COMPARISON OF GROWTH OF THE E-GOVERNMENT INDEX IN THE BALKAN REGION

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Abstract: The development and application of e-Government for the needs of citizens, businesses and other digital services is much needed today. Improving the telecommunications infrastructure, increasing online services and creating human resources in the use of information technologies have created conditions for mass application of e-Government. Today we can talk about e-Learning, e-Health, e-Judiciary, e-Security, e-Administration, e-Business, e-Elections, etc. The development of e-Government is different in different countries of the world. This development can be measured by the situation on the ground. An opportunity to measure the rate of development of e-Government in different countries around the world is based on the so-called e-Government Development Index (EGDI). Mathematically the e-Government Development Index (EGDI) is 1/3 of the sum of the values of the three parameters which are: the online services index (OSI), the telecommunications infrastructure index (TII) and the human capital index (HCI). These indices are produced independently for each country separately and in this paper data from the United Nations are used which are taken from the field every two years and reports are published. The rapid dynamics of technological development in the fields of ITC creates development conditions in e-Government as well. This affects different countries and regions for the e-Government Development Index to be permanently increasing because it increases performance in infrastructure (TII) and online services (OSI) as well as human resources (HCI). The purpose of the study is to compare the level of application of e-Government in several Balkan countries including the following countries: Albania, Greece, northern Macedonia, Bulgaria, Montenegro, Bosnia and Herzegovina and Serbia. For this purpose, carefully selected data from eight e-Government survey reports conducted by the United Nations every 2 years in the period from 2004 to 2018 are used. Based on these data, an analysis of the trend of increasing e-government application and a descriptive comparison between these states. The basic element is the e-Government Development Index (EGDI). The comparison and description of the upward trend is done for three constituent indices of EDGI and then a comparison is made between countries, the average e-government development index at the global level and regional level. From the data for comparison can be concluded that the constituent indices of EGDI in the countries of this region have had a constant increase. With the outbreak of COVID-19 a significant increase in the application of the Online Services Index (OSI) is expected due to isolation circumstances.
Keyword: eGovernment Development Index EGDI, HCI, TII, OSI

1. INTRODUCTION

This paper compares the growth of the e-Government Development Index in several countries in the Balkan region. States develop different development strategies in different areas. One of the strategies is the e-Government Strategy which sets priorities for development in certain areas of e-Government. Different countries in these strategies set different priorities and therefore the level of development and implementation of these areas is different. The degree of technical and technological development in a region is important but is not always the dominant factor. One of the three constituent parameters of the e-Government Development Index is the online services index (OSI) which is increased by using the distance learning platforms which arecurrenlty much needed in isolation due to the the outbreak of COVID-19. Today there are various free e-Learning platforms. One of them is Moodle which has has been chosen to be the official e-Learning platform used in primary and secondary schools in the Republic of North Macedonia. This will undoubtedly affect the growth of the Online Services Index (OSI). The following paper provides theoretical definitions of e-government and application benefits. The comparative methodology is used with data for EGDI from eight e-Government survey reports conducted by the United Nations over a 16-year period (UN, 2018). As a conclusion from the paper emerge comparative data which describe the permanent growth of the e-government Development Index in the Balkan region and the comparison with the EGDI average at the global and regional level.

2. E-GOVERNMENT AND BENEFITS IN APPLICATION

The term e-government describes the electronic handling of administration and democracy processes in the context of government activities through information and communication technologies to support public tasks efficiently

(Daiser, 2015). The e-government application provides information through communication technology to cost-effectively increase the range and quality of information and services provided to citizens, businesses, civil society. There are several areas that are part of e-government such as e-health services, e-judiciary, e-security, e-elections, e-commerce, e-learning, etc. Some of the benefits of e-government for all areas are: lower business costs, time savings, reduced documentation, easier supervision, easier access to information, increased and easier collaboration. There are agendas for building a common digital market with fast and ultra-fast internet access, trust and security, research and innovation, increasing digital literacy skills and using ICT to include the most marginalized sgroups of society (EU, 2013).

3. RESEARCH METHODOLOGY AND DATA COLLECTION

The data needed to make the comparison between the countries in the Balkan region are taken from the published reports of the United Nations from 2004 to 2018 (Social, 2018). The comparison is made between the data which describe the pace of development of e-government between the countries in the region as well as other comparisons. In this paper, basic dindicator for analysis is the e-Government Development Index (EGDI) with three other component indices that describe the growth of online services, telecommunications performance and human resources. For each country a table is created with the three indices OSI, TII and HCI and compared. The tables and data from Figure 1 to Figure 7 show the growth of indices for each country separately. Figure 8 additionally shows the EGDI for the same countries in November 2020.

	OSI	TII	HCI	EGDI	EGDI Regjion_A	EGDI world_A
2004	0.1622	0.0578	0.8	0.34	0.5866	0.3846
2005	0.1615	0.068	0.89	0.3732	0.6012	0.3999
2008	0.3913	0.1251	0.887	0.467	0.6188	0.4279
2010	0.3111	0.1629	0.886	0.4519	0.5937	0.4199
2012	0.4248	0.337	0.786	0.5161	0.7188	0.4882
2014	0.4488	0.3548	0.71	0.5046	0.6936	0.4712
2016	0.5942	0.53	0.652	0.5331	0.7241	0.4922
2018	0.7361	0.4318	0.788	0.5491	0.7727	0.5491

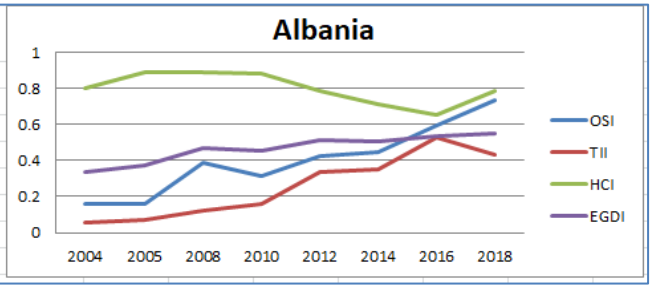

Figure 1. Albania (EGDI) 2004-218

	OSI	TII	HCI	EGDI	EGDI Regjion_A	EGDI world_A
2004	0.4093	0.3349	0.93	0.5581	0.5866	0.3846
2005	0.5115	0.3148	0.95	0.5921	0.6012	0.3999
2008	0.4147	0.3356	0.9698	0.5718	0.6188	0.4279
2010	0.3556	0.3829	0.9804	0.5707	0.5937	0.4199
2012	0.5752	0.5531	0.9332	0.6872	0.7188	0.4882
2014	0.6063	0.6549	0.8741	0.7118	0.6936	0.4712
2016	0.5797	0.6032	0.8901	0.691	0.7241	0.4922
2018	0.8194	0.6439	0.8867	0.7833	0.7727	0.5491

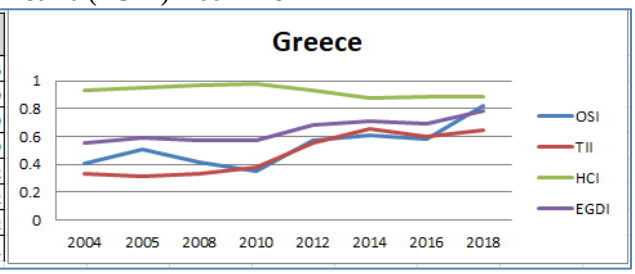

Figure 2. Greece (EGDI) 2004-2018

	OSI	TII	HCI	EGDI	EGDI Regjion_A	EGDI world_A
2004	0.1236	0.1261	0.866	0.3609	0.5866	0.3846
2005	0.3962	0.1237	0.87	0.4633	0.6012	0.3999
2008	0.3579	0.2314	0.8745	0.4866	0.6188	0.4279
2010	0.3206	0.3804	0.8835	0.5261	0.5937	0.4199
2012	0.451	0.4135	0.8115	0.5586	0.7188	0.4882
2014	0.2441	0.4521	0.7198	0.472	0.6936	0.4712
2016	0.6087	0.4693	0.6877	0.5886	0.7241	0.4922
2018	0.7153	0.4859	0.6924	0.6312	0.7727	0.5491

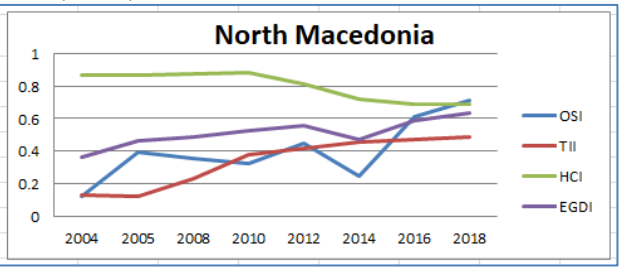

Figure 3.North Macedonia (EGDI) 2004-2018

	OSI	TII	HCI	EGDI	EGDI Regjion_A	EGDI world_A
2004	0	0	0	0	0.5866	0.3846
2005	0	0	0	0	0.6012	0.3999
2008	0.3712	0.024	0.8911	0.4282	0.6188	0.4279
2010	0.3143	0.3311	0.891	0.5101	0.5937	0.4199
2012	0.5098	0.5375	0.8182	0.6218	0.7188	0.4882
2014	0.5276	0.5481	0.8279	0.6345	0.6936	0.4712
2016	0.6812	0.5222	0.8165	0.6733	0.7241	0.4922
2018	0.6667	0.6059	0.8172	0.6966	0.7727	0.5491

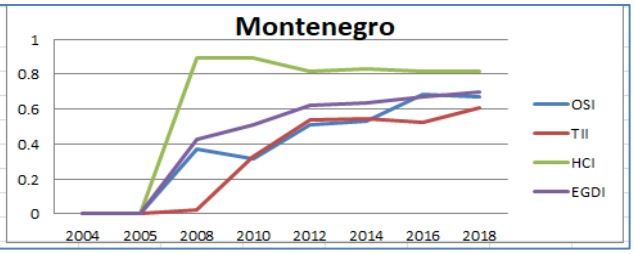

Figure 4. Montenegro (EGDI) 2004-2018

	OSI	TII	HCI	EGDI	EGDI Regjion_A	EGDI world_A
2004	0.2201	0.0869	0.83	0.379	0.5866	0.3846
2005	0.2731	0.0926	0.84	0.4019	0.6012	0.3999
2008	0.2943	0.1887	0.8744	0.4509	0.6188	0.4279
2010	0.2762	0.2505	0.8886	0.4698	0.5937	0.4199
2012	0.3725	0.3917	0.8341	0.5328	0.7188	0.4882
2014	0.2835	0.3998	0.7288	0.4707	0.6936	0.4712
2016	0.4493	0.4047	0.6815	0.5118	0.7241	0.4922
2018	0.4306	0.4385	0.7217	0.5303	0.7727	0.5491

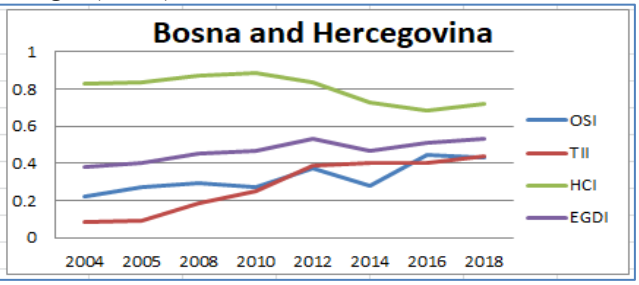

Figure 5.Bosna and Hercegovina (EGDI) 2004-2018

	OSI	TII	HCI	EGDI	EGDI Regjion_A	EGDI world_A
2004	0.3359	0.1312	0.694	0.3871	0.5866	0.3846
2005	0.4462	0.1417	0	0.196	0.6012	0.3999
2008	0.3512	0.21	0.8911	0.4828	0.6188	0.4279
2010	0.2222	0.2695	0.891	0.4585	0.5937	0.4199
2012	0.5752	0.4701	0.8484	0.6312	0.7188	0.4882
2014	0.3937	0.4681	0.7796	0.5472	0.6936	0.4712
2016	0.8188	0.5434	0.777	0.7131	0.7241	0.4922
2018	0.7361	0.6208	0.7896	0.7155	0.7727	0.5491

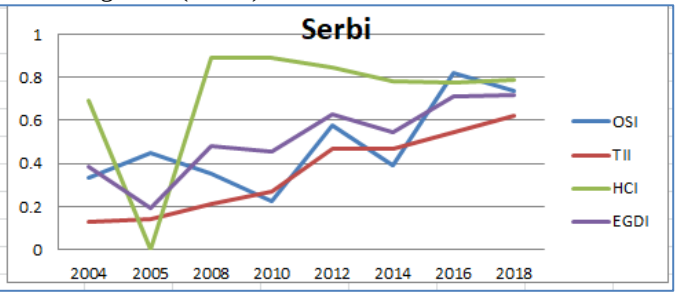

Figure 6.Serbia (EGDI) 2004-2018

	OSI	TII	HCI	EGDI	EGDI Regjion_A	EGDI world_A
2004	0.5058	0.2094	0.91	0.5417	0.5866	0.3846
2005	0.5192	0.2522	0.91	0.5605	0.6012	0.3999
2008	0.4849	0.3071	0.926	0.5719	0.6188	0.4279
2010	0.4095	0.337	0.935	0.559	0.5937	0.4199
2012	0.4902	0.5006	0.8486	0.6131	0.7188	0.4882
2014	0.2362	0.5941	0.796	0.5421	0.6936	0.4712
2016	0.5652	0.5602	0.7875	0.6376	0.7241	0.4922
2018	0.7639	0.5782	0.8106	0.7177	0.7727	0.5491

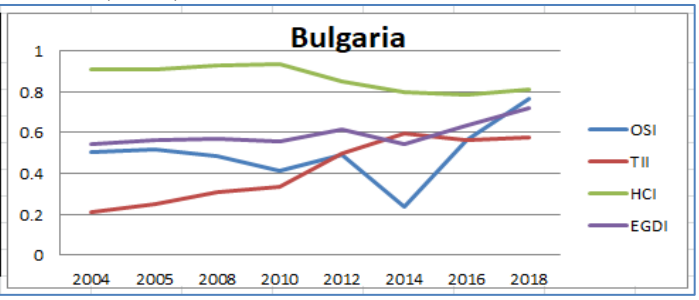

Figure 7. Bulgaria (EGDI) 2004-2018

	COUNTRIES	EGDI
1	Greece	0.8021
2	Bulgaria	0.798
3	Serbia	0.7474
4	Albania	0.7399
5	North Macedonia	0.7083
6	Montenegro	0.7006
7	Bosna and Hercegovina	0.6372
8	EGDI word_Average	0.5988

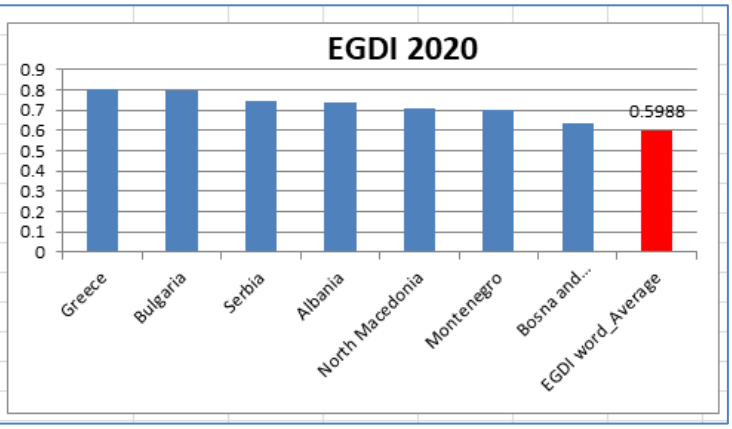

Figure 8. Balkan countries (EGDI) November 2020

In the figures for each separate country, the EGDI Region A column is set the average EGDI for the region at the given 2-year period. In the tables it can be seen that in the respective years some countries are closer to this average and some farther. In all the figures the constant growth of the EGDI index can be clearly seen A comparison can also be made with the average value of the Global e-Government Development Index which is seen in the last column. If we make a comparison of the e-government Development Index (EGDI) in the tables for each country for 2018 we will have this ranking: Greece-0.7833, Bulgaria-0.7177, Sebia-0.7155, Montenegro- 0.6966, North Macedonia-0.6312, Albania-0.5491, Bosnia and Herzegovina-0.5303.The world average EGDI for this year is 0.5491. Greece, Bulgaria, Serbia, Montenegro, North Macedonia are above the world average for 2018, Albania is on the border while Bosnia and Herzegovina below the world average of EGDI.

For the year 2020, all Balkan countries are above the global average but at the regional level this index (EGDI) is below the regional level as seen in the table for each country. Although the year 2020 has not ended, considering the previous growth tendency, one can expect the same to continue. In March 2020, these countries applied isolation measures, but Figure 8 shows that even in such conditions we have an increase in the application of e-government.

4. CONCLUSIONS

With data selected from United Nations reports on seven Balkan countries, we have provided an overview of the growth rate of Online applications and the development of e-Government infrastructure. The e-government development index has been increasing every two years. The tables and graphs show that the e-Government Development Index in these Balkan countries has been growing steadily since 2004 and this growth is expected to continue. The constituent indices of EGDI such as OSI, TII and HCI for each country are different depending on where priority has been given to development i.e. in Online Services (OSI) or increasing performance in telecommunications (TII). In all countries the Human Capital Index (HCI) since 2004 has been at a high (acceptable) value and with few changes. Before the end of 2020, there is a change where all the Balkan countries exceed the EGDI average at the global level for 2020, ie over 0.5988.

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