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Analysis of the Digitization Process of Turkish Public Administration Based on the Perspective of Digital Government Index and E-Government Development Index

Türk Kamu Yönetiminin Dijitalleşme Sürecinin Dijital Yönetim Endeksi ve E-Devlet Gelişmişlik Endeksi Açısından Analizi

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ÖZET

Modern devletlerin 15. ve 16. yüzyıllarda feodalizmin yıkılmasıyla başladığı düşünüldüğünde, devletlerin günümüze kadar olan süreçte çok farklı işlevler üstlendiği görülmektedir. Buna paralel olarak teknolojinin getirdiği gelişmeler çerçevesinde kamu hizmetlerinin sunumu da gelişmiştir. Bu noktadan hareketle çalışma kapsamında öncelikle geleneksel devlet anlayışından dijital devlete uzanan süreç genel hatlarıyla ele alınmıştır. Ardından Türkiye'nin dijitalleşme süreci incelenmiş ve Cumhurbaşkanlığı bünyesinde kurulan Dijital Dönüşüm Ofisi hakkında bilgilere yer verilmiştir. Ayrıca, WASEDA Üniversitesi tarafından oluşturulan "Dijital Devlet Endeksi" ve Birleşmiş Milletler "E-Devlet Kalkınma Endeksi" verileri kullanılarak veriler toplanmış ve analiz edilmiştir. Bu bağlamda çalışmanın temel amacı, WASEDA Dijital Devlet Endeksi bağlamında Türkiye'nin dünyadaki yerini karşılaştırmalı bir şekilde değerlendirmektir. Ayrıca Birleşmiş Milletler E-Devlet Gelişmişlik Endeksi temel alınarak "e-devlet gelişimi, e-katılım, çevrimiçi hizmet endeksi, telekomünikasyon altyapı endeksi ve beşerî sermaye endekslerinin" yıllara göre dağılımı karşılaştırmalı olarak incelenmiştir. Türkiye'nin dijitalleşme sürecinin farklı endeks verileri ışığında incelenmesi çalışmayı farklı ve önemli kılmaktadır. Betimsel yöntem ve istatistiksel verilerin kullanıldığı çalışmada, araştırma verileri kapsamında Türkiye'nin son 20 yılın dijitalleşme serüveni dikkate alındığında dijitalleşme sürecinde önemli ilerlemeler kaydettiği görülmüştür. Sonuç olarak, dijitalleşmenin, kamu hizmetlerinin konum gözetmeksizin online olarak aktarıldığı, bürokratik engelleri azalttığı, hız ve esneklik getirdiği, vatandaşların işlerini kolaylaştırdığı Türk kamu yönetiminde bir paradigma kayması olduğu çalışmanın temel iddiasıdır.

Anahtar Kelimeler:

Dijitalleşme,

Dijital Dönüşüm,

Dijital Devlet,

Dijital Devlet Endeksi,

E-Devlet Gelişmişlik Endeksi,

ABSTRACT

Considering that modern states began with the collapse of feudalism in the 15th and 16th centuries, states have assumed very different functions in the process up to today. Parallel to this, the delivery of public services has evolved in the context of the advances brought by technology. In this context, the study first discusses the shift from traditional to digital states in general terms. Then, Turkey's digitalization process was examined and information about the Digital Transformation Office established within the Presidency was included. Data from WASEDA University's "Digital State Index" and the United Nations' "E-Government Development Index" were also collected and analyzed. The main purpose of the study is to evaluate Turkey's place in the world using the WASEDA Digital State Index and to compare it with other countries. In addition, based on the United Nations E-Government Development Index, the distribution of "e-government development, e-participation, online service index, telecommunication infrastructure index and human capital indexes" according to years was analyzed comparatively. Examining Turkey's digitalization process in the light of different index data makes this study unique and important. The study used a descriptive method and statistical data, and it was found that Turkey has made significant progress in its digitalization process over the past 20 years. The study's main conclusion is that digitalization is a paradigm shift in Turkish public administration, as it allows for the online delivery of public services regardless of location, reduces bureaucratic obstacles, brings speed and flexibility and facilitates the work of citizens.

Keywords:

Digitalization,

Digital Transformation,

Digital Government,

Digital Government Index,

E-Government Development Index,

1. INTRODUCTION

The reasons for the digitalization of public administration are generally shown as the development of civilization and technology, globalization, industry 4.0. First, if we need to evaluate civilization and technological advances, humanity has gone through three important periods from hunting to agricultural revolution, from agricultural revolution to industrial revolution and then from industrial revolution to information revolution. Alvin Toffler, one of the first doyens of the information age, in his work "*Third Wave*" written in 1980, deals with these periods in a way that expresses the first wave agricultural society, the second wave industrial society and the third wave information society. Alvin Toffler emphasized that change is not superficial, and that the information age upsets many assumptions using the metaphor of the wave (Mercan et al., 2013:126).

Secondly, when we evaluate globalization, globalization began to affect and transform the fields of state, administration, state-society relations, and public administration at the end of the 1980s. With the emergence of globalization, which is a phenomenon that has changed the nature and character of the state and public administration all over the world, researchers working in the field of public administration and political science have pushed a difference of opinion. The reason for this is those who argue that the nation state will completely disappear and even completely erase the concept of the state from history and that the state will be weakened by those who argue that the state will turn into a new and more functional, supranational form. With the globalization process, the nation state and the centralist dominant structure have changed their shell and transformed from the traditional welfare state to the institutional welfare administrative state. Due to globalization, the traditional centralist management approach in the field of public administration has been moved away and the understandings specific to business management have been developed. In this context, emphasis has begun to be placed on the use of information technologies in order to reduce the state, make it more effective, efficient and effective, and on the other hand, to ensure transparent and honest management. This transformation led to the emergence of a new administrative order and the change in the understanding of the state in the information age (Farazmand, 2006).

Finally, cyber-physical systems and internet of things technologies are used in e-industry 4.0 production systems. Cyber physical systems are technologies that connect the physical world with the cyberspace with the internet. This concept was first used in 2006, and the development of these systems has been going on since 1932. The concept of the Internet of Things was first used in 2011. This concept refers to the ability of objects in the workplace or factory to collect, reproduce and organize data by communicating with each other. Industry 4.0 is the intelligent automation of cyber-physical systems with technologically based, control and advanced connectivity (Gypsumi, 2016:23-25).

Since the acceleration of globalization in the way of transferring information to citizens by state organizations, especially in the 1980s, it is seen that the functioning of the state and the provision of services have become more transparent, accountable and responsive and have been transferred to online channels. In this study, the situation of Turkey was examined by using the indices of the United Nations and Waseda University, where the digital indices of the state are measured.

2. CONCEPTUAL FRAMEWORK

In this part of the study, the transition process from the traditional state to the digital state, the concept of the digital state, the digitalization adventure of the Turkish public administration, the digital transformation office are included.

2.1. From Traditional Government to Digital Government

In the traditional state management model, business processes are based on the parties meeting face to face and making demands on each other. In such a model, the state asks the needy person to write a petition, fill out forms (documents), prepare documents, etc. In the case of the electronic state, all these processes undergo a transformation or disappear completely (Pamukoğlu and Ocak, 2007:59). Therefore, while trying to carry out the transactions of citizens in need, there is no loss of time in the queues that occur while eliminating the obligation to go to the state office. In this respect, the digital state is based on changing / transforming and innovating the service provided to citizens by benefiting from ICTs (Doğan and Ustakara, 2013:4).

The emergence of the digital state first began with a move away from traditional information monopolies and hierarchies in the public sector (Asgarkhani, 2005:466). This period has been beginning in the world since the early 1980s (Aktan, 2011:190). In traditional public administration, the process is based on a hierarchical information flow and interaction model. In this model, information is passively received and transmitted from a single government source to be transferred to designated recipients. In the upward flow of information, feedback from the community flows through a limited number of channels and is integrated into a central government resource. For example, information can be transmitted from elected officials to public officials (civil servants operating in a fixed department) and from them to passive citizens. Feedback is usually taken into account during election periods. The digital state is the process of reducing traditional hierarchies in government practices and transforming the flow of information into a two-way environment by introducing governance processes (Asgarkhani, 2005:466-467).

Table 1. Comparison of Traditional Government and Digital Government

Traditional Government	Digital Government
Bureaucratic control, authority and hierarchy	Empowerment of services and community, reduced and blurred hierarchy
Process orientation	Citizen/customer orientation
Administrative functions and confidentiality in data collection	Open-source services and information orientation
Organization based on functional expertise or geographical basis	Removal of barriers between units and integration of units
Decision-making process based on uniform rules and inadequate reporting practices	Decision-making process based on negotiation, confidential control and appropriate reporting
Isolated administrative functions	Integrated resource allocation
Disjointed information technologies	Integrated network solutions
Slow-moving processes	Fast and fluid responses

Source: Chen vd., 2005:193.

In the traditional state, a lot of paperwork is going on in the services provided to citizens, and many public officials are needed to perform these services, and also citizens who want to benefit from the service must be present individually at the state office where the service is provided. This may lead to citizens having to take a break from their own work for hours during this process. Therefore, by linking these services to automation processes, the state provides great savings for both government institutions and citizens and businesses (Fath-Allah et al., 2014:101).

2.2. Digital Government

The use of information and communication technologies in the public sector and the provision of more effective, efficient and transparent services by states force states to digitally transform. With digital transformation and updated legal regulations, the digital state emerges. Through the integration of digital technologies into the public sector, governments are changing the way they work and organize, and are using new digital tools. Thus, governments are adapting their approaches to public service delivery, policy-making, participation, and cooperation into the digital age. In order for governments to successfully meet the expectations of citizens and businesses, new digitally developed approaches need to be implemented (OECD, 2019).

The concept of e-government can still be used in the sense of digital state today. For this reason, in order to fully understand the digital government, the concept of e-government should be emphasized first. First, the concept of e-government was included in the reports of reform studies in the USA in 1993. In addition to the concept of digital state, concepts such as virtual state and online state have also been used instead of (Sobacı and Yıldız, 2012:5-6). When it comes to the state that provides public services over the Internet, e-government comes to mind, while the digital state; e-business includes various services such as e-democracy, e-voting, e-participation, e-procurement, e-government and open government (Veit and Huntgeburth, 2014:10).

In this parallel with the developing digital technologies, the types of services are increasing day by day and this diversity brings with it a complexity. For this reason, the themes of the services provided by the digital government have been gathered in four main categories and this confusion has been tried to be eliminated. These are: e-services, e-governance, e-democracy and e-politics. While issues such as citizen participation with e-democracy, financial transparency and open government are discussed, elements such as planning and

personnel problems are addressed in the e-management category. Another category, e-services; service delivery, accessibility, government websites. The elements of conducting research and regulation on issues related to technology adoption are also discussed in the e-policy category (Gil-Garcia et al., 2018:638-639).

2.3. The Digitalization Adventure of Turkish Public Administration

With the use of information technologies in public administration, there is an expectation that organizational efficiency will increase and bureaucracy will decrease at the same time. Although the use of information technologies in public administration is primarily focused on speed and efficiency, it has become a necessity of the digital age, especially with the widespread use of the internet. The reason for the use of information technologies in the public sector is that the public sector is a slow-moving, ineffective structure and the belief that faster, more efficient public services should be provided with the use of information technologies (Öktem and Aydın, 2005:5).

When Turkey's five-year development plans are examined, it is observed that policies are created with the idea that planned development activities will be more successful with the effective and efficient work of the public sector. For the first time, in the Third Five-Year Development Plan (1973-1977), under the heading of "the problem of public administration", it was stated that the public sector should be flexible enough to keep up with modern developments in the world. In the Seventh Five-Year Development Plan (1996-2000), it was stated that the use of computer technologies in the public sector should be given importance. In the Ninth Five-Year Development Plan (2007-2013), it is stated that the prevalence and effective use of information and communication technologies will be important for all existing organizations and Turkey. The Tenth Development Plan (2014-2018) emphasizes that e-government services should be increased for more effective, transparent, citizen-oriented public service delivery, and at the same time, ICT purchases in the public sector should be increased. The eleventh Development Plan (2019-2023) specifies the importance of digital transformation for the industrial sector. The use of digital technologies (*cloud computing, artificial intelligence, big data, etc.*) to improve public services and processes is mentioned (Hisoğlu Koç, 2020:64-65).

The projects and studies carried out in order to realize the digital transformation due to the transition to the information society in the public sector in Turkey since 1993 are listed as follows (Republic of Turkey Strategy and Budget Directorate, 2021):

- IT and Economic Modernization Report
- Turkish National Information Infrastructure Master Plan Project
- E-Commerce Coordination Board
- KamuNet
- E-Turkey Initiative
- E-Transformation Turkey Project
- Information Society Strategy Action Plan
- T.R. Presidential Digital Transformation Office

In the study in question, only information about the digital transformation office was provided in order not to be separated from the subject integrity.

2.4. Digital Transformation Office (DTO)

On 24 June 2018, the Turkish Public Administration, which de facto became a presidential request, brought with it new policy actors. Digital Transformation Office is one of the 4 offices established to eliminate bureaucracy as a reflection of the new public administration understanding under the Presidency with the Presidential Decree No. 1, which was published in the Official Gazette dated July 10, 2018 and numbered 30474. In the Presidential Decree of the Republic of Turkey (2018), offices are defined as "*structures that operate directly under the Presidency, obtain the data and information needed for the formulation of public policies for the relevant field and prepare and/or plan appropriate policy recommendations related to them*" (Akman and Çetin, 2019:228; Tamer and Övgün, 2020).

The duties of the Digital Transformation Office are briefly listed as follows (Presidency of the Republic of Turkey, 10.07.2018, K: 2018/30474):

- To lead the digital transformation in the public sector in accordance with the presidential policies, to develop e-government platform applications and to integrate institutions into this process.
- To prepare the digital transformation roadmap to be followed by the public sector.
- To provide cooperation on digital platforms between universities, non-governmental organizations, public sector and private sectors.
- To put forward projects that improve information and cyber security,
- To develop applications that implement and coordinate big data and artificial intelligence technology in the public sector.
- To increase the use of domestic and national technologies in the public sector.
- To effectively present the cost of digital technologies to public institutions and organizations.

2.4.1. Digital Transformation Office (DTO) Projects

DTO, which has been working since 2018, has implemented various projects for the digitalization of the public sector in coordination with the private sector, universities and non-governmental organizations. These projects are: AçıkVeri (Open Data), Digital Turkey, E-Correspondence, Idea Marathon, HackİstanbuI, KamuNet, KAYSİS, TekDurak, National Data Dictionary, 81 Cyber Heroes (Presidency of the Republic of Turkey, 2021). The contents of these projects are presented below from the website of the Presidential Digital Transformation Office of the Republic of Turkey:

- ***Open Data Portal Project:*** It is a project implemented for the development of artificial intelligence and innovative technologies in the public sector. In order to meet the data need for advanced technologies, it aims to produce value from data by sharing "*anonymized and confidentialized data*". Thus, by interacting with public institutions and other authorities, effective, transparent and accountable public services and economic growth-oriented governance can be achieved.
- ***Digital Turkey Project (DTP):*** This project, which existed before DTO, was presented to the service of citizens by developing various versions (such as 1.0, 1.1) with the work of the office. The main purpose of the development of this project is to reduce bureaucracy, to provide services on more digital platforms for citizens to benefit from more Digital Turkey platforms and thus to save time and money.
- ***E-Correspondence Project:*** This project, which has been ongoing since 2011, aims to make the official correspondence of public institutions and organizations in electronic environment in a secure manner. The new version of the E-Correspondence project is being developed by DTO.
- ***Idea Marathon and HackIstanbul Project:*** The main purpose of these projects is to design new services on Digital Turkey and e-Transformation with the participation of university students and young people and to raise awareness about cyber security.
- ***KamuNet Project:*** It is a project put forward to improve the existing KamuNet network and minimize cyber security risks.
- ***KAYSIS Project:*** It is an information management system that transfers all kinds of information about public institutions and organizations to the electronic environment with the basis of legislation and integrates Digital Turkey applications from a single center. The main purpose of the project is to standardize the activities of public institutions in electronic environment, to ensure the determination of bureaucratic processes, to plan the work of Digital Turkey, to record the development of the state organization in the electronic environment.
- ***TekDurak Project:*** This project, which aims to provide all citizens with access to public service delivery on the electronic platform, has started to be developed with the addition of 32 new services to the E-Government Portal.

- ***National Data Dictionary Project:*** Studies are carried out within the scope of this project to ensure language unity in information systems in the public sector. In this direction, it is within the scope of the project to ensure terminology unity, to make a national data inventory and to develop models.
- ***81 Cyber Hero Project:*** This is project "*TÜSİDAM*" (*Turkey Strategic Technology Transformations Research Center*) under the auspices of DTO. This project, which aims to raise awareness of cyber security among young people, has been implemented in 20 provinces. Within the scope of this project, trainings are organized under various main headings related to cyber security.

To summarize DTO will contribute to the digital transformation of the Turkish Public Administration by coordinating both the digital applications within the state itself and the digital applications of the state with the citizens, contributing to the development of domestic digital applications, and gathering the needed digital applications on a single platform (Avaner and Fedai, 2019:160).

3. WASEDA UNIVERSITY WORLD DIGITAL GOVERNMENT RANKING COUNTRY ASSESSMENT REPORT AND TURKEY

Table 2 shows the ranking of the digital government scores of the countries of the world. Denmark takes the first place; Singapore is the second place, and the United Kingdom is in third place. Turkey is ranked 48th in Waseda University's world digital government rankings. Turkey, which has a young population, is a country with the potential to climb higher in the world ranking. The rapid establishment and adaptation of distance education and remote working systems during the Covid-19 pandemic process has led to significant progress in the ICT sector (WASEDA Survey Part II, 2021:325-326).

Table 2. World Digital Government Comprehensive Ranking (2021)

No	Country	Score	No	Country	Score	No	Country	Score
1	Denmark	94.2748	23	Italy	81.4697	45	Vietnam	69.0893
2	Singapore	94.0520	24	Belgium	80.4378	46	Chile	68.2531
3	UK	93.9841	25	Thailand	79.6510	47	Mexico	68.1738
4	USA	93.7210	26	Russia	79.5482	48	Turkey	67.8051
5	Canada	90.9754	27	Spain	78.7469	49	China	66.6266
6	Estonia	90.1617	28	Hong Kong	76.5967	50	Macau	66.2558
7	New Zealand	90.0918	29	Oman	76.4807	51	Georgia	65.9696
8	South Korea	88.1366	30	Saudi Arabia	76.4124	52	Bahrain	65.5004
9	Japan	87.6184	31	Kazakhstan	75.2545	53	Romania	65.2758
10	Taiwan	87.3255	32	Philippines	73.2548	54	Kenya	63.8613
11	Australia	87.2496	33	Malaysia	73.2088	55	Argentina	60.4899
12	Sweden	86.8587	34	Indonesia	72.9366	56	Egypt	59.2642
13	Finland	86.5711	35	Uruguay	72.4353	57	Peru	58.9727
14	Netherlands	86.0419	36	Portugal	72.3409	58	Brazil	58.9361
15	Switzerland	85.3347	37	South Africa	71.1474	59	Morocco	58.1522
16	UAE	83.6673	38	India	70.5637	60	Costa Rica	57.3152
17	Iceland	83.5351	39	Colombia	70.5028	61	Pakistan	56.9483
18	Norway	83.0516	40	Israel	70.2476	62	Nigeria	55.4067
19	Ireland	82.9404	41	Brunei	69.8509	63	Fiji	54.8498
20	Germany	82.6809	42	Lithuania	69.5926	64	Tunisia	54.2517
21	Austria	82.3929	43	Czech	69.4843			
22	France	81.7544	44	Poland	69.2256			

Source: Waseda University Institute of D-Government Survey Part-I, 2021.

- ***Network Infrastructure Preparedness:*** According to the Waseda University index, Turkey is in the 49th position in network infrastructure. According to January 2021 data, Turkey has approximately 66 million internet users. About 71% of the country's population has access to social media. On the other hand, about 91% of the population has mobile internet access. (WASEDA Survey Part II, 2021:326).

- ***Management Optimization:*** Turkey's electronic government goal and program have been integrated with the "*National Development Plan and Information Society Strategy*". 2016–2019 "*National e-Government Strategy and Action Plan*" is one of the important steps taken in the digital transformation and progress of public administration. In order to achieve Turkey's 2023 goals and contribute to the development of the country, it becomes important to implement this action plan. The aim of this plan is to increase the living standards of citizens through e-Government (WASEDA Survey Part II, 2021:326).
- ***Online Service:*** In 2005, MERNIS made open to public institutions and institutions to access citizens' identity information. Another development was made in the case of public procurement. Since 2010, public tenders have started to be carried out electronically through EKAP (Electronic Public Procurement Platform). Waseda University is ranked 33rd in Turkey in the online service index (WASEDA Survey Part II, 2021:327).
- ***National Portal:*** Turkey created an electronic state gateway in 2008 where people and companies have access to many services. Public institutions and organizations offer many services to the use of citizens through this electronic door. The national portal serves at https://turkiye.gov.tr (WASEDA Survey Part II, 2021:327).
- ***E-Government Promotion:*** The development plan approved by the parliament in Turkey aims to increase the country's position and social welfare vis-à-vis the countries of the world. The initial development plan of the presidential system of government focuses on social welfare and includes a number of proposals for the fair realization of economic distribution. The sections related to e-Government in the plan are located in the "*E-Government Applications in Government Services*" section. Improving the quality of public services through the digitalization of the state 11. It is highlighted in the development plan (WASEDA Survey Part II, 2021:327-328).
- ***E-Participation:*** In Turkey, information flow between public institutions and organizations, data communication is provided through "KamuNet" over a secure network closed to the internet as of 2019, 39 public institutions and organizations have been connected to this network. E-Participation is realized with the participation of citizens through the e-Government portal (WASEDA Survey Part II, 2021:328).
- ***Cyber Security:*** Cyber security is becoming a very important element for states in ensuring national security. In the circular issued by the Presidency, the importance of cyber security is emphasized. It is also mentioned that the solutions related to the issue are produced and the necessary developments are made (WASEDA Survey Part II, 2021:328).
- ***The use of Emerging ICT:*** The ICT market in Turkey was growing by approximately 22% per year, and in 2020, the ICT sector was projected to grow between 5% and 10%. By 2020, the ICT market capitalization was expected to be worth 189 billion Turkish Liras. In order to activate big data and artificial intelligence applications, universities, public institutions and organizations and non-governmental organizations are working jointly and an artificial intelligence strategy is being developed in accordance with the Presidential annual program (WASEDA Survey Part II, 2021:329).

4. UN E-GOVERNMENT DEVELOPMENT INDEX

UNDESA "*United Nations Department of Economic and Social Affairs*" has been given the opportunity to provide access to information and data through practical one access to governments, public institutions, non-governmental organizations and researchers. UN e-Government data (from 2003 to 2020) contain information on member states available in comparative tables. The survey reveals the systematic report of 193 member states on the use of information and communication technologies "*efficiency, effectiveness, transparency, accountability, access to public services and citizen participation*" for development (UNeGovKB, 2022).

4.1. UN E-Government Development Index and Turkey

Mathematically, the E-Government Development Index (EGDI) is the weighted average of normalized scores on the three most important dimensions of egovernment, namely (UNeGovKB Survey, 2022:269):

- The scope and quality of online services quantified as the Online Service Index (OSI)

- The status of the development of telecommunication infrastructure or the Telecommunication Infrastructure Index (TII)
- The inherent human capital or the Human Capital Index (HCI). Each of these indices is a composite measure that can be extracted and analyzed independently.

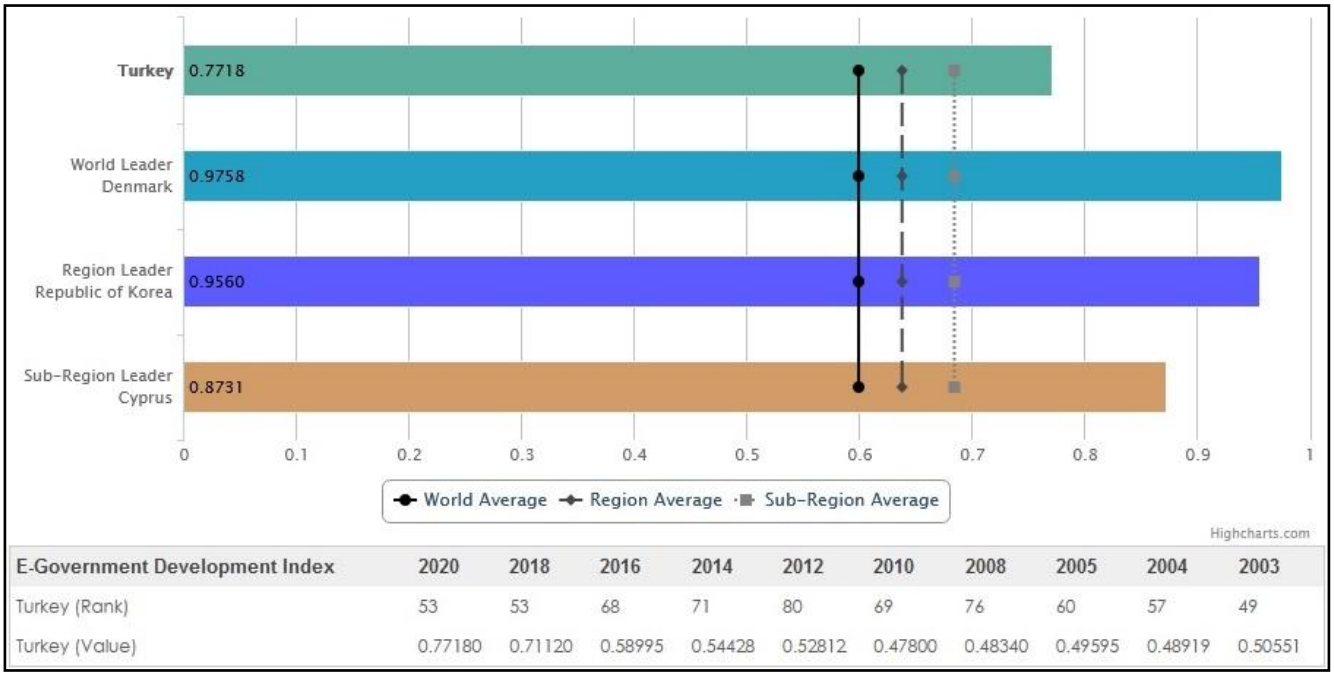
Table 3. EGDI Formula

$$EGDI = \frac{1}{3}(OSI_{normalized} + TII_{normalized} + HCI_{normalized})$$

Source: UNeGovKB Survey, 2022:269

According to the results of the UN e-Government development index, Turkey ranks 53rd in the United Nations as of 2020, while Denmark ranks as the world leader, South Korea as the regional leader and Cyprus as the sub-regional leader.

Figure 1. E-Government Development Index (2020)

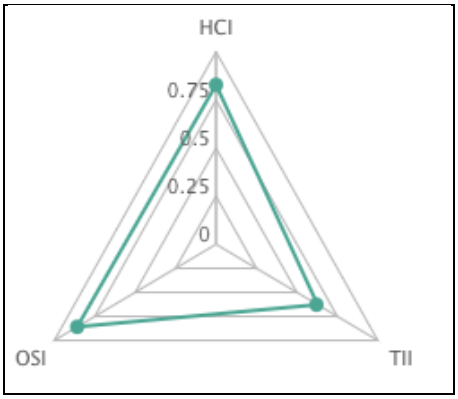


E-Government Development Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Turkey (Rank)	53	53	68	71	80	69	76	60	57	49
Turkey (Value)	0.77180	0.71120	0.58995	0.54428	0.52812	0.47800	0.48340	0.49595	0.48919	0.50551

Source: https://publicadministration.un.org/egovkb/en-us/data-center

Since 2003, while Turkey has not been able to show progress in terms of ranking, we see that it has made significant progress in terms of value.

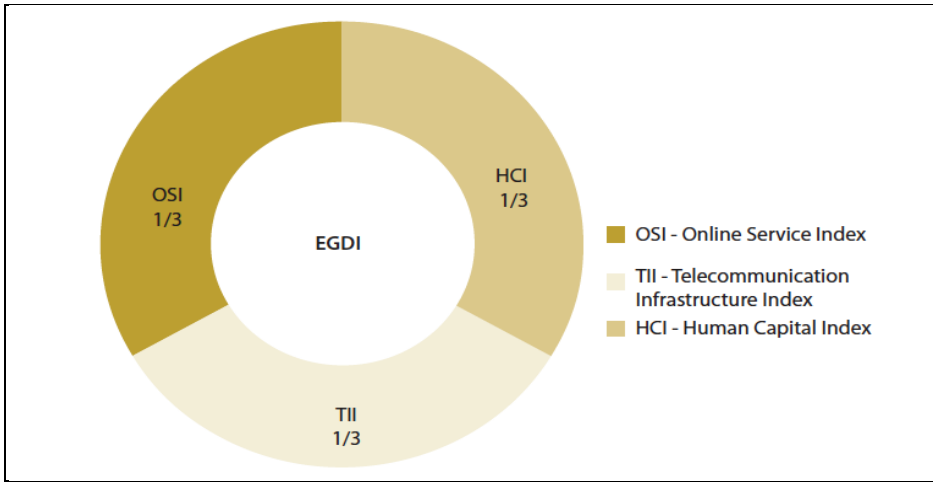
Figure 2. UN E-Government Development Index Average Weight Chart of Turkey as of 2020



Source: https://publicadministration.un.org/egovkb/en-us/data-center

It is seen that the shortcomings that cause Turkey to rank 53rd among 193 countries are mainly due to the lack of telecommunication infrastructure, which has an index score of 0,62. While Turkey has made significant progress in the online services and human resources indices, it is seen that it lags behind in telecommunication infrastructure, another component of the UN E-Government Development Index. In order to have a better e-Government index, it needs to create policies that will improve the telecommunication infrastructure.

Figure 3. The Three Components of the E-Government Development Index (EGDI)



Source: 2022 https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2020

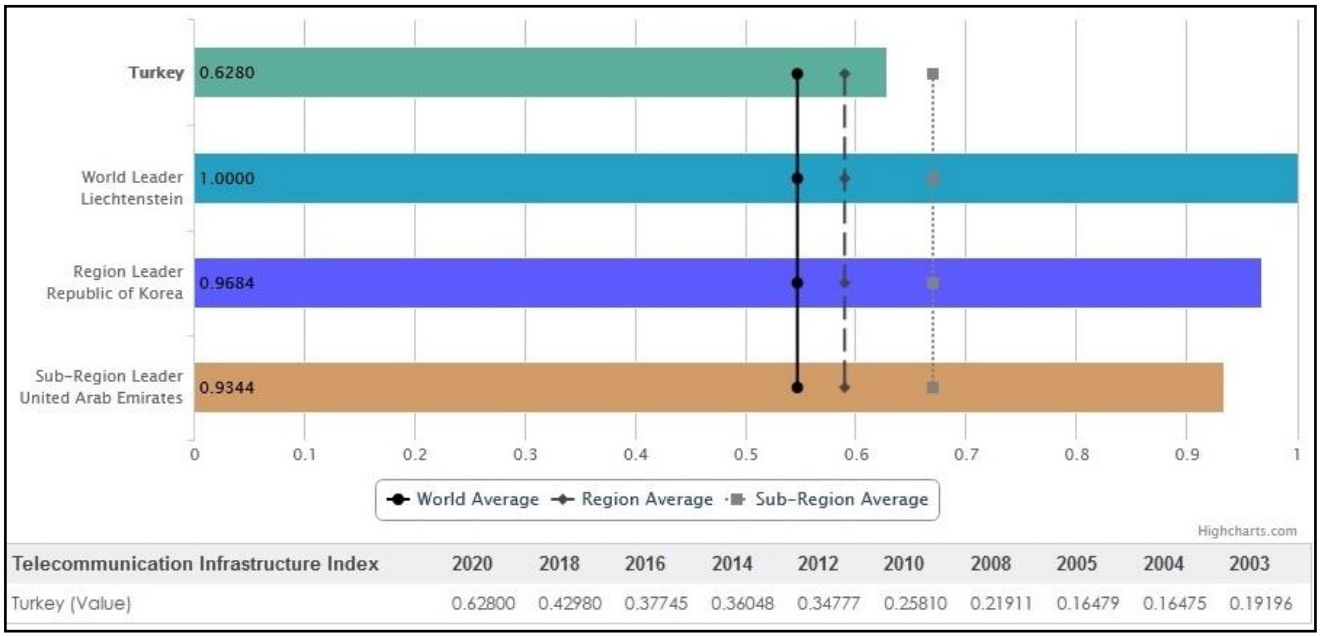
The UN e-Government development index consists of the OSI, TII and HCI indices. In this section, the situation of Turkey will be examined by making information about these indices.

4.1.1. Telecommunication Infrastructure Index

This index is an "*arithmetic average composite of four indicators*" (UNeGovKB Survey, 2022:270);

- Estimated internet users per 100 inhabitants,
- Number of mobile subscribers per 100 inhabitants;
- Active mobile-broadband subscription; and
- Number of fixed broadband subscriptions per 100 inhabitants.

Figure 4. Telecommunication Infrastructure Index (2020)



Telecommunication Infrastructure Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Turkey (Value)	0.62800	0.42980	0.37745	0.36048	0.34777	0.25810	0.21911	0.16479	0.16475	0.19196

Source: https://publicadministration.un.org/egovkb/en-us/data-center

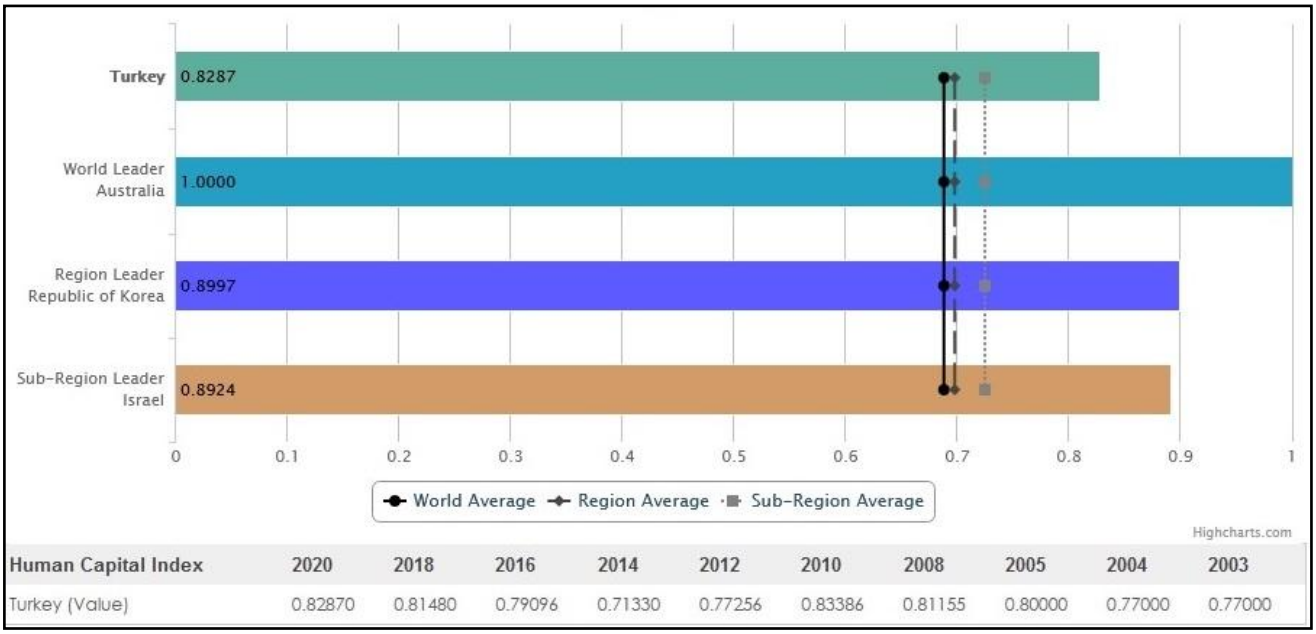
According to the UN E-Government 2020 Index results, Liechtenstein has become the world leader in terms of telecommunications infrastructure. While South Korea took the regional leadership, B.A.E took the Sub-Region leadership. Turkey scored above the World average and the regional average. Although Turkey made a rapid increase compared to 2018, it is observed that it remains below the average in terms of Sub-Region country comparison. From this point of view, it is seen that the steps taken by Turkey in the BTS Action Plan in 2016 achieved success and increased its score. It is also seen that there is still a need for steps to be taken in this area in order to catch the Sub-Region average and increase the index score. It is seen that Turkey has achieved a significant upward momentum since 2003 and reached an increase exceeding three times by 2020.

4.1.2. Human Capital Index

This index consists of four components (UNeGovKB Survey, 2022:273):

- Adult literacy rate,
- The combined primary, secondary and tertiary gross enrolment ratio,
- Expected years of schooling,
- Average years of schooling.

Figure 5. Human Capital Index (2020)



Human Capital Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Turkey (Value)	0.82870	0.81480	0.79096	0.71330	0.77256	0.83386	0.81155	0.80000	0.77000	0.77000

Source: https://publicadministration.un.org/egovkb/en-us/data-center

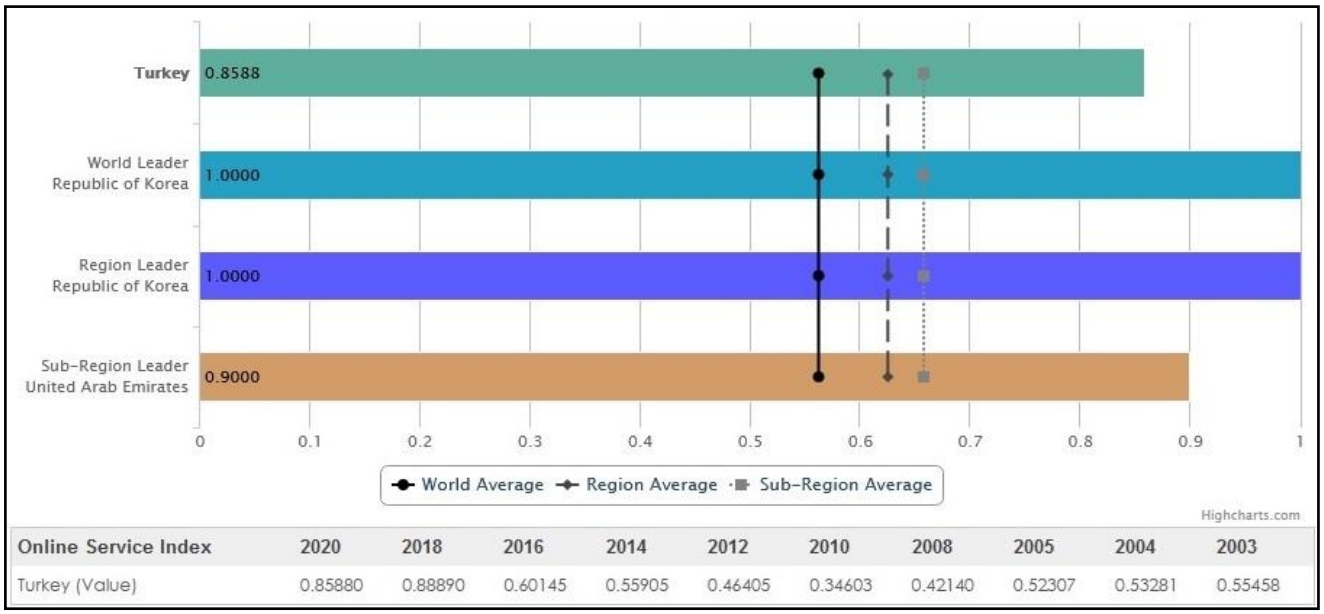
According to the UN e-Government Human Capital Index 2020, the world leader is Australia, the regional leader is South Korea, and the sub-regional leader is Israel. Turkey's position is above the world average, regional average and sub-regional average. When we evaluate it according to the years, there is a general increase in 2003 until 2020 (except for the decline in 2012 and 2014).

4.1.3. Online Service Index

The 2020 Online Services Questionnaire "*consists of a list of 148 questions. Each question calls for a binary response. Every positive answer generates a more in-depth question inside and across the patterns. The outcome is an enhanced quantitative survey with a wider range of point distributions reflecting the differences in the levels of e-government development among Member States. To arrive at a set of Online Service Index values for 2020, along with 14 UN staff members and 18 interns who has worked for the Survey, a total of 212 online United Nations Volunteer (UNV) researchers from 98 countries covering 69 languages, assessed each country's national website in the native language, including the national portal, e-services portal and e-*

participation portal, as well as the websites of the related ministries of education, labor, social services, health, finance and environment, as applicable" (UNeGovKB Survey, 2022:274-275).

Figure 6. Human Capital Index (2020)



Online Service Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Turkey (Value)	0.85880	0.88890	0.60145	0.55905	0.46405	0.34603	0.42140	0.52307	0.53281	0.55458

Source: https://publicadministration.un.org/egovkb/en-us/data-center

As of 2020, according to the UN e-Government human resources index, South Korea ranks first in both the world and the region, while the United Arab Emirates ranks first in the sub-regional leadership. Turkey, on the other hand, has managed to rank above the world average, regional average and sub-regional average.

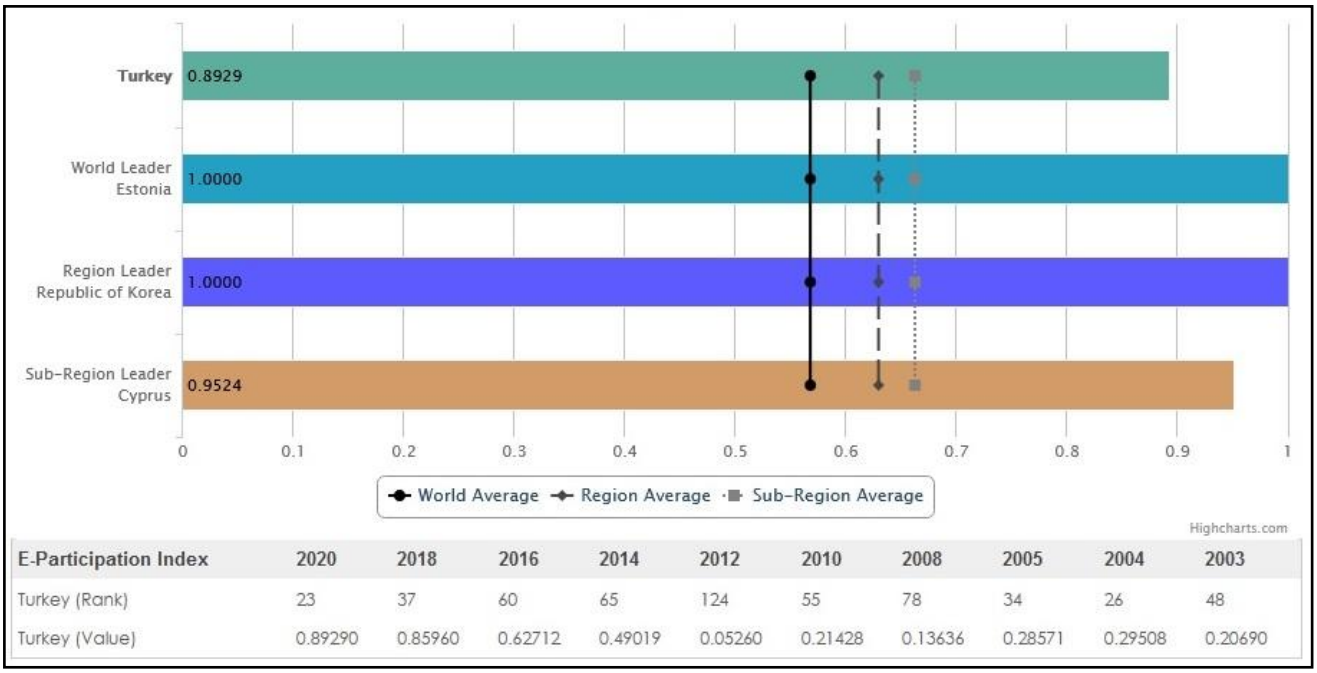
Between 2008 and 2014, Turkey could not develop in terms of OSI scoring and regressed. With the contributions of the Information Society Strategies Action Plan, which was put into practice in 2015, it is seen on the table that it has made rapid progress since 2016.

4.2. UN E-Participation Index

The E-Participation Index (EPI) "*is derived as a supplementary index to the United Nations E-Government Survey. It extends the dimension of the Survey by focusing on the government use of online services in providing information to its citizens or e-information sharing, interacting with stakeholders or e-consultation and engaging in decision-making processes or e-decision-making*" (UNeGovKB Survey, 2022:288):

- ***E-Information***: Enabling participation by providing citizens with public information and access to information without or upon demand.
- ***E-Consultation***: Engaging citizens in contributions to and deliberation on public policies and services.
- ***E-Decision-Making***: Empowering citizens through co-design of policy options and co-production of service components and delivery modalities.

Figure 7. UN E-Participation Index



E-Participation Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Turkey (Rank)	23	37	60	65	124	55	78	34	26	48
Turkey (Value)	0.89290	0.85960	0.62712	0.49019	0.05260	0.21428	0.13636	0.28571	0.29508	0.20690

Source: https://publicadministration.un.org/egovkb/en-us/data-center

According to the results of the UN e-Participation index, Turkey ranks 23rd among UN members, while Estonia ranks as the world leader, South Korea as the regional leader and Cyprus as the sub-regional leader. It is observed that Turkey, which entered the list from the 43rd rank in 2003, regressed to the 124th rank in the following years. Turkey, which started to climb to the top of the e-Participation index again after 2012, managed to rise to the 23rd place by 2020.

5. CONCLUSION

In the history of societies, a series of developments such as wars, the discovery of new lands, inventions, the invention of steam engines and the industrial revolution, globalization, scientific and technological revolutions, the invention of the Internet and ease of access to information have forced states to transform. In recent history, the idea that globalization will destroy or at least weaken nation states has been on the agenda. Instead of the traditional understanding of the state, the idea that business management techniques can be applied in public administration and that the state will be more effective and efficient has been discussed. Today, while it is emphasized that information and communication technologies should dominate public administration, the state is becoming minimal in a more transparent and accountable situation. All processes in social life have begun to transform digitally. In this study, where the indices are examined globally, we see that countries are in a fierce digitalization race in order to adapt to competition and not to be left behind. In this sense, digitalization means the integration of digital technologies into societies and all segments by countries. Digital transformation does not only take place by transferring data to the digital environment. Digital transformation is taking place with the digitalization process of all business and processes.

Governments have a great job to do to ensure digital return in the public sector. It offers great opportunities for digital governments, societies and economies; It uses technology to deliver open, user-centric, proactive and inclusive public services; redesigns government processes and enables data-driven decisions. Turkey, which is developing with its young population and growing economy, shows rapid growth both in the use of the internet and in the transformation of these technologies as public services. While the studies carried out in Turkey present public information as more easily accessible, it has succeeded in modernizing public services and making them online. The digital transformation office has been one of the most important steps taken in achieving the success of the digitalization of the state and ensuring coordination.

It is surprising that Turkey, which ranks 23rd in the world economic size ranking as of 2022, ranks 48th in the Waseda Digital States Index ranking. In order for Turkey to rise to the top, it should improve its network

infrastructure (49th), start fully implementing the "*National Development Plan and Information Society Strategy*", increase the diversity and quality of online services (33rd), 11. The digitalization emphasis and strategy made in the development plan should be included in the next development plans, resources should be allocated for investments in Turkey's ICT market and packages and programs to encourage the private sector should be prepared.

According to the UN e-Government Development Index, Turkey ranks 53rd among 193 countries. It is seen that the level of development of the infrastructure of telecommunication, one of the components that make up the index, has not developed at an adequate level in Turkey. In order for Turkey to rise to higher ranks, it needs to allocate resources for investments that will improve its telecommunication infrastructure.

Authors who will conduct research on Turkey or different countries can analyze the relevant European Union e-Government Index, World Economic Forum Network Society and Readiness Index, International Telecommunication Union ICT Development Index and World Wide Web Foundation Open Data Barometer Index and OECD Digital Government Indexes comparatively. In this research, Waseda University Index and United Nations Index data were used.

In the digital state indices examined within the scope of the study, it is seen that Turkey's current position and digitalization from past to present draw a successful graph and it is seen that it has managed to rank above the world, region and sub-region ranking in the index analysis.

In the digital age we are in Turkey, we should develop technology and communication infrastructure systems by supporting them with economic progress, and accelerate the digitalization process by increasing the diversity of services to citizens in the digital world. In the process of digitalization, Turkey should take into account the digital e-Government index reports and identify the deficiencies and defects and take steps to solve them.

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