

Development of E-administration Services in Poland

Władysław Świątek¹,

¹Department of Finance and Information Technologies, Bielsko-Biała School of Finance and Law
ul. Tańskiego 5, 43-382 Bielsko-Biała- Poland

Abstract— Advances in information and communication technologies impact the requirements the citizens have with respect to state administration. Nowadays, the citizens expect continuous expansion of electronic channels in administration to be able to access various offices and settle their administrative affairs online. The purpose of this publication is to present the current state of development of e-administration in Poland and to highlight the barriers that must be overcome in order to assure smooth operating of e-administration platforms which are supposed to be user friendly and reduce the costs of functioning of the State. This study presents a method of measuring the level of digitization of public administration by means of the E-Government Digital Index. Conditions for development of e-services in Poland as compared to other countries and the use of available e-services in Polish voivodships are also presented. The data used in this study were provided by the Central Statistical Office and the United Nations Department of Economic and Social Affairs.

Index Terms— administration, public administration, E-Government Digital Index, Human Capital index, Telecommunication Infrastructure Index, Online Service Index

I. INTRODUCTION

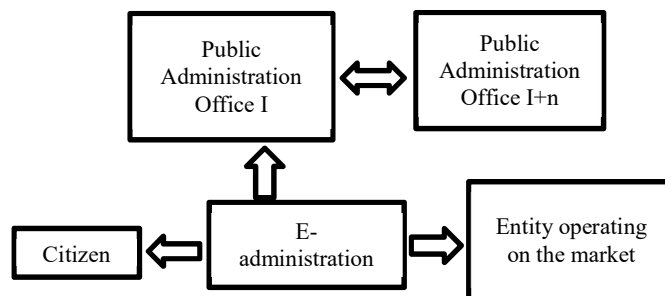
Development of information society is not possible without e-administration because the basic factor of socio-economic development of each country is the level of its digitization which now applies to every aspect of human life. According to the 2017 *Strategy for Responsible Development*, e-government is one of the conditions for an efficient state. Development of e-administration and e-services is mainly conditioned by technological, economic, socio-cultural as well as human and organizational factors. Efficient public administration is also necessary for proper economic and social development as citizens and entrepreneurs expect to be able to handle their administrative matters in a way that will not disturb their operations and participation in public life (Jedlińska and Rogowska 2016). Administrations in every country should strive to make their services widely available (24/7/365)

because unlimited availability is one of the basic features of public administration. Unlike traditional administration, e-administration should be a customer-friendly, flexible and open mechanism which ensures that individual and collective needs of citizens are met (Fleszer 2014). This study presents the current state of development of e-administration in Poland compared to other countries and the types of e-services provided by public administration. The author also points to the main barriers preventing further development of e-services which public administration in Poland is facing in the era of information society.

II. CONDITIONS FOR DEVELOPMENT OF E-ADMINISTRATION

The concept of e-administration is very difficult to define because it is associated with many areas of life i.e. IT, economics, management, law, administration and social sciences. It is commonly stated that e-administration allows for contacts which result in the settlement of matters between citizens, entities operating on the market and public administration bodies and offices by means of ICT tools (Mikulski 2008). The directions of interaction between e-administration and various entities are shown in Figure 1.

FIGURE 1. INTERACTIONS OF E-ADMINISTRATION WITH ITS CLIENTS



Source: Own elaboration

Evolution of administration into e-administration should not be based solely on the creation of websites that will provide public services online but it should focus on the appropriate



design of internal processes in traditional administration. Organizational changes and improvements, modernization and optimization of administrative processes are also necessary. E-administration cannot exist without relevant legal regulations which stimulate its development. The list of relevant primary legal regulations is presented in Table 1.

TABLE 1: LIST OF PRIMARY LEGAL ACTS REGULATING DIGITIZATION OF PUBLIC ADMINISTRATION

Title	Publisher
Act of 17 February 2005 on computerization of entities carrying out public tasks.	Journal of Laws 2005 No 64 item 565.
Act of 6 September 2001 on access to public information.	Journal of Laws 2001 No 112, item 1198.
Act of 18 September 2001 on electronic signature.	Journal of Laws 2001 No 130, item 1450.
Act of 18 July 2002 on the provision of services by electronic means.	Journal of Laws 2001 No 130, item 1450.
Act of 5 July 2002 on the protection of certain services provided by electronic means based on, or consisting of, conditional access.	Journal of Laws 2002 No 126, item 1068.
Act of 12 September 2002 on electronic payment instruments.	Journal of Laws 2002 No 169 item 1385
Act on the Amendment of the Public Procurement Law Act and Other Acts.	Journal of Laws 2007 No 82 item 560.
Executive acts	
Ordinance of 28 March 2007 on the plan of computerization of the State for 2007-2010.	Journal of Laws 2007 No 61, item 415.
Ordinance of 30 October 2006 on the necessary elements of the structure of electronic documents.	Journal of Laws 2006 No 206, item 1518.

Title	Publisher
Ordinance of 2 November 2006 on the technical requirements of recording formats and IT data carriers on which archival materials have been recorded and transferred to state archives.	Journal of Laws 2006 No 206, item 1519.
Ordinance of 29 September 2005 on the organizational and technical conditions for the delivery of documents to electronic public entities.	Journal of Laws 2005 No 200, item 1651.
Ordinance of 11 October 2005 on requirements for ICT systems.	Journal of Laws 2005 No 212, item 1766.

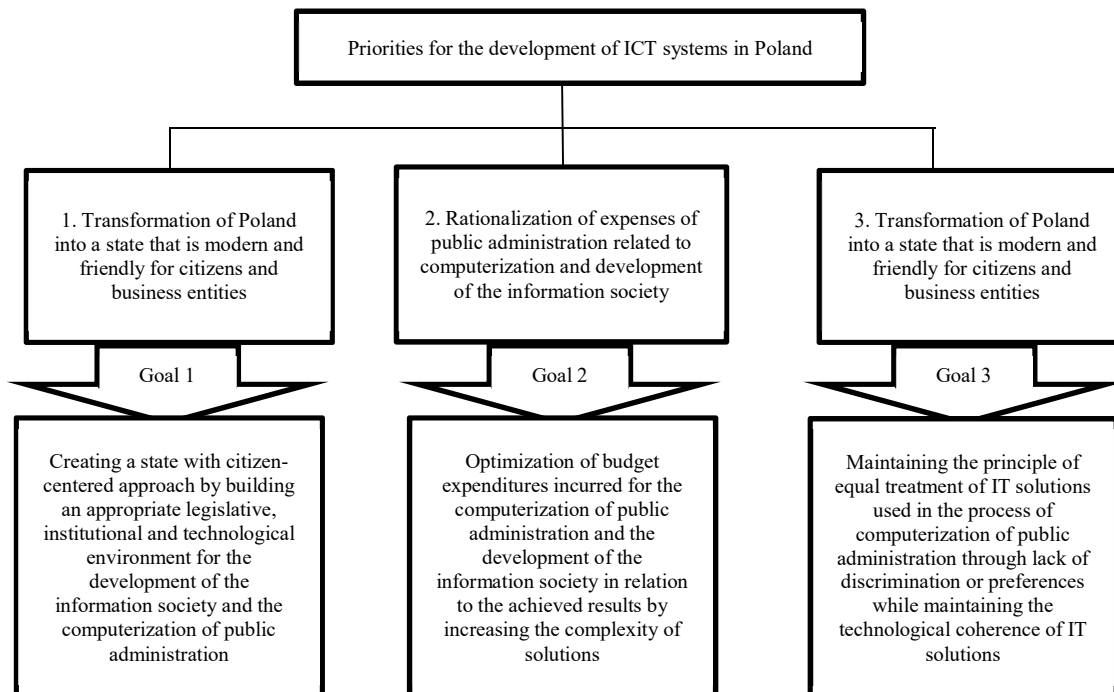
Source: Own elaboration.

Apart from relevant legislation in the field of digitization of public services, the following strategy papers were crucial in the creation of efficient e-administration in Poland:

- 1) The National Plan of Computerization for 2007-2010.
- 2) The Draft of the Strategy for the Development of the Information Society in Poland for 2007-2013.
- 3) *ePolska*. Action plan for the Development of the Information Society in Poland for 2001-2006.

The National Plan of Computerization for 2007-2010 was introduced by the Ordinance of 28 March 2007 on the National Plan of Computerization for 2007-2010. The plan sets out three priorities for the development of ICT systems for carrying out public tasks (Figure 2).

FIGURE 2: PRIORITIES FOR THE DEVELOPMENT OF ICT SYSTEMS IN POLAND



Source: Own elaboration based on Ordinance of 28 March 2007 on the national Plan of Computerization for 2007-2010

Objective 1 has been achieved thanks to appropriate activities such as:

- simplification of administrative procedures related to

providing services to natural persons or other entities by public administration;

- improvements and proliferation of electronic access to

- public administration services and public information;
- raising the level of public knowledge about the possibilities and benefits offered by electronic access to public administration services and public information;
- raising the level of public confidence in electronic methods of providing access to public administration services;
- supporting research and development works in the field of information technologies and supporting innovation in the ICT sector.

Objective 2 has been achieved thanks to appropriate actions such as:

- coordination and integration of the process of computerization of public administration;
- preventing unnecessary duplication of activities in public administration regarding the computerization and the development of the information society;
- changes in the functional range of methods of obtaining and operating ICT systems in public administration to rationalize the costs incurred in this respect;
- effective use of the European Union funds for the implementation of activities in the field of computerization and development of information society;
- interconnection of registers, including the establishment of reference registers (in particular the register of citizens, legal entities and territorial units) taking into account the need to implement the Act of 17 February 2005 on computerization of entities carrying out public tasks.

Objective 3 has been achieved thanks to appropriate actions such as:

- developing legislative activities in the area of computerization and development of the information society which are strengthening the principle of equal treatment of IT solutions used in the process of computerization of public administration by ensuring lack of discrimination or preference for any of them;
- supporting technological neutrality of ICT systems of public administration in the National Interoperability Framework;
- recommending the usage of open, publicly available IT standards;
- supporting the development of IT solutions conducive to increasing technological neutrality in the process of computerization of public administration (Ordinance of 28 March 2007 on the National Plan of Computerization for 2007-2010).

Draft of the Strategy for the Development of the Information Society in Poland defined the priority actions for the years 2007 - 2010, which, among others, included: removing legal barriers and supporting the construction and use of telecommunications infrastructure and access to the Internet, improving operations of government institutions with the support of information and

telecommunications technologies, coordination of the process of computerization of public administration, promulgation of IT skills and increasing the use of ICT in the education process, ensuring a constant increase in the volume of ICT specialists being educated, stimulating development of information society in higher education and development of entrepreneurship and innovation in e-economy (www.ideo.pl, 2019). The main objectives of the document: *ePolska*. Action Plan for the Development of the Information Society in Poland for 2001-2006 consists of:

- development of ICT infrastructure,
- universal, cheaper, faster and secure Internet,
- investment in people and skills,
- stimulating more widespread utilization of information technology,
- ICT in rural areas,
- development of digital radio and television.

The changes taking place in administration are determined by the needs of the information society functioning in a knowledge-based economy. The concept of e-administration and the concept of the information society have not been clearly defined yet but it is assumed that functioning of information society is dependent on the existence of relevant processes closely related to information management (acquisition, processing, collection, sharing and application of information in the process of taking social and economic decisions). In the information society, the circulation of information is a necessary condition, thus a computer, the Internet and all digital technologies which make information processing possible, have become indispensable tools to be used in all aspects of life and work.

III.E-ADMINISTRATION IN POLAND AS COMPARED TO OTHER COUNTRIES

Development of individual countries when it comes to e-administration is determined mathematically by an indicator called E-Government Digital Index (EGDI), created by the United Nations Department of Economic and Social Affairs. This indicator is a weighted average of normalized three indicators shaping the level of e-government development in a given country. The structure of EGDI is presented in Figure 3.

The value of the e-government development indicator is influenced by three dimensions of e-government presented in Figure 3, which include:

- Human Capital Index – HCI,
- Telecommunication Infrastructure Index – TII,
- Online Service Index – OSI.

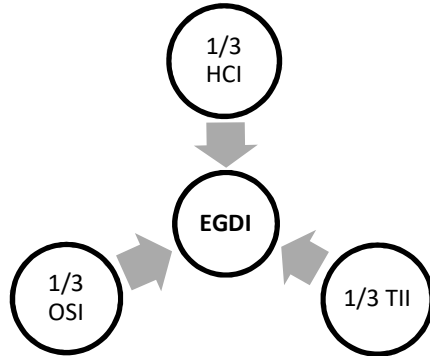
Each dimension is a specific constituent indicator which is subject to Z-score standardization calculated for a given component according to the formula:

$$X_{new} = \frac{(X - \mu)}{\sigma}$$

Where:

X-primary (raw) data which are subject to standardization, μ -average of the population, σ -population standard deviation

FIGURE 2: STRUCTURE OF THE EGDI.



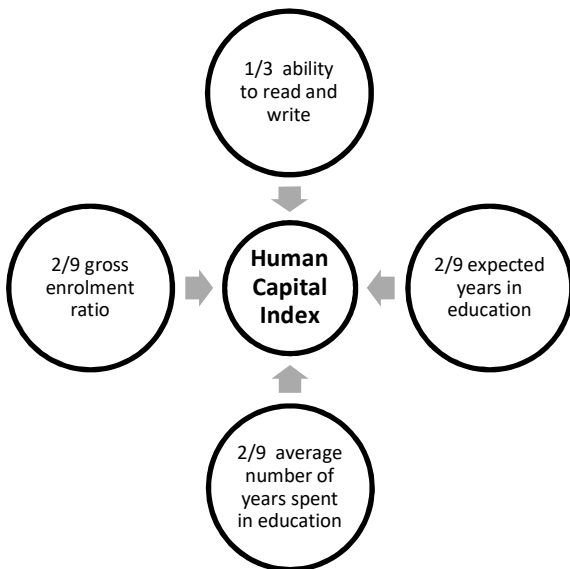
Source: own elaboration based on united nations, 2016.

The value of each constituent indicator is standardized and ranges from 0 to 1, while the final indicator of e-government development is the mean average of the three constituent indicators:

$$EGDI = \frac{1}{3} \cdot (TII + OSI + HCI)$$

The Human Capital Index (HCI) consists of 4 elements shown in Figure 4.

FIGURE 3: COMPONENT INDICATORS OF THE HCI.



Source: own elaboration based on united nations, 2016.

Reading and writing skills are measured as the percentage of people aged 15 and over who possess the skill of reading comprehension and writing short and simple texts e.g. about their personal lives. The expected number of years of education is the total number of years of education that a child of a certain age can expect in the future.

The average number of years of education is the number of years of education completed by adults in a given country (25

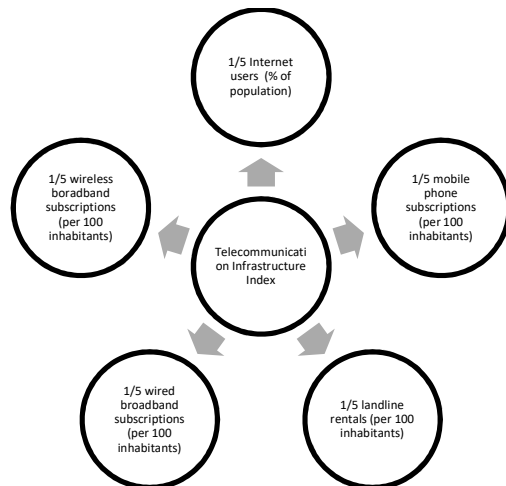
years and more), excluding years spent on retaking given classes. Gross enrolment ratio is a measure that combines gross enrolment ratios of primary, secondary and higher schools; the total number of students enrolled in these schools regardless of age as a percentage of the school age population.

HCI is the weighted average of the above four indicator components expressed by the formula below:

$$\text{Total human capital value} = \frac{1}{3} \times \text{Adult illiteracy rate Z-score} + \frac{2}{9} \times \text{Gross schooling rate Z-score} + \frac{2}{9} \times \text{Expected years of education Z-score} + \frac{2}{9} \times \text{Average number of years of education Z-score}.$$

The obtained human capital value is standardized by subtracting the lowest composite value obtained in the study from the composite value for a given country and dividing it by the range of composite values for all countries. Telecommunications Infrastructure Index (TII) is the arithmetic average of the five indicators shown in Figure 5.

FIGURE 4: COMPONENT INDICATORS OF THE TII.



Source: own elaboration based on united nations, 2016.

- estimated number of internet users per 100 inhabitants includes people who have used the Internet from anywhere in the last three months before conducting the survey;
- landlines per 100 inhabitants- is an indicator of the telephone lines connecting a client terminal equipment to a public telephone network, which has a dedicated port on the telephone exchange;
- number of mobile phone subscribers per 100 inhabitants - is an indicator showing the number of subscriptions to mobile services in the last three months. This indicator covers both analog and digital cellular systems and technologies;
- subscriptions to wireless broadband connections; the sum of satellite broadband connections, terrestrial wireless broadband connections and active mobile broadband connections to the public Internet;
- number of wired broadband subscriptions per 100

inhabitants - permanent subscriptions that provide high-speed public Internet access, with a download speed of 256kbit/s or more. This indicator covers all permanent wireless technologies including both individual citizens' subscriptions and subscriptions of organizations. However, it does not include subscriptions that provide access to data transmission, including the Internet, through mobile cellular networks.

Each of the component indicators presented in Figure 5 is subject to standardization using the Z-score procedure. After receiving standardized component indicators, Telecommunications Infrastructure Index can be calculated as the mean average of five standard component indicators.

TII

$$= \frac{1}{5} (\text{internet users } z\text{-score} + \text{number of mobile phone subscribers } z\text{-score} + \text{number of landline telephone subscribers } z\text{-score} + \text{wired broadband connection subscriptions } z\text{-score} + \text{wireless broadband subscriptions } z\text{-score})$$

The final result is standardized by subtracting the lowest composite value obtained in the study from the composite value for a given country and dividing it by the range of composite values for all countries.

TABLE 2: TELECOMMUNICATIONS INFRASTRUCTURE INDEX (TII) AND ITS COMPONENTS IN INDIVIDUAL PARTS OF THE WORLD.

TII average	TII	Percentage of Individuals using the Internet	Landline subscriptions per 100 inhabitants	Mobile/cellular telephone subscriptions per 100 inhabitants	Wired broadband subscriptions per 100 inhabitants	Wireless broadband subscriptions per 100 inhabitants
Africa	0.1724	16.40	3.33	83.99	1.20	12.02
Americas	0.3844	49.64	19.84	109.86	11.03	21.75
Asia	0.3730	42.95	14.35	114.03	8.68	34.63
Europe	0.6438	75.28	37.68	122.92	28.31	55.68
Oceania	0.2599	34.78	12.86	64.78	6.94	27.59
World	0.3711	43.34	17.35	103.28	11.26	30.16

Source: united nations, 2016.

The data presented in Table 2 indicate that the level of tele-information infrastructure in European countries far exceeds the rest of the world. A detailed analysis of individual countries indicates that the value of TII index for Poland in 2016 was at the level of 0.5805.

Online Service Index (OSI) is an indicator established by the UN experts who rated all websites built in a particular country in its native language. The assessment covered: national websites, e-services websites, participation websites, as well as websites of Ministries of: Education, Labour, Social Affairs, Health, Finance and Environment. Each website was rated by a minimum of 3 experts. The total number of points scored by a given country was then standardized in the range from 0 to 1. The value of the index is equal to the sum of points awarded to a given country minus the lowest total score divided by the total value range of results for all countries. EGDI indicator and its components for individual countries of the world are presented in Table 3.

The highest rate of development of e-government services in individual countries can be observed in Europe with EGDI value of 0.7241, which is 0.2319 higher than the global EGDI

value.

TABLE 3. E-GOVERNMENT DIGITAL INDEX FOR INDIVIDUAL REGIONS OF THE WORLD.

Region	EGDI	Online Service Component	Telecomm. Infrastructure Component	Human Capital Component
Africa	0.2882	0.2567	0.1724	0.4355
Americas	0.5245	0.4959	0.3844	0.6933
Asia	0.5132	0.5120	0.3730	0.6545
Europe	0.7241	0.6926	0.6438	0.8360
Oceania	0.4154	0.2966	0.2599	0.6897
World	0.4922	0.4623	0.3711	0.6433

Source: united nations, 2016.

America and Asia also recorded higher EGDI value compared to the global average. The list of 40 most developed countries in the world in terms of e-administration is presented in Table 4.

TABLE 4. 40 COUNTRIES WITH THE HIGHEST EGDI VALUE IN 2018.

Word	Region	OSI	HCI	TII	EGDI	2016 Rank	2018 Rank
Denmark	Europe	1.0000	0.9472	0.7978	0.9150	9	1
Australia	Oceania	0.9722	1.0000	0.7436	0.9053	2	2
Republic of Korea	Asia	0.9792	0.8743	0.8496	0.9010	3	3
United Kingdom of Great Britain and Northern Ireland	Europe	0.9792	0.9200	0.8004	0.8999	1	4
Sweden	Europe	0.9444	0.9366	0.7835	0.8882	6	5
Finland	Europe	0.9653	0.9509	0.7284	0.8815	5	6
Singapore	Asia	0.9861	0.8557	0.8019	0.8812	4	7
New Zeland	Oceania	0.9514	0.9450	0.7455	0.8806	8	8
France	Europe	0.9792	0.8598	0.7979	0.8790	10	9
Japan	Asia	0.9514	0.8428	0.8406	0.8783	11	10
United States of America	Americas	0.9861	0.8883	0.7564	0.8769	12	11
Germany	Europe	0.9306	0.9036	0.7952	0.8765	15	12
Netherlands	Europe	0.9306	0.9206	0.7758	0.8757	7	13
Norway	Europe	0.9514	0.9025	0.7131	0.8557	18	14
Switzerland	Europe	0.8472	0.8660	0.8428	0.8520	28	15
Estonia	Europe	0.9028	0.8818	0.7613	0.8486	13	16
Spain	Europe	0.9375	0.8885	0.6986	0.8415	17	17
Luxembourg	Europe	0.9236	0.7803	0.7964	0.8334	25	18
Iceland	Europe	0.7292	0.9365	0.8292	0.8316	27	19
Austria	Europe	0.8681	0.8505	0.7716	0.8301	16	20
United Arab Emirates	Asia	0.9444	0.6877	0.8564	0.8295	29	21
Ireland	Europe	0.8264	0.9626	0.6970	0.8287	26	22
Canada	Americas	0.9306	0.8744	0.6724	0.8258	14	23
Italy	Europe	0.9514	0.8341	0.6771	0.8209	22	24
Liechtenstein	Europe	0.7986	0.8237	0.8389	0.8204	32	25
Bahrain	Asia	0.7986	0.7897	0.8466	0.8116	24	26
Belgium	Europe	0.7569	0.9740	0.6930	0.8080	19	27
Monaco	Europe	0.6250	0.7901	1.0000	0.8050	31	28
Portugal	Europe	0.9306	0.8170	0.6617	0.8031	38	29
Malta	Europe	0.8403	0.7973	0.7657	0.8011	30	30
Israel	Asia	0.8264	0.8635	0.7095	0.7998	20	31
Russian Federation	Europe	0.9167	0.8522	0.6219	0.7969	35	32
Poland	Europe	0.9306	0.8668	0.5805	0.7926	36	33
Uruguay	Americas	0.8889	0.7719	0.6967	0.7858	34	34
Greece	Europe	0.8194	0.8867	0.6439	0.7833	43	35
Cyprus	Asia	0.7847	0.8083	0.7279	0.7736	64	36
Slovenia	Europe	0.7986	0.8923	0.6232	0.7714	21	37
Belarus	Europe	0.7361	0.8681	0.6881	0.7641	49	38
Kazakhstan	Asia	0.8681	0.8388	0.5723	0.7597	33	39
Lithuania	Europe	0.7986	0.8323	0.6293	0.7534	23	40

Source: united nations, 2018.

According to the data presented in the table above, in 2018 Poland has been ranked 33rd among all countries in the world in terms of development of e-government services. The United Nations classified Poland as a country with high EGDI value. The best ratio for Poland, however, can be observed in case of OSI index (0.9306 with European average 0.6926). When it comes to HCI index for 2018, Poland reached the value of 0.8668 with the European average 0.8360. Telecommunications Infrastructure Index (TII) value for Poland was only 0.5805 with the European average 0.6438. This means that Polish telecommunications infrastructure requires in-depth reconstruction and improvement. The ratio of development of e-government services for individual EU countries is presented in Table 5.

TABLE 5. EGDI VALUES FOR EUROPEAN UNION COUNTRIES.

Country	EGDI	2018 Rank	2016 Rank	Change in Rank
Denmark	0.9150	1	9	8
United Kingdom	0.8999	4	1	-3
Sweden	0.8882	5	6	1
Finland	0.8815	6	5	-1
France	0.8790	9	10	1
Germany	0.8765	12	15	3
Netherlands	0.8757	13	7	-6
Switzerland	0.8520	15	28	13
Estonia	0.8486	16	13	-3
Spain	0.8415	17	17	0
Luxembourg	0.8334	18	25	7
Austria	0.8301	20	16	-4
Ireland	0.8287	22	26	4
Italy	0.8209	24	22	-2
Belgium	0.8080	27	19	-8

Country	EGDI	2018 Rank	2016 Rank	Change in Rank
Portugal	0.8031	29	38	9
Malta	0.8011	30	30	0
Poland	0.7926	33	36	3
Greece	0.7833	35	43	8
Slovenia	0.7714	37	21	-16
Lithuania	0.7534	40	23	-17
Hungary	0.7265	45	46	1
Bulgaria	0.7177	47	52	5
Slovakia	0.7155	49	67	18
Czech Republic	0.7084	54	50	-4
Croatia	0.7018	55	37	-18
Latvia	0.6996	57	45	-12
Romania	0.6671	67	75	8

Source: united nations, 2018.

Poland is on the 18th place in Europe when it comes to development of e-government services. But globally, Poland went up in the ranking from 36th to 33rd place. Denmark is the leader of the classification increasing its position by 8 places within the period 2016-2018.

IV. CURRENT STATE OF E-ADMINISTRATION IN POLAND

In an attempt to predict directions of development of e-administration in Poland it would be best to focus on such activities in the scope of e-services which are already in use and which place Poland on the 33rd place in the UN ranking called E-Government Digital Index. The list of currently available e-services in Poland is presented in Table 6.

TABLE 1. E-SERVICES AVAILABLE IN POLAND.

CATEGORY	Name of service	Description
CENTRAL SERVICE	ePUAP	Electronic platform of public administration services.
	CRWDE	Central depository of samples of electronic documents.
JUDICIARY	eMS – e-platform of the Ministry of Justice	eKRS/S24 – registration of limited liability companies, general partnerships, limited partnerships; search of entities and debtors, print verification. eMSiG – enables scrolling the Court and Commercial Gazettes. eKRK- through this service citizens may order a certificate from the National Criminal Register.
	eKW – electronic land and mortgage registers	Enables scrolling land and mortgage registers online. Through this service citizens may order excerpts from land and mortgage registers, obtain online copies or certifications of closure of a land and mortgage register which may be then printed and used, as such documents are equally authentic as those issued by the court. Verification of authenticity and validity of excerpts from land and mortgage registers and copies and certifications of electronic closures of land and mortgage registers.
	eSAĐ – electronic proceedings by writ of payment	Applicable in call for payment proceedings in uncomplicated cases which do not require evidence proceedings and the files for these cases are stored in the information system of e-court.
	PDI – access information subsystem	Enables filing and sending motions, attachments and documents to register

CATEGORY	Name of service	Description
		courts, to the Central Information of the National Court Register and to the Court and Commercial Gazette.
	Repository of court rulings	Portal with rulings of general courts.
SOCIAL INSURANCE	PUE – Platform of Social Insurance Institution (ZUS)	<ul style="list-style-type: none"> • Checking data stored on individual ZUS accounts, • tracking the status of cases and receiving e-mail and SMS notifications, • making appointments in local branches of ZUS, • checking the balance on the account, • checking information on insurance, assessment basis of contributions, • for beneficiaries: checking information on granted and received benefits (pensions, annuities and allowances), • access to PIT 11A form i.e. information on revenues paid by ZUS, • access to PIT 40A form i.e. annual tax settlement by ZUS, • for payers of contributions: checking the amount of contributions due and the payments, • checking information on persons registered for insurance, • checking the balance of payers, • generating documents about ZUS account balance and about the number of insured persons, • ePłatnik app through which it is possible to register persons for insurance and to settle contributions (pue.zus.pl), • transmission of electronic medical leaves directly to employers (e-ZLA).
	e-registration for rehabilitation holidays	Enables searching for vacancies on rehabilitation holidays offered by entities listed in the register of operators of rehabilitation stays.
	e-registration for crèches and pre-school clubs	Enables searching for places in child care institutions ran by entities listed in the register of crèches and pre-school clubs.
	empatia.mpips.gov.pl	Enables searching for information on social benefits. The service accepts online applications for: family benefits, social assistance, attestation of the assistance received, amendment to the repayment scheme etc.
HEALTH CARE SYSTEM	eWUS	Electronic verification of patient entitlement within the National Health Fund.
	Integrated Patient Directory	Service with information on treatment and financing treatment of patients registered within the National Health Fund.
	Queue service	Enables to check how many patients are waiting to see a given doctor.
	Medical Registers Platform	<ul style="list-style-type: none"> • Register of entities providing medical activity services - medical entities, medical practices of doctors and dental doctors as well as nurses and midwives; • register of pharmacies – register of generally accessible pharmacies, points of pharmacy, hospital pharmacies, company pharmacies and departments of hospital pharmacies, • register of pharmaceutical wholesalers who possess permission for wholesale trading of medicines in Poland, • register of medicinal products for people and animals registered in Poland, • register of lab diagnosticians, • register of medical assistants , • register of coding system – medical dictionaries aimed at elimination of misunderstandings resulting from usage of medical terms.
	eRecepta (electronic prescription)	Prescription for medicines received by a text message or an e-mail.
	eSkierowanie (electronic referral)	Fully electronic services related to doctor's referral system. Currently the application is in test phase – planned implementation 1 January 2021.
	Air quality platform	Displays up to date results of air quality tests taken all over the country.

CATEGORY	Name of service	Description
PUBLIC EMPLOYMENT SERVICES	praca.gov.pl	<ul style="list-style-type: none"> • registration of unemployed and job-seekers, • placing job offers, • searching and scrolling job offers, • placing job offers offering employment to foreigners, • processing applications for deprivation of unemployment status, • directing correspondence to the job office, • processing applications for training courses, • processing application for contracting an agreement of internship. <p>The portal also features the following services:</p> <ul style="list-style-type: none"> • www.kwalifikacje.praca.gov.pl/ - searching for standards of professional classification, module training programmes and information on various professions, • http://psz.praca.gov.pl/ - enables searching and scrolling the International Standard Classification of Occupations, • ris.praca.gov.pl – enables processing applications for entry, update or removal from the Register of Training Institutions, • www.kraz.praca.gov.pl - enables searching and scrolling entities in the National Register of Employment Agencies, • https://prem.msz.gov.pl/ - through which candidates may find employment in international organisations and obtain information on employment conditions, vacancies and planned competitions.
BUSINESS ACTIVITY	biznes.gov.pl	E-services related to setting up, conducting and terminating business activity.
	firma.gov.pl (CEiDG - Central register and Information on economic activity)	Registration of a business activity.
	Espacenet	Giving access to patent documents.
	Patents	Enables to submit applications for trademark rights.
PUBLIC PROCUREMENT	Costs- reserves	Through this app entrepreneurs may submit to the Ministry quarterly reports on costs incurred in connection with obligatory reserves of oil.
	Bulletin of Public Procurement	Enables scrolling and publishing contract notices.
	e-Catalogues	Enables purchasing of goods whose monetary value does not exceed the amount written down in the Public Procurement Law above which the tender procedure applies.
	Electronic auction platform	Enables operation of online auctions.
TAXES AND CUSTOMS	Electronic bidding platform	Enables operation of electronic biddings.
	e-Deklaracje; e-Pit	Electronic tax settlements.
	Electronic Services Portal of the Customs Service (PUESC)	E-services available on this portal include: e-Tranzyt – service of requests in transit procedure, e-ZEFIR – service of excise declarations, e-Klient – registration for the purposes of excise, duty and EORI number, e-Wnioski – electronic service of applications in proceedings before customs organs, e-Booking TRUCK – service which enables date booking of export procedure service, e-INTRASTAT – service of INTRASTAT declarations, e-IMPORT – the service is to cover all the processes delivered by the Automated Import System (AIS/IMPORT).
	e-clo (e-customs)	The portal includes: CELINA customs system which supports servicing of customs declarations (import), ECS - the European electronic messaging system to confirm movement of goods out of the EU customs territory.
SECURITY	Portal Granica (the border portal)	The portal includes: eBooking Bus – electronic notification about planned border crossing by a bus what considerably shortens customs clearance time, VAT return for travellers – speeding up of customs clearance through online declarations, Mobile application "granica" (the border).
	www.icwroclaw.pl	Service offering vital excise information (WIA).
	112	Handling 112 calls.
	RSO – regional warning system	Free mobile app informing about threats.
AGRICULTURE	Tourism without risk	Portal with warnings and tips for people planning holiday in Poland and abroad.
	The Agency for Restructuring and Modernisation of Agriculture (ARMA)	Service ARMA enables to submit applications for subsidies.

CATEGORY	Name of service	Description
	Regional platforms e.g. Gateway to Lesser Poland	Handling requests related to agriculture and forestry on local government level.
PUBLIC INFORMATION	stat.gov.pl	Depository of Central Statistical Office: <ul style="list-style-type: none"> • handling statistical reporting, • access to registry data REGON, • KEP – assigning REGON numbers, • KRS - assigning REGON numbers with back transfer of REGON number, • Edustat education system.
	Dane.gov.pl	Central Repository of Public Data enables online access to such thematic areas: <ul style="list-style-type: none"> • public administration, • business and economy, • budget and public finance, • education and science, • labour and social welfare, • agriculture, • society, • sport and tourism, • environment.
	geo.stat.gov.pl	Geostatic portal including databanks on: society and economy, demography, social work, environment as well as results of censuses.
	geoportal.gov.pl	<ul style="list-style-type: none"> • cadastral reference data, • review of layers of buildings, • access to data on specific plots of land, • possibility to order paid maps and aerial photos, • e-communication of contractors of the geodesy works with the documentation centre, • services related to scrolling and downloading map-related data, • referential dictionaries of towns, streets and addresses.
HIGHER EDUCATION AND SCIENCE	polon.nauka.gov.pl	POLON system contains: <ul style="list-style-type: none"> • national register of academic teachers and scholars, • list of warnings issued by the Minister of Science and Higher Education, • register of non-state higher education institutions and associations of non-state higher education institutions, • register of higher education institutions, • register of academic units, • information on church institutions, • list of majors offered by higher education institutions, • entitlements of academic units to award academic titles, • list of persons with the title of professor, • list of persons with the title of doctor (PhD) or habilitated doctor (associate professor), • list of real estate owned by entities in the field of science and higher education, • list of infrastructure owned by entities in the field of science and higher education, • list of investments carried out by entities in the field of science and higher education, • list of scientific laboratories and equipment owned by entities in the field of science and higher education, • information on scientific projects, • list of academic libraries, • complex evaluation of scientific units, • anti-plagiarism verification of contents of final theses (engineer, BA, MA).
	Edustat	System disseminating knowledge on public statistics.
	pbn.nauka.gov.pl	Information on academic units and publications of Polish scientists.
	pol-index.opi.org.pl	Information on scientific journals, papers and citations.
	wybiezstudia.nauka.gov.pl	Useful information on various majors for high school leavers and candidates.
osf.opi.org.pl	Service which enables submitting applications for funding of scientific projects or scientific activity as well as comprehensive and partial proceedings.	

CATEGORY	Name of service	Description
	jsa.opi.org.pl	Uniform Anti-Plagiarism System.
	Educational information system	Information on schools, teachers and students.

Source: Own work based on data from the Ministry of Digitization, 2019.

Continuous development of e-services in Polish administration is largely appreciated by entrepreneurs who increasingly use the Internet in their contacts with public administration (Table 7).

TABLE 2. POLISH COMPANIES WHO USED ONLINE SERVICES OFFERED BY PUBLIC ADMINISTRATION IN THE PERIOD 2015-2017 (IN %).

Voivodeship	2015	2016	2017
LOWER SILESIA	93,8	95,5	96,5
KUYAVIAN-POMERANAIN	94,3	94,9	94,5
LUBLIN	94	95,8	94,3
LUBUSZ	94,3	96,3	97,2
ŁÓDŹ	91	93,7	92,8
LESSER POLAND	93	93,4	94,9
MASOVIA	94,5	94,6	96,3
OPOLE	93,4	92,5	93,3
SUBCARPATHIAN	93,9	94,6	94,2
PODLASKIE	95,3	96,3	93,7
POMERANIA	94,7	93,2	96
SILESIA	94,7	96,4	94,9
HOLY CROSS	94,4	91,7	94,3
WARMIAN-MASURIAN	92,5	94,6	92,3
GREATER POLAND	91,7	93,2	94,7
WEST POMERANIA	92,6	95,8	98,2

Source: Own work based on Bdl.stat.gov.pl (2019).

According to data presented in the table above, entrepreneurs from West Pomerania, Lubusz, Masovia and Lower Silesia use the Internet in contacts with public administration to the greatest extent. The smallest number of entrepreneurs who handle their administrative matters online live in Warmian-Masurian, Łódź and Opole voivodeships. Activities such as submitting online documents signed with qualified electronic signature (QES) or sending documents via ePUAP platform are also gaining popularity among entrepreneurs which facilitates further development of e-services in public administration (Table 8).

The highest concentration of entrepreneurs who transfer documents to the public sector organs electronically can be found in West Pomerania, Lubusz, Masovia and Lower Silesia, the lowest concentration, in Warmian-Masurian and Łódź voivodeships. It should be highlighted that in all Polish voivodeships the figure was above 92%.

The above data indicate that the development of e-services in public administration is necessary not only due to Poland's membership in the European Union but also because of growing popularity of e-services among citizens. This development is also dictated by the need of optimization of costs related to public administration as a whole. However, it should be

remembered that this development is hindered by a number of barriers.

TABLE 3. POLISH COMPANIES WHO USE THE INTERNET TO SEND COMPLETED FORMS IN ELECTRONIC VERSION TO PUBLIC ADMINISTRATION BODIES (IN %).

Voivodeship	2015	2016	2017
LOWER SILESIA	93,8	95,5	96,3
KUYAVIAN-POMERANAIN	94,1	94,9	94,5
LUBLIN	94	95,5	94,3
LUBUSZ	94,3	96,3	97,2
ŁÓDŹ	90,9	93,5	92,8
LESSER POLAND	92,9	93,2	94,9
MASOVIA	94,5	94,2	96,2
OPOLE	92,9	91,6	93,3
SUBCARPATHIAN	93,9	94,6	94,2
PODLASKIE	95,3	95,9	93,7
POMERANIA	94,7	92,8	95,8
SILESIA	94,7	96,2	94,9
HOLY CROSS	94,4	90,8	94,3
WARMIAN-MASURIAN	91,8	94,2	92,3
GREATER POLAND	91	92,8	94,7
WEST POMERANIA	92,6	95,8	98,2

Source: Own work based on Bdl.stat.gov.pl (2019).

The biggest obstacles for development of e-administration in Poland are, obviously, not sufficient budget for digitization and the wireless broadband connection system in urgent need of expansion. Additionally, the following aspects slow down the development of e-administration:

- low level of compatibility and interoperability of tele-information systems functioning in various offices,
- no harmonization of documents and procedures in offices,
- computerization of offices which in fact is only internal,
- not sufficient IT infrastructure,
- digitization of paper documentation is not complete,
- domination of domain systems over central systems,
- decentralization of registers which means that the same documents must be presented in various offices,
- digital exclusion of a certain part of the society,
- insufficient knowledge about e-administration,
- low level of technical knowledge among potential users (citizens, entrepreneurs, clerks),
- constantly amended legal regulations,
- the qualified electronic signature (QES) is still not common and there is low awareness of its scope of applications,

- low confidence of the society in e-services offered by public e-administration.

Breaking down the barriers mentioned above and building a considerable level of confidence in public administration in the society is the only way forward for e-administration and development of e-services in Poland. In the future it will translate into lower costs of handling particular cases and will facilitate communication between entrepreneurs and public administration offices.

United Nations (2018). E-Government In Support Of Sustainable Development. Survey 2018. New York: Department of Economic and Social Affairs,

www.ideo.pl, i. (2019). Strategia Rozwoju Społeczeństwa Informatycznego / Dokumenty strategiczne / E-prawo / Strefa wiedzy / Cyfrowy Urząd - e-government - elektroniczna administracja. [online] CyfrowyUrząd.pl. Available at: http://www.cyfrowyurząd.pl/strefa_wiedzy/eprawo/dokumenty_strategiczne/strategia_rozwoju_spoleczenstwa/ [Accessed 4 Aug. 2019].

V. CONCLUSIONS

The implementation of e-services in public administration brings considerable benefits both for public administration offices and for citizens. The demand from citizens is manifested by the requests for more e-services provided by means of internet portals or traditional services rendered face to face but supported with state of the art IT tools (Papińska-Kacperek 2008). The present paper presented a method of measuring the digitization of public administration services based on E-Government Digital Index which uses components such as: Human Capital Index, Telecommunication Infrastructure Index and Online Service Index. According to E-Government Digital Index of all countries in the world, Poland was on 33rd place in 2018 (36th in 2016). However, when it comes to digitization of public administration services in the EU countries, Poland occupies 18th position. The results of research showed that the level of interest in e-services provided by public administrations fluctuates between 92.3% and 98.2% depending on a given Polish Voivodship. The data mentioned above show clear interest of entrepreneurs in e-services which means that public administration in Poland should constantly improve its infrastructure and implement innovations in order to meet the growing demand from the general public.

VI. REFERENCES

- BdL.stat.gov.pl. (2019). GUS - Bank Danych Lokalnych. [online] Available at: <https://bdl.stat.gov.pl/BDL/dane/podgrup/temat> [Accessed 29 Sep. 2019].
- Fleszer, D. (2014). Wokół problematyki e-administracji. *Roczniki Administracji i Prawa*, (ROK XIV), p. 126.
- Jedlińska, R. i Rogowska, B. (2016). Rozwój e-administracji w Polsce. *Ekonomiczne Problemy Usług*, (123) p. 137.
- Mikulski, K. (2008). Technologia informacyjna w administracji i dla administracji. Bydgoszcz: Wydawnictwo Kujawsko-Pomorskiej Szkoły Wyższej, p.72.
- Ministerstwo Cyfryzacji. (2019). E-usługi w administracji - Ministerstwo Cyfryzacji - Portal gov.pl. [online] Available at: <https://www.gov.pl/web/cyfryzacja/e-uslugi> [Accessed 29 Sep. 2019].
- Papińska-Kacperek, J. (2008). *Społeczeństwo informacyjne*. Warszawa: PWN, p. 534.
- Resolution of 28 March 2007 on the Plan of Informatization of the State for 2007 – 2010.
- United Nations (2016). E-Government In Support Of Sustainable Development. Survey 2016. Annexes. New York: Department of Economic and Social Affairs, p.3.