. Wan, Z., Fang, Y. and Wade, M. (2007) A ten-year odyssey of the 'IS productivity paradox' - A citation analysis (1996-2006). *Proceedings of the Americas Conference on Information Systems (AMCIS) 2007*, Keystone, Colorado, USA.
396. Warschauer, M. (2000) Technology and school reform: a view from both sides of the track. *Education Policy Analysis Archives*. Vol. 8(4), 1-22.
397. Warschauer, M. (2003) *Technology and Social Inclusion: Rethinking the Digital Divide*. Cambridge: MIT Press. USA.
398. Weerakkody, V., Dwivedi, Y. K., El-Haddadeh, R., Almuwil, A., Ghoneim, A. (2012) Conceptualizing E-inclusionin Europe: AnExplanatoryStudy. *Information Systems Management*. Vol. 9(4), 305-320.
399. Wells, W., Prensky, D. (1996) *Consumer Behaviour*. Wiley, New York, US.
400. Wherton, J., Prendergast, D. (2009) The Building Bridges Project: Involving Older Adults in the Design of a Communication Technology to Support Peer-to-Peer Social Engagement. HCI and Usability for e-Inclusion. *Lecture Notes in Computer Science*. Vol. 5889, 111-134.
401. Whyte, D. A., Overton, L. (2001) Digital literacy workshop. A Discussion Paper. Brussels 10-11 May 2001. Available from: http://www.ibmweblectureservices.ihost.com/eu/elearningsummit/ppps/downloads/diglitworkshop.pdf [26.02.2014.]
402. Whitely, B. (1997) Gender differences in computer related attitudes and behaviour: a meta analysis. *Computers in Human Behavior*. Vol. 13(1), 1–22.
403. Wilhelm A.G. (2000) *Democracy in the Digital Age*. New York, London, Routledge.
404. Wilcox, R. R. (2010) *Fundamentals of modern statistical methods: Substantially improving power and accuracy*. Springer Science & Business Media. Los Angeles, USA.
405. Wind, Y. J. (2001) The challenge of “customerization” in financial services. *Communications of the ACM*. Vol. 44(6), 39-44.

406. Wong, Y., C., Law, C., K., Chu Fung, J., Y. (2010) Vincent Wan Ping Lee: Digital divide and social inclusion: policy challenge for social development in Hong Kong and South Korea. *Journal of Asian Public Policy*. Vol. 3(1), 37-52.

407. Wolske, M., Williams, N. S., Noble, S., Johnson, E. O., Duple, R. Y. (2010) Effective ICT Use for Social Inclusion, iConference, Available from: https://www. Ide als. Illinois.edu/bitstream/handle/2142/14952/wolske.pdf?sequence=2. [20.07.2013.]

408. Worcman, K. (2002) Digital division is cultural exclusion. But isdigital inclusion cultural inclusion?. *DLib Magazine*. Vol. 8(3), Available from: http://www.dlib.org/ dlib/march02/worcman/03worcman.html [17.06.2013.]

409. World Health Organization (2009) Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth 2009, Available from:http://www.who.int/goe/publications/goe_telemedicine_2010.pdf [06.03.2015.]

410. World Health Organization (2011) Atlas eHealth country profiles: based on the findings ofthe second global survey on eHealth. World Health Organization, Geneva, Switzerland.

411. World Summit on the Information Society (2003) Declaration of Principles, Building the Information Society: a global challenge in the new Millennium, Available from: http://www.itu.int/wsis/docs/geneva/official/dop.html [13.04.2014.]

412. Yang, H. H. (2013) New world, new learning: trends and issues of e-learning. *Procedia-Social and Behavioral Sciences*. Vol. 77, 429-442.

413. Zhao, L., Lu, Y., Huang, W., Wang, Q. (2010) Internet inequality: the relationship between high school students' Internet use in different locations and their Internet self efficacy.*Computers & Education*. Vol. 55, 1405–1423.

414. Žajdela, H., N., Mekovec, R., Bubaš, G. (2015) Croatian central e-government portal: a usefulness analysis. *Proceedings of the Central and Eastern European eDem and eGov Days 2015, May 7-8* . 27-42.

415. Žugaj M, Dumičić K, Dušak V. (2006) *Temelji znanstvenoistraživačkog rada: Metodologija i metodika.* Fakultet organizacije i informatike, Varaždin.

Appendix 1 Descriptive statistical analysis

Table 48. Results of descriptive statistical analysis

Category - Access								
Attribute - The material access								
Indicators		**Not at all**	**Very rarely**	**Rarely**	**Frequently**	**Very Frequently**	**M**	**s**
AMN1	I access the Internet and digital content via desktop computer.	45,43	11,24	13,82	16,16	13,35	2,41	1,51
AMN2	I access the Internet and digital content via portable computers (laptops, netbooks, tablet).	49,65	5,62	10,77	14,05	19,91	2,49	1,65
AMN3	I access the Internet and digital content via some of the mobile devices (mobile phone, smart phone, e-book reader).	50,82	3,75	10,54	17,33	17,56	2,47	1,63
Attribute - Network								
Indicators		**Not at all**	**Very rarely**	**Rarely**	**Frequently**	**Very Frequently**	**M**	**s**
AMN4	I access the Internet via fixed broadband connections, (DSL, ADSL, VDSL, cable, optical fibre, satellite, public WiFi connections.	34,67	6,79	12,41	24,12	22,01	2,92	1,60
AMN5	I access the Internet via mobile broadband connections (via mobile phone network, at least 3G, e.g. UMTS, using (SIM) card or USB key, mobile phone or smart phone as modem).	55,26	4,92	9,37	17,10	13,35	2,28	1,57

Category - Use									
Attribute - Intensity of use									
Items		None	Less than 1 hour	Between 1 and 5 hours	Between 6 and 10 hours	Between 11 and 20 hours	More than 20 hours	M	s
UIU1	How much time do you spend in a week using ICT and the Internet at home.	30,44	10,77	22,01	15,00	14,05	7,73	2,95	1,65
UIU2	How much time do you spend in a week using ICT and the Internet at the workplace.	61,83	7,73	9,13	8,43	7,03	5,85	2,09	1,62
UIU4	How much time do you spend in a week using ICT and the Internet in public places where access to and use is not paid for?	65,57	16,39	13,11	4,22	0,47	0,23	1,58	0,93
Attribute - Skills									
Items		Very poor	Poor	Moderately good	Very good	Excellent	M	s	
USE1	How would you evaluate your knowledge of using software for writing and text editing (eg. Word ...).	30,70	13,11	18,50	21,07	16,63	2,80	1,48	
US10	How would you evaluate your knowledge of using software for making a chart in a spreadsheet (Excel, Lotus)?	38,17	18,03	15,93	16,63	11,24	2,45	1,42	
US4	How would you evaluate your knowledge of creating electronic presentations by using presentation software (e.g. slides), including e.g. images, sound, video or charts?	40,98	17,33	14,29	15,93	11,47	2,40	1,44	
US1	How would you evaluate your knowledge of using the Internet search engines (Google, Yahoo ...)?	27,63	5,62	13,35	25,77	27,63	3,20	1,58	
US5	How would you evaluate your knowledge of the use of ICT and the Internet to download and install the software tools on the computer?	42,62	14,05	15,69	16,16	11,48	2,40	1,45	
US7	How would you evaluate your knowledge of using specialized programs for communication via Internet (e.g. Skype)?	42,62	11,94	15,69	16,16	13,59	2,46	1,50	
US8	How would you evaluate your knowledge of using forums for the exchange of information?	42,86	15,22	18,74	11,71	11,47	2,34	1,42	
US9	How would you evaluate your knowledge of using chat rooms for communication (Messenger, IRC)?	45,20	12,88	13,58	14,29	14,05	2,39	1,51	

Attribute - Motivation/Attitudes								
Items		**Strongly disagree**	**Disagree**	**Neither agree / nor disagree**	**Agree**	**Strongly agree**	**M**	**s**
UMA1	I consider the use of ICT and the Internet to be useful.	2,34	2,34	19,67	40,75	34,90	4,04	0,92
UMA2	The use of ICT and the Internet is simple for me.	14,29	11,94	20,61	31,38	21,78	3,48	1,15
UMA3	By using ICT and Internet I acquire important information that help me make better decisions.	8,43	8,43	30,21	33,02	19,91	3,34	1,33
Attribute Social support / coercion								
Items		**Strongly disagree**	**Disagree**	**Neither agree / nor disagree**	**Agree**	**Strongly agree**	**M**	**s**
USSC1	I have support from relatives and family members to use ICT and the Internet.	10,30	7,26	26,00	35,60	20,84	3,50	1,20
USSC3	I have support from friends to use ICT and the Internet.	10,54	7,49	27,87	33,02	21,08	3,47	1,21
USSC4	I have support from colleagues at work / faculty / in the association to use ICT and the Internet.	26,23	6,56	29,27	21,55	16,39	2,95	1,41
USSC5	I am forced to use ICT and Internet for business / educational / legal obligations.	28,10	15,69	24,82	16,39	15,00	2,75	1,41
Attribute - Digital engagement								
Items		**Not at all**	**Very rarely**	**Rarely**	**Frequently**	**Very Frequently**	**M**	**s**
UDE1	In the last three months I have used ICT and Internet to search for information (news, health).	30,91	5,15	14,29	30,91	18,74	3,01	1,53
UDE2	In the last three months I have used ICT and Internet for learning purposes (educational materials, employment opportunities, training courses).	51,29	13,82	11,01	13,11	10,77	2,18	1,45
UDE5	In the last three months I have used ICT and Internet for leisure activities (hobbies, travel).	37,24	10,07	16,39	22,01	14,29	2,66	1,51
UDE6	In the last three months I have used ICT and Internet for entertainment (computer games, music, movies, theatre).	38,41	9,37	15,69	18,74	17,79	2,68	1,56
UDE11	The use of ICT and Internet has become my daily routine.	32,79	9,37	12,65	25,29	19,91	2,90	1,57

Category - Impact on quality of life								
Attribute - E-learning								
Items		Not at all	Very rarely	Rarely	Frequently	Very Frequently	M	s
IQLEL1	I use ICT and Internet to attend educational courses.	67,21	16,16	9,60	5,39	1,64	1,58	0,98
IQLEL2	I use ICT and the Internet to find information about educational courses.	63,23	13,35	12,18	7,49	3,75	1,75	1,15
IQLEL3	I use ICT and the Internet to access and download materials for education / training.	61,36	11,48	11,48	10,53	5,15	1,87	1,26
Attribute – E-work								
Items		Not at all	Very rarely	Rarely	Frequently	Very Frequently	M	s
IQLDE4	In the last three months I have used ICT and the Internet to find information about employment	68,38	11,24	6,56	6,79	7,03	1,73	1,26
IQLDE5	In the last three months I have used ICT and the Internet to send job applications.	77,52	8,90	6,32	4,22	3,04	1,46	1,00
IQLDEE2	In the last three months I have used ICT and the Internet to log on portals for mediation in employment (eg. Portals posao.hr, moj.posao.net ...).	79,63	6,32	4,45	6,79	2,81	1,47	1,04
Attribute - DIGITAL ECONOMY (E-commerce, E-banking, E-communication and E-entertainment)								
Items		Not at all	Very rarely	Rarely	Frequently	Very Frequently	M	s
IQLDE1	In the last three months I have used ICT and Internet to find information about specific / desired products and services.	34,89	11,24	17,10	26,23	10,54	2,66	1,44
IQLDE2	In the last three months I have used ICT and Internet to buy shoes and clothes, food, household supplies.	46,37	12,65	19,44	15,22	6,32	2,23	1,34
IQLDE3	In the last three months I have used ICT and Internet to pay the bills, the products and services via e-banking.	58,78	4,45	5,85	16,63	14,329	2,23	1,57
IQLECEC2	I use ICT and the Internet to listen / download music.	44,26	7,03	14,05	19,91	14,75	2,54	1,57
IQLECEC3	I use ICT and the Internet to watch / download movies.	50,82	6,09	14,52	14,05	14,52	2,35	1,55
IQLECEC9	For communication via ICT and the Internet, I use e-mail.	46,37	7,73	7,26	19,20	19,44	2,58	1,65
IQLECEC10	For communication via ICT and Internet, I use social networks (Facebook, Twitter ...).	56,21	4,45	7,03	11,94	20,37	2,36	1,68
IQLECECE5	In the last three months I have used ICT and Internet to buy / book tickets (concerts, theatre, exhibitions).	67,21	14,75	10,54	4,22	3,28	1,62	1,05
IQLECEC4	I use ICT and the Internet to read online newspapers, magazines....	39,81	3,28	13,58	24,59	18,74	2,79	1,61
IQLECECE6	I use ICT and the Internet to listen radio station.	56,68	13,35	16,39	9,13	4,45	1,91	1,22
IQLECECE7	I use ICT and the Internet to watch TV shows.	58,31	13,35	13,35	8,43	6,56	1,92	1,28

Category - Impact on quality of life								
Attribute - E-culture								
Items		Not at all	Very rarely	Rarely	Frequently	Very Frequently	M	s
IQLECEC5	I use ICT and the Internet to read / download digital books.	64,87	15,69	10,54	5,15	3,75	1,67	1,09
IQLECEC6	I use ICT and the Internet to visit museums online.	85,25	8,67	4,68	1,17	0,23	1,23	0,61
IQLECEC7	I use ICT and the Internet to watch theatrical performances.	81,97	7,96	7,26	1,87	0,94	1,32	0,77

Category - Empowerment								
Attribute - Social computing - networking								
Items		Not at all	Very rarely	Rarely	Frequently	Very Frequently	M	s
ESM1	I upload self-created content to any website to be shared (text, photos, music, videos, software etc.).	67,44	8,20	12,18	7,26	4,92	1,74	1,21
ESM8	I create and manage a profile on social networks (Facebook, Twitter ...).	60,42	5,62	7,26	12,88	13,82	2,14	1,56
ESM5	I share my work online, such as my own artwork, photos, stories or videos.	66,98	9,60	9,60	9,37	4,45	1,75	1,22
ESM6	I use forums to obtain information and share opinions.	53,16	10,30	14,99	16,16	5,39	2,10	1,34
ESM7	I communicate via portals and read the comments.	49,88	7,73	17,56	16,16	8,67	2,26	1,43
Attribute - Social computing - content creation								
Items		Not at all	Very rarely	Rarely	Frequently	Very Frequently	M	s
ESM2	I create or work on my own online journal or blog.	86,41	6,09	5,15	0,94	1,41	1,25	0,72
ESM3	I create or work on my own website.	87,59	4,92	3,04	2,58	1,87	1,26	0,80
ESM4	I create or work on websites or blogs for others, including friends, relatives, employers, groups I belong to...	88,53	5,15	2,58	3,04	0,70	1,22	0,70

Category - Empowerment								
Attribute - E-participation								
Items		**Not at all**	**Very rarely**	**Rarely**	**Frequently**	**Very Frequently**	**M**	**s**
EEDP3	I asked for information from the public authorities via the Internet and I got a response.	77,28	11,48	6,79	2,81	1,64	1,40	0,86
EEDP4	With help of ICT and the Internet, I find all information related to work of the Government and public administration.	71,44	13,58	9,13	4,68	1,17	1,51	0,92
EEDP5	I follow and use educational content that public authorities publish on their websites (webinars, online courses, educational films, etc.).	75,18	12,88	8,20	3,04	0,70	1,41	0,82
EEDP6	I communicate directly to the officials of public authorities via e-mail.	88,76	7,49	1,64	1,64	0,47	1,18	0,58
EEDP8	I participate in public discussions related to the enactment of law regulations, rules etc. via ICT and the Internet.	89,92	5,39	2,34	1,41	0,94	1,18	0,63
Attribute - E-democracy								
Items		**Strongly disagree**	**Disagree**	**Neither agree / nor disagree**	**Agree**	**Strongly agree**	**M**	**s**
EEDP10	I believe that each Parliament and each session of leaders of local government should be accompanied by videoconference.	10,07	12,88	37,23	25,53	14,29	3,21	1,15
EEDP12	I believe that citizens should have the opportunity of voting in elections /participate in referendum electronically.	10,07	13,58	29,04	28,81	18,50	3,32	1,21
EEDP13	I believe that every municipal mayor or the mayor should communicate with citizens on websites or social networks.	6,09	8,67	29,98	35,82	19,44	3,54	1,09
EEDP14	With the help of ICT and the Internet, I find all documents and information regarding the enactment of law regulations, rules ...	2,81	2,11	24,59	44,49	26,00	3,89	0,91
EEDP15	I believe that, on the occasion of election for president / parliament / local and regional levels, the list of candidates should be available on websites with contact information for each candidate.	3,28	3,98	22,25	44,96	25,53	3,86	0,96
EEDP18	With help of ICT and the Internet, I receive information about various community organizations and their initiatives.	4,22	2,11	24,36	44,02	25,29	3,84	0,97

Source: made by the author

Appendix 2 Results of analysis of variance by categories of model of e-inclusion by demographic, social, economic and cultural variable

Table 49. Analysis of variance by variable gender

Gender								
Category - Access								
Homogenity of Variances		Levene	p-value	0,2229	Brown-Forsythe		p-value	0,1880
Analysis of Variance	F-value	2,9441	Df Effect	1	Df Error	425	p-value	0,0869
Category - Use								
Homogenity of Variances		Levene	p-value	0,7813	Brown-Forsythe		p-value	0,7098
Analysis of Variance	F-value	6,8546	Df Effect	1	Df Error	425	p-value	0,0092*
Category - Impact on quality of life								
Homogenity of Variances		Levene	p-value	0,1788	Brown-Forsythe		p-value	0,3374
Analysis of Variance	F-value	1,2399	Df Effect	1	Df Error	425	p-value	0,2661
Category - Empowerment								
Homogenity of Variances		Levene	p-value	0,2357	Brown-Forsythe		p-value	0,1986
Analysis of Variance	Welch F	5,0465	Df Effect	1	Df Error	380,4076	p-value	0,0252*

*The mean difference is significant at the 0.05 level

Source: made by the author

Table 50. Analysis of variance by variable age for category *access*

Category – Access									
Homogenity of Variances			Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value		125,1371	df Effect	6	df Error	168,4804	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal					
Age	18-24 (1)	25-34 (2)	35-44 (3)	45-54 (4)		55-64 (5)	65-74 (6)	75 and more (7)	
18-24 (1)				*		*	*	*	
25-34 (2)				*		*	*	*	
35-44 (3)				*		*	*	*	
45-54 (4)	*	*	*			*	*	*	
55-64 (5)	*	*	*	*			*	*	
65-74 (6)	*	*	*	*		*			
75 and more (7)	*	*	*	*		*			

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 51. Analysis of variance by variable age for category *use*

Category – Use								
Homogenity of Variances		Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	151,7795	df Effect	6	df Error	166,8834	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal				
Age	18-24	25-34	35-44	45-54	55-64	65-74	75 and more	
18-24			*	*	*	*	*	
25-34				*	*	*	*	
35-44	*			*	*	*	*	
45-54	*	*	*		*	*	*	
55-64	*	*	*	*		*	*	
65-74	*	*	*	*	*		*	
75 and more	*	*	*	*	*	*		

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 52. Analysis of variance by variable age for category *impact on quality of life*

Category - Impact on quality of life									
Homogenity of Variances		Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000	
Analysis of Variance	Welch F-value	68, 7160	df Effect	6	df Error	169,8837	p-value	0,0000*	
Post Hoc Test – Games-Howell			Group size - unequal						
Age	18-24	25-34	35-44	45-54	55-64	65-74	75 and more		
18-24				*	*	*	*		
25-34				*	*	*	*		
35-44				*	*	*	*		
45-54	*	*	*		*	*	*		
55-64	*	*	*	*			*		
65-74	*	*	*	*					
75 and more	*	*	*	*	*				

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 53. Analysis of variance by variable age for category *empowerment*

Category - Empowerment								
Homogenity of Variances		Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	43,7924	Df Effect	6	Df Error	158,0595	p-value	0,0000*
Post Hoc Test – Games-Howell								
Age	18-24	25-34	35-44	45-54	55-64	65-74	75 and more	
18-24			*	*	*	*	*	
25-34				*	*	*	*	
35-44	*				*	*	*	
45-54	*	*				*	*	
55-64	*	*	*					
65-74	*	*	*	*				
75 and more	*	*	*	*				

*The mean difference is significant at the 0.05 leve
Source: made by the author

Table 54. Analysis of variance by variable household structure for category *access*

Category - Access									
Homogenity of Variances		Levene		p-value	0,0209	Brown-Forsythe		p-value	0,0627
Analysis of Variance		F-value	17,27127	df Effect	6	df Error	420	p-value	0,0000*
Post Hoc Test – Tukey - Kramer				Group size - unequal					
Household structure	One-person household	Adults without dependent children	Single parent with one or more dependent children	Two adults with one or more dependent children	One to two adults who live with their father and / or mother	Other households with dependent children	Other households without dependent children		
One-person household				*	*				
Adults without dependent children				*	*				
Single parent with one or more dependent children									
Two adults with one or more dependent children	*	*				*			
One to two adults who live with their father and / or mother	*	*				*			
Other households with dependent children				*	*				
Other households without dependent children									

*The mean difference is significant at the 0.05 level; Source: made by the author

Table 55. Analysis of variance by variable household structure for category use

Category - Use								
Homogenity of Variances	Levene			p-value	0,3160	Brown-Forsythe		p-value	0,3432
Analysis of Variance	F-value		15,36408	df Effect	6	df Error	420	p-value	0,0000*
Post Hoc Test – Tukey - Kramer				Group size - unequal					
Household structure	One-person household	Adults without dependent children	Single parent with one or more dependent children	Two adults with one or more dependent children	One to two adults who live with their father and / or mother	Other households with dependent children	Other households without dependent children	
One-person household				*	*			
Adults without dependent children				*	*			
Single parent with one or more dependent children								
Two adults with one or more dependent children	*	*				*		
One to two adults who live with their father and / or mother	*	*				*		
Other households with dependent children				*	*			
Other households without dependent children								

*The mean difference is significant at the 0.05 level

Source: made by the author

Table 56. Analysis of variance by variable household structure for category *impact on quality of life*

Category - Impact on quality of life								
Homogenity of Variances	Levene		p-value	0,7697	Brown-Forsythe		p-value	0,3710
Analysis of Variance	F-value	12,0627	df Effect	6	df Error	420	p-value	0,0000*
Post Hoc Test – Tukey - Kramer			Group size - unequal					

Household structure	One-person household	Adults without dependent children	Single parent with one or more dependent children	Two adults with one or more dependent children	One to two adults who live with their father and / or mother	Other households with dependent children	Other households without dependent children
One-person household				*	*		
Adults without dependent children				*	*		
Single parent with one or more dependent children							
Two adults with one or more dependent children	*	*				*	
One to two adults who live with their father and / or mother	*	*				*	
Other households with dependent children				*	*		
Other households without dependent children							

*The mean difference is significant at the 0.05 level

Source: made by the author

Table 57. Analysis of variance by variable household structure for category *empowerment*

Category - Empowerment								
Homogenity of Variances	Levene		p-value	0,2151	Brown-Forsythe		p-value	0,2173
Analysis of Variance	F-value	4,2651	df Effect	6	df Error	420	p-value	0,0003*
Post Hoc Test – Tukey – Kramer			Group size - unequal					

Household structure	One-person household	Adults without dependent children	Single parent with one or more dependent children	Two adults with one or more dependent children	One to two adults who live with their father and / or mother	Other households with dependent children	Other households without dependent children
One-person household							
Adults without dependent children				*			
Single parent with one or more dependent children							
Two adults with one or more dependent children		*					
One to two adults who live with their father and / or mother							
Other households with dependent children							
Other households without dependent children							

*The mean difference is significant at the 0.05 level

Source: made by the author

Table 58. Analysis of variance by variable marital status for category *access*

Category - Access								
Homogenity of Variances		Levene	p-value	0,0000		Brown-Forsythe	p-value	0,0000
Analysis of Variance	Welch F-value	91,2239	df Effect	4	df Error	42,3623	p-value	0,0000*

Post Hoc Test – Games-Howell					
Marital status	Single	Married	Partnered	Divorced	Widowed
Single		*			*
Married	*				*
Partnered					*
Divorced					*
Widowed	*	*	*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 59. Analysis of variance by variable marital status for category *use*

Category - Use								
Homogenity of Variances		Levene	p-value		0,0000	Brown-Forsythe	p-value	0,0000
Analysis of Variance	Welch F-value	98,9859	df Effect	4	df Error	42,3102	p-value	0,0000*

Post Hoc Test – Games-Howell					
Marital status	Single	Married	Partnered	Divorced	Widowed
Single		*			*
Married	*				*
Partnered					*
Divorced					*
Widowed	*	*	*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 60. Analysis of variance by variable marital status for category *impact on quality of life*

Category - Impact on quality of life								
Homogenity of Variances		Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	43,1526	df Effect	4	df Error	41,4968	p-value	0,0000*

Post Hoc Test – Games-Howell					
Marital status	Single	Married	Partnered	Divorced	Widowed
Single		*			*
Married	*				*
Partnered					
Divorced					*
Widowed	*	*		*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 61. Analysis of variance by variable marital status for category *empowerment*

Category - Empowerment								
Homogenity of Variances		Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	41,0901	df Effect	4	df Error	41,8673	p-value	0,0000*

Post Hoc Test – Games-Howell					
Marital status	Single	Married	Partnered	Divorced	Widowed
Single		*			*
Married	*				*
Partnered					
Divorced					
Widowed	*	*			

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 62. Analysis of variance by variable employment for category *access*

Category - Access								
Homogenity of Variances		Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	65,9330	df Effect	4	Df Error	65,0446	p-value	0,0000*

Post Hoc Test – Games-Howell					
Employment	Employed - full time	Employed - part time	Unemployed	Student	Retired
Employed - full time				*	*
Employed - part time				*	
Unemployed				*	*
Student	*	*	*		*
Retired	*		*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 63. Analysis of variance by variable employment for category *use*

Category - Use								
Homogenity of Variances		Levene	p-value		0,0000	Brown-Forsythe	p-value	0,0000
Analysis of Variance	Welch F-value	162,9772	df Effect	4	df Error	67,9440	p-value	0,0000*

Post Hoc Test – Games-Howell					
Employment	Employed - full time	Employed - part time	Unemployed	Student	Retired
Employed - full time				*	*
Employed - part time				*	
Unemployed				*	*
Student	*	*	*		*
Retired	*		*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 64. Analysis of variance by variable employment for category *impact on quality of life*

Category - Impact on quality of life								
Homogenity of Variances		Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	59,0582	df Effect	4	df Error	62,7050	p-value	0,0000*

Post Hoc Test – Games-Howell					
Employment	Employed - full time	Employed - part time	Unemployed	Student	Retired
Employed - full time				*	*
Employed - part time				*	
Unemployed				*	*
Student	*	*	*		*
Retired	*		*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 65. Analysis of variance by variable employment for category *empowerment*

Category - Empowerment								
Homogenity of Variances		Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	36,9335	df Effect	4	df Error	62,3985	p-value	0,0000*

Post Hoc Test – Games-Howell					
Employment	Employed - full time	Employed - part time	Unemployed	Student	Retired
Employed - full time				*	*
Employed - part time				*	
Unemployed				*	*
Student	*	*	*		*
Retired	*		*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 66. Analysis of variance by variable family assets situation for category *access*

Category - Access								
Homogenity of Variances	Levene		p-value	0,5413	Brown-Forsythe		p-value	0,3332
Analysis of Variance	F-value	8,5101	df Effect	2	df Error	414	p-value	0,0002*

Post Hoc Test – Fisher LSD			
Family assets situation	Something worse than the majority	Neither better nor worse than the majority	Something better than the majority
Something worse than the majority		*	*
Neither better nor worse than the majority	*		*
Something better than the majority	*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 67. Analysis of variance by variable family assets situation for category *use*

Category - Use								
Homogenity of Variances		Levene		p-value	0,5061	Brown-Forsythe	p-value	0,3039
Analysis of Variance	F-value	10,1118	df Effect	2	df Error	414	p-value	0,0000*

Post Hoc Test – Fisher LSD			
Family assets situation	Something worse than the majority	Neither better nor worse than the majority	Something better than the majority
Something worse than the majority		*	*
Neither better nor worse than the majority	*		*
Something better than the majority (	*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 68. Analysis of variance by variable family assets situation for category *impact on quality of life*

Category - Impact on quality of life								
Family assets situation								
Homogenity of Variances	Levene	p-value	0,6916			Brown-Forsythe	p-value	0,7326
Analysis of Variance	F-value	2,98177	df Effect	2	df Error	414	p-value	0,0517

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 69. Analysis of variance by variable family assets situation for *empowerment*

Category - Empowerment								
Homogenity of Variances		Levene	p-value	0,1741	Brown-Forsythe		p-value	0,1184
Analysis of Variance	F-value	4,1454	df Effect	2	df Error	414	p-value	0,0164*

Post Hoc Test – Fisher LSD			
Family assets situation	Something worse than the majority	Neither better nor worse than the majority	Something better than the majority
Something worse than the majority			*
Neither better nor worse than the majority			*
Something better than the majority	*	*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 70. Analysis of variance by variable the level of income of the household in the last three years t for *access*

Category - Access								
Homogenity of Variances		Levene	p-value		0,0075	Brown-Forsythe	p-value	0,0163
Analysis of Variance	Welch F-value	14,5536	df Effect	3	df Error	118,7395	p-value	0,0000*

Post Hoc Test – Games-Howell				
The level of income of the household in the last three years	Increased	Decreased	Stayed the same	Do not know
Increased		*	*	
Decreased	*		*	
Stayed the same	*	*		*
Do not know			*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 71. Analysis of variance by variable the level of income of the household in the last three years t for *use*

Category - Use								
Homogenity of Variances		Levene	p-value		0,0200	Brown-Forsythe	p-value	0,0256
Analysis of Variance	Welch F-value	16,0058	df Effect	3	df Error	118,6547	p-value	0,0000*

Post Hoc Test – Games-Howell				
The level of income of the household in the last three years	Increased	Decreased	Stayed the same	Do not know
Increased		*	*	
Decreased	*		*	
Stayed the same	*	*		*
Do not know			*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 72. Analysis of variance by variable the level of income of the household in the last three years t for *impact on quality of life*

Category - Impact on quality of life									
Homogenity of Variances		Levene		p-value	0,6568	Brown-Forsythe		p-value	0,6217
Analysis of Variance	F-value	17,0267	df Effect	3		df Error	405	p-value	0,0000*

Post Hoc Test – Fisher LSD				
The level of income of the household in the last three years	Increased	Decreased	Stayed the same	Do not know
Increased		*	*	*
Decreased	*		*	
Stayed the same	*	*		*
Do not know	*		*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 73. Analysis of variance by variable the level of income of the household in the last three years t for *empowerment*

Category - Empowerment								
Homogenity of Variances			Levene	p-value	0,1532	Brown-Forsythe	p-value	0,1103
Analysis of Variance	F-value	9,9704	df Effect	3	df Error	405	p-value	0,0000*

Post Hoc Test – Fisher LSD				
The level of income of the household in the last three years	Increased	Decreased	Stayed the same	Do not know
Increased		*	*	
Decreased	*		*	
Stayed the same	*	*		*
Do not know			*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 74. Analysis of variance by variable place of residence for *access, use, impact on quality of life*

Place of residence									
Category - Access									
Homogenity of Variances			Levene	p-value	0,0160	Brown-Forsythe		p-value	0,0184
Analysis of Variance	Welch F-value	1,5884	df Effect	2		Df Error	187,0666	p-value	0,2070
Category – Use									
Homogenity of Variances			Levene	p-value	0,5711	Brown-Forsythe		p-value	0,6339
Analysis of Variance	F-value	1,4318	df Effect	2		df Error	424	p-value	0,2400
Category - Impact on quality of life									
Homogenity of Variances			Levene	p-value	0,3888	Brown-Forsythe		p-value	0,4568
Analysis of Variance	F-value	2,3027	df Effect	2		df Error	424	p-value	0,1012

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 75. Analysis of variance by variable place of residence for *empowerment*

Category - Empowerment								
Homogenity of Variances		Levene	p-value		0,4356	Brown-Forsythe	p-value	0,4458
Analysis of Variance	F-value	3,2968	df Effect	2	df Error	424	p-value	0,0380*

Post Hoc Test – Fisher LSD			
Place of residence	Urban	Urban – suburban	Rural
Urban		*	
Urban – suburban	*		
Rural			

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 76. Analysis of variance by variable membership in the religious organization for *access, use, impact on quality of life, empowerment*

Membership in the religious organization								
Category - Access								
Homogenity of Variances		Levene	p-value		0,8460	Brown-Forsythe		0,8865
Analysis of Variance	F-value	3,9076	df Effect	1	df Error	388	p-value	0,0487*
Category - Use								
Homogenity of Variances		Levene	p-value		0,0592	Brown-Forsythe	p-value	0,1300
Analysis of Variance	F-value	2,8920	df Effect	1	df Error	388	p-value	0,0898
Category - Impact on quality of life								
Homogenity of Variances		Levene	p-value		0,0125	Brown-Forsythe	p-value	0,0133
Analysis of Variance	Welch F	2,2012	df Effect	1	df Error	350,3373	p-value	0,1387
Category - Empowerment								
Homogenity of Variances		Levene	p-value		0,0054	Brown-Forsythe	p-value	0,0025
Analysis of Variance	Welch F	4,8282	df Effect	1	df Error	358,2103	p-value	0,0286*

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 77. Analysis of variance by variable membership in the political party for *access, use, impact on quality of life, empowerment*

Membership in the political party								
Category - Access								
Homogenity of Variances	Levene	p-value	0,7388		Brown-Forsythe		p-value	0,6708
Analysis of Variance	F-value	0,0700	df Effect	1	df Error	409	p-value	0,7914
Category – Use								
Homogenity of Variances	Levene	p-value	0,6845		Brown-Forsythe		p-value	0,4707
Analysis of Variance	F-value	0,2883	df Effect	1	df Error	409	p-value	0,5915
Category - Impact on quality of life								
Homogenity of Variances	Levene	p-value	0,8331		Brown-Forsythe		p-value	0,8698
Analysis of Variance	F-value	1,7298	df Effect	1	df Error	409	p-value	0,1891
Category – Empowerment								
Homogenity of Variances	Levene	p-value	0,5303		Brown-Forsythe		p-value	0,6556
Analysis of Variance	F-value	0,7396	df Effect	1	df Error	409	p-value	0,3902

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 78. Analysis of variance by variable membership in the one / several non-profit organizations for *access, use, impact on quality of life, empowerment*

Membership in theone / several non-profit organizations								
Category - Access								
Homogenity of Variances		Levene	p-value	0,7605	Brown-Forsythe		p-value	0,8193
Analysis of Variance	F-value	0,4508	df Effect	1	df Error	410	p-value	0,5023
Category – Use								
Homogenity of Variances		Levene	p-value	0,7721	Brown-Forsythe		p-value	0,6814
Analysis of Variance	F-value	0,2586	df Effect	1	df Error	410	p-value	0,6113
Category - Impact on quality of life								
Homogenity of Variances		Levene	p-value	0,8199	Brown-Forsythe		p-value	0,8661
Analysis of Variance	F-value	1,6949	df Effect	1	df Error	410	p-value	0,1936
Category – Empowerment								
Homogenity of Variances		Levene	p-value	0,0014	Brown-Forsythe		p-value	0,0557
Analysis of Variance	F-value	5,3787	df Effect	1	df Error	410	p-value	0,0209*

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 79. Analysis of variance by variable knowledge of English in speech and writing for *access*

Category - Access								
Homogenity of Variances		Levene	p-value	0,0209	Brown-Forsythe		p-value	0,0119
Analysis of Variance	Welch F-value	80,0659	df Effect	5	df Error	106,4920	p-value	0,0000*
Post Hoc Test – Games-Howell						Group size - unequal		
Knowledge of English in speech and writing	I do not know	Very insufficient		Insufficient		Good	Very good	Excellent
I do not know		*		*		*	*	*
Very insufficient	*					*	*	*
Insufficient	*					*	*	*
Good	*	*		*				
Very good	*	*		*				
Excellent	*	*		*				

*The mean difference is significant at the 0.05 level

Source: made by the author

Table 80. Analysis of variance by variable knowledge of English in speech and writing for *use*

Category - Use								
Homogenity of Variances	Levene		p-value	0,00176		Brown-Forsythe	p-value	0,0030
Analysis of Variance	Welch F-value	118,2571	df Effect	5	df Error	107,5880	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal				
Knowledge of English in speech and writing	I do not know	Very insufficient	Insufficient	Good	Very good	Excellent		
I do not know		*	*	*	*	*		
Very insufficient	*			*	*	*		
Insufficient	*			*	*	*		
Good	*	*	*			*		
Very good	*	*	*					
Excellent	*	*	*	*				

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 81. Analysis of variance by variable knowledge of English in speech and writing for *impact on quality of life*

Category - Impact on quality of life								
Homogenity of Variances	Levene		p-value		0,0000	Brown-Forsythe	p-value	0,0000
Analysis of Variance	Welch F-value	81,9320	df Effect	5	df Error	101,1484	p-value	0,0000*
Post Hoc Test – Games-Howell					Group size - unequal			
Knowledge of English in speech and writing	I do not know	Very insufficient	Insufficient		Good		Very good	Excellent
I do not know		*	*		*		*	*
Very insufficient	*				*		*	*
Insufficient	*				*		*	*
Good	*	*	*					*
Very good	*	*	*					
Excellent	*	*	*		*		*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 82. Analysis of variance by variable knowledge of English in speech and writing for *empowerment*

Category - Empowerment								
Homogenity of Variances	Levene	p-value	0,0000		Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	39,3812	df Effect	5	df Error	99,2332	p-value	0,0000*
Post Hoc Test – Games-Howell			Group size - unequal					
Knowledge of English in speech and writing	I do not know	Very insufficient	Insufficient		Good		Very good	Excellent
I do not know		*	*		*		*	*
Very insufficient	*						*	*
Insufficient	*				*		*	*
Good	*		*					*
Very good	*	*	*					
Excellent	*	*	*		*			

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 83. Analysis of variance by variable level of education for *access*

Category - Access									
Homogenity of Variances	Levene			p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value		202,9639	df Effect	5	df Error	147,4280	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal					
Level of education	Incomplete primary school	Primary school	Craft, the profession for a period of three years	High school for a period of four years		College		Faculty	
Incomplete primary school			*	*		*		*	
Primary school			*	*		*		*	
Craft, the profession for a period of three years	*	*		*		*		*	
High school for a period of four years	*	*	*			*		*	
College	*	*	*	*					
Faculty	*	*	*	*					

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 84. Analysis of variance by variable level of education for *use*

Category - Use									
Homogenity of Variances			Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value		160,5395	df Effect	5	df Error	142,4003	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal					
Level of education	Incomplete primary school	Primary school	Craft, the profession for a period of three years	High school for a period of four years	College	Faculty			
Incomplete primary school			*	*	*	*			
Primary school			*	*	*	*			
Craft, the profession for a period of three years	*	*		*	*	*			
High school for a period of four years	*	*	*		*	*			
College	*	*	*	*					
Faculty	*	*	*	*					

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 85. Analysis of variance by variable level of education for *impact on quality of life*

Category - Impact on quality of life									
Homogenity of Variances			Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value		104,4822	df Effect	5	df Error	147,1569	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal					
Level of education	Incomplete primary school	Primary school	Craft, the profession for a period of three years	High school for a period of four years		College		Faculty	
Incomplete primary school			*	*		*		*	
Primary school			*	*		*		*	
Craft, the profession for a period of three years	*	*		*		*		*	
High school for a period of four years	*	*	*			*		*	
College	*	*	*	*					
Faculty	*	*	*	*					

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 86. Analysis of variance by variable level of education for *empowerment*

Category - Empowerment									
Homogenity of Variances			Levene	p-value	0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value		37,8835	df Effect	5	df Error	124,9063	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal					
Level of education	Incomplete primary school	Primary school	Craft, the profession for a period of three years	High school for a period of four years		College		Faculty	
Incomplete primary school			*	*		*		*	
Primary school			*	*		*		*	
Craft, the profession for a period of three years	*	*		*		*		*	
High school for a period of four years	*	*	*					*	
College	*	*	*					*	
Faculty	*	*	*	*				*	

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 87. Analysis of variance by variable disability for *access*

Category - Access								
Homogenity of Variances	Levene	p-value	0,0001	Brown-Forsythe			p-value	0,0000
Analysis of Variance	Welch F-value	29,3059	df Effect	2	df Error	27,9102	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal				
Disability		yes		partial disability			no	
yes								*
partial disability								
no			*					

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 88. Analysis of variance by variable disability for *use*

Category - Use								
Homogenity of Variances	Levene	p-value	0,0001	Brown-Forsythe			p-value	0,0000
Analysis of Variance	Welch F-value	34,2737	df Effect	2	df Error	28,2876	p-value	0,0000*
Post Hoc Test – Games-Howell				Group size - unequal				
Disability		yes		partial disability			no	
yes								*
partial disability								
no			*					

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 89. Analysis of variance by variable disability for *impact on quality of life*

Category - Impact on quality of life								
Homogenity of Variances	Levene	p-value		0,0000	Brown-Forsythe		p-value	0,0000
Analysis of Variance	Welch F-value	36,2297	df Effect	2	df Error	29,9427	p-value	0,0000*

Post Hoc Test – Games-Howell	Group size - unequal		
Disability	yes	partial disability	no
yes			*
partial disability			
no	*		

*The mean difference is significant at the 0.05 level
Source: made by the author

Table 90. Analysis of variance by variable disability for *empowerment*

Category - Empowerment								
Homogenity of Variances	Levene	p-value		0,0381	Brown-Forsythe		p-value	0,0430
Analysis of Variance	Welch F-value	7,0881	df Effect	2	df Error	27,5590	p-value	0,0033*

Post Hoc Test – Games-Howell	Group size - unequal		
Disability	yes	partial disability	no
yes			*
partial disability			
no	*		

*The mean difference is significant at the 0.05 level
Source: made by the author

Appendix 3 Projects of e-inclusion countries of European Union

Table 91. List of the projects of e-inclusion EU countries

Target groups	Projects and initiative	Year	Country	Description of the project	Output of the project
Whole population	Open architecture for Accessible Services Integration and Standardization (OASIS) project	2010	Greece, Switzerland	animated project video, application of the OASIS project: Independent living applications, Nutritional advisor, Activity coach, Brain and skills trainer, Social communities platform, Health monitoring, Environmental control, Autonomous Mobility and Smart Workplaces Applications, Transport information services, Route guidance, Personal mobility, Smart workplaces	increase the quality of life of people with the help of ICT
	Estonian Information Centre	2010	Estonia	enhancing people's knowledge and skills as to the use of digital solutions, promote safe Internet use, target group: children and youngsters under 21 and the adults	use of digital services easier, more user-centric and secure, increase opportunities for people with special needs and participation in the Information Society
	Come Along!	2010	Estonia	free advice to anyone interested about the way electronic services work, training sessions - municipal post offices, training sessions lasted about 10 to 15 minutes, free-of-charge	computer trainings for 100 000 people, connection to the Internet 50 000 additional families
	Multimedia Projects	2010	France	favour social cohesion, promote assisted access to ICT, acquisition of digital competences and the use of multimedia	increase the quality of life of people with the help of ICT

	Projects and initiative	Year	Country	Description of the project	Output of the project
	'WebActivate'	2010	Ireland	provide free digital skills training scheme for building websites for local small businesses	create employment for hundreds of people in four major population centres across Ireland
	'Home Access Programme'	2010	UK	helps low-income families lacking access to a computer and/or the Internet to get online at home to support learning	free computers and internet connections to 270 000 families with children of school age, along with educational guidance
	'Virtual Bus' project	2009	Cyprus	offers citizens and enterprises at every location the chance to participate in the research work, assistance to citizens in the use of e-services	free Internet access for citizens; use of applications on eGovernment, eLearning, eBusiness, eHealth and Tele-work
	The Flemish plan	2009	Belgium	educate citizens on free software; help to increase the region's use of the Internet, including electronic government services, media, culture, health services and eLearning	regional government office - improve access to high-quality media content, which combines technological innovations and new media
	Data Mailbox project	2009	Czech Republic	a personal register of all electronic communications with the public authorities, Data Boxes' information system is set to become available to other types of communication, such as citizen-to-citizen, citizen-to-business and business-to-business	Data Boxes' information system
	'Linea Amica' activity	2009	Italy	network of contact centres whose mission is to promote, through various channels, eGovernment or mobile government services	exceeded 100 000 contacts, opened more than 51 000 offices, and resolved 98 % of the requests it received

	Projects and initiative	Year	Country	Description of the project	Output of the project
	Modern Ways of Acquiring ICT Knowledge	2008	Lithuania	offered an opportunity to all those interested to improve their computer literacy knowledge through distant training	increased level of information literacy of participants
	Citizen Offices for Young and Older People	2008	Austria	Internet training courses for the elderly; courses are held by IT professionals	increased opportunities for basic internet training for seniors
	Service W@tson, the 'virtual local councillor'	2008	Belgium	available to answer questions from the citizens of Waterloo for 24 hours a day through an instant messaging platform	increased capacity to direct users in order to find relevant information on the Commune's website by an intuitive recognition of keywords
	'Mobile Citizen Service Centre'	2008	Cyprus	established in remote areas in Cyprus - mountainous area and village; offer internet access;	Mobile Citizen Service Centre travelling around Cyprus
	Czech POINT	2008	Czech Republic	more than 1 500 Czech Points became operational at post offices, municipal bureaus and the embassies; the terminals provided certified documents for frequently sought public records, such as criminal records, and the land and commercial registers	network of access points to eGovernment services
	Centrum Internetu	2008	Czech Republic	provide personal assistance and courses to those who cannot use a computer; offer professional inclusion services to target groups with special needs, such the disabled, the elderly, the unemployed youth, and other potentially socially excluded groups	32 000 participants had benefited from this activity

	Projects and initiative	Year	Country	Description of the project	Output of the project
	'Red.es Telecentres'	2008	Spain	free Internet access points located across Spain's rural areas, instruct the population on how to perform operations via the eGovernment portal and how to obtain information by electronic means	over 500 Telecentres trainers, within 1 500 Telecentres
	UK Online Centres & Telecentre Europe	2008	UK	Telecentre Europe is a newly-founded network that brings together international telecentres to share experiences and know-how. UK Online Centres is a well-established network of telecentres within the United Kingdom, which offers courses and support on anything related with technology in deprived communities.	about 250 members, all actively involved on the social networking website at www.telecentre.org.; member organisations may be operating at regional, local, or city level but they are all involved in running telecentres and in working with users directly
	VillageRoad3	2005-2008	Estonia	extend access to broadband internet connections in remote rural areas, undertaken in collaboration with local governments, district councils and the telecommunications board	achieve 90 % coverage of internet broadband access in Estonia, 98 % of the country has been achieved upon completion of this programme in May 2008
	'Distance Education Centres in rural areas'	2007-2008	Poland	establish learning centers in rural areas, equippe centers with computers and software and required technical infrastructure, free eLearning training	1 374 distance learning centers established in rural areas
	'N@utobus	2007	Poland	introducing new technologies, modern applications and the Internet to the rural population, training courses and presentations	in six months (July 2006 - January 2007), more than 10 000 people benefited from the initiative

	Projects and initiative	Year	Country	Description of the project	Output of the project
	Public library development project	2006-2008	Latvia	public libraries in Latvia equipped with modern computers and software, broadband internet connections and free Wi-Fi access	874 public libraries provide free access to computers and the Internet
	Campaign 'Internet for everyone'	2006-2007	Belgium	affordable package deal to potential buyers: PC, an Internet connection and a training session	project contributed to 16 % of the increase of new Internet connections over a period of one year, the project contributed to almost a quarter of the increase of Internet connections
	Easy-e-Spaces	2006	Belgium	provide free internet, computer access, use a printer and a scanner and ICT training to both the general public and specific target groups	over the course of 4 years, more than 400 of these spaces started up and were sustained in Belgium
	Free-of-charge basic computer courses	2006	Czech Republic	courses covered the same topics as those of the European Computer Driving Licence; courses on eSignatures and the use of the government portal	raising computer competences, more than 10 000 people registered in the first six months
	Computer Literacy Basics for a Lithuanian E-citizen	2006-2008	Lithuania	provided fundamental computer skills laying special emphasis on the various elderly residents living in rural areas	50 012 people have graduated from the courses whose age average was 43 , geographical coverage all 60 municipalities of Lithuania 12 % of those graduated were people over 60 years of age and 78 % of all participants were women

	Projects and initiative	Year	Country	Description of the project	Output of the project
	Internet for education	2006	Slovakia	support households, to increase broadband access and further improve information literacy	40 000 households was supported
	Citizen Service Centre	2005	Cyprus	established in remote areas in Cyprus - mountainous area and village; offer internet access;	Citizen Service Centres all over Cyprus
	Original campaign Peeceefobie/Pécéphobie	2005	Belgium	Ginette, a fictional character, explained - via a TV commercial, a website (www.peeceefobie.be), a booklet, and a teaching package - how she had overcome her fear of PCs and the Internet	informing users about privacy, safety and security on the Internet
	eSchool	2005	Portugal	making portable notebook PCs with wireless broadband connectivity available to students, adult trainees and teachers, different pricing schemes according to the beneficiaries' economic status, favourable conditions for disabled persons and low socio-economic status groups	targeting nearly 750 000 citizens, delivered over 1 300 000 portable PCs
	'It's never too l@te'	2004	Italy	initiatives undertaken to turn the commitment of the Government for an information society from which no one is excluded	RAI Educational channel - TV training programmes for digital literacy diffusion
	'Latvia@World' initiative	2004	Latvia	training the entire population in the use of ICT, with special attention paid to special needs groups	more than 39 000 people had acquired digital literacy skills
	'Simply Internet'	2003-2005	Germany	transfer essential knowledge about: the Internet; online surfing and navigation; email basics; and online banking and research	Internet online training courses organised at regional educational centres in over 200 German cities; 5 training modules

	Projects and initiative	Year	Country	Description of the project	Output of the project
	The first Citizen Cards	2003	Austria	Citizen Card was purposed to enable secure citizen access to electronic public services, and settlement of all routine procedures electronically	Citizen Cards
	' iCentres' project	2003	Bulgaria	facilitating access to information and education to virtually every citizen, regardless of gender, wealth, race, age, or physical disadvantages; developing network of telecentre facilities has been established in local communities in Bulgaria	106 telecentres - fully operational access points with modern computer, multimedia equipment, sophisticated server system, real-time communication system, mobile telecentre; iCentres' E-Learning System
	eHungary Programme 2.0	2003	Hungary	establish a network of community Internet access points helping to introduce disadvantaged groups to the benefits of the information society	3 032 access points had been set up by May 2005
	'Ikonk@	2003	Poland	as many local communities as possible enjoyed easy, universal and free access to the Internet	Internet Access Points (PIAPs) were created in the cultural institutions of all municipalities in Poland
	'Network of Public Internet Access Points'	2002-2008	Lithuania	create Public Internet access points in libraries, centres of culture, elderly homes, community centres, etc; ensure that the nearest public internet access point would be within 8–10 km from villages	700 access points where Lithuanians can have Internet access, free of charge
	Information Society initiative	1995	Austria	Federal Government set up an Information Society Working Group composed of more than 350 experts in the fields of state administration, business and science	identifying the opportunities and threats posed by the development of the Information Society in Austria

	Projects and initiative	Year	Country	Description of the project	Output of the project
	'Internet for Rural Western Pomerania', 'MEW@ - Digital Competence', 'Equal Internet opportunities in Suwalski'	2009-2011	Poland	provide underprivileged households with computer equipment, Internet access and comprehensive training in order to acquire the required skills for computer/Internet use in all aspects of everyday life	the projects include 37 training sessions (1 056 hours) targeting 325 households
	‘TIC TAC’	2009-2010	Spain	training programme for all citizens on the use of advanced ICTs, and especially for people with disabilities, citizens with Internet access difficulties are able to gain access through appropriately equipped public centres, or specifically adapted equipment	distribution of adapted software and hardware to persons with special needs, key equipment to public centres: videoconference systems, eID card readers, multipurpose equipment, etc.
	The Computer for €0.99ċ scheme	2008	Malta	giving the opportunity to the public to buy a latest technology computer at the rate of €0.99ċ daily	8 912 families benefited from this scheme and purchased a computer at subsidised rates
	'My Potential' scheme	2008	Malta	enable individuals to achieve their full potential in ICT, cover a portfolio of 82 certifications issued by renowned private sector companies and institutions	more that 1 085 individuals have taken advantage of this scheme and follow ICT studies
	'Go Digital 2.0'	2009	Greece	offered students a new laptop with a maximum subsidy of € 400, free access to 100 GBytes of 'online' storage area via the PITHOS+ service, and access to new open source educational software	Increased ICT accessibility for students

	Projects and initiative	Year	Country	Description of the project	Output of the project
	'Smart Learning'	2008	Malta	the distribution of new laptops to school teachers	3 800 laptops were distributed to school teachers together with the necessary training so as to have access, Furthermore nearly 6 000 computers in schools were changed by means of the PC Leasing
	'Internet in the classroom'	2005-2009	Spain	advance the use of ICT as an educational tool strengthening the role that new technologies play	796 schools across Spain having installed 89 979 computers, 36 483 video projectors, interactive boards, 7 767 wireless access points in classrooms, 91 692 classrooms involved, number of students having benefited from those actions reached 2 700 000
	Digital 'Štúrovstvo' at schools	2005-2006	Slovakia	increase the digital literacy of the population through setting up education centers in elementary and secondary schools, access to the Internet and to electronic eGovernment services, in centres citizens were assisted by trainers, when needed	829 elementary schools where involved in the project and affected approx. 70 000 people in Slovakia
	eFit Strategy - 'eFit', 'eFit2'	2000, 2005	Austria	developed to bring together schools, further education in universities and technical universities, life-long education and culture, in several initiatives on the spread of ICT skills and increase of ICT literacy	ensuring the necessary technical infrastructural and pedagogical conditions for the establishment of new media and changed learning cultures in the Austrian educational system

	Projects and initiative	Year	Country	Description of the project	Output of the project
	EURO200	2004	Romania	provides financial support of € 200 for scholars and students deriving from low-income families, stimulate the acquisition of computers	38 000 computers
	e-School	2003	Estonia	engage parents more actively in the study process, make information on subjects more available to children as well as to parents, and to facilitate the work of teachers and of school management	430 schools across Estonia using eSchool, which corresponds to 67% of schools in Estonia
Target groups	**Projects and initiative**	**Year**	**Country**	**Description of the project**	**Output of the project**
Young people/minors	Programme 'CT of young men'		Bulgaria	access of young persons to ICT is improving through gaining knowledge	training of unemployed youth
	'Fly on the Internet'	2002	Italy	special conditions for young people to buy PCs	
	'Empowerment of Youth for E-transformation of Turkey' project		Turkey	increase the number of digital literates, mainly among youth and women	more than 900 young people from 70 provinces have volunteered to provide basic computer and internet skills to their peers, 107 000 citizens have benefited from the project including the disabled and other special needs groups

Target groups	Projects and initiative	Year	Country	Description of the project	Output of the project
People with disabilities	VERITAS project	2010	Belgium, Switzerland	designers or developers active in the design and development process in the automotive, smart living spaces, workplace, eHealth and/or infotainment domains, have been invited to complete the survey by answering related questionnaire(s)	potential relation to older people and people with disabilities
	ÆGIS project	2010	Greece, Romania, Switzerland	develops software for persons with disabilities, covering the desktop platform, the Web and mobile devices	application suitable for both Braille experts and occasional users
	'Latvia@World' initiative	2004	Latvia	training the entire population in the use of ICT, with special attention paid to special needs groups	more than 39 000 people had acquired digital literacy skills
	'Pegasus 2010'	2010	Poland	remove functional barriers that prevent, or impede education opportunities and gainful employment for the disabled	assistive devices and ICT hardware and software
	'Disability and Social Exclusion	2009	Italy	improve the social inclusion of people with disabilities, with particular focus on overcoming prejudice and stereotypes, enhancing experiences, identifying and promoting the development and implementation of good practices, disseminating information through concrete local, regional and national initiatives, and creating a network among key stakeholders	bilingual (Italian and English) project website, numerous activities were carried out: round tables, conference, 18 best practices have been identified and disseminated

	Projects and initiative	Year	Country	Description of the project	Output of the project
	Plain Language Search	2008	Finland	implement an information search service for special needs groups	information search service
	Implementation of Technology'	2008	Denmark	implement communication technology as a natural aspect of everyday life for residents and personnel in homes for the disabled; establish partnerships with research groups, IT companies, volunteers and residences for the disabled by combining different competencies and perspectives; develop teaching materials and courses related to the implementation of IT for disabled persons for educational institutions and relevant stakeholders	technology-screening in the use of IT in care homes for the disabled; establishment of an IT volunteers' network at care homes for the disabled; training to improve the IT skills for personnel working in care homes for the disabled
	'Anysurfer'	2008 2007	Belgium	encouraging further improvements in the accessibility of public administration websites to the sight-impaired and Internet surfers with disabilities	accessible websites for people with disabilities, reducing examination periods and improving cost control
	'SmartStart' scheme	2008	Malta	persons with disability, were given the opportunity to buy a reconditioned computer	949 reconditioned computers were distributed under the 'SmartStart' scheme
	'Open Door' Project	2007	Latvia	intends to expand the eInclusion in Latvia research on assistive technology products, adaptive software and accessibility features in order to serve people with disabilities, provide assistance on how to adapt ICT to the needs of the disabled	training opportunities for specialists in eAccessibility, e-Accessibility Centre, Guide for the disabled

	Projects and initiative	Year	Country	Description of the project	Output of the project
	'Digital Library'	2007	Slovakia	designed to offer a service to blind users	audio books artistically narrated and available to blind users via multi-channel delivery, for instance: the Internet, mobile phones and mp3 players
	'Pythagoras 2007'	2007	Poland	directed at deaf, hearing impaired, and blind college and university students	purchase of hardware and software for visual impairment, deafness and hearing loss
	Communit-e process	2006 2005	Belgium	only the electronic procedure	application for social help for the disabled
	'EFTEHNOS'	2003 2006	Greece	training activities are targeted towards the academic, research and business communities, and are aimed at introducing methods and practices that enable the use of ICT by people with disabilities	development of a network of excellence in the domain of IT based Assistive Technologies for persons with disabilities
	'Paediatrics ICT'	2005	Portugal	technological resources available to children hospitalized in pediatric wards, enabling them to relax and be in contact with their families, school and friends via web-cams, personal computers and small family blogs	included 22 hospital
	Initiatives related to internet access insurance of people with disabilities	2003	Bulgaria	examination and analysis of the basic requirements for creating internet access places for people with disabilities; business plan on the necessary equipment for one universal place for access and training of different categories of people with disabilities	specialised portal - allowed access for people with sight, hearing and vocal impairments to web documents and information mainly related to their specific needs and necessities

	Projects and initiative	Year	Country	Description of the project	Output of the project
	'Bulgaria for All' Program	2003	Bulgaria	information access for blind people was ensured throughout an established Bulgarian version for reading machines, and computers with Braille and synthetic speech	software for synthetic speech
	'Plain-e: Accessibility for Everyone' project	2003	Finland	promote accessibility of public web services for people with learning disabilities	unofficial certification scheme, advisory service to public and private organisations
	'Blind Friendly Web' project	2000	Czech Republic	offered testing methods, courses and consultancy geared towards webmasters who want to create accessible web pages, including material on principles of web accessibility for users with severe vision impairments	consulting services on assistive aids, assistive technologies, PC courses; website provides voluntary eAccessibility guidelines
	Fruit Tree		Sweden	database network - users can participate in discussion groups, retrieve information and send or receive emails in a way that is easily accessible and adapted to the needs of the user	database network - assist the deaf-blind and people with a severe loss of vision
	Electronic kiosk		Switzerland	utilises a simple user interface, and a periodical can be quickly downloaded to a PC, the DAISY or an MP3 player	blind and visually impaired access to numerous newspapers and magazines in German, French or Italian

Target groups	Projects and initiative	Year	Country	Description of the project	Output of the project
Elderly	OASIS project	2008-2010	Bulgaria	revolutionizes the interoperability, quality, width and usability of services for all the daily activities of the elderly; key areas of the project: independent living and socialising, autonomous mobility and flexible work-ability	provide holistic services to older people; support their physical and psychological independence; stimulate social or psychological engagement; foster their emotional well-being
	Technology for the Elderly'	2010-2012		test and develop new technology for the elderly in their homes	ICT for the Elderly, Internet café
	Living at home	2010	France	home improving the living environment of the aged, access to new technologies and to public services addressed to he individual	help older people live at their own
	'Reasonable use of the Internet'	2010	Germany	provide elderly people with the necessary skills for the safe use of PC and the Internet, use of new media in the town of Friedrichshafen, first steps in the world of the Internet	'Senior-Internet-Carers' from Friedrichshafen were trained
	'Get Digital'	2010	UK	promote deliver and sustain digital literacy skills	20 000 older people in sheltered housing are supported to go online
	'Internet goes countryside'	2009	Germany	training seminars to elderly people living in particular in the rural areas of Baden-Württemberg on how to use the Internet services, such as online banking, online purchasing of medication, among other services, for their benefit	various training seminars and workshops are taking place across the Federal state of Baden-Württemberg

	Projects and initiative	Year	Country	Description of the project	Output of the project
	KÄKÄTE - user-centred technology for elderly people and care givers	2010	Finland	improve the awareness of the needs of elderly people and the possibilities of technology to meet these needs, promote the use of technology as a resource in elderly care	improve the quality of life of elderly people, improve the possibilities of them to influence the development work
	'Attentianet' eTEN project	2007	Belgium	project has taken into account the fact that there has been a great need of simple things that become difficult with age, especially, communication	enhance the quality of life elderly
	T-Seniority	2007	Cyprus	significantly improve quality of life and ensure efficient health and social care for the ageing population by specifying and demonstrating innovative ICT enabled products and services	digital inclusion through TV; set of integrated care e-Service throughout TV oriented towards the Elders
	'Finland on the Web'	2005	Finland	Libraries and citizens' service centres advised the elderly on the use of electronic services, provided IT and eServices training for free	enhance the information Literacy of elderly
	Click on it Grandma!	2003	Hungary	organising ICT courses for the elderly, courses are widely spread around the country and are designed to give an overview of computers and Internet usage over a 25-hour tuition period	more than 1 000 participants
	Grandchildren-Grandparents IT Contest	2003-2009	Hungary, Slovakia	participation of old people in the information society by pairing them with their grandchildren, digital active citizenship of the elderly, teachers of the elderly are young students who have volunteered and act as 'grandchildren'	enhance the information Literacy of elderly

	Projects and initiative	Year	Country	Description of the project	Output of the project
	myWeb Plus		Malta	training programme offered for free to people aged 61 years and older through the Community Technology Learning Centres (CTLCs), teach in theory the use of computer	enable participants to use different technologies that can improve the quality of their lives
Target groups	**Projects and initiative**	**Year**	**Country**	**Description of the project**	**Output of the project**
Minorities/migrants	project for the ‘eIntegration’ of minorities	2008	Bulgaria	help young people from the Roma community to make the most of their skills and abilities and reach their full potential	nine-month training courses of 80 Roma men and women between the ages of 16 and 30
	Asylum Service	2005	Cyprus	migrants and asylum applicants arriving in Cyprus have access to information about their country, the laws and regulations of Cyprus and other matters via the Internet	internet centre for migrants and asylum applicants
	'TRIO Project for Foreigners'		Italy	training project aimed to provide foreign nationals (in particular immigrants) living in Tuscany with tools that can improve their integration in the community in which they live	free e-learning courses in the TRIO's training centres or at local associations
	'Online Skills for the immigrants in Germany'	2007-2009	Germany	website designed initially for children of Italian origin who encounter language difficulties at German schools; school children can, through different online learning activities, develop their ICT skills, enhance their bilingualism, play and learn words assisted by an online repeat requesting service, select a topic from a variety of school-related areas, delve into a subject, write articles and stories as well as upload their own paintings onli	mondoli.de website; publication of the 'Recommendations for actions towards optimising the ICT skills of immigrants'

Target groups	Projects and initiative	Year	Country	Description of the project	Output of the project
Unemployed	EQUAL project	2007	Latvia	intended to boost the digital literacy skills of the unemployed	more than 8 000 jobseekers and unemployed people were trained in ICT competencies
	'Second Step' Training Programme	2010	Malta	enables participants to achieve a diploma in ICT for free, targets individuals who are unemployed, at risk of unemployment, those employed in the manufacturing industry, women who would like to return to work, school leavers and those who opt to advance or change their career	jobseekers and unemployed people were trained in ICT competencies
	'First Step'- advanced training programme in ICT	2008	Malta	aimed at preparing participants for a higher level of training in ICT, with the intention of assisting them in advancing their career in this sector	more than 300 persons have benefited from this programme
Adults	Empowerment Programme for IT use: Outreach for Micro Entrepreneurship		Malta	identify the ICT and entrepreneurial training needs of the Maltese labour force; develop and deliver a training curriculum to address the skill gaps identified; support the course with seminars and publicity campaigns	increase in employment and stimulation of competitiveness, increase the number of adults acquiring sound ICT skills with a focus on entrepreneurship
	'Computer for Homer 2010'	2010	Poland	occupational and social rehabilitation of the visually impaired	purchase of assistive technology and Braille devices

Source: made by the author based on [http://www.epractice.eu/en/factsheets/.].

Curriculum Vitae

Nikolina Žajdela Hrustek was born on 10th of December 1981 in Čakovec, where she received high school diploma from economy. She graduated at the Faculty of Economy in Rijeka in the course of finances and banking. During studies she was receiving the state scholarship of category A and was working as an assistant in a Informatics and Monetary economy courses. She graduated in the top 10% of students at the Faculty of Economy in Rijeka. Currently she work at the Faculty of Organization and Informatics University of Zagreb, where she teach the following courses: Project Management, Operations Research, Modelling and Simulation and Operations Management. Before joining faculty, she was working as accounting department manager for several years.

Hers research interests are in e-inclusion, e-services, project management, modelling and simulation, operations research. She has published six scientific, two expert articles in scientific Journals and thirteen scientific articles in international scientific conferences. Recently, she was participating on a Croatian national scientific project "Conceptual modelling of complex systems" (016-0161711-1707). She is married and lives in Kotoriba.

List of Publications

Scientific and professional papers in journals

1. Bedi, Krunoslav; Žajdela Hrustek, Nikolina: Marketing vs. Games in Secondary School: Is it Secondary School?. International Journal of Innovation in the Digital Economy (IJIDE). 4 (2013), 3; 35-50 (scientific paper).
2. Orehovački, Tihomir; Žajdela Hrustek, Nikolina: Development and Validation of an Instrument to Measure the Usability of Educational Artifacts Created with Web 2.0 Applications. Lecture Notes in Computer Science. 8012 (2013) ; 369-378 (scientific paper).
3. Žajdela Hrustek, Nikolina; Jarmić, Tomislav; Jagić, Marija: The role of standard ISO/TEC 12207 in informatics Projects Management. Informatologia. 44 (2011) , 1; 31-39 (scientific paper).
4. Bedi, Krunoslav; Šestan, Suzana; Žajdela, Nikolina: Avatars and identification in online communication. International Journal of Intelligent Defence Support Systems. 3 (2010) , 1/2; 22-29 (scientific paper).
5. Bedi, Krunoslav; Žajdela Hrustek, Nikolina: Generic icons – yes or no?. Journal of Information and Organizational Sciences. 34 (2010) , 1; 17-26 (scientific paper).
6. Severović, Kornelija; Žajdela, Nikolina; Cvetković Šoštarić, Bojana: Konceptualni model kao alat za upravljanje kvalitetom bankarskih usluga. Ekonomski vjesnik : časopis Ekonomskog fakulteta u Osijeku. 1 (2009) ; 147-160 (scientific paper).
7. Žajdela Hrustek, Nikolina; Dušak, Vesna; Severović, Kornelija: Sektorski pristup upravljanju projektima. Zbornik Ekonomskog fakulteta u Zagrebu. 11 (2013) , 1; 121-141 (professional paper).
8. Severović, Kornelija; Perši, Nenad, Žajdela Hrustek, Nikolina. Customer relationship management and problem solving using queuing simulation modeling, Zbornik radova Veleučilišta u Karlovcu, (2013), (professional paper).

Scientific papers in conference proceedings

1. Žajdela Hrustek, Nikolina; Mekovec, Renta; Bubaš, Goran: Croatian central e-government portal: a usefulness analysis. Proceedings of the Central and Eastern European eDem and eGov Days 2015, May 7-8, 2015. 27-42.
2. Žajdela Hrustek, Nikolina: Multidimensional and multiperspective approach for monitoring e-inclusion. ICEGOV '14 Proceedings of the 8th International Conference on Theory and Practice of Electronic Governance, ACM, 2014. 520-523.
3. Bedi, Krunoslav; Žajdela Hrustek, Nikolina; Vrbanec, Tedo: E_Learning vs. Multimedia (Ivica & Marica - Hansel & Gretel) Proceedings of the 36th MIPRO International Convention on Computers in Education / Petar Biljanović (ur.). Rijeka : Croatian Society for Information and Communication Technology, Electronics and Microelectronics - MIPRO, 2013. 736-741.
4. Orehovački, Tihomir; Žajdela Hrustek, Nikolina: Towards a Framework for Usability Evaluation of Educational Artifacts created with Web 2.0 Applications: A Pilot Study Proceedings of the 36th International Convention on Information and Communication Technology, Electronics and Microelectronics / Biljanović, Petar (ur.). Rijeka : Croatian Society for Information and Communication Technology, Electronics and Microelectronics, 2013. 691-696.
5. Bedi, Krunoslav; Hrustek, Nikolina Žajdela; Ćorić, Ana: Teaching vs. 3D gaming in secondary school Proceedings of the 34th MIPRO International Convention on Computers in Education / Čičin-Šain, Marina ; Uroda, Ivan ; Turčić Prstačić, Ivana ; Sluganović, Ivanka (ur.). Rijeka : Croatian Society for Information and Communication Technology, Electronics and Microelectronics, 2011. 1325-1330
6. Bedi, Krunoslav; Žajdela Hrustek, Nikolina; Ćorić, Ana: Intuitive sound perception in Media Technician and Web Designer courses Proceedings of the 34th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO 2011) / Čičin-Šain, Marina ; Uroda, Ivan ; Turčić Prstačić, Ivana ; Sluganović, Ivanka (ur.). Rijeka Croatian Society for Information and Communication Technology, Electronics and Microelectronics, 2011. 1319-1324

7. Bedi, Krunoslav; Žajdela Hrustek, Nikolina; Štedul, Ivan: Preferred Information Receiving Channels in Secondary School and University Students Proceedings of the 21th Central European Conference on Information and Intelligent Systems / Boris Aurer, Miroslav Bača, Markus Schatten (ur.). Varaždin : Faculty of Organization and Informatics Varaždin, 2010. 157-162
8. Pihir, Igor; Žajdela Hrustek, Nikolina; Dušak, Vesna: Survey of Simulation Capabilities of the IBM WebSphere Business Modeler Business Process Modeling Tool on the Example of Processing a Loan Application Proceedings of the ITI 2010 32nd International Conference on Information Technology Interfaces / Lužar-Stiffler, Vesna ; Jarec, Iva ; Bekić, Zoran (ur.). Cavtat, Croatia : University Computing Centre, University of Zagreb, 2010. 645-650.
9. Severović, Kornelija; Žajdela Hrustek, Nikolina; Bedi, Krunoslav: Implementing e-learning into banking system in Croatia – perspectives and possibilities Proceedings of the ITI 2010 32nd International Conference on Information Technology Interfaces / Luzar-Stiffler, Luzar ; Jarec, Iva ; Bekic, Zoran (ur.). University of Zagreb : University Computing Centre, 2010. 391-396.
10. Bedi, Krunoslav; Vrbanec, Tedo; Žajdela Hrustek, Nikolina: University level GIMP online course : Faculty of teacher education (ICT course) 33rd International Convention on Information and Communication Technology, Electronics and Microelectronics. Computers in technical systems. Intelligent systems (CTS & CIS). With Mipro to knowledge society : poceedings = 33. međunarodni skup MIPRO : S Miprom u društvo znanja / Bogunović, Nikola ; Ribarić, Slobodan (ur.). Rijeka : Croatian Society for Information and Communication Technology, Electronics and Microelectronics - MIPRO, 2010. 229-233.
11. Bedi, Krunoslav; Šestan, Suzana; Žajdela, Nikolina: Perception of visual identity of programs used in Web designer and media technician courses Proceedings of the 20th Central European Conference on Information and Intelligent Systems / Aurer, Boris ; Bača, Miroslav ; Rabuzin, Kornelije (ur.). Faculty of Organization and Informatics Varaždin : Faculty of Organization and Informatics Varaždin, 2009. 341-345.
12. Bedi, Krunoslav; Ille, Ljiljana; Žajdela, Nikolina: Organizational culture and e-education in secondary school teaching process Proceedings of the 19th Central European Conference on Information and Intelligent Systems,

September 24-26, 2008, Varaždin, Croatia / Aurer, Boris ; Bača, Miroslav (ur.). Varaždin : FOI Varaždin, 2008. 157-162.

13. Žufić, Janko; Vukmirović, Slavomir; Žajdela, Nikolina: Impact of using e-communication and e-learning technologies on the education via Internet Computers in Education : conference : proceedings = Računala u obrazovanju : savjetovanje : zbornik radova / Čičin-Šain, Marina ; Turčić Prstačić, Ivana ; Sluganović, Ivana (ur.). Rijeka : Croatian Society for Information and Communication Technology, Electronics and Microelectronics - MIPRO, 2007. 260-264.