

# THE NATIONAL TECHNOLOGY INITIATIVE FOR DIGITALIZATION IN THE PUBLIC SECTOR

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### **Abstract**

The objective of this article is to emphasize the importance of the National Technology Initiative for digitalization in the public sector and its practice in the priority areas. The National Technology Initiative is a comprehensive initiative that requires pursuit of implementations at the national level as well as the developments beyond our national borders. The motivation behind addressing this subject is to analyze the implications of this initiative on the digitalization process of the public sector. The Digital Transformation Office (DTO) of the Presidency of the Republic of Türkiye, which was established with the transition to the Presidential Government System in order to orchestrate the digital transformation of the public sector under a single roof, is of critical importance for the understanding of this process. In this article, the section “Big Data and Artificial Intelligence” thoroughly examines big data and artificial intelligence by public sector as the locomotive technologies of digital transformation, and includes the projects of DTO in related fields. The section “Cybersecurity Governance” focuses on the practices carried out to adopt a holistic approach which will strengthen national resistance against new generation cyber threats. Under the section “Coordination of Digital Transformation of the Public Sector”, the strategy documents prepared to develop policies are analyzed. The section “The Platform of Digital Türkiye: e-Government Gateway” explains the efforts devoted to increase citizen satisfaction by digital service delivery channels. The section “Importance of International Collaboration for National Digital Ecosystem” elaborates on the practices that concentrate on establishing international collaborations to strengthen our national digital ecosystem. Finally, in the section “Vision 2023 and Digital Türkiye”, actions and their outputs on the path towards strong Digital Türkiye with domestic and national technologies are discussed in all aspects.

### **Keywords**

*Digital Transformation, e-Government, Innovative Technologies, Digital Türkiye.*

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## **Introduction**

In today's digital era, the number of technological products and services entering our lives has been exponentially increasing. Many developments which have been recognized as a dream until recently have become real in this age of digital and now almost everything is connected with each other and has become a factory that produces data. Such innovative technologies as big data, artificial intelligence, internet of things, cloud environment, blockchain, digital twin, and quantum systems which are likely to radically transform the world we live in are changing the way we think, act and do business. We all together have been experiencing deep-seated changes in economy, management mentality, professions, education, media, and in many fields of social life. We will continue to face these changes at an increasing rate.

## **Digital Transformation in The Public Sector**

### ***Agile, Adaptive, and Innovative Policies***

We live in an era where the technological developments run ahead of their progress in social and economic structures. The policies that support digital transformation are required in a period where digital technologies are rapidly influencing the socio-economic life and changing our habits. These policies are needed for ensuring the sustainability of the countries' development.

In this regard; agile, adaptive, and innovative policies are of utmost importance in terms of responding to the rapidly changing conditions and emerging needs.

States have been the first users of information technologies. For the execution of such main service areas as tax, population, property, security and health, more advanced information technologies have always been needed. The most common and permanent users of today's information technologies, which have transformed from written paper to "0/1" based electronic microprocessors, are public institutions and organizations.

Accessibility of digital technologies by all individuals has enhanced the dependency on these technologies, products and services. Therefore, we have entered a period in which agile policies for the effective use of digital technologies in service areas are at the forefront, as well as policies for the development and management of these technologies that trigger transformation.

Particularly the public institutions and organizations that are intertwined with technology are expected to put forth favorable policies in order to respond to the rapidly changing needs of the citizens. The most important input for the preparation of these policies is the data emerging as a result of the interaction between the citizens and the system.

### ***Data Based Decision Making Processes***

One of the most important focal elements for the preparation of national technologies developed in our country on the basis of the standards to be determined is the creation of a common data space. A "Public Data Space" will be established by The Digital Transformation Office of the Presidency in order to generate value from the data of public institutions and to maximize data governance. The aim of the Public Data Space is primarily to increase the awareness of institutions in data governance and to establish an appropriate interoperability framework. From this point of view, it is necessary to prepare projects in order to increase the data capacity of public institutions and to share data sets, to define roles and reveal details about infrastructure, human resources and legislation. For

this purpose public institutions and organizations with different roles should be able to work together with an inclusive, holistic and data-oriented approach. The fact that institutions dominate their own data will also help determine the data ownership of other institutions. By determining the ownership of the data, the person responsible for the data derived from the new concepts can be determined as soon as it is created. The data strategy to be published will be the basis for the formation of this structure. At the same time, the data strategy, the National Artificial Intelligence Strategy (NAIS) published in 2021 and the Digital Government Strategy, which is planned to be published in 2023, will be strategies that complement each other. In this direction, NAIS has been prepared with strategic priorities to reveal the connection with these strategies. Measures that indicate that a “Public Data Space” will be established within the NAIS, point to the “Open Data Portal” requirements and focus on promoting the “Open Data Cluster” of the private sector, are in line with the data strategy.

### ***Data Transmission/Transfer and Open Data***

The creation of the National Open Data Portal, which will generate added value from public data and ensure that it is shared with third parties, is an important step. In this context, the data produced by public institutions in their business processes will be shared in the form of open government data, taking into account the privacy principles of personal data as well as national and commercial secrets. With the Open Data project initiated by the Digital Transformation Office of the Presidency, it is aimed to enable the adoption of transparency, accountability principles and the production of new value-added services in data owner administrations, after this data sharing has reached the level where it can be realized.

With the Open Data project, open government data road map has been put forth in a sense. This road map encompasses the following sections in detail:

- Enhancing the accessibility and quality of open data,
- Ensuring the coordination in the publication of the open data in public institutions,
- Formation of state policies, establishment of legal infrastructure,
- Developing a public demand from the target audience for the use of data.

### ***From Connecting Everyone to Connecting Everything***

An important element in the preparation of data standards is the creation of structures that will enable different systems to talk to each other while working over different applications and the ability to demonstrate data transmission. It is planned that the systems under government institutions and organizations and individuals will be connected to each other by taking these issues into account, again with the Open Data project. This will include not only the individual or institution's access to their own data, but also the ability to connect different systems and different individuals in line with established standards.

### ***Global Competition and Sustainable Digital Development***

At the very basis of the global competition and economic integration, there lies free movement of goods, persons (workforce), capital and services. The fact that the digital data is everywhere has put the free movement of data topic on the agenda besides these four titles. Data ownership has become the main argument of the competition among the states and even among the multinational companies. In today's world, where data-oriented transformation and innovation have become a development move, adapting to changing technologies and putting forward a sustainable development process have become one of

the most serious tests of countries in terms of structure. Digital development is not a matter of choice for our country within the rapidly transforming global value chains. Our position in this race will be determined by the extent to which we transform the flows of goods, services, capital and data that are blended with our own resources into value.

While real and legal person transactions, which started to be digitalized in the early 2000s, caused centralization-oriented discussions about e-government applications, the volume of data collected and processed by multinational companies today forms the basis for more critical individual rights discussions. In a reality where people and even autonomous systems can access all kinds of information and content on the internet, the ownership and sharing of data has gained importance. In these discussions, it is out of question for the states, which take their place as the highest regulatory authority, to leave global competition to market conditions. Every country takes steps to maximize its own benefit and to ensure its continuity. The digital development process demands the development of technology beyond traditional information society and e-government strategies. Current advancements in such fields as agriculture, health, etc. require the use of digital technologies. As it is known, all countries attach importance to digital development moves and perform actions in this direction. In order to make the most of digital technologies in Türkiye and to adapt the technological needs and digital development to the country in the best way, the National Technology Initiative has been implemented. With the spirit of the National Technology Initiative, there is a state understanding that aims to gain competencies in these fields and to offer high-level technologies to the service of the nation in the best way. In the global competition where economic benefit is prioritized, it is necessary to make a total effort for the establishment and sustainability of a human and environment-oriented understanding. It is obvious that with this effort we will protect the future of our country in global competition with the shaping of the state in all institutions, research centers, businesses and decision-making mechanisms.

### ***Vision 2023 and Digital Türkiye***

Digital Transformation Office of the Presidency has been undersigning the important actions in accordance with our national development goals. Digital transformation has been determined as an accelerating policy area in the Eleventh Development Plan (2019-2023) which was prepared with the vision of “A stronger and prosperous Türkiye that produces more value, shares more fairly”. The measures taken by our Office as the responsible institution on the axes of “Competitive Production and Efficiency” and “State of Law, Democratization and Good Governance” act as a leverage for a new techno-economic breakthrough shaped by our 2023 vision.

In our country, various policies towards the information society have been implemented since the end of the 1990s and with the transition to the Presidential Government System in 2018, the importance given to digital transformation has been brought to a higher level. In fact, all these processes and practices we have implemented are the milestones on the way to become a “Digital Türkiye”. Digital Türkiye is a globally competitive Türkiye with the increase in productivity it provides by using digital technology, products and services and the value it derives from data. This vision will be achieved by adapting to technology and implementing innovations in the business and operations of our state, society and economy.

With the COVID 19 pandemic, we stepped into a period where digital products and services became widespread and consumer habits changed. With this period, which is often

called the “new normal”, it can be predicted that technological developments will be felt more and their impact will continue to increase. In the new normal, where the physical world and the cyber environment are intertwined and interact in a multidimensional way, norms and rules are redefined on a global scale. In today's world, where the rules of the global order are rewritten in line with technological possibilities, public administration is being reorganized in our country, as in all countries, in order to take steps to protect the interests of our country in the most effective way. It is obvious that countries that can make the improvements required by new generation digital technologies in their technological infrastructure, data resources, human capital and business processes in a timely manner and adapt to the needs and requirements of this period will be the winners of the upcoming period.

Our country demonstrates preparedness for this period with its Digital Türkiye vision and National Technology Initiative. When Türkiye's vision and strategies are examined in detail, it can be observed that the implications of this period are tried to be discussed in detail in every field. While dealing with these issues, the preparations are made not only on the basis of the technical needs of the period but also by taking into account the situations specific to Türkiye, especially in areas such as social and cultural.

Our Digital Türkiye vision and National Technology Initiative are shaped by a data-oriented approach which is the most precious treasure of the 21<sup>st</sup> century. As the Digital Transformation Office of the Presidency, we maintain our efforts with a motivation that aims to provide large scale contributions to the Digital Türkiye vision. The protection of country data, which is seen as a national value, remains the most important priority in this process. Promoting domestic and national technology and in this sense, realizing the targets of our Office for training qualified experts are among our important agenda topics within the scope of our country's 2023 Vision. Digital Türkiye will be implemented with the contributions of all our institutions in order to make the most of digital technologies in all sectors from defense to education, from health to manufacturing industry, from agriculture to finance.

With this vision, while accelerating the influence of new generation digital technologies on the socio-economic structure, on the other hand, we must serve to establish rules and regulations that will ensure that these technologies are used for the benefit of our people in particular and all humanity in general. We are aware of the opportunities and risks brought by new generation digital technologies, especially artificial intelligence, which have come to the fore in recent years all over the world. We are taking steps to eliminate these risks on behalf of our country. For example, artificial intelligence, which has been determined as one of the critical technology areas for our country, is one of the most important carriers of our 2023 vision, which reveals a new techno-economic breakthrough. The National Artificial Intelligence Strategy (2021-2025), implemented with this perspective, constitutes the main roadmap for the studies that Türkiye will carry out in this field. Our strategy is of an exploratory nature and basically aims to create an agile and sustainable ecosystem that can manage the transformation in the socio-economic structure and to reduce the possible inefficiencies in the functioning of this ecosystem as much as possible. Due to the rapidly developing nature of the field of artificial intelligence, the common acceptances in the strategy and the guides that are expected to be prepared with the participation of all stakeholders in this context will be a living and constantly evolving reference. In its focus; the strategy, which has three basic artificial intelligence competencies determined as “skill”, “data” and “infrastructure”, aims to make our country a global player in line with the

international "trustworthy and responsible AI" values and principles of which it is a stakeholder.

Global problems such as the COVID-19 pandemic, climate change, financial crises and migration movements have brought the search for data-driven global solutions to the agenda. Digital data, which is also the lifeblood of artificial intelligence studies, is the most fundamental variable of the re-established world order. For a fairer world, it is necessary to overcome the domination over the collection and processing of digital data by certain companies and countries. In order to defend the interests of the country, our institutions are actively involved in international studies and we have a greater say as a country. In this context, the rights of our citizens and enterprises will continue to be protected through innovative regulations. On the other hand, it will be ensured that the private sector can be more competitive globally. In our work, it is essential to preserve the cyber homeland and grow the digital economy. The digital transformation of the state is vital for our country to keep up with the transforming world order. With cloud computing, digital government and national data strategies, which are under preparation, our country will clearly reveal its vision and goals in the new normal, by moving the existing systems further. The Digital Türkiye and National Technology Initiative are not a matter of choice, but a strategic reflection of our country's effort to exist strongly in the rapidly transforming global system in line with new technologies. In this framework; we will continue to work to lead the digital transformation of the public, which is the main carrier of the Digital Türkiye goals.

### ***The Platform of Digital Türkiye: E-Government Gateway***

The e-government concept, which is a direct reflection of digital transformation on public administration, has become a more valuable structure day by day. E-government studies, which started in the 1990s, have also found value in international competitiveness by constantly developing and expanding its scope. Countries aimed to maximize citizen satisfaction and increase performance and quality of public services by associating digital service delivery channels with technologies such as big data and artificial intelligence. Türkiye also continued its efforts to develop the e-government Gateway, which was opened in 2008, by following the agenda closely.

In the adventure of e-government Gateway, which started with 22 services of 9 integrated institutions in its establishment, it has reached a point where it has become the digital platform of Türkiye with 851 integrated institutions, 6,248 services and 57,663,332 users as of the end of 2021. 37% of the Digital Türkiye Platform consists of services to public institutions, 49% to municipalities and 14% to the private sector. In order to facilitate the life of users and meet their expectations, new services continue to be added to this platform every day. Electronic services, which were initially accepted as a method where traditional public service delivery methods were abandoned and away from bureaucracy and where data is spoken instead of documents, have not been able to fully meet the rising and expanding expectations of citizens over time. This has been the case for all e-government structures in the world. Especially with the derivative technologies taking a wider place in our lives day by day, not only the digitalization of services but also the design and presentation of interrelated services, especially vital events, together and in an integrated manner has gained importance. In order to gradually abandon individual service offerings, to provide higher added value from the services offered by the state in the digital environment, to increase citizen satisfaction to higher levels and to enable more effective data sharing between institutions, the process of integrated service provision has started at Türkiye's e-government Gateway as of 2020. In this context, services under the titles of



“My Vehicles”, “My Residence” and “My Working Life”, which have received great interest from citizens, have been opened to access.

The pandemic, which emerged unexpectedly and caused an increasing chaos environment, brought about a period that questioned the digital infrastructures of countries and measured their resistance levels, once again revealed the effectiveness of digital technologies in the public and private sectors. In this period all services offered on digital platforms, including e-Government services, gained a special importance with the increasing demand from users. According to a study<sup>1</sup> (Mckinsey & Company, 2020) on how digital technologies are adopted during the Covid-19 process, private sector organizations have adopted any change in the digital field 20-25 times faster in this period. In fact, the changes that employees expect to last for 1 year in their organizations were implemented in an average of 11 days. Experiences such as remote work and distance education will probably continue to exist as the new normals of life after the pandemic.

Türkiye has started this process quite fast and adapted successfully, being one of the countries that took rapid action with its public administration culture and the effective coordination mechanism that came forward with the structuring of the Digital Transformation Office in the new government system.

In addition to the opening of integrated services during the pandemic period, the services offered to citizens over the age of 65, students and the business world have contributed to both reducing the risk of contamination that may arise due to the crowd and making use of public services 24/7. Undoubtedly, this success has been achieved thanks to years of clear knowledge, determination, institutions with strong institutional capacity and technical and administrative personnel specialized in this field.

Approaches, in which an online management approach is increasingly dominant, deeply affect public administration. Considering that the most basic function of public administration is to provide public services to all segments of the society, the speed, scope, trust and quality of these services are gaining importance day by day and citizen expectations are constantly increasing with digitalization.

In the design of e-Government services, meeting the expectations and satisfaction of the citizens, who are the main users of the service, is the main priority, in addition to technological tools, institution expectations or legislative principles. The facilitating features of the services, such as the service coverage of all segments of the society as much as possible and the high added value are factors that directly increase the satisfaction level of the user. In addition to these factors, governments are designing e-Government services under the influence of trust, quality, social welfare, sustainability, social and political goals.

Citizen notifications are taken into account for services modeled or improved on the e-Government Gateway; periodic digital satisfaction surveys, service-specific digital notifications and data collected from other channels are evaluated. In the survey conducted with the participation of 817,000 users that was reported in 2021, the e-Government Gateway citizen satisfaction level was determined to be 95%. The survey study for 2022 was concluded with the participation of 1,000,000 users and the reporting phase has begun. When the current data is examined, it is seen that the general satisfaction rate is still over

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<sup>1</sup> According to the survey carried out with the question of “How COVID-19 has pushed companies over the technology tipping point—and transformed business forever?”; Covid-19 accelerated the adoption of digital technologies and demonstrated that these changes will continue in the long term.

90%. In the reporting process, not only satisfaction is measured, but also detailed data scanning and text mining are carried out for the development of new services, improvements on existing services and modeling of new integrated services.

The Presidency Digital Transformation Office, which set out with the motto "Our Goal is Digital Türkiye", continues its efforts to develop the e-Government Gateway with each passing day, to increase the scope of the services offered, to respond to the expectations of citizens and to ensure maximum satisfaction from these services.

Digital Transformation Office of the Presidency of the Republic of Türkiye, with its vision of "Digital Türkiye" and the "National Technology Initiative", as well as its approach aiming to be a pioneer in the development of digital technologies at the international level, carries out its work to direct the developments in the legal field in addition to the developments in the technical field. Considering the cross-border impact of disruptive technologies, it is obvious that national regulations alone will not be sufficient to set these technologies on a legal basis.

### ***Big Data and Artificial Intelligence***

With the projects carried out in our office in the field of artificial intelligence in health; the aim is to increase the benefit by utilizing artificial intelligence in the health sector by way of generating value from the data, reducing the workload of health personnel and increasing survival rates with early diagnosis in the country. The first of this work is the "Turkish Brain Project". According to the Ministry of Health Statistics Yearbook in 2019; Türkiye ranks first compared to the other countries in terms of the number of imaging per MR device. As a similar statistic, the number of MR imaging per 1000 people is 195 and it ranks first in the world in this field (Health Statistics Yearbook, 2019). In our healthcare system, where the number of MRI scans exceeds 15 million, the "Turkish Brain Project (TBP)" was initiated in order to assist our physicians and reduce their workload. Within the scope of the project, the first application was implemented at Gazi University Hospital in cooperation with the Digital Transformation Office of the Presidency of the Republic of Türkiye and Gazi University. With this project, the aim is: (1) to perform various analyzes on brain MR images thanks to artificial intelligence-based systems, (2) to facilitate the detection and diagnosis of various brain anomalies, (3) to develop decision support systems for disease detection with the help of an artificial intelligence-based system as soon as the image comes from the MR device, (4) to ensure the integration of the developed systems into the Picture Archiving and Communication System (PACS), (5) prioritize the MR images taken according to the analysis results supported by artificial intelligence and (6) to present them to our physicians for evaluation, (7) to be able to intervene more quickly to patients who may need emergency intervention and to reduce the possibility of various complications, (8) to support the artificial intelligence ecosystem in healthcare.

The principle of usefulness, one of the basic principles of medical ethics, is also observed in other artificial intelligence projects of our office and the "Digital Eye Project" has been created in order to support life-saving and early diagnosis of breast cancer. Breast cancer is the most common type of cancer among women in the world and it is the number one cause of cancer-related death. In the last 50 years, the incidence of breast cancer has more than doubled in the world. In our country, this rate has been increasing in recent years. It is important and necessary to use artificial intelligence for various purposes in the early diagnosis process in order to minimize the problems associated with breast cancer. The most effective method for early detection of breast cancer is screening mammography at

regular intervals. Diagnosing breast cancer at an early stage reduces mastectomy rates, reduces long-term side effects of combined treatments, shortens the healing process and increases survival rates. The developed artificial intelligence system has been subjected to validation tests in university hospitals such as Başkent University Ankara Hospital, Ankara University Faculty of Medicine İbni Sina Research and Application Hospital. It has also been confirmed by specialist physicians and academics that the performance and model performance is above 90 percent.

In addition to the "Digital Eye Project", "Artificial Intelligence Modeling of Liver Transplantation" is being conducted with the aim of reducing the time spent by medical professionals on repetitive tasks, with improved understanding leading to better treatment. Liver transplantation is the only treatment method for end-stage liver failure. The liver to be transplanted is obtained from cadavers or from living donors providing appropriate conditions. It is vital to calculate the volume and weight of the right lobe of the liver to be given to the recipient and the left lobe to be left in the donor correctly before the operation is made from a living donor. The liver volume to remain in the donor should not be less than 30 percent of the total volume. Today, these measurements are made by radiologists using automatic or semi-automatic programs on Computed Tomography (CT) images and it takes time because the measurements are detailed and many donor candidates are evaluated. With the study of "Artificial Intelligence Modeling of Liver Right-Left Lobe Segmentation and Volume Measurement Before Liver Transplantation", the aim is to develop an artificial intelligence model that can automatically perform liver segmentation and volume calculation in order to reduce the workload of radiologists as well as to quickly calculate the liver volume and shorten the waiting time before liver transplantation.

### ***Cybersecurity Governance***

In the past, solutions were created only to meet the communication needs of individuals, but today, a structure has emerged in which billions of objects with the ability to communicate are included in the communication network. We now live in an era of large volumes of data flowing from very different sources in a variety of formats and at high speeds, which is impossible to manage with traditional database tools.

The 5G communication networks were created in response to several needs such as high data and traffic density, all-to-all communication and extremely low latency. Similarly, the 6G communication networks are expected to have a design that will increase the quality of communication by using medium information aside from classical data communication. All of this means that enormous amounts of data will be transferred to the communication medium and processed faster and with better quality.

Increasing amounts of data and developing innovative technologies are resulting in both the diversification of cyber threats as well as making it more difficult to ensure data security. The cyberattacks that are increasingly becoming more complex, can cause damage to systems used in the delivery of critical services even from miles away. Partial or complete deactivation of critical infrastructures, systems and services have the potential to disrupt social order and threaten national security. As a result of these attacks, systems can become inoperable, personal information can be stolen, communication can be disrupted, banks can be out of order, cities can be left without electricity and reputational losses can be experienced with fake documents.

Technologies of the future are also fundamentally changing the future outlook regarding perspectives on security. The cyber-attacks that took place in the past with simple methods

and purposes are becoming state-level, automatized, more frequent, complex, destructive and target oriented. The use of technology for smarter and more effective attacks by big data-supported artificial intelligence algorithms carried out by cyber-attack planners has made cybersecurity an integral part of digitalization.

Cyberspace, as the fifth war environment after land, sea, air and space, is an integral and most important component of national security for countries. Cyber-attacks are used as an element of symmetric, asymmetric or hybrid warfare methods, either alone or together with traditional warfare tools and play an active role in achieving the military and political goals of the parties involved. Its results can be seen not only in the virtual environment but also in the physical environment and can cause loss of life and property as in traditional warfare. The fact that cyber-attacks have turned into wars has made it mandatory for countries to protect their digital infrastructures, just like their borders.

In today's world where cyber-attack methods are diverse, key infrastructures are targeted and the time it takes to detect the source and target of an attack is long, if not impossible, the need for new defense approaches is growing. The biggest risk in this regard is to defend against threats and attacks created by new generation technologies with existing methods. Intelligent attacks can only be neutralized with smarter methods.

Artificial intelligence systems are now being employed in many areas such as automatic threat detection, detecting abnormal behaviors, modeling attacks, learning attack behavior and creating new attacks. In addition, it is expected that artificial intelligence will contribute more frequently in areas such as automatic countering to attacks as well as identifying and preventing vulnerabilities.

More than ever, there is a need to protect our citizens, institutions and digital infrastructures against rapidly increasing cyber threats. It is important to reduce and neutralize security risks in information and communication systems and to ensure the security of critical systems that may threaten national security or cause disruption of public order.

Undoubtedly, there is no such a thing as 100% security anywhere in the world. However, it is possible to avoid destructive effects with the right and conscious steps to be taken in each of the dimensions of human, technology, organizational structure, legal regulation, national and international cooperation, which are the most important components of reaching sufficient maturity in cybersecurity. Among these dimensions, the human being is the weakest link and the organizational structure is the most effective element.

Cyber threats, which have increased both in scale and diversity in recent years, have led countries to take new measures to protect their digital infrastructures and to reevaluate their policy, strategy and governance structure with a holistic perspective.

All the actors who have a share in the management, in mutual interaction and cooperation, heading towards the goals determined together as a single body is defined as governance. Its basis is involvement in management, cooperation, synchronization and communication. Ensuring cybersecurity depends on the functionality of the organizational structure with effective policies and strategies, as well as technological measures. For this reason, the concept of "governance" is used extensively when it comes to the national management of cybersecurity.

The cybersecurity governance of countries is in a constant change and development in accordance with the trends around the world. Threats, new technologies in the fight against threats, the security requirements brought by these technologies, the establishment of

structures to fulfill the requirements, the need for continuous surveillance and control of these structures require the monitoring and updating of cybersecurity governance in a life cycle process.

At this point, one of the best steps to take would be the reorganization of the distributed legislation in our country focused on individual needs in the field of cybersecurity. It would have a holistic approach that clarifies roles and responsibilities in accordance with the structure of the new government system and increase national resistance against technological developments and new generation cyber threats.

Given the current state of digitalization, cybersecurity should be approached not only from a defensive perspective but also from a broader perspective in line with the vision of becoming a deterrent cyber power. In the upcoming period, it will be our most important priority to bring the national cybersecurity governance to a new structure that will include the public, academia, private sector and even individuals in fields additional to defense, such as offensive security, capacity building, auditing and combating cybercrime.

### ***International Cooperation for The National Digital Ecosystem***

The National Technology Initiative, aside from implications at the national level, also requires following the developments beyond our borders. In line with such comprehensive initiative, Digital Transformation Office's approach towards international cooperation in the area of digital transformation is structured on two significant pillars. One of the main pillars focuses on improving the national digital ecosystem by establishing partnerships at the multinational level. There are certain reasons for participating in the work of international organizations. The first of these reasons is to benchmark what we have achieved and need to achieve by following country experiences. The second is to support strategy and policy making processes in specific areas such as data privacy. The last reason to be emphasized is to contribute to the international negotiations by providing our country's approach to digital transformation, artificial intelligence and other relevant areas. Within this framework, the Digital Transformation Office is participating in the relevant working groups under various international and regional organizations that Türkiye is a member of, such as Organization for Economic Cooperation and Development (OECD), European Commission, World Bank, G20, Organization of Turkic States (OTS) and the North Atlantic Treaty Organization (NATO). The focus area of the ongoing work under these organizations has a wide range, from a general focus, such as the assessment of the digital government as a whole, for example, to focus on fields that are very specialized and specific, such as data ethics of artificial intelligence.

At the general level, the Digital Transformation Office makes annual contributions to our country's report by updating the relevant developments in digital transformation in line with the harmonization process with the EU Acquis. Also, Digital Transformation Office is currently working with the OECD on the Digital Government Review (DGR), which is an in-depth analysis of Türkiye's digital government system. The results of the review will allow us to improve our e-government policy even further and help us draft the comprehensive Digital Government Strategy that is currently in the works. Türkiye's global rankings in the internationally renowned indices are among the developed countries, specifically when it comes to digital government.

The United Nations has been measuring the e-Government Development Index (EGDI) every two years since 2001, which covers 193 countries. Within the scope of the UN e-Government Survey Report, there are three indices that are measured to support EGDI;

the E-Participation Index, Open Government Development Index (OGDI), as well as Local Online Service Index (LOSI). Türkiye has made a significant progress in the e-Participation Index, going from 60th in 2016 to 16th in 2020. In the Open Government Development Index (OGDI), Türkiye was grouped among the high OGDI scores. The Local Online Service Index (LOSI) was measured for the first time in 2018 for 40 cities as a pilot and information was presented for 86 cities in the 2020 report (United Nations Department of Economic and Social Affairs, 2020).

At the European level, the e-Government Benchmark is published annually by the European Commission (European Commission, Directorate-General for Communications, Networks Content and Technology, 2021). In the 2022 report (based on 2020 and 2021 data), which is planned to be published at the end of June this year, Türkiye is expected to rank 16<sup>th</sup>. Considering the latest 2021 data, based on the same vital events evaluated, it is expected that our country will rise from 13th to 5th place according to the data of the previous period (2019).

Additionally, in the GovTech Maturity Index, the first of which is conducted by the World Bank with a focus on measuring digital transformation in the public sector, countries are categorized under four groups. Among the 198 countries in 2021, Türkiye ranks in Group A, described among the "GovTech Leaders" consisting of the top 21% of the 4 groups (Dener et al., 2021).

The second pillar of Digital Transformation Office's approach to international cooperation focuses on bilateral relations. In order to showcase Türkiye's skills and progress made in the digital field, a direct dialogue is necessary with other countries. Through bilateral cooperation mechanisms, such as the High-Level Strategic Cooperation Council (YDSK) and the Joint Economic Commissions (KEK), the Digital Transformation Office has identified focus countries and conducted negotiations to explore possible areas of cooperation that would benefit both countries.

Türkiye also has a unique relationship with the Turkish Republic of Northern Cyprus (TRNC). The Digital Transformation Office has taken the responsibility to create the digital government infrastructure in TRNC as well as establishing the foundations for government cloud services.

Digital transformation is among the highest priorities for nations globally as it is a means to improve governance, boost economic development and strengthen democratic institutions. As the Digital Transformation Office, we give the utmost priority to both bilateral and multilateral relations in order to contribute to the National Technology Initiative. By carrying out our efforts within international organizations and developing multinational collaborations, we are not only benefiting from the outcomes of the newest research and the policy making initiatives, but we are also able to promote Türkiye's development in digital transformation by including them in internationally renowned indices and rankings. Similarly, by holding bilateral negotiations in order to develop cooperation with other countries, we are able to encourage and develop our national digital ecosystem.

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## About Author

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He completed his undergraduate degree in 2001 at Bilkent University, Department of Electrical and Electronics Engineering with a full scholarship. Afterward, he received his master's and doctorate degrees in the Department of Electrical Engineering at the University of Texas at Dallas, both with full scholarships. KOÇ joined Intel USA in 2006 as a research and development (R&D) engineer. During his tenure at Intel, he developed 61 patents, published 23 scientific articles and developed and managed several international projects. In 2013, he became one of the 10 awarded engineers who developed the most patents. After returning to Türkiye in 2014, he started to work as the Chief Counsellor of the Prime Ministry and in the same year he was appointed as the Head of Information Technologies of the Presidency. During his tenure at the Presidency, he also managed the formation of the State Information Coordination Center (SICC) in the Presidency Security Policies Department and started the information flow from all ministries and security units to the Presidency. By discretion of H.E. President Recep Tayyip ERDOĞAN, KOÇ was appointed as the Head of the Digital Transformation Office on 12 September 2018. Besides his duties at the Presidency, he is also a board member of TURKSAT Satellite Communications Cable TV and Business Inc. KOÇ teaches graduate and doctorate courses at the Department of Electrical and Electronics Engineering at Bilkent University. He is also a licensed pilot, fluent in English and married with one child.