THE CHALLENGES OF DIGITAL ECONOMY DEVELOPMENT IN SOUTH-EAST EUROPEAN COUNTRIES*

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Abstract: *The digitalization level of society and economy is growing in accordance with the rising acceptance and implementation of digital technologies and the transfer of social and economic activities to the Internet. Digital technologies and innovations are powerful, pervasive and have multiple, indirect impacts. These innovations are changing economies and markets, and reinventing relationships between organizations, suppliers and customers, thus becoming critical elements for growth, innovation and job creation. Both developed and developing countries are trying to put in place right enabling conditions in order to use all the innovation and growth opportunities offered by proper implementation of digital technologies in different sectors of national economy and society. This paper examines South East European (SEE) countries in transition readiness to develop digital economy by analyzing and comparing some of the key measuring indicators mainly connected with the infrastructure development, but also some complex measuring information and communication technology (ICT) indexes such as network readiness index and ICT development index.*

Keywords: *Digital economy, digital entrepreneurship, competitiveness, innovation.*

1. INTRODUCTION

The ongoing digital transformation of the economy and society holds many promises to spur innovation, generate efficiencies, improve production and services, and in doing so boost more inclusive and sustainable growth, either of developed or developing economies. Offered opportunities will not materialize automatically and may require policy action to make digital transformation work for growth and well-being. For selected countries in transition in South-Eastern Europe (Serbia, Croatia, Bosnia and Herzegovina, North Macedonia and Montenegro) faced with economic and financial constraints it is very challenging to put in place right enabling conditions in order to use all the innovation and growth opportunities offered by proper digital technology implementation in different sectors of national economy and society. Although in the past two decades information and communication technology have generally improved their performance and growth of ICT sector has been reasonable strong in SEE countries, they still need to reform their economies in the way that allows digital technologies to become "the great enabler" it can be [1].

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2. THE NEW DIGITAL BUSINESS ENVIRONMENT FOR SEE COUNTRIES

Today, the world is at a critical point in the ongoing digital transformation. Technologies continue to develop rapidly and are combined in novel and innovative ways, pushing digital transformation in new and often unpredictable directions. According to the European Digital Transformation Scoreboard 2017 [2], there are seven important digital technologies for doing successful business today and they are: mobile services, social media and cloud technologies, the Internet of things, cybersecurity solutions, robotic and automated machinery, big data and data analytics. The specificity of these digital innovations defined as The Fourth Industrial Revolution is that they bring about changes in the complete industry sectors, becoming in this way a key condition for further competitive business operations in the global market.

The exponential speed of developments, disruption across all major industries, and the impact on entire systems of production, management, and governance are what differentiate these developments from previous "industrial revolutions". The future holds an even higher potential for human development as the full effect of new technologies such as the Internet of things, artificial intelligence, 3-D Printing, energy storage, and quantum computing unfold [3].

To face with new challenging business environment, SEE countries need to put in place following policy directions [4]:

- **Awareness** that reformation toward digital is very comprehensive and profound. Digital economy isn't just about speeding up communication across borders or changing the skills workers need, it is about changing the very nature of consumption, competition and how markets operate;
- **Readiness** to embrace change determines the level of success in this digital world and can only happen by having pledged massive investment in future-oriented technologies, solutions, and business models;
- **Transformation** of traditional to digital economy requires widespread and systematic use of digital technologies by all stakeholders - individuals, businesses, and government. Though digital technologies are affecting every industry and business function, the impact and pace at which digitalization takes place differs across industries and businesses in selected SEE counties.

3. WHY ANALYZED SEE COUNTRIES NEED DIGITAL ECONOMY

As indicated in Table 1. digital technologies offer the solution for different economic challenges that SEE countries has to deal with in order to overcome stagnant or decreasing growth rates, rising unemployment and a worsening living standard of their citizens. SEE countries need new digital sources of growth and the importance of digital transformation of their economies is rising as it will enable further reform, modernization and innovation of different industry sectors. In order to face decreasing production and export challenges caused by inside or outside factors, SEE companies can use digital technologies to reduce business costs, improve internal management, optimize supply chains, making it easier to get goods and services to the market. Digital technology supported production and digital-based services have the potential to create jobs and advance the economic goals of SEE countries.

Digital technologies as a part of the solution for a number of problems and challenges for* SEE *countries	**SEE *countries suffer from these key barriers***	***Policy attention should be on***
SEE countries need new sources of growth	Lack of policy attention	Digital technologies and the process of digital transformation should be a key priority for national governments
A severe lack of productivity, lack of competition and growth	Businesses find it difficult to operate in the new ICT based manner, markets are closed and monopolized	Digital transformation of companies and liberalization of markets
Low level of innovation	Decreasing R&D activities, number of researchers, brain drain	Increase investment in education, research and development especially in digital technologies
High unemployment levels	Jobs lost in the process of privatization, young unemployment	Active labor market policies, skills, life-long learning and education
Inefficient and expensive state	Low productivity of public sector	Support e-government development
Transforming SEE countries to a digital economy	Lack of awareness about digital technology potentials and risks	Create digital technology supportive environment

Table 1. Digital technologies as a solution for economic challenges in SEE countries
Source: adapted by the authors according to [5].

4. SEE COUNTRIES PROGRESS IN DIGITAL TRANSFORMATION

Progress to digital economy in selected SEE countries will be analyzed by using and comparing some key infrastructure development indicators, indicators of ICT usage, but also complex measuring ICT indexes such as Network readiness index or Composite ICT development index. Except Republic of Croatia who has become a full EU member state since 2013, all analyzed countries (Republic of Serbia, North Macedonia, Montenegro and Bosnia and Herzegovina) have been taking part in an ongoing process of the enlargement of the European Union [1]. The collecting and comparing these data were possible as selected countries base their statistics in information society area on Eurostat methodology.

Fundamental indicators of the evolving digital economy in SEE countries are the extent to which enterprises and people have affordable access to relevant ICTs and digital solutions, and whether they make productive use of them. While ICT uptake is improving, the variations in the extent to which businesses and individuals are making effective use of ICTs need to be addressed [6].

Indicators of access to ICT – Affordable access to different ICTs in selected countries are analyzed by using the following indicators: fixed-telephone subscriptions, mobile-cellular subscriptions, fixed broadband subscriptions, mobile broadband subscriptions, households with Internet access, individuals using the Internet, enterprise using the Internet (Table 2).

	Croatia	North Macedonia	Montenegro	Republic of Serbia	Bosnia and Herzegovina	EU28
Fixed lines per 100 populations (%)						
2010	39,3	20,2	27,7	41,4	24,7	40,0
2014	35,0	18,9	26,6	39,6	22,2	38,3
2017	33,5	17,3	24.2	37,5	21,7	43,0
Mobile subscriptions per 100 populations (%)						
2010	143,5	106,1	173,9	132,0	87,5	124,4
2014	104,0	108,7	163,8	130,0	90,0	120,5
2017	104,5	106,2	163,0	122,1	91,3	123,0
Fixed broadband subscriptions per 100 inhabitants (%)						
2012	18,3	12,5	8,3	11,2	8,2	25,7
2014	20,7	13,7	8,4	12,9	10,6	28,6
2017	23,0	16,8	16,7	15,6	14,2	34,3
Mobile broadband subscriptions per 100 inhabitants (%)						
2012	15,5	6,5	22,0	4,1	9,2	54,2
2014	53,9	25,1	27,5	52,1	12,2	69,3
2017	68,5	49,5	31,0	66,4	27,0	72,3
Internet use by individuals (%)						
2010	54,0	52,0	37,5	40,9	42,7	68,0
2014	69,2	68,1	64,5	62,5	60,8	78,0
2017	77,1	75,0	71,3	70,3	69,5	84,0
Households with Internet access at home (%)						
2010	56,0	46,0	51,4	39,0	29,8	70,0
2014	68,0	68,0	63,6	62,8	47,5	81,0
2017	76,0	70,0	70,0	65,0	57,0	87,0
Enterprises with Internet access (%)						
2010	95,0	84,0	95,0	96,8	-	94,0
2014	96,0	93,0	98,0	100	-	97,0
2017	96,0	-	99,1	99,7	99,3	97,0
Enterprises with WEB sites (%)						
2010	61,0	43,0	62,2	67,5	-	67,0
2014	66,0	53,0	73.3	74,0	63,2	74,0
2017	71,0	52,0	76,4	75,2	67,5	77,0

Table 2. Indicators of access to ICT
Source:[7],[8], [9], [10],[11].

Although connectivity has improved greatly in all analyzed countries, gaps still remain between them and the average value of selected indicators for EU28. The decline in the total number of fixed telephone lines in the analyzed SEE countries have been accelerated since 2012, thanks to continued fixed-to-mobile substitution. The total number of mobile subscriptions rises. Growth rates are not as high as before owing to penetration going over 100% in all countries except Bosnia and Herzegovina. The fixed broadband market in the SEE countries measured by the number of active connections grew, but still is below the European average of 34,3% in 2017. Mobile broadband is the fastest growing and most dynamic segment of the electronic communications market in this region as well. In Serbia and Croatia, the mobile broadband penetration rate exceeded 65% in 2017, but still is lower that EU-28 average.

In EU28 87% of households had Internet access in 2017. The number of households with Internet access is rising in analyzed part of SEE region as well. The highest proportion of households

with Internet access in 2017 was recorded in the Croatia (76%) and the lowest in Bosnia and Herzegovina (57%).

Internet usage by individuals is over 70% in 2018 in all analyzed SEE countries, but still below the EU average penetration rate of 85%. Situation in business sector indicate that like in EU28 nearly all enterprises in SEE region with at least 10 persons employed had Internet access in 2017. Close to three quarters (75%) of enterprises had a website and were visible on the Internet in 2017.

Indicators of ICT usage – are more modest and indicate that although access to the Internet as the cornerstone of developing e-business solutions exists in SEE countries the progress in usage of various e-business tools is rather slow (Table 3).

	Croatia	North Macedonia	Montenegro	Republic of Serbia	Bosnia and Herzegov-ina	EU28
Individuals						
% of individuals using Internet for internet banking						
2014	28	9	-	13,5	-	44
2017	33	8	4	16	-	51
% of individuals using the Internet for ordering goods or services						
2014	28	11	7	21,6	-	50
2017	29	15	13	31	-	57
Enterprises						
% Enterprises receiving orders online (at least 1%)						
2014	-	5	24,3	22,9	-	15
2017	18	-	26,9	26,9	-	18
% Enterprises purchasing online (at least 1%)						
2014	-	4	14,7	40,3	-	22
2017	13	2	26,7	41,9	18	26
% Enterprises using ERP						
2014	15	21	-	-	-	31
2017	26	-	-	18	-	34
% Enterprises using CRM						
2014	26	6	-	21	-	17
2017	18	-	14	24	-	20
% Enterprises using Cloud computing						
2014	22	11	-	3	-	18
2018	30,7	-	18	15,4	8,3	26,2

Table 3. Indicators of ICT usage
Source: [8],[10],[11],[12],[13].

Despite having WEB sites, around a quarter of companies in selected SEE countries use the Internet for purchasing or selling online. In this way SEE companies do not properly use the potential of new technologies for sharing information electronically and automatically between different business functions, both within a single enterprise and/or in cooperation with suppliers or customers. The same situation is with individuals poorly using internet for e-commerce or e-banking activities.

The share of EU28 enterprises that used ERP software applications stood at 34 % in 2017, with a considerable difference in its use between small enterprises (those with 10-49 persons employed; 28 %) and large enterprises (those with at least 250 persons employed; 76 %) [12]. The same difference between big and small companies is present in SEE region as well, only the share of companies using ERP systems is even lower. It is believed that the adoption of CRM improves marketing and sales performance by improving customer service and customer relationships. Some 33 % of EU28 enterprises used CRM software applications in 2017, with the share among small enterprises (30 %) about half that recorded for large enterprises (62 %) [12]. Enterprises in analyzed SEE countries are very slow in accepting CRM practices in their work and are lagging behind EU average. The same situation is with low implementation of cloud services in SEE region (Table 3).

Composite Indexes of digital economy development - The achieved level of digital transformation in SEE countries can be analyzed by using the different indicators of digital transformation published by various international organizations and bodies. These organizations apply different systems for monitoring the development of the digital economy and society that have been accepted as relevant. Their methodologies are changing and improving in line with the dynamics of ICT development. Table 4 presents some of these methodologies and comments and compares the position of different SEE countries in the relevant lists following the progress they are making in different aspects of digital technology implementation.

Despite evident progress in the digital technology implementation, SEE countries continue to suffer from low rates of e-business, a weak regulatory framework and a poor business and innovation environment. These factors affect the capacity to further leverage ICTs to boost their economies and benefit from higher rates of products and service innovation [18]. Croatia being an EU member country is taking a leading position on all analyzed lists, and all other countries (Serbia, Montenegro, North Macedonia and Bosnia and Herzegovina) are usually very closely positioned and from year to year are differently scored.

The data analyzed indicated that despite the fact that all selected SEE countries have a good foundation for the digital economy development, they are still positioned in the so-called „new digital divide“. This means that although digital technologies are becoming increasingly affordable in their economies, these countries have not enough capabilities and capacity to [19]:

- Use digital potentials and improve the business quality of their domestic enterprises,
- Realize the real impact of digital technology implementation on the transformation of their economy and society.

The way out of the digital divide cannot be based only on investment in digital technologies. Although important, access is only one ingredient in the recipe for success. The effective use of digital technologies and data requires additional investments in complementary knowledge-based capital (KBC)-in particular in (organization-specific) skills and know-how, and in organizational change including new business models and processes. Those with low or no formal education lack the necessary skills and know-how to take advantage of digital technologies or to introduce the changes needed for digital technology productive use in businesses and across society.

International Telecommunication Union - Composite ICT Development Index (IDI)

What it follows: Over 11 indicators divided into 3 fields compare the level of ICT development between different countries. The progress of the country on the IDI list depends on a combination of three factors: availability and accessibility of infrastructure (IDI Access Sub-Index), high level of ICT use (IDI Use Sub-Index), the ability to use ICT effectively, which is directly conditioned by the quality of the available workforce (IDI Skills Sub-Index).

Rank on the list (in brackets total number of analyzed countries)

Year	Serbia	Montenegro	Croatia	BIH	North Macedonia
2016 (176)	**55**	**56**	**42**	**81**	**68**
IDI Access SI	53	58	41	85	69
IDI Use SI	59	63	41	76	65
IDI Skills SI	48	54	38	79	84
2017 (176)	**55**	**61**	**36**	**83**	**69**
IDI Access SI	53	59	39	86	69
IDI Use SI	63	66	41	79	67
IDI Skills SI	49	57	38	82	91

World Economic Forum - Network Readiness Index (NRI)

What it follows: It assesses the degree to which a particular country is ready to take advantage of the opportunities and benefits offered by the digital economy through a composite index made of four main categories (sub-indexes): 1) sub-index for environments (political and regulatory environment, business and innovation environment) 2) sub-index of readiness (infrastructure indicators, accessibility, skills); 3) sub-index of use (use by individuals, enterprises, states), 4) sub-index of effect (economic impact, social impacts).

Rank on the list (in brackets total number of analyzed countries)

Year	Serbia	Montenegro	Croatia	BIH	North Macedonia
2014 (148)	80	52	46	68	57
2015 (143)	77	56	54	-	47
2016 (139)	75	51	54	97	46

UN, e-Government Development Index (EGDI)

What it follows: It explores and measures the development of e Government, as a significant part of the development of an information society with return effects on the overall social development. In addition to e-government in the narrow sense, the UN monitors related issues such as Open government data, e-participation, and the like.

Rank on the (in brackets total number of analyzed countries)

Year	Serbia	Montenegro	Croatia	BIH	North Macedonia
2016 (188)	39	47	37	92	69
2018 (186)	49	58	55	105	79

McKinsey company - Country Digitization Index

What it follows: It aggregates more indicators from different areas such as ICT offer, innovation, and usage by individuals, companies, governments, to compare the level of digitization of selected countries through them. According to the results of their research, what is happening in the real world reflects on the digital world, so the intensity of the digitization of countries is under the significant influence of political and overall socio-economic changes and developments.

Rank on the list (in brackets total number of analyzed countries)

Year	Serbia	Montenegro	Croatia	BIH	North Macedonia
2016 (243)	127	140	57	179	148
2017 (243)	114	133	60	164	164

Table 4. Different methodologies for monitoring the development of digital economy and society in SEE countries. *Source: [14], [15], [16], [17].*

4. CONCLUSION

Digital technologies are one of the most important sources of growth for national economies. They enable economies to create more jobs, improve people's lives and build better and greener societies. However, the analysis performed in SEE countries proved that despite progress in the last decade in the creation of basic preconditions for the digital economy, the huge potentials of digital technology still remain untapped.

Continuous work on improving the basics for the development of the digital economy and society in analyzed SEE countries has three essential components: TECHNOLOGICAL which deals with further development and improvement of the quality of the existing physical infrastructure, CAPITAL which provides financing of activities and deals with the availability of the necessary capital and REGULATORY which creates the legal infrastructure for a new business environment.

Closing the digital divide is a pressing concern for all governments in selected SEE countries and it is a significant opportunity for growth in today's digital economy that should not be neglected. There is a need to stimulate a more innovative and entrepreneurial mind-set and accelerate smarter use of 'digital' technology in various sectors of the economy. Education and innovation hold high importance in this respect.

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