2025

MASTER'S THESIS

Esra ÖZSEVEN



T.C.
ANKARA YILDIRIM BEYAZIT UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES

DIGITAL TRANSFORMATION IN TURKISH PUBLIC ADMINISTRATION: NATIONAL DEVELOPMENT PLANS (8TH-12TH)

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DEPARTMENT OF POLITICAL SCIENCE AND PUBLIC ADMINISTRATION

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ANKARA, 2025

APPROVAL PAGE

The thesis titled " Digital Transformation in Turkish Public Administration: National Development Plans (8th-12th)" prepared by Esra Özseven has been accepted as a Master's Thesis at Ankara Yıldırım Beyazıt University, Institute of Social Sciences, Department of Political Science and Public Administration by the following jury by unanimous vote.

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Director of the Graduate School of Social Sciences

DECLARATION

I hereby declare that this thesis is my own work, that I have not had any unethical behaviour that violates patent and copyright rights in any stage, from the planning to the writing up of the thesis, that I have collected all the information by following academic and ethical rules and that I have cited all the information and comments used in this study. Date (05. 08. 2015)

Esra ÖZSEVEN

DEDICATION

Canım Annem İfakat ve Babam Tekin Özseven'e

ACKNOWLEDGMENTS

I am deeply grateful to my advisor, Asst. Prof. Esin Kıvrak Köroğlu, whose invaluable feedback and guidance greatly contributed to the successful completion of my thesis.

I also wish to extend my sincere thanks to my esteemed professors, Assoc. Prof. Süha Oğuz Albayrak and Asst. Prof. Seval Yaman, for their constructive contributions during my thesis defense and their kind congratulations afterward.

My appreciation further goes to Asst. Prof. Murat Kaçer for his valuable insights that helped shape my thesis title, as well as for his unwavering support throughout my master's studies.

Finally, I owe my heartfelt thanks to my dear mother, my beloved father, and my one and only sister, whose constant encouragement and support have been my greatest source of strength throughout my academic journey.

Esra ÖZSEVEN

ABSTRACT

Digital Transformation in Turkish Public Administration: National Development Plans (8th–12th)

In the contemporary era, digital transformation has emerged as a foundational dynamic restructuring public administration on a global scale. This thesis offers a comprehensive analysis of the evolution of digital transformation within public administration in Türkiye, through the lens of five national development plans spanning the period from 2001 to 2028. Positioned within the framework of five-year development plans, this study analytically examines how key concepts—such as research and development (R&D), information and communication technologies (ICT), science, technology and innovation, e-government, digitalization, and the digital state—have been constructed, redefined, and embedded within an institutional structure in the context of these plans.

Adopting a qualitative research methodology, the study employs a multidimensional approach that includes document analysis, content analysis, descriptive examination, and comparative evaluation. Digital transformation policies and initiatives presented in the development plans are systematically analyzed through triangulation with relevant legal frameworks, academic literature, and Eurostat data. Major digital public initiatives are examined in parallel with each development plan and are presented descriptively, taking into account the periods in which they were implemented.

The findings indicate a clear evolution in the policy content—from an initial emphasis on infrastructure development toward a more integrated and citizen-oriented model of digital governance that incorporates principles of environmental sustainability and green transformation. The integration of national policy content analysis with international comparative frameworks provides a holistic perspective on Türkiye's digital transformation trajectory, encompassing both planning and implementation dimensions.

This research focuses exclusively on development plans issued by the central government. Due to the limited availability of empirical data regarding implementation outcomes, the scope and interpretation of the findings are framed within this constraint. Nevertheless, the study aims to provide a robust analytical foundation for examining digitalization in the public sector and to guide the development of future digital public policies.

Keywords: Public Administration, Development Plans, Digital Transformation.

ÖZET

Türk Kamu Yönetiminde Dijital Dönüşüm: Ulusal Kalkınma Planları (8.–12. Dönem)

Günümüz çağında dijital dönüşüm, kamu yönetimini küresel ölçekte yeniden yapılandıran temel bir dinamik olarak ortaya çıkmıştır. Bu tez, Türkiye'de kamu yönetimi alanındaki dijital dönüşümün evrimini, 2001 ile 2028 yıllarını kapsayan beş ulusal kalkınma planı çerçevesinde kapsamlı bir şekilde analiz etmektedir. Beş yıllık kalkınma planları çerçevesinde konumlandırılan bu çalışma, araştırma ve geliştirme (Ar-Ge), bilgi ve iletişim teknolojileri (BİT), bilim, teknoloji ve yenilik, e-devlet, dijitalleşme ve dijital devlet gibi temel kavramların söz konusu planlarda nasıl inşa edildiğini, yeniden tanımlandığını ve kurumsal bir yapı içerisinde nasıl yer bulduğunu analitik bir biçimde incelemektedir.

Nitel bir araştırma metodolojisi benimseyen bu çalışmada; doküman analizi, içerik analizi, betimleyici inceleme ve karşılaştırmalı değerlendirmeyi içeren çok boyutlu bir yaklaşım kullanılmaktadır. Kalkınma planlarında yer alan dijital dönüşüm politikaları ve girişimleri; ilgili yasal çerçeveler, akademik literatür ve Eurostat verileriyle üçgenleme (triangulation) yöntemiyle sistematik olarak analiz edilmiştir. Başlıca dijital kamu girişimleri, her kalkınma planıyla paralel olarak incelenmiş ve uygulandıkları dönemler dikkate alınarak betimleyici biçimde sunulmuştur.

Bulgular, politika söyleminde açık bir evrime işaret etmektedir: Başlangıçta altyapı geliştirmeye odaklanan yaklaşım, zamanla çevresel sürdürülebilirlik ve yeşil dönüşüm ilkelerini de içeren, daha bütünleşik ve vatandaş odaklı bir dijital yönetişim modeline dönüşmüştür. Ulusal politika içeriği analizinin uluslararası karşılaştırmalı çerçevelerle entegrasyonu, Türkiye'nin dijital dönüşüm sürecine planlama ve uygulama boyutlarını kapsayan bütüncül bir bakış açısı sağlamaktadır.

Bu araştırma yalnızca merkezi hükümet tarafından yayımlanan kalkınma planlarına odaklanmaktadır. Uygulama sonuçlarına ilişkin ampirik verilerin sınırlı olması nedeniyle, bulguların kapsamı ve yorumu bu kısıt çerçevesinde ele alınmıştır. Bununla birlikte çalışma, kamu sektöründeki dijitalleşmenin analizine sağlam bir analitik temel sunmayı ve gelecekteki dijital kamu politikalarının geliştirilmesine katkı sağlamayı amaçlamaktadır.

Anahtar Kelimeler: Kamu Yönetimi, Kalkınma Planları, Dijital Dönüşüm.

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LIST OF ABBREVIATIONS

5G	: Fifth Generation
BİMER	: Prime Ministry Communication Center
BTYK	: Supreme Council for Science and Technology
CHP	: Republican People's Party
CIMER	: Presidency's Communication Centre
DETSİS	: State Organization Central Registration
DPT	: State Planning Organization
DTO	: Digital Transformation Office
DTVT	: State Organization Database
EBA	: Education Informatics Network
EBYS	: Electronic Document Management System
EKAP	: Electronic Public Procurement Platform
EU	: European Union
FTE	: Full-time Equivalent
GDP	: Gross Domestic Product
HES	: Hayat Eve Sığar- Life Fits Into Home
HRST	: Human Resources in Science and Technology
ICT	: Information and Communication Technologies
IT	: Information Technology
IXP	: Internet Exchange Point
KADES	: Women's Emergency Support System
KamuNet	: Public Virtual Network
MERNİS	: Central Population Administration System
NAIS	: National Artificial Intelligence Strategy
NGO	: Non-governmental Organisations
ODTÜ	: Middle East Technical University
OECD	: Organisation for Economic Co-operation and Development
R&D	: Research and Development
RTÜK	: Radio and Television Supreme Council
TAKBİS	: Land Registry and Cadastre Information System
TBMM	: The Grand National Assembly of Türkiye

TDK : Turkish Language Association

TUENA : National Information Infrastructure Master Plan

UKEVM : National Public Integrated Data Center

UNESCO : United Nations Educational, Scientific and Cultural Organization

UYAP : National Judiciary Informatics System

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CHAPTER 1: INTRODUCTION

In recent decades, the digital transformation of public administration has emerged as one of the most significant structural shifts reshaping the functioning, governance, and service delivery mechanisms of modern states. This transformation process, driven by advancements in information and communication technologies (ICT), has influenced how governments interact with citizens, design policies, and deliver public services (Ebert & Duarte, 2018). As in many other countries, Türkiye has developed national strategies to align its public sector with global digitalization trends. In this context, national development plans—particularly since the early 2000s—have become the primary documents outlining the state's vision for digital transformation.

This thesis focuses on the evolution of digital transformation in Turkish public administration as reflected in five consecutive national development plans between 2001 and 2023 (8th–12th). These plans not only offer policy guidelines and sectoral strategies, but also reveal the discursive construction and institutionalization of key concepts such as digitalization, e-government, ICT, innovation, and data governance. By tracing how these concepts have changed over time and been embedded in national planning content, the research uncovers the trajectory of Türkiye's digital public governance paradigm.

The main motivation of this study is shaped around three main axes. The first is to observe how the contents related to digital transformation in development plans have changed over time and to present this change through a discursive analysis in order to provide guiding insights for future periods. The second is to present how these contents have been transformed into concrete implementations and national projects such as MERNIS, UYAP, the e-Government Gateway, and CIMER within the context of relevant periods, thereby conducting a comparative analysis. In this way, it will be possible for the reader to access comprehensive and comparable information regarding the respective periods. The third is to evaluate Türkiye's international position in the field of digitalization based on Eurostat data through specific concepts and indicators. Within this framework, the research not only aims to reveal Türkiye's digitalization strategies and policies but also to provide a comprehensive evaluation in terms of discursive dimension, implementation level, and international position.

Methodologically, this study adopts a qualitative research design and employs a mixed analytical approach, including document, content, descriptive, quantitative, and comparative analyses. This research is grounded in document analysis, which involves systematically examining development plans to identify and interpret key themes and ideas presented in the texts. The development plans are treated as primary sources, supported by secondary materials such as official legislation, Eurostat data, and academic literature. Analysis is employed to trace the chronological development of digital transformation strategies, while content analysis explores the changing language and narratives surrounding digitalization. Descriptive and quantitative content analyses are used to systematize and measure the presence of digital-related themes. Lastly, comparative analysis is applied to evaluate Türkiye's international positioning using Eurostat indicators and to identify structural and thematic differences between development plans.

This thesis is particularly relevant for three reasons. First, digital transformation has become a critical component of public sector reform and strategic planning globally. Second, while Türkiye has made substantial strides in implementing e-government systems and digital services, academic research on the evolution of these strategies through development planning remains limited. Third, the period between 2001 and 2023 represents a turning point in Türkiye's administrative and technological modernization efforts—marked by institutional restructuring, policy shifts, and global integration processes.

The structure of this thesis is organized as follows: Chapter 2 outlines the conceptual and theoretical framework, including the definitions of public administration, development plans, and digital transformation. Chapter 3 presents a detailed analysis of digital transformation narratives and projects in each development plan period. Chapter 4 provides a cross-period content analysis, supported by international comparative data. Finally, Chapter 5 concludes with key findings and reflections on future policy directions in public sector digitalization.

This study aims to contribute to the digital government literature by presenting the content and policy implementations within Türkiye's development plans through comparative and periodized distinctions, while also providing insightful guidance for future strategic planning processes in the public sector.

1.1. Methodology

This study is a qualitative research examining how the process of digital transformation is addressed within Turkish development plans—an important policy tool in public administration—and how this process has evolved over time. The research is based on document analysis conducted on development plan documents and is supported by various analytical techniques.

The primary types of analyses used are as follows:

Document Analysis :

One of the primary qualitative methods employed in this research is document analysis. This method involves the systematic examination and interpretation of written, visual, digital, or physical materials related to the research topic. Merriam (2009) defines document analysis as a data collection technique that includes not only written texts but also visuals and digital materials. The main data set of this study consists of the 8th, 9th, 10th, 11th, and 12th Development Plans. These documents are considered direct and reliable sources, as they reflect Türkiye's digital transformation process and shifts in public policy priorities. In this context, key concepts related to digitalization (e.g., e-government, digital state, information and communication, science and technology, Research and Development (R&D), digital transformation) were identified, and the sections in which these concepts appear were systematically reviewed.

Bowen (2009) emphasizes that document analysis is a "non-reactive" method, meaning that the data source is not influenced by the research process. This characteristic makes documents especially valuable for tracing historical developments and institutional change (p. 29). Kıral (2020) notes that document analysis can be used not only as a primary qualitative research method but also as a supportive tool alongside other data collection and analysis techniques. He emphasizes that using multiple sources of evidence is an expected practice in qualitative research and that document analysis contributes significantly to the triangulation process (p. 175).

In conclusion, document analysis in this thesis is used both as an independent qualitative method and as a technique that complements other analytical tools. Through the examination of development plans, the study systematically analyzes the digital transformation process in its descriptive, conceptual, and comparative dimensions.

Content Analysis:

Content analysis is a scientific method that enables the systematic identification and interpretation of meanings, themes, and patterns within communication materials. This approach combines qualitative and quantitative techniques to examine various types of data such as text, visuals, audio, or video (Krippendorff, 2018). Its primary purpose is to analyze the structure and content of messages within a specific context based on objective criteria and to make generalizations from the findings (Neuendorf, 2017). Widely used in the social sciences, content analysis can be applied to both historical documents and contemporary media content, providing researchers with the opportunity to assess both historical and societal trends (Bryman, 2016).

In this study, the content analysis method was employed to examine Türkiye's digital public administration paradigm through development plans. Content analysis is a qualitative research technique that enables the systematic identification and interpretation of concepts, themes, and discourses found in written texts. Within this scope, the five relevant Development Plans were examined in terms of key concepts related to digitalization (e.g., e-government, digital state, information and communication, science and technology, R&D, digital transformation), and the contexts, frequencies, and priorities with which these concepts were addressed in the texts were analyzed.

Descriptive Analysis:

Descriptive analysis refers to the systematic organization and summarization of qualitative data without incorporating subjective interpretation. Its primary goal is to offer an impartial and thorough representation of the subject matter under study (Yıldırım & Şimşek, 2018, p. 123). Within the social sciences, this technique is frequently employed to objectively present information derived from policy-related documents.

The content on digitalization found in the development plans has been systematically presented together with the goals and strategies outlined in the respective plans, as well as the digital transformation practices implemented in public administration during the same period. While presenting the contents and practices of the plan periods, the analysis remained aligned with the topics related to digital transformation in the development plans; the contents and implemented projects were conveyed through a non-interpretative approach by referring to legislation, legal frameworks, official websites, and academic sources.

Quantitative Analysis:

Quantitative content analysis is a systematic technique used to count the occurrence of specific words or themes within a text corpus, allowing researchers to detect patterns and shifts over time (Krippendorff, 2018, p. 30). This approach facilitates an understanding of

the relative emphasis placed on certain concepts by measuring their frequency. In this study, frequency counts of terms related to digital transformation found within the development plan documents were conducted, and subsequent analyses were grounded on these quantitative data.

Comparative Analysis:

Comparative analysis is a methodological approach that systematically evaluates two or more data sets based on specific criteria to identify commonalities and distinctions. Within the realm of public administration, this technique is frequently applied to assess variations in policy frameworks over different periods, across nations, or among institutional arrangements (Landman, 2008, p. 45). This analysis encompasses both the comparison of the contents of different development plans and the comparison of Türkiye's level of digitalization with other countries based on the latest Eurostat data. The continuity and changes in the discursive language and objectives across development plans were evaluated comparatively. Each period was analyzed individually, and digital government initiatives launched during the relevant period were incorporated. In the final section of this thesis, the contents common to all development plans and periods were analyzed and compared, focusing on how these contents have evolved over time. Additionally, Türkiye's international position was assessed within the scope of relevant concepts based on recent Eurostat data.

Within this methodological framework, the approach of development plans to digital transformation was evaluated both nationally and internationally, and the findings were presented in an analytically coherent manner.

Data Collection Process:

In the data collection process of this study, qualitative research methods were employed. The analysis was conducted based on a descriptive research approach, ensuring an objective and non-interpretative examination of development plans and relevant official documents. The data derived from the content of development plans were identified through the analysis of predefined keywords and thematic elements associated with digital transformation.

Digital initiatives introduced during each development plan period were systematically categorized under relevant timeframes, based on information retrieved from official websites and legislative documents. Additionally, up-to-date statistical data related to the research topic were obtained from the official Eurostat website.

Academic literature, including scholarly books and reports, was also reviewed. Among these sources and objective data, free from subjective interpretation, were selected and incorporated into the analysis.

Dataset :

The materials used in the study were obtained from sources, including:

- Development Plans published by the Presidency of Strategy and Budget Office (8th–12th),
- Public documents related to digital transformation projects of public institutions,
- Legislation published in the Official Gazette,
- Eurostat databases and reports,
- Academic articles, books, and institutional reports.

The data were analyzed within the framework of specific concepts, revealing the stages of the digital transformation process in development plans and demonstrating Türkiye's current level in this process alongside international comparisons.

Research Process and Stages:

The research process was structured in line with a qualitative research design and consists of the following key stages:

1. Data Collection:

Official documents and sources related to the 8th, 9th, 10th, 11th, and 12th Development Plans were systematically collected. These documents served as the primary data sources for examining the historical development and discursive structure of Türkiye's digital transformation policies.

2. Data Classification:

The collected data were classified according to the periods of the development plans and thematic categories such as science and technology, information and communication, and digital state. This classification allowed for each period's digital transformation approach to be evaluated within its specific context.

3. Project-Based Examination:

Digital public projects implemented during each development plan period (e.g., MERNIS, UYAP, e-Nabız, FATİH Project) were analyzed individually. This analysis enabled the establishment of a historical connection between the content found in the plans and the concrete implementations.

4. Evaluation of Policy Objectives:

Key concepts related to digitalization—such as science and technology, information and communication, R&D and innovation, e-government, and digital state—were comparatively analyzed across plan periods from a discursive perspective. Türkiye's international position in the field of digitalization was also assessed using up-to-date Eurostat data.

5. Interpretation and Presentation of Findings:

Based on the findings, the digital transformation process in the development plans was evaluated holistically in terms of its comparative and conceptual dimensions. Discursive shifts and Türkiye's positioning at the international level were taken into account in the interpretation of results.

1.2. Research Subjects and the Aim of the Thesis

The aim of this study is to analyze how digital transformation and related elements have evolved in the development plans published in Türkiye between 2001 and 2023, covering the period from 2001 to 2028, and how the policies related to these plans have been shaped. The research covers the period from the 8th to the 12th Development Plan and provides a detailed examination of concepts such as science and technology, information and communication, research and development (R&D) and innovation, e-government, digital transformation, and digital state addressed in the plans. Each development plan is first introduced with an introductory section, followed by a thematic analysis within the same framework.

The primary objective of the study is to reveal the changes in content and practices related to science and technology, information and communication, R&D and innovation, e-government, digital transformation, and digital state in the development plans from a unified perspective. Moreover, digital government applications implemented during the implementation period of each development plan are presented, and the relationship between period policies and implementations is evaluated. Following this, the development plans were comparatively analyzed according to the relevant themes and evaluated using quantitative methods. To conduct an international comparison, Eurostat data were utilized to assess Türkiye's position in the field of digital transformation. One of the objectives of the study is to raise awareness of the changing contents in development plans and Türkiye's international standing, thereby guiding the direction of future transformation processes and providing the public with the necessary information accordingly.

The research process was structured with a holistic perspective, moving from parts to the whole. Initially, a conceptual framework was established, followed by an examination of the development plans and the related digital transformation initiatives implemented during their respective periods. Finally, the content changes within the development plans were analyzed, and Türkiye's position in the international context was evaluated, leading to inferences about the trajectory of the current system and global transformation in future periods.

1.3. Scope, Challenges, and Limitations of the Study

The scope of this study is confined to an in-depth analysis of central government development plans and their treatment of digital transformation between 2001 and 2023. It primarily examines the strategic intent and policy content around digitalization, rather than assessing the technical or operational effectiveness of implementation.

Due to the nature of the source material, the study is limited to textual analysis of official planning documents and excludes other administrative or field-level reports. As such, the research does not attempt to evaluate real-world outcomes or technological success rates of specific digital projects. Instead, the focus remains on policy framing, conceptual evolution, and the alignment of content with broader governance objectives.

Another limitation arises from the relatively recent emergence of digital governance as a formal policy field in Türkiye, which results in a limited body of academic literature and comparative datasets, particularly in earlier planning periods. Furthermore, the study deliberately excludes digital transformation initiatives at the local government level in order to maintain methodological coherence and to reflect the centralized nature of the development plans as primary instruments of national strategic planning.

Accordingly, the findings of this study have the potential to inform future policy-making processes and support the development of strategic roadmaps for upcoming periods.

CHAPTER 2: CONCEPTUAL AND THEORETICAL FRAMEWORK

2.1. Definition of Public Administration

Given that public administration is a broad concept encompassing the notion of management, it is essential to first define the concept of management prior to a detailed discussion of public administration. According to Robbins and Coulter (2018, p. 9), management fundamentally involves a set of core functions that managers perform to coordinate work efficiently and effectively. These functions include planning, organizing, leading, and controlling. This process involves the appropriate allocation and use of resources, the determination of strategies required to reach objectives, and the monitoring of these strategies. The fundamental basis of the concept of management lies in the fact that all these activities are carried out with a certain group of people. Two crucial elements of management are the specific group of individuals and the common activity or objective they pursue.

Individuals form groups, groups form societies, and societies constitute states. As Aktan (2015) notes, wherever human communities exist, management and managers have always been present, and the state is regarded as an necessary organizational structure for sustaining a civilized social life (p. 50).The state represents an organizational framework that actively safeguards the rights and interests of its citizens, fulfilling its legitimate mandate by providing optimal public services. To execute this mandate, the state employs various organizational and functional mechanisms at the national level. Among these mechanisms, public administration stands out as a critical structure, representing the state’s interface with society (Parlak, Doğan; 2022, p. 1).Wherever the state exists, administration is also necessary. Public administration serves as an instrument through which the state's policies are practically realized. In this context, public administration emerges as an executive body implementing the policies of the state.Although public administration is distanced from politics in principle, it remains closely connected to political networks since the decisions it implements are often grounded in political ideas.

The fundamental distinction between politics and public administration can be traced back to the ideas of Woodrow Wilson. As Kettl (1993) points out, Woodrow Wilson, in his seminal work The Study of Administration (1887), drew the most famous boundary in public administration by articulating a clear distinction between politics and administration.

According to Shafritz, Russell, Borick, and Hyde (2017,p. 15), “the discipline of public administration, after developing as part of political science, emerged as an independent field in the second half of the twentieth century.”

Wilson described administration as “the most obvious part of government; it is government in action; it is the executive, the operative, the most visible side of government, and is of course as old as government itself. It is government in action, and one might very naturally expect to find that government in action had arrested the attention and provoked the scrutiny of writers of politics very early in the history of systematic thought” (Wilson, 1887 , p. 198-199).Wilson paved the way for a scientific approach to public administration. He argued that public administration should not be viewed solely through its political dimension but should be made efficient and presented as a distinct scientific discipline (Wilson, 1887 , p. 199).Similarly, Goodnow (2003) contended that state administration is fundamentally based on politics and management, where politics plays a role in determining general policies, while administration is responsible for executing these policies.

Another fundamental pillar of public administration, aside from management, is undoubtedly the concept of the “public.” In the context of Turkish administrative terminology, the term “public” refers to all state institutions serving the citizens (Turkish Language Association [TDK], 2024). Public administration is often defined as “government in action—the management of public affairs or the implementation of public policies” (Shafritz & Russell, 2017 , p. 6). Holzer and Schwester define public administration as the creation, implementation, and execution of public policies (Holzer & Schwester, 2011 , p. 32). Basu (2004 , p. 2) further explains that public administration operates public affairs at all levels—national, state, and regional. Public administration is a process through which the state, via its institutions and organizations, delivers services to the public, engages in certain activities, and safeguards the interests of the people. A strong public administration not only provides essential public services but also enables effective decision-making in critical areas such as crisis management, economic development, social justice, and sustainability.

In this context, public administration regulates the relationship between the state and its citizens, playing a crucial role in enhancing social peace and welfare. Good public administration strengthens the bonds between the government and society, ensuring quality services for all segments of the population. Ultimately, public administration consolidates the state’s interaction with society, producing efficient and effective solutions to social needs, thereby laying the foundation for sustainable development.

2.1.1. A Brief Overview of Public Administration: From Bureaucracy to Digital-Era Governance

Public administration has undergone significant transformation over time, evolving from a rigid bureaucratic model toward a more adaptive, technologically integrated structure. The classical Weberian bureaucracy, grounded in hierarchy, rational-legal authority, and rule-bound conduct, dominated administrative theory and practice throughout the 20th century. According to Weber (1946), bureaucracy ensures predictability and legality but tends to suppress individual initiative and flexibility in rapidly changing environments (pp. 196–198). This model was foundational, yet eventually criticized for its inefficiency and detachment from emerging societal needs.

In the late 1970s and early 1980s, critiques of classical bureaucracy led to the rise of New Public Management (NPM). According to Hood (1991), New Public Management (NPM) reflects a transformation in public administration by introducing managerial principles derived from the private sector. He defines NPM as an approach that emphasizes decentralization, competition, and performance-based management. In this model, the state moves away from directly delivering services and instead takes on a regulatory and guiding role. Key aspects include efficient use of public resources, focus on outputs rather than inputs, clear performance standards, the application of private sector management techniques, and increased citizen involvement through local governance. The overall aim is to enhance transparency, accountability, and the effectiveness of public service delivery (p. 4). The New Public Management (NPM) approach advocates for the adoption of private sector techniques by the state to deliver public services more efficiently and with a stronger focus on performance. Within this framework, citizens are perceived as customers, and public employees are evaluated similarly to private sector personnel, leading to a restructuring of organizational forms accordingly. However, this perspective, particularly the treatment of citizens as customers and the “user pays” principle, has generated dissatisfaction among citizens, who are the true owners of the state (Denek, 2019).

Reacting to NPM’s limitations, the early 2000s saw the emergence of Digital-Era Governance (DEG). Dunleavy et al. (2006) described DEG as a paradigm characterized by reintegration of functions, holistic service design, and the use of digital technologies to enhance responsiveness and coordination (pp. 468–470). Unlike NPM, which focused on outputs and market logics, DEG emphasizes user-centered, integrated digital services and real-time decision-making capacity.

The digital transformation of public administration encompasses not just technological upgrades but also structural and cultural reforms. Mergel, Edelmann, and Haug (2019) argue that digital transformation includes changes in internal workflows, public engagement mechanisms, and strategic governance structures (p. 3). This transformation demands not only IT infrastructure but also a new mindset that prioritizes transparency, agility, and citizen collaboration.

Moreover, the Organisation for Economic Co-operation and Development (OECD) (2020) underscores that digital transformation empowers governments to handle complex global challenges by leveraging data analytics, cross-sector collaboration, and AI-driven policy tools (p. 11). In this context, digital transformation is no longer optional but a strategic imperative for resilient and inclusive governance.

In conclusion, throughout the evolution of public administration, shifts in expectations regarding the role of the state and modes of interaction with citizens can be observed at each stage. This study aims to elucidate the phases of this process as it evolves into digital transformation within Turkish public administration by examining the digital transformation efforts in Türkiye's public administration from the 8th to the 12th Development Plans, in accordance with the objectives set forth in these plans.

2.2. Definition of Development Plans

According to TDK, a plan is defined as the arrangement designed to be followed for the realization of a task or work, or for the proper conduct of a matter (TDK, 2025). Plans are tools that countries use to achieve the goals set for the future, and the concept of planning often enters national agendas after periods of crisis.

In Turkey, the understanding of planning has undergone transformations depending on changing economic and social conditions over different periods. In a central planning model, every area from production to consumption is regulated by the state, whereas capitalist planning involves state intervention mainly in cases where the market fails. The mixed economic model combines characteristics of both approaches, aiming to address market failures and ensure equity in income distribution. Until the 1980s, mixed-model planning dominated in Turkey, after which the influence of the free market became more evident. Since the founding of the Republic, planning has sometimes focused on industry or agriculture, and at other times evolved into a broad strategy encompassing all aspects of social life. This process can be divided into five phases: industrial planning in the 1930s,

agricultural programs in the 1940s, the unplanned period of the 1950s, development planning from 1960 to 1980, and post-1980 market-oriented planning. Since the 2000s, the strategic planning approach has led to profound changes in the state structure (Övgün, 2010).

Development can be defined as a country's progress in economic, social, and cultural fields, in line with the requirements of the era. It encompasses not only economic growth but also objectives aimed at improving people's quality of life (Gönel, 2010). Especially for developing countries, development means not only increasing production capacity but also raising societal welfare and achieving structural transformations. Therefore, development should be evaluated within a broader framework that includes both quantitative and qualitative changes (Erdinç, 2018, p.17).

A development plan is a document prepared to achieve these goals. In Turkey, development plans are generally prepared in five-year periods and determine the roadmap to reach the country's development objectives. Today, development planning is most intensively applied in economically less-developed or developing countries, which aim to transform their social and economic structures to reach higher levels of development and rapidly close the gap with developed countries. In this context, economic planning has become a necessity rather than a choice for these countries (Öney, 1982).

Planned development emerged as a response to the shortcomings of the market mechanism and was developed to ensure the efficient use of resources and achieve structural transformation. Following the crises of the 1930s, Keynesian policies prevailed, and the period from 1945 to 1975 is described as the "Golden Age" of planned development. During this period, public spending and social policies were intensively used to ensure full employment and growth. However, after the oil crisis, inflation, and stagnation in the 1970s, state intervention was questioned, and from the 1980s onward, outward-oriented free-market policies gained prominence (Bedir, 2019).

In Turkey, the idea of planning first emerged at the İzmir Economic Congress in 1923, and the state-led industrialization process began with the First Five-Year Industrial Plan in 1934. The establishment of the State Planning Organization (DPT) in 1960 marked the start of institutionalized planned development, initially focusing on infrastructure and industry. After 1980, priorities shifted to exports, liberalization, EU harmonization, and competitiveness (Bedir, 2019).

The 1950–60 period began with the Democrat Party pursuing a liberal development model based on private enterprise, agriculture, and reliance on foreign resources. Although the Korean War and favorable agricultural conditions initially created economic optimism,

by the mid-1950s, growing budget deficits, rising foreign debt, inflation, and balance of payments problems pushed the economy into crisis. During this period, the Democrat Party abandoned its initial opposition to state intervention, established new public enterprises, and, under pressure from international financial institutions, moved toward the idea of economic planning. In 1958, a Coordination Ministry was established, and a team led by Jan Tinbergen began planning work. At the same time, the bureaucracy aimed to regain influence through planning, while the emerging industrial bourgeoisie saw it as a solution to capital accumulation challenges. Altogether, these dynamics paved the way for the planned development era and the establishment of the State Planning Organization after the May 27, 1960 coup (Soyak, 2003).

Following the May 27, 1960 coup, the Constituent Assembly adopted development plans as a tool to raise the country's economic level to that of developed nations. The period beginning in 1960 is referred to as the era of planned development, during which the State Planning Organization (DPT) was established and the planned development process officially began.

The 1961 Constitution made the preparation and implementation of development plans a constitutional obligation, laying the foundation for a planned period aimed at guiding the country's economic growth and development. The Constitution envisaged shaping the economic and social order based on justice, full employment, and living conditions befitting human dignity. Within this framework, the state was explicitly tasked with increasing national savings, directing investments according to societal benefit priorities, and preparing development plans.

The principle of conducting development in a planned manner was introduced, and the establishment and duties of the State Planning Organization (DPT), which would manage this process, were regulated by a special law (Turkish Constitution, 1961, Articles 41, 129). Thus, development and industrialization began to be conducted through plans and overseen by the DPT during this new constitutional period (Tepecik, 2017).

Furthermore, the establishment of the DPT was supported by a broad coalition including the military, the Republican People's Party (CHP), bureaucracy, and intellectuals, while the leading international organization of the time, the Organisation for Economic Co-operation and Development (OECD), also supported the process. Development experts such as Jan Tinbergen provided consultancy to the DPT, laying the groundwork for planning (Pamuk, 2012 , p.235 -236).

In the 1960s, development planning in Türkiye became institutionalized and began to be implemented through five-year plan periods via the State Planning Organization (Devlet Planlama Teşkilatı - DPT). During this period, the DPT played a key role as a central body coordinating development policies. However, following the adoption of neoliberal economic approaches after the 1980s, significant changes occurred in the understanding of planning, and the functions of the DPT gradually weakened.In the 1990s, the acceleration of Türkiye's full membership process with the European Union brought about the adoption of more localized and participatory models in planning. In line with the EU's regionalization policies, Development Agencies were established at the local level in Türkiye to benefit from financial support, and these agencies were designed as key instruments of regional development (Fedai, 2016 , p.417).

According to Övgün, the establishment of the Ministry of Development marks a structural transformation in public administration in Türkiye. This transformation signifies not only the emergence of a new institution but also the replacement of the strong planning body, the State Planning Organization (DPT), with a more flexible and regionally focused structure. The new development approach adopts a strategic and participatory planning perspective based on local priorities, with the Ministry of Development designed to coordinate between central and local administrations. External factors such as the European Union process, regionalization policies, and structural funds have been decisive in this structural change. Consequently, the planning approach in public administration has shifted from a national holistic framework to a more regionally based model (Övgün, 2011, pp. 278-279).

Accordingly, the State Planning Organization (DPT) was transformed into the Ministry of Development with Decree Law No. 641 issued in 2011. With this change, a more strategic and coordination-focused model was adopted in development planning.However, this structure was replaced by the Presidency of Strategy and Budget following the transition to the Presidential Government System in 2018. The Presidency was officially established with Presidential Decree No. 1, published in the same year, and its duties and authority were further detailed with Decree No. 13, reorganizing the institutional structure of the organization (Bedir, 2019).

In line with the institutional transformations brought by the Presidential Government System, the Presidency of Strategy and Budget, established in 2018, has taken a central role in development planning, budget preparation, and coordination of public investments in Türkiye. The Presidency collaborates with relevant public institutions, primarily the

Ministry of Treasury and Finance, throughout the entire process from preparing development plans, medium-term programs, financial plans, and annual programs to their implementation.

Additionally, the Presidency holds fundamental authorities including the development of strategic plans for public administrations, monitoring performance programs, and planning public investments. It sets the technical principles and standards for the preparation of the public budget by ensuring fiscal discipline and the efficiency of public expenditures, directs public spending policies, and coordinates state aids. All these responsibilities are carried out in accordance with the core goals, policies, and principles determined by the Presidency (Presidential Decree on the Organization of the Presidency of Strategy and Budget, 2018).

Development plans are highly important from the perspective of public administration because they can be said to provide a guiding framework for the government in terms of policy, resources, and services. For the implementation and execution of development plans within public administration, necessary coordination efforts, specific allocations, and policies to achieve the set targets are integrated into the government agenda.

The content of the development plans implemented in our country does not only include economic goals; it also encompasses all necessary social, cultural, and scientific objectives required to adapt to the evolving and changing world order. Development plans are framework plans aimed at increasing the welfare of society and shaping the future. When examined in detail, these plans are binding for the public sector and serve as guidelines for the private sector. Therefore, it is important to focus on strengthening the relationships between the public and private sectors and to encourage cooperation rather than competition during the preparation of these plans (Kurtoğlu & Seferoğlu, 2011).

Prepared at the national level, these plans are structured within a macroeconomic framework but also carry a comprehensive nature that includes micro-level details (Bedir, 2019). In this context, development plans influence the way the state delivers services to its society and the decision-making processes of administrators. The content of development plans includes strategic decisions that determine the functioning and priorities of public administration, which requires a strong and efficient public administration to ensure effective implementation of the plans.

2.3. Definition of Digital Transformation

The term "digital" generally carries a broader meaning than just electronic devices; it primarily refers to the process of processing and displaying data in a digital environment. In this context, digitalization can be defined as the process of converting data into meaningful information (Bozkurt, Hamutoğlu, Liman Kaban, Taşçı & Aykul, 2021). Digitalization is an important tool for public organizations to engage with citizens and the global community. This process should be considered together with reorganization and organizational restructuring. Today, digitalization has become a fundamental element encompassing organizational growth and downsizing, sustainability, and managerial processes. Organizational transformation achieves a holistic structure through the integration of digital technologies (Tamer & Övgün, 2023, p. 517). Digital transformation is a comprehensive process that reshapes business processes, organizational structures, social interactions, and the functioning of public administration through the use of digital technologies and innovative information systems.

Digital transformation is not merely a technological innovation but also aims to create fundamental changes in how institutions operate. This process seeks to transform the digital infrastructure of the state to provide public services more quickly, effectively, and transparently. Digital transformation involves the use of innovative technologies to increase efficiency and social welfare. In this regard, governments and various organizations are developing long-term strategies (Ebert & Duarte, 2018).

Digital transformation in public administration involves the integration of technologies such as e-government applications, digital citizen services, data analytics, artificial intelligence, and automation. This transformation enables public services to become more efficient and accessible. The effects of digital transformation on public administration provide significant advantages in terms of speed, efficiency, and transparency in the delivery of public services. Furthermore, digital transformation strengthens the interaction between the state and citizens through digital platforms and helps reduce inequalities in service delivery.

Digital transformation can also be defined as the determination of digital maturity levels, the implementation of business and process-based transformation, and the identification of appropriate software requirements for this process, aiming for public institutions to achieve an efficient, effective, and transparent service structure (Tübitak Bilgem, n.d.).

The digitalization process is transforming the core elements of strategic management in the public sector by facilitating the analysis of the current state, reshaping institutional visions for the future, and enhancing administrative capacity while reducing bureaucratic burdens (Tamer & Övgün, 2023). Today, technological advancements have significantly changed the nature and delivery methods of public services. Particularly, the widespread use of the internet and information technologies has enabled public services to be delivered more effectively, rapidly, and at lower costs. In this process, e-government applications have laid the groundwork for adopting modern approaches in public administration such as quality, efficiency, and citizen-centricity. In Türkiye, since the 2000s, e-government has become a strategic public policy, and the accessibility of public services in digital environments has come to the forefront (Yavuz & Çarıkçı, 2009).

Digital transformation also improves decision-making processes in public administration. Tools such as data analytics and artificial intelligence provide public managers with the ability to make faster and more accurate decisions. Additionally, digital transformation allows public administration to reduce bureaucratic obstacles, accelerate processes, and utilize resources more efficiently. This process enables both public employees to perform their tasks more efficiently and citizens to access services more easily. Digital technologies have encouraged reforms in public administration and accelerated the search for reliable data and evidence. These technologies increase the speed, accessibility, and quality of services while allowing big data sources to be analyzed more quickly and in greater detail. This development has provided public managers and policymakers with the opportunity to make decisions more aligned with citizens' demands (Gül, 2017).

Public organizations should advance with strategic management techniques within the process of digitalization, thereby becoming architects of the state's integrated capacity. The three main elements of digitalization are developing digital capacity, creating public benefit and value, and institutionalizing change. However, digitalization also brings challenges such as excessive centralization, democratic erosion, data privacy issues, and cybersecurity risks. The opaque nature of algorithms and intensive data usage can hinder transparency and participation in public administration. Overcoming these issues requires public organizations to develop up-to-date strategies and adapt to the future (Tamer & Övgün, 2023, p. 530).

In today’s rapidly digitalizing world, the integration of advanced technologies into societal structures has become not merely a possibility, but a necessity. Governments, businesses, and individuals are adapting to a new digital era that is transforming service delivery, decision-making processes, and information management. This transformation,

widely referred to as digital transformation, encompasses a broad range of innovations—from artificial intelligence and big data to blockchain and cybersecurity. As digital tools become increasingly embedded in both public and private domains, understanding their functions and impacts becomes critically important. In this context, in order to facilitate a better understanding of the concepts featured in development plans throughout the research, the following section briefly outlines key terms related to digital transformation. These conceptual explanations aim to enhance the comprehensibility of development plans and provide a clearer framework for interpreting them.

2.3.1. Research & Development (R&D)

Research and development (R&D) is the process of creating new products, services, and processes by utilizing existing knowledge and capital. These activities aim to produce outputs that are original from a scientific and technical perspective. Today, countries place great importance on R&D efforts to keep up with global developments and enhance their competitiveness. The main reason for this is that R&D has become a key factor for sustainable economic growth and competitive advantage (Karagöl & Karahan, 2014, p. 9).

Innovation driven by R&D not only fuels technological progress but also shapes the economic future of nations. Investing in R&D fosters a cycle of continuous improvement and adaptation, which is essential for countries aiming to maintain relevance and leadership on the global stage. Ultimately, the commitment to research and innovation determines how well a country can respond to challenges and seize new opportunities in an increasingly competitive world (Özeroğlu, 2012, p. 113).

According to the Turkish Statistical Institute (2024), as of 2023, R&D expenditures in Türkiye have increased significantly. Total R&D spending reached 377.5 billion Turkish lira, accounting for 1.42% of the country's gross domestic product (GDP). Personnel expenses constituted the largest share of these expenditures (52.5%), while the private sector was responsible for the majority of the spending (65.1%).In terms of financing, the private sector also ranked first (52.6%), followed by the government (33.1%) and higher education institutions (12.7%). The number of R&D personnel reached 290,850, of whom 34.1% were women. Regarding educational attainment, individuals with bachelor's and doctoral degrees made up the largest portion. The highest amount of R&D spending occurred in the Ankara region, while Istanbul had the highest number of R&D personnel (Turkish Statistical Institute, 2024).

2.3.2. Broadband

The rapid growth of the internet and advancing technology have increased demand for faster connections from telecommunications providers. Broadband technologies offer much higher speeds compared to older narrowband connections. The adoption of these technologies depends less on cost and more on provider behavior, user habits, infrastructure availability, government policies, and marketing strategies (Kılıç, 2004, p. 1). These technologies enable users to quickly reach information online, enhancing communication and data exchange. Thanks to broadband, the internet has become an essential tool for communication and supports the integration of both fixed and mobile access technologies (Çalış & Özdemir, 2013, p. 880).

2.3.3. Digital Divide

According to Van Dijk (2020), the concept of the digital divide first emerged in the United States in 1995 and was initially used to describe the difference between those who have access to digital media and those who do not. The idea quickly spread to Europe and the rest of the world, gaining significant attention in both social and academic contexts by the early 2000s. Van Dijk (2020) explains that the term *"digital divide"* is a metaphor referring to a social division rather than a literal geographic boundary. Although the word *digital* may suggest a technical issue, the digital divide is fundamentally a social problem, where inequality stems from social factors, even though technology plays a crucial role in enabling access and use (pp. 3–7). Digital divide refers to the unequal access to and benefits from information technologies due to inadequate infrastructure, high access costs, and weak policies. Factors such as education, income, quality of regulations, competition level, and urbanization deepen this divide. It exists both between countries and within countries among different groups (rich-poor, young-old, urban-rural, male-female). To address this issue, policies should be developed to increase access to technology for individuals, businesses, and governments, infrastructure investments should be made, education provided, and international cooperation encouraged (Hüsnüoğlu & Öztürk, 2017).

2.3.4. Cybersecurity

The widespread integration of information and communication technologies (ICT) into all areas of life has increased the need to protect these systems from cyberattacks. Cybersecurity refers

to a comprehensive set of technologies, processes, and practices designed to protect information systems, software, data, and networks from unauthorized access, modification, or destruction. It also encompasses core principles such as confidentiality, integrity, and availability. An effective cybersecurity approach should not rely solely on technological solutions but also be supported by human factors, policies, and procedures. Defense systems must be dynamic and multi-layered to address evolving threats (Sarker, Kayes, Badsha, et al., 2020).

The article by Craigen, Diakun-Thibault, and Purse (2014) addresses the conceptual ambiguity surrounding the term cybersecurity, highlighting the limitations of existing definitions that are often narrow, technically biased, or inconsistent. Through a comprehensive literature review and collaborative discussions with experts from multiple disciplines, the authors identify the need for an inclusive and multidimensional definition. As a result, they propose defining cybersecurity as "the organization and collection of resources, processes, and structures used to protect cyberspace and cyberspace-enabled systems from occurrences that misalign de jure from de facto property rights." This definition aims to unify diverse perspectives and encourage interdisciplinary engagement in addressing cybersecurity challenges across academic, industrial, and governmental domains. Cyberspace is a virtual environment where communication and data exchange occur through digital devices and networks.

With the rapid acceleration of digitalization in recent years, threats targeting activities conducted through information and communication technologies have diversified and increased. In response to these developments, the institutionalization of cybersecurity within the framework of Turkish public administration has gained formal recognition through a legal foundation. In this context, the Cybersecurity Law No. 7545, which was adopted on March 12, 2025, and promulgated in the Official Gazette dated March 19, 2025 (No. 32846), constitutes a comprehensive legal regulation aimed at protecting the Republic of Türkiye's critical information assets and systems in the digital domain.

The primary objective of the law is to prevent cyberattacks—whether originating domestically or internationally—targeting digital systems in both the public and private sectors, to mitigate the impact of such incidents, to develop protective measures, and to establish national-level cybersecurity strategies. The scope of the law encompasses all actors operating in the digital environment, including public institutions, professional organizations with public institution status, private sector entities, natural persons, and organizations without legal personality.

Furthermore, the law mandates the establishment of the Cybersecurity Council to ensure the coordination of cybersecurity policies at the national level. In doing so, it aims to enhance

the institutional capacity for safeguarding Türkiye's digital infrastructure and to build a sustainable cyber defense mechanism.

2.3.5. Artificial Intelligence (AI)

According to the Turkish Language Association (TDK, n.d.), artificial intelligence is defined as the ability of a computer, a robot controlled by a computer, or a programmable device to perform functions similar to human capabilities such as perception, learning, reasoning, decision-making, problem-solving, and communication. This definition highlights the multifaceted nature of AI, emphasizing its capacity to mimic complex human cognitive processes through technological means.

According to Born (1997), Artificial Intelligence (AI) initially emerged as a subfield within computer science and was officially named during the Dartmouth Conference in 1956. The concept and understanding of AI involve a tension between the internal scientific viewpoints and everyday interpretations. AI is generally described as computer systems that perform functions resembling human intelligence, though this does not mean that machines actually possess human-like intelligence. While definitions vary, a widely accepted perspective considers AI as the design of computer systems that imitate behaviors linked to human intelligence. Furthermore, AI has evolved into a complex, multidimensional discipline that extends beyond syntactic programming techniques (such as smart programs) to include semantic and pragmatic approaches that investigate the core principles of intelligence. Consequently, AI programs are intended to be adaptive systems capable of learning and adjusting based on new information and experiences.

According to the AI Index 2025 Annual Report by Stanford University's Institute for Human-Centered (2025) AI, artificial intelligence performance has significantly improved between 2023 and 2024, surpassing human capabilities in complex tasks such as video generation and programming. Despite limited progress in responsible and ethical AI practices, governments worldwide have intensified regulations and fostered international collaboration. While global optimism toward AI is rising, notable regional disparities persist. Technological advancements have made AI more affordable, efficient, and accessible; however, challenges remain in education due to infrastructure and teacher preparedness gaps.

The digital era has brought significant changes, especially in the field of public administration. Information and communication technologies (ICT) have enabled innovative approaches to service delivery in the public sector. E-government initiatives began in the 1990s and gained momentum in the 2000s with the widespread use of the internet and mobile

technologies. In the various stages of e-government development, advanced technologies such as artificial intelligence (AI) and the Internet of Things (IoT) have recently come to the forefront. AI has evolved into a multidisciplinary field that includes not only computer science but also philosophy, psychology, economics, and law. Research on AI in public administration has notably increased in recent years(Uzun, Yıldız & Önder, 2022).

Artificial intelligence is a crucial technology that enables faster and more efficient public administration services. While improving decision-making processes and optimizing resource use, it can also raise challenges related to ethics, security, and data protection. These issues can be addressed through education, strong legal regulations, and transparent oversight. With the widespread digitalization, the use of artificial intelligence in the public sector has become a critical necessity for adapting to changing conditions. As awareness and trust increase, society is expected to adopt these applications more widely (Erol, 2024).

According to data from the Turkish Statistical Institute's 2023 research on the use of information technologies in enterprises, the adoption of artificial intelligence (AI) technologies among businesses showed a noticeable increase compared to the previous year. Specifically, the proportion of enterprises employing any form of AI rose from 3.5% in 2022 to 5.5% in 2023. When considering company size, AI usage was more prevalent among larger enterprises: 4.9% of businesses with 10-49 employees, 6.5% of those with 50-249 employees, and 18.5% of companies with 250 or more employees reported utilizing AI solutions, all reflecting incremental growth from 2022 figures. Among the AI applications in use, image recognition technologies for identifying objects or individuals were the most common, employed by 48.4% of AI-using firms. This was followed by AI tools aimed at automating workflows or supporting decision-making (43.7%), and technologies that generate written or spoken language (41.5%). On the other hand, the main barriers preventing AI adoption were identified as high costs, cited by 60.7% of enterprises not using AI, alongside a lack of necessary expertise (53.8%) and incompatibility with existing hardware, software, or systems (49.6%).

In summary, artificial intelligence is rapidly advancing both in technological capabilities and practical applications across various sectors. While AI adoption is increasing among enterprises, especially larger ones, challenges such as high costs and skill shortages remain significant barriers. Simultaneously, ethical considerations and regulatory frameworks are evolving globally, highlighting the growing importance of AI development.

2.3.6. Internet of Things (IoT)

The Internet of Things (IoT) is a system where physical devices equipped with sensors, software, and network connectivity are interconnected to collect and exchange data. Its applications range widely, from smart home devices to industrial machinery and even smart city solutions. By enabling communication between devices and over the internet, IoT enhances efficiency in various areas such as automated process management, environmental monitoring, traffic regulation, and inventory tracking. For businesses, IoT offers significant benefits including optimized operations, cost reduction, data-driven decision making, and improved customer experiences (IBM, n.d.).

Data collected from IoT devices is transmitted to central systems, enabling real-time analysis and intervention. Data-driven decision-making processes in various sectors such as agriculture, transportation, and energy are improved through IoT. The European Commission allocates significant funding for research and innovation projects in IoT and edge computing under the Horizon Europe program. These projects aim to move data processing and analysis closer to the device level, thereby reducing the load on the cloud and increasing energy efficiency(European Commission Digital Strategy Portal, n.d.).

2.3.7. Big Data Analytics

With the increase of sources such as social media, the Internet of Things (IoT), and multimedia, the volume and detail of data collected by organizations are continuously and rapidly growing. These data exist in both structured and unstructured formats, and this phenomenon, referred to as "big data," has attracted significant attention from academia, government, and industry. Big data is characterized by three main features: its large volume, inability to fit into traditional databases, and the rapid generation and processing of data. Moreover, it is driving fundamental changes in fields such as healthcare, science, engineering, finance, and business (Hashem et al., 2015).

In 2010, Apache Hadoop defined big data as datasets that general-purpose computers cannot capture, manage, or process within an acceptable timeframe. Later, in 2011, McKinsey & Company described big data as datasets that traditional database software cannot store or manage, highlighting it as a new frontier for innovation, competition, and productivity. According to these definitions, big data refers to datasets whose size can increase over time or

with technological progress and varies depending on different applications. Currently, big data typically ranges from several terabytes to petabytes (Chen, Mao, & Liu, 2014).

2.3.8. Internet Exchange Point (IXP)

The Internet consists of independently managed Autonomous Systems (ASes), which typically interconnect either through dedicated private links or via Internet Exchange Points (IXPs). While dedicated links connect only two ASes directly, IXPs provide a shared infrastructure that enables multiple ASes to interconnect cost-effectively (Xu, Duan, Zhang, & Chandrashekar, 2004).

Internet Exchange Points (IXPs) are critical infrastructures where different networks (Autonomous Systems - AS) come together to exchange traffic. These points play a vital role in the expansion and efficient operation of the Internet, especially in developing regions. In traditional IXPs, traffic control is limited and governed by rigid rules. As a solution to this limitation, Software-Defined Internet Exchange Points (SDXs) enable flexible and participant-specific traffic management. Traditional Internet routing is inherently inflexible, difficult to manage, and offers limited control due to several constraints. SDXs address these issues by leveraging Software-Defined Networking (SDN) technologies to allow more flexible, application-specific, and fine-grained traffic policies within IXPs (Gupta et al., 2014).

2.3.9. Blockchain

Blockchain is a peer-to-peer distributed ledger technology that ensures secure, tamper-resistant recording of data.Originally introduced with Bitcoin in 2008, blockchain has since been recognized for its transformative potential across sectors like finance, media, and government. While some organizations are still exploring its use, others have already begun developing real-world applications, signaling that the shift toward broader adoption is well underway (Bashir, 2017, pp. 1–16).

According to the OECD report titled Blockchains Unchained: Blockchain Technology and its Use in the Public Sector, blockchain technology is now being widely addressed not only in the financial sector but also in the public sector. The report reveals that at least 46 countries have launched or are planning more than 200 blockchain-related initiatives. These initiatives include applications aimed at increasing transparency, reducing costs, and enhancing security in public services (Berryhill, Bourgery, & Hanson, 2018).

CHAPTER 3: CONCEPTUAL ANALYSIS OF DIGITAL TRANSFORMATION IN NATIONAL DEVELOPMENT PLANS

The first concrete strategies regarding digitalization in development plans emerged with the 8th Development Plan. Although previous plans did not contain direct policy objectives on this subject, there were indirect references to information technologies. In this context, the main focus of this study begins with the 8th Development Plan.

3.1. The 8th Development Plan Period (2001–2005)

The Eighth Five-Year Development Plan and Long-Term Strategy, covering the period 2000-2005, was prepared in accordance with Law No. 3067 and was approved by the General Assembly of the Grand National Assembly of Türkiye on June 27, 2000. The plan presents a strategic roadmap aimed at achieving the country's long-term development goals (State Planning Organization [DPT], 2000).

During the 8th Development Plan period from 2001 to 2005, the presidency in Türkiye was held by Ahmet Necdet Sezer. At the beginning of this period, Bülent Ecevit occupied the position of Prime Minister. The government was a coalition consisting of the Democratic Left Party (DSP), the Nationalist Movement Party (MHP), and the Motherland Party (ANAP). Following the November 2002 elections, although the presidency remained unchanged, Abdullah Gül initially assumed the office of Prime Minister. Subsequently, he resigned from his position, and Recep Tayyip Erdoğan succeeded him. From that point onward, the government was led by the Justice and Development Party (AKP) as a single-party administration.

3.1.1. Analysis of Contents and Goals in the 8th Development Plan

The period in which digital transformation practices began and became explicitly included in development plans in Turkish public administration coincides with the Eighth Development Plan. This plan targeted the integration of information and communication technologies into public institutions and forthcoming applications within the framework of the information society vision, aiming to make public services more effective and accessible.

In the general situation assessment section prior to the 8th Development Plan, global developments and some recommendations for Türkiye were mentioned. Since the late 1970s,

the globalization process, accelerated by advances in information and communication technologies, has created profound impacts on economic, social, and cultural fields. As production and management processes globalized, firms became capable of operating worldwide, and consumer preferences and lifestyles began to converge. Information became the most important production tool of the new era, while productivity increases and technological innovations became continuous. During this process, foreign capital investments, technology transfer, and commercial opportunities gained prominence for developing countries; however, issues such as income distribution deterioration, cultural homogenization, and financial fragility also came to the fore. For Türkiye to benefit maximally from this transformation, completing structural reforms, investing in human resources, and adapting to the transition process to an information society are of great importance (DPT, 2000).

As of 1997, the resources allocated to research and development (R&D) activities in Türkiye were insufficient, and the desired level in terms of both quality and quantity could not be achieved in this field. The share allocated to R&D within the Gross Domestic Product (GDP) was only around 0.49%, and the full-time equivalent R&D personnel per ten thousand economically active individuals was limited to 10.4. This situation particularly revealed the limited capacity of public administration regarding science and technology policies. The inability to provide the resources foreseen for R&D within the scope of the Seventh Five-Year Development Plan, and consequently the failure to increase the researcher workforce, exposed the implementation shortcomings of the plan. Furthermore, the lack of a holistic approach integrating science, technology, and industrial policies with education and R&D policies stood out as one of the fundamental structural obstacles to digital transformation (DPT, 2000).

However, during this period, cooperation efforts between the public sector, universities, and private sector increased; and social awareness regarding information technologies developed to a certain extent. This can be regarded as an important development laying the groundwork for digitalization policies. Nevertheless, although the National Information Infrastructure Master Plan (TUENA), approved by the Supreme Council of Science and Technology and prepared under the coordination of the Ministry of Transport, was completed, the institutional and technical structures envisaged in the plan could not be implemented. This situation reflects the lack of institutional capacity in implementing strategic decisions (DPT, 2000).

In the second section of the Eighth Development Plan, the fundamental objectives of Türkiye's long-term development strategy for the period 2001–2023 were determined. This strategy aimed for Türkiye to become an influential global state in line with the economic and social changes worldwide. The plan focused on Atatürk's goal of surpassing contemporary civilization levels by increasing Türkiye's capacity in science and technology, accelerating the transition to an information society, and achieving a stronger position in global competition (DPT, 2000).

The main elements of the plan include the restructuring of the state, improving the levels of education and health, developing innovations in the fields of science and technology, and protecting the environment. A transition to an export-oriented, technology-intensive production structure was targeted. Additionally, Türkiye's participation in the full membership process with the European Union, compliance with international norms, and strengthening regional cooperation were emphasized as important opportunities (DPT, 2000).

Among Türkiye's 2023 goals are ensuring sustainable economic growth, reaching a per capita income level close to that of the European Union, and increasing the efficiency of the industrial and service sectors. Furthermore, with changes in the population structure and increases in schooling rates, societal transformation was also aimed for. To enhance the competitiveness of Turkish industry, priority will be given to technology production, R&D, environmentally compliant production, and the use of qualified labor (DPT, 2000).

In the eighth chapter of this development plan, under the main heading of development goals and policies related to social and economic sectors, the section on improving scientific and technological capability addresses both progress made and challenges faced in science and technology. Currently, sufficient resources have not been allocated to R&D expenditures, and the goal to increase the number of researchers has not been fully achieved. However, steps are being taken to ensure harmony between science-technology-industry policies and education and R&D policies, and efforts are being made to strengthen university-industry cooperation (DPT, 2000).

Under the heading of objectives, principles, and policies, the aim is to achieve scientific and technological progress to increase international competitiveness. The share allocated to R&D activities from GDP is targeted to be raised to 1.5%, with aims to increase the number of researchers and to integrate local and international information networks (DPT, 2000).

R&D activities in advanced technology fields such as biotechnology, genetic engineering, software, and information and communication technologies will be supported. In addition, interactive Science and Technology Centers will be established to bring science and technology closer to society (DPT, 2000).

Under the heading of legal and institutional regulations, risk capital investments will be encouraged to support R&D-based ventures, and legal arrangements related to university-industry cooperation are planned. The legal infrastructure for the establishment of technoparks and technology development zones will be strengthened, and legislative regulations will be made to improve the working conditions of researchers. Additionally, it was stated that the TÜBİTAK Law would be updated and a National Aviation and Space Organization would be established to coordinate activities in the fields of aviation and space (DPT, 2000).

Under the section titled Information and Communication Technologies (ICT) in the eighth chapter, it is stated that since the second half of the twentieth century, these technologies have become an important tool for countries and companies to gain a competitive advantage. It is noted that with the development of these technologies, computers became widespread, suitable for personal use, and rapid progress was made in software, hardware, and content areas. Furthermore, it is emphasized that ICT has increased interaction between sectors such as telecommunications and broadcasting, leading to the emergence of new applications (DPT, 2000).

During the plan period, the goal is to increase the competitiveness of the information and communication technology sector. The software sector was identified as a strategic area and planned to be encouraged. The fundamental goal of the telecommunications policy is to develop Türkiye's global-level telecommunications service capability and to increase economic and social welfare. The spread of mobile communication, internet access, and e-commerce applications is expected (DPT, 2000).

According to the Eighth Development Plan, it is noted that advances in information and communication technologies may also bring various issues such as violations of personal rights, and these issues will be resolved in accordance with the basic principles of law. At the same time, the judicial system is targeted to be supported by modern technological tools, and scientific and technological developments will be utilized at the highest level in justice services (DPT, 2000).

In the ninth chapter, titled Increasing Efficiency in Public Services, it is indicated that the focus is on improving and restructuring public administration. It is stated that rapid

advancements in science and technology have made changes in the organization of public administration at both central and local levels necessary. The increase in responsibilities of the central government is emphasized to have caused bottlenecks and dysfunctions in many parts of the system. It is mentioned that the unhealthy distribution of duties among central, regional, and local administrations leads to efficiency problems. Furthermore, it is noted that the strategic planning skills of public administrators and employees should be developed, and management methods aimed at improving the quality of public services should be adopted (DPT, 2000).

Within the scope of the plan, it is emphasized that R&D studies will be supported on technologies aimed at local services, and the most appropriate types of technology will be identified. Accordingly, priority will be given to technological developments and strategies that improve the quality of public service delivery (DPT, 2000).

According to the plan, technological developments that will increase Türkiye's competitiveness and accelerate the transition to the information society have been identified as a primary objective. Within this framework, scientific and technological innovations will be supported, and the physical, human, and legal infrastructure will be developed. Additionally, state supports for R&D activities will be increased, technoparks will be supported, and venture capital practices will be developed (DPT, 2000).

In summary, the Eighth Development Plan marks a significant turning point in Türkiye, as it is the first instance where digital transformation was comprehensively integrated into public policy. The plan prioritized the integration of information and communication technologies into public services, positioning the transition to an information society as a strategic objective. However, its implementation revealed several structural shortcomings, such as insufficient investment in R&D, lack of institutional capacity, and the failure to harmonize science and technology policies with education and industrial strategies. Despite these challenges, the growing collaboration between the public sector, universities, and the private sector, along with increasing societal awareness of digitalization, laid an important foundation for future digital policies. The plan identified scientific and technological advancements as key drivers of national development and proposed various legal, institutional, and financial reforms to enhance Türkiye's global competitiveness and accelerate the digital transformation process.

3.1.2. Application Areas and Implemented Projects

Türkiye's transformation into an information society has taken important steps since the 1990s despite various political and economic challenges. The e-Türkiye Initiative was adopted as a digitalization policy aligned with the European Union, and projects such as MERNIS, UYAP, and BİMER strengthened the digital infrastructure in public services. These projects have made interactions between citizens and the government faster, more transparent, and more accessible, while significantly facilitating data sharing and processes among public institutions. In particular, the digitization of population records, automation of justice services, and electronic handling of citizen applications have played a critical role in developing Türkiye's e-government capacity. These developments can be seen as significant steps toward Türkiye's goal of becoming not just an information-consuming but also an information-producing society.

3.1.2.1. e-Türkiye Initiative

In the 1990s, Türkiye initiated efforts to become a competitive information society by shifting from labor-intensive to high value-added production, supported by innovation and investments in science and technology. The National Information Infrastructure Master Plan was developed by BTYK to guide this transformation, though political and economic instability hindered implementation (OECD, 2007). In 2000, the Telecommunications Authority was established, aligning with the EU's Lisbon Strategy aimed at creating a knowledge-based economy. Türkiye joined the eEurope+ Initiative in 2001 and launched the e-Türkiye Initiative as part of its EU accession process. However, due to ongoing instability, progress was limited in the early years, leading the government to initiate policy reviews through 13 project groups (OECD, 2007).

Although the origins of e-government initiatives in Türkiye date back earlier, the first concrete and structured step was taken in 2002 with the launch of the e-Türkiye Initiative Action Plan by the Prime Ministry. This plan aimed to define the scope, rationale, and strategic goals of e-government within the broader vision of building an information society (Yeşilbaş, 2011, p. 3). The e-Türkiye circular, published by the Prime Ministry on June 19, 2002, encompasses an initiative aimed at accelerating Türkiye's transformation into an information society. The circular emphasizes the need to build an information-based economy and ensure the transition to an information society for the country to reach the level

of contemporary civilization. The e-Türkiye initiative aims to help the country achieve its goals in the field of informatics while also empowering the young population through digital education and transforming society into one that not only consumes but also produces information technologies. To achieve these objectives, various sub-working groups were established, and it was stated that high-level coordination was necessary to successfully carry out these efforts. Additionally, Türkiye's commitments and planned activities were detailed within the framework of the eEurope+ action plan, which was accepted in alignment with the European Union (Prime Ministry, 2002).

In November 2002, a new reform government took office after receiving a vote of confidence from the Parliament. The reform agenda of this government included achieving economic stability and modernizing the public sector. Additionally, within the framework of the Emergency Action Plan announced in 2002, short-term action plans related to the e-Transformation Türkiye Project were developed. In 2003, the e-Transformation Türkiye Executive Board was established, and many representatives from the public sector and civil society were included in this board (OECD, 2007).

3.1.2.2. MERNİS (Central Population Administration System) Project

In the past, Türkiye took some digitalization steps in line with its goal of becoming an information society. In the 1970s and 1980s, when the internet was not widespread, data processing and storage were prioritized. Within this context, projects like MERNİS (1982) laid the groundwork for digital infrastructure in public services. Although these projects are not structured the same as today's e-government applications, they formed key pillars of the digital transformation process (Naralan, 2010).

The MERNİS Project aims to keep population records digitally in Türkiye and securely share the information. Initiated in 1972, it was implemented by Middle East Technical University (ODTÜ) in the 1980s and accelerated in 1997. In 2000, a unique Identity Number was assigned to every Turkish citizen. By 2002, 923 district population directorates were connected online to a central system, and the project was nationwide. In 2005, the Identity Sharing System enabled data exchange between public institutions, and in 2006, the Population Services Law more systematically linked personal and address information. MERNİS centralized all population records in a single database and became the foundation for e-government projects. The system increased speed, efficiency, and security in public services while reducing bureaucracy. Through MERNİS, all citizens' population

records were digitized, and each was assigned a Turkish Republic Identity Number. This system is crucial for government institutions to recognize citizens and link records (Eroğlu, 2006).

3.1.2.3. National Judiciary Informatics System (UYAP)

The Ministry of Justice started automation efforts in 1998, believing that effective use of information technologies would increase service speed and reliability. In this context, the Information Processing Department was established in 1999 and further strengthened by Law No. 4674 in 2001. The department is responsible for establishing, operating, and maintaining IT systems to ensure efficient justice services.

Launched in 2000, UYAP aims to provide justice services more quickly and securely in a digital environment. The project was implemented in two phases: in 2001, automation of the Ministry of Justice's central units was completed, and by 2005, automation was finalized for judicial and administrative courts, forensic medicine, and detention centers. Today, UYAP operates electronically in all judiciary units in Türkiye. The Court of Cassation integrated its software with UYAP and joined the project. Consequently, UYAP is used 100% in all judiciary units in Türkiye, with judicial and administrative procedures conducted electronically (UYAP, 2025).

3.1.2.4. BİMER (Prime Ministry Communication Center)

Established by the Prime Ministry Circular published in the Official Gazette on January 20, 2006, numbered 26055, BİMER began operating digitally on February 24, 2006. This system was created to strengthen the interaction between the government and citizens through the use of information and communication technologies. Through BİMER, citizens gained the ability to directly reach the Prime Ministry without any time or location restrictions, enabling continuous communication with public administration (Turan, Aydilek & Şen, 2015).

During this period, the Presidency accepted complaints, suggestions, opinions, and information requests from citizens either in written or electronic form within the scope of Petition Rights Law No. 3071 and Right to Information Law No. 4982. It forwarded these applications to relevant institutions and ensured the monitoring and coordination of the process (Prime Ministry Communication Center, 2011).

3.2. The 9th Development Plan Period (2007–2013)

The Ninth Development Plan, which determined Türkiye's development policies for the 2007–2013 period, was published in the Official Gazette dated July 1, 2006, number 26215, and entered into force (State Planning Organization [DPT], 2006).

The 9th Development Plan period covers the years 2007 to 2013. During this time, Ahmet Necdet Sezer held the office of the presidency at the beginning of the period, while Abdullah Gül assumed the presidency as of Agust 2007. The position of Prime Minister was maintained by Recep Tayyip Erdoğan throughout the plan period. The government was led by the Justice and Development Party (AKP) as a single-party administration.

3.2.1. Analysis of Contents and Goals in the 9th Development Plan

In the introduction of the Ninth Development Plan, the general framework and fundamental objectives of the plan were outlined. This plan aimed to guide Türkiye's economic, social, and cultural transformation process during a period marked by accelerated global change and increasing competition. The plan's goal was to transform Türkiye into a country that grows steadily with stability, distributes income more equitably, has become a knowledge society, and successfully completed the European Union membership process (State Planning Organization [DPT], 2006).

The new approach adopted in the plan further strengthened the guiding role of the state and focused on strategic priorities. Within this framework, the principles of transparency and accountability were emphasized in implementation. Additionally, the plan was designed to be compatible with the EU and structured to work alongside both national and regional development programs (DPT, 2006).

Public participation was highly valued during the preparation process, with contributions from the public sector, private sector, and civil society organizations shaping the plan. The fundamental framework of the plan was built around five main development axes: enhancing competitiveness, improving employment, strengthening human development and social solidarity, ensuring regional development, and increasing quality and efficiency in public services. With this approach, the plan aimed to serve as a strategic guide for Türkiye to achieve its development goals (DPT, 2006).

The second section of the plan, titled "Vision and Fundamental Principles," presented a comprehensive development vision for Türkiye for the 2007-2013 period, taking economic and

social realities into account. This vision emphasized a Türkiye that grows steadily with stability, establishes a more equitable income distribution structure, competes internationally, attains the characteristics of a knowledge society, and completes the EU membership process.The fundamental principles adopted to achieve this vision form a significant part of the plan. A holistic approach was embraced, considering not only economic but also social and cultural dimensions of development. The plan aimed to strengthen participation by involving all segments of society in the process, thereby promoting ownership of the plan (DPT, 2006).

In line with a human-centered development approach, it was stated that a competitive market order, effective public administration, and a strong civil society would function as mutually supportive elements. In the delivery of public services, priority was given to transparency, accountability, efficiency, and citizen satisfaction. It was emphasized that the state should take on a regulatory and supervisory role rather than a direct producer position (DPT, 2006).

In the third section of the Ninth Development Plan, titled "International Developments and Key Trends," attention was drawn to how globalization and especially rapid advances in information and communication technologies have significantly affected the economic and social structures of countries. The plan points out that technology has created a profound transformation not only in production processes but also in ways of doing business and organizational structures (DPT, 2006).

The plan also addresses how technological progress transforms human life and social structures. Particularly, with easier access to information and the diminishing impact of physical borders, the importance of a well-educated and qualified workforce has increased globally. In this context, the expansion of educational opportunities and the enhancement of the quality of human capital were highlighted as necessary (DPT, 2006).

In short, this section emphasizes that Türkiye must adapt to digital transformation, accelerate its transition to an information society, and prioritize high-technology-based production to keep pace with global developments.

The Ninth Development Plan underlines that in the process of globalization and rapid technological development, specialization in international markets and the capability to develop technology have become key components of competitiveness. It is stated that information and communication technologies have led to profound changes in ways of doing business, and in economic development, knowledge-intensive and high value-added production have come to the forefront.

According to this plan, although there has been some improvement in Türkiye's ranking in economic competitiveness in recent years, these developments have not deepened sufficiently nor become permanent. Despite productivity increases achieved through structural reforms and macroeconomic stability, Türkiye's competitiveness is still below the desired level in some areas. The main factors affecting this situation include deficiencies in the quality of the business environment, access to finance, energy and transportation infrastructure, environmental protection, research and development (R&D) and innovation, dissemination of information technologies, as well as issues related to informality and the industrial structure (DPT, 2006).

In the 5th chapter of the Ninth Development Plan, under the heading "Development of R&D and Innovation," the current state of science, technology, and R&D activities is examined in detail. Innovation is considered one of the fundamental elements of a competitive economic structure, and most innovations arise from research and development (R&D) activities. However, in Türkiye, a large part of the R&D infrastructure relies on universities and public research institutions. Nevertheless, effective collaboration and information flow between these institutions have not been established, leading to R&D outcomes that are distant from industry needs and lack practical application (DPT, 2006).

The share of R&D expenditures in GDP was only around 0.67% as of 2002, which is quite low compared to developed countries that invest significantly in science and technology. Although public resources for science and technology began to increase from 2005 onwards, the share of R&D expenditures in GDP remains below 1% .During the Eighth Development Plan period, firms operating in technology development zones benefited from various tax exemptions until 2013, and part of their R&D expenditures was deductible from the tax base. Additionally, through the Türkiye Research Area Program initiated by TÜBİTAK, academic and applied R&D supports were provided, and programs for training scientists were also launched. These findings reveal the need to increase Türkiye's capacity in R&D and innovation and to better link R&D activities with the industry. It is emphasized that R&D should move beyond being merely an academic activity and become a factor that responds to industrial needs and enhances national competitiveness through increased collaboration and resource allocation (DPT, 2006).

Under the title "Widespread Use of Information and Communication Technologies" in the Ninth Development Plan, the liberalization process of the electronic communications sector in Türkiye is discussed. The liberalization, which began with the establishment of the Telecommunications Authority in 2000, allowed for increased competition in the sector by 2004. During this process, secondary regulations aligned with EU regulations were completed, and the

Draft Electronic Communications Law was prepared and submitted to the Turkish Grand National Assembly (DPT, 2006).

With the liberalization of the telecommunications sector, new operators were authorized in the former monopoly areas of Türk Telekom A.Ş., and mobile communication services grew rapidly. While the fixed-line telephone subscription density decreased as of 2000, mobile phone subscription density showed a significant increase. The concession agreement signed in 2002 marked major development in the mobile phone market (DPT, 2006).

Additionally, necessary infrastructure works for the transition to digital broadcasting were completed under the coordination of RTÜK (Radio and Television Supreme Council), and the use of information and communication technologies in public services expanded through the e-Transformation Türkiye Project. These developments increased the demand for internet access and broadband infrastructure, and by the end of 2005, the number of broadband subscribers had reached 1.5 million (DPT, 2006).

In the Information Technology Services section of the Ninth Development Plan, it is stated that the size of the information technology market in Türkiye is around 3 billion dollars. While hardware constitutes the majority of this market, software and services account for about 30% of the market (DPT, 2006).

Although many companies operate in the software and services sector, these firms face challenges in terms of scale, competence, experience, and financial strength. On the other hand, it is emphasized that globally, software and services sectors have begun to provide productivity gains in the economy as well as significant employment opportunities. The importance of structural improvements and support for the sector is highlighted to foster growth in this area (DPT, 2006).

In the section on "Expansion and Activation of e-Government Applications" in the Ninth Development Plan, it is noted that significant steps have been taken to expand e-government applications in Türkiye. The e-Transformation Türkiye Project, launched in 2003, brought together the separate initiatives of public institutions under one roof and placed great emphasis on effective information sharing throughout the process. Moreover, laws such as the electronic signature and the right to information were enacted (DPT, 2006).

With the MERNİS Project, citizen identity information was consolidated under a single number, and this information began to be shared with public institutions. Tax and customs procedures were widely offered electronically, while social security processes such as the e-Declaration application were also digitized. The necessary legal and administrative infrastructure for the use of electronic signatures in the public sector was established and

implemented. Furthermore, e-government portal efforts initiated in 2005 aimed to provide citizens with services from a single point (DPT, 2006).

During this period, Türkiye provided 12 out of the 20 fundamental public services accepted by the EU through electronic channels. As of 2005, Türkiye's level of delivering basic public services electronically was 53%, while the EU-25 average was 65% (DPT, 2006).

In the Research & Development and Innovation Development section of the Ninth Development Plan, it was emphasized that research and development (R&D) activities need to be effectively directed to increase Türkiye's competitive power. Accordingly, the share of R&D expenditures in GDP would be increased, and the private sector's capacity for innovation would be strengthened. The main objective of science and technology policies is to create a suitable environment for the private sector to produce innovative projects (DPT, 2006).

In line with the goal of technology development, it is planned to encourage entrepreneurship and to expand the use of various financial instruments such as venture capital. Additionally, it is stated that the private sector will be supported in establishing research centers in designated priority areas. To raise social awareness in the fields of science, technology, and innovation, various awareness-raising activities are also planned to be intensified (DPT, 2006).

To conduct R&D studies more efficiently, it is emphasized that the researcher human resource needs to be improved both qualitatively and quantitatively. In this context, encouraging Turkish researchers working abroad to return to Türkiye and taking steps to employ foreign researchers in the country are targeted. It is also planned to evaluate concrete outputs, patents, and similar results obtained from R&D activities in universities as academic success criteria to ensure these studies generate economic and social contributions. Strengthening university-industry collaboration by increasing interaction between universities and the private sector is also aimed. In this framework, the capacity of Technology Development Zones will be increased to offer the R&D infrastructure in universities to the use of the private sector and to consolidate cooperation (DPT, 2006).

Strategically important fields such as nanotechnology, biotechnology, defense, and space technologies are defined as priority research areas for the future, and it is stated that R&D activities in these fields will be supported. Technology Transfer Centers will be established to facilitate the transfer of R&D outputs to industry, thereby ensuring the integration of knowledge and technologies into production processes (DPT, 2006).

Additionally, the public procurement system is planned to be restructured to support domestic technology production, and cooperation with European Union countries on technology

transfer is targeted to be strengthened. These efforts are expected to enhance Türkiye's R&D and innovation capacity and increase its global competitiveness (DPT, 2006).

Under the title of Dissemination of Information and Communication Technologies (ICT), it is stated that ICT is aimed to become a decisive factor in global competition. Within this scope, it is planned to increase competition in the electronic communication sector, provide alternative infrastructure and services, and expand access to information quickly, securely, and at reasonable costs (DPT, 2006).

To accelerate the transformation to an information society, the tax burden on electronic communication services will be gradually reduced to reasonable levels, and broadband communication infrastructures will be made more widespread. Accordingly, actions to promote the use of ICT by businesses, citizens, and institutions will be implemented in line with the Information Society Strategy prepared for the 2006-2010 period (DPT, 2006).

Furthermore, it is aimed to enhance Türkiye's competencies in satellite technology production and establish a research center in this field. The public sector's broadband communication needs will be consolidated and met collectively, thereby reducing costs for the public and developing infrastructure (DPT, 2006).

Within the scope of Information Technology Services, Türkiye aims to be a regional player in the software and services sector. Various strategies will be applied to increase the competitiveness of the sector (DPT, 2006).

Primarily, it is stated that in addition to increasing domestic demand, a favorable environment will be created for direct foreign investment. This approach is expected to encourage technology transfer, help Turkish firms obtain international quality certificates, improve their business capacities, and facilitate easier access to financial resources. Thus, the competitiveness of the sector will be increased, and Türkiye's position in information technologies will be strengthened (DPT, 2006).

Sectors with increased competition levels are planned to be directed toward exports, with priority given to the development of high value-added software products. In this context, project-based service exports will be supported especially in strategically important areas such as telecommunications, education, health, and defense industry (DPT, 2006).

Moreover, software activities in technoparks will be specialized according to regional and sectoral priorities. This will enable the production of software solutions better suited to local needs (DPT, 2006).

Finally, legislation protecting intellectual property rights in the software sector will be effectively enforced. These regulations are expected both to protect the rights of domestic

producers and to encourage innovation within the sector. Overall, these strategies are aimed at increasing Türkiye's competitiveness in the information technology field and positioning the country as a regional leader (DPT, 2006).

Under the heading "Expansion and Enhancement of e-Government Applications," various strategies have been outlined to make public services in Türkiye more efficient, transparent, and accessible. The primary goal of these strategies is to transform public services through the use of information and communication technologies (ICT), providing faster and more effective services for citizens and the business community (DPT, 2006).

The first step involves redesigning the business processes and service delivery of public services according to the needs of citizens and the business sector. In this redesign, the opportunities offered by ICT will be maximized to increase the efficiency, transparency, and reliability of services. Additionally, services will be provided through a single portal and multiple integrated platforms, enabling easy access for citizens (DPT, 2006).

e-Government will be utilized as an important tool in the restructuring of the public sector and will contribute to the establishment of a flexible, high-quality, effective, and interoperable public administration, including local governments. In this process, existing public institutions will be strengthened and restructured to align with the e-government system (DPT, 2006).

Basic information infrastructures will be established, and through these infrastructures, data related to real and legal persons will be collected in common databases and shared according to certain authority and responsibility principles. During this data sharing, the principle of confidentiality of personal information will also be observed (DPT, 2006).

Priority will be given to e-government investments related to public services with high demand and high returns. These investments will be made through common standards and infrastructure that enable information sharing, preventing redundant investments and ensuring effective use of public resources. For example, identity verification and electronic payment processes will be managed through a single gateway, simplifying access to services and accelerating business processes (DPT, 2006).

Information security will be treated as a critical issue, with a secure public network established and a center created for extraordinary situations. In addition, the use of electronic signatures in the public sector will be promoted, further enhancing the security of transactions (DPT, 2006).

Electronic services provided by local governments will be developed, standards for these services will be established, and data sharing will be ensured. Synergy opportunities will be

created among local governments to enhance citizens' participation in governance through information and communication technologies (DPT, 2006).

Finally, developments in electronic public services in the European Union will be closely monitored, and necessary measures will be taken to align Türkiye with the defined targets. Within this framework, Türkiye's e-government strategy is aimed to be harmonized with international standards (DPT, 2006).

In summary, the Ninth Development Plan (2007-2013) aimed to steer Türkiye's economic, social, and cultural transformation in a rapidly changing global environment. It focused on achieving stable growth, equitable income distribution, becoming a knowledge-based society, and completing EU membership. The plan emphasized the state's guiding role, transparency, and collaboration among public, private, and civil sectors. Key priorities included enhancing competitiveness, employment, human development, regional development, and improving public service quality. It underscored the importance of adapting to digital transformation, increasing investment in R&D and innovation, strengthening university-industry partnerships, and expanding ICT infrastructure and e-government services to boost efficiency and accessibility. Overall, the plan aimed to raise Türkiye's global competitiveness and promote citizen participation through technological advancement and effective governance.

3.2.2. Application Areas and Implemented Projects

Türkiye's digital transformation in public administration has advanced significantly since the 1980s, evolving into a comprehensive e-government system launched with the 2008 e-Government Gateway. This platform has expanded from offering basic services to integrating thousands of public institutions, enabling millions of citizens to access government services online efficiently and transparently. Parallel initiatives like the State Organization Central Registration System (DETSIS) have standardized institutional data management, enhancing inter-agency coordination. Educational transformation through the FATİH Project and improvements in document management with the Electronic Document Management System (EBYS) reflect broader efforts to modernize state functions digitally. Additionally, the National Public Integrated Data Center (UKEVM) centralizes IT infrastructure, boosting cybersecurity and resource efficiency. Collectively, these developments illustrate's commitment to leveraging technology for streamlined governance, increased citizen access, and sustainable public service delivery.

3.2.2.1. e-Government Gateway (2008)

The structure of the state has evolved historically in parallel with economic and social developments; with the transition to the information society, new approaches have emerged in public administration. The management understanding has shifted from the welfare state model of the industrial society to a governance model based on information and communication technologies (ICT). In this context, the e-government model stands out as a transformation aimed at delivering public services more quickly, economically, transparently, and effectively (Demirel, 2006).

The transition process to e-government in Türkiye began in the late 1980s with the integration of technological and informatics developments into public services. In the 1990s, with the widespread adoption of the Internet, countries around the world accelerated their efforts to transition to the information society and knowledge-based economy. The private sector was the first to recognize the benefits of the Internet and created websites, followed by public institutions using the Internet to provide services to citizens. Initially established to provide information, these websites gradually transformed into e-government applications (Naralan, 2010).

The concept of electronic government services came to the fore in 2003, and since then, efforts to deliver government services in digital environments have accelerated. The first significant step was the launch of the "Electronic Government Gateway" project in 2003, aimed at making public services accessible in digital form. This process reached an important turning point with the implementation of the "e-Government Gateway Project" in 2008, which integrated fragmented e-applications and centralized service delivery (Çarıkçı, 2010).

Initially managed under the Ministry of Transport, the system was transferred to the Digital Transformation Office with Presidential Decree No. 48 following the transition to the Presidential Government System in 2018. The Digital Transformation Office took on the responsibility for the digitalization of public services and the coordination of e-government policies. Within this scope, the name of the e-Government Gateway was changed to the "Digital Türkiye Portal." This management change allowed e-government activities to be carried out by a more specialized body while enabling the Ministry of Transport and Infrastructure to focus on its core duties (Duman & Aktel, 2021).

The foundation of the e-government platform was based on establishing a system that would enable citizens to carry out all interactions with the state digitally. Launched in 2008, the e-government gateway was created by consolidating previous digitalization efforts of public

services. While initially offering a limited number of services and transactions, the e-government platform has continuously been developed and expanded over time. As a result, citizens have gained the ability to perform many state-related transactions and functions online without needing to visit public institutions.

In the information age, states are radically restructuring public administration by investing in e-government systems to provide fast, transparent, and efficient services to their citizens. E-government reduces bureaucracy, speeds up processes, shortens complaint resolution times, and increases citizen satisfaction. In this process, where technological developments transform management approaches, states' ongoing digitalization to keep up with social changes is inevitable for delivering public services that meet contemporary requirements (Akçakaya, 2017).

E-government refers to the process of transferring traditional public services into an electronic environment, and this transformation is influenced by many factors such as economic development, governance style, and technical and human infrastructure. Although economic development is an important factor, it is not sufficient on its own; some developing countries can surpass developed countries in e-government rankings. This situation emphasizes the importance of strategic planning. Additionally, democratic and transparent governance structures tend to be more successful in e-government development compared to centralized and closed systems. Besides technical infrastructure, the digital literacy levels of citizens are crucial for the effective use of e-services. While broadband infrastructure and a user-friendly e-government portal facilitate access, making some services mandatory can also help foster habitual use (Naralan, 2010).

In the traditional public administration model, citizens cannot directly access information. Public institutions keep the information they produce or store in back-end information systems and provide this information to citizens when needed. In this process, bureaucratic obstacles, paper-based transactions, redundancies, time losses, and communication problems between citizens and institutions are inevitable. Moreover, weak information sharing between institutions forces citizens to apply in person to meet their information demands. Although these problems in the traditional model are often attempted to be solved by new institutional structuring and increasing personnel, their long-term effects are limited and recurring bottlenecks continue.

In the electronic government model, information systems are placed directly between the public institution and the citizen. In this model, public institutions try to anticipate citizens' needs in advance and provide services accordingly. While citizens are given direct access to

information, communication and integration of information systems between institutions significantly reduce bureaucratic processes, time losses, and paper-based transactions. E-government increases cooperation between public institutions and enables a rapid and effective response to citizens' requests. However, the current individual websites do not fully perform the role of e-government and are considered only a preliminary stage of this model (İnce, 2001).

Since the early 2000s, the primary goal of public administrations has been to solve the problems of the public. During this period, many public services began to be offered over the internet, and the number of digital platforms available to citizens increased. The fundamental understanding of this period has been shaped around ensuring that e-government allows users easy access to the services they need and provides uninterrupted service without requiring any searches (Akçaöz & Akçaöz, 2023). Türkiye has shown significant progress in information and communication technologies since the 2000s. Public services initially began to digitalize through e-government applications, and this process has evolved into implementations in various fields (Çeliksoy & Akça, 2024).

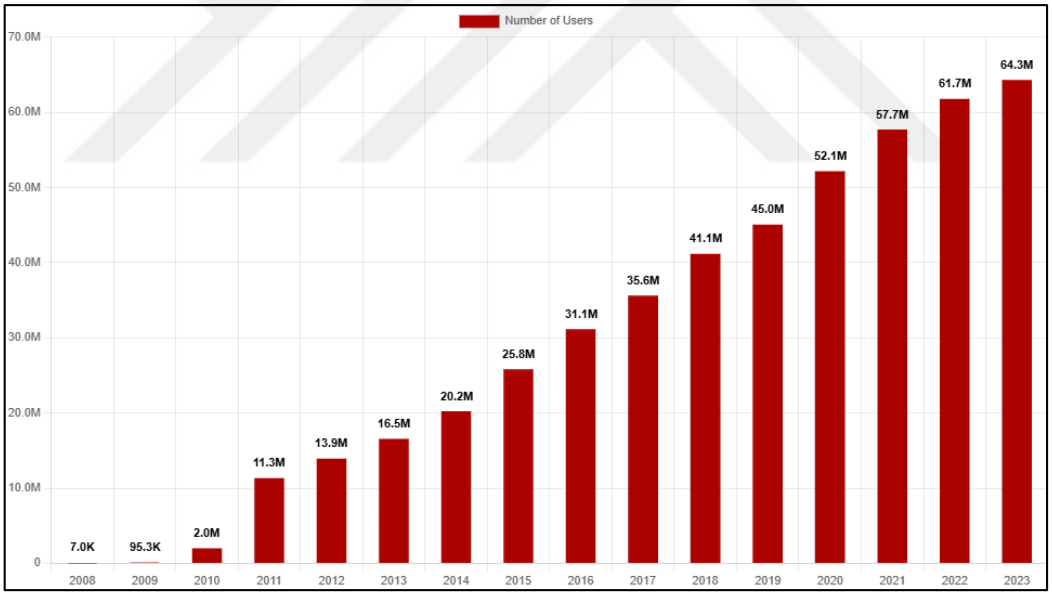


Figure 3.1. Development of the Number of e-Government Users in Türkiye Between 2008 and 2024

Source: Digital Transformation Office. (2024). e-Government Statistics 2024. https://cbddo.gov.tr/istatistikler/edevlet-istatistik-2024/

In 2008, the number of e-Government users was only 7.6 million, while by 2024 this number had reached 66.8 million. During this period, especially from 2010 onwards, a rapid and steady increase was observed. Between 2013 and 2016, the number of users increased by an average of 5 to 6 million annually.

The period after 2020 marked a significant acceleration in digitalization, and due to the impact of the pandemic, there was a substantial rise in e-Government usage. The number of users was 52 million in 2020, rising to 57.7 million in 2021, and 61.7 million in 2022.

Although growth continued in 2023 and 2024, the rate of increase slowed somewhat compared to previous years. During this period, the increase in the number of users was approximately 2.5 million.

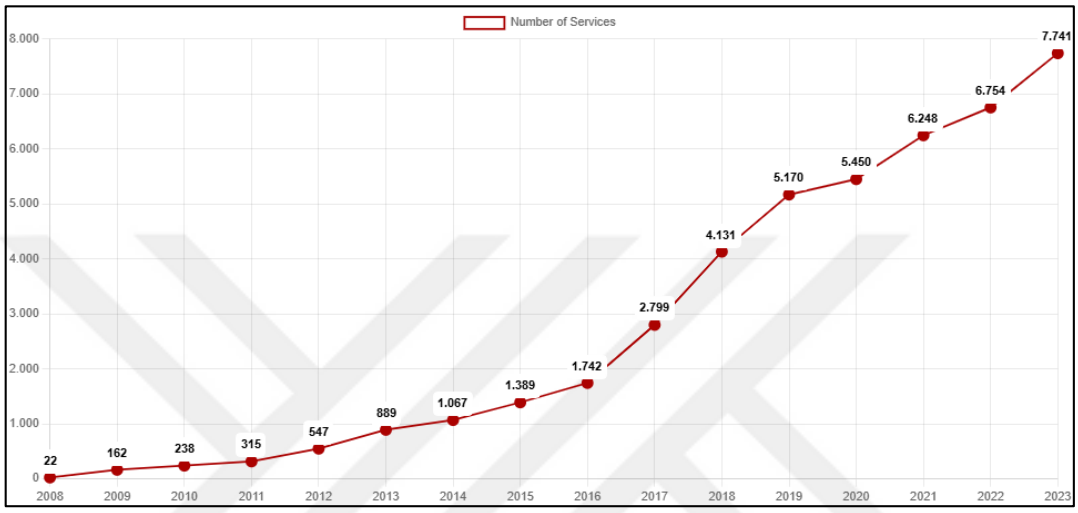


Figure 3.2. Development in the Number of Services Offered Through e-Government Between 2008 and 2024

Source: Digital Transformation Office. (2024). e-Government Statistics 2024. https://cbddo.gov.tr/istatistikler/edevlet-istatistik-2024/

One of the key indicators showing the development of the e-Government system is the increase in the number of services offered through the platform. In 2008, the e-Government platform provided only 22 services, but over the years, it has experienced significant growth. Until 2016, the increase was relatively limited, but from that year onward, a remarkable acceleration in the number of services was observed. The number of services rose from 1,742 in 2016 to 2,799 in 2017, 4,131 in 2018, and 5,170 in 2019. This upward trend continued after 2020, and by 2024, the total number of services offered through e-Government reached 8,309.

This development indicates that the diversity of digital public services in Türkiye is steadily increasing, allowing citizens to perform more transactions online. The growth in the number of services reflects both an improvement in the digitalization capacity of public institutions and a strengthening of citizens' habits in using digital channels. Moreover, this trend has significantly contributed to reducing bureaucracy and facilitating easier access to public services.

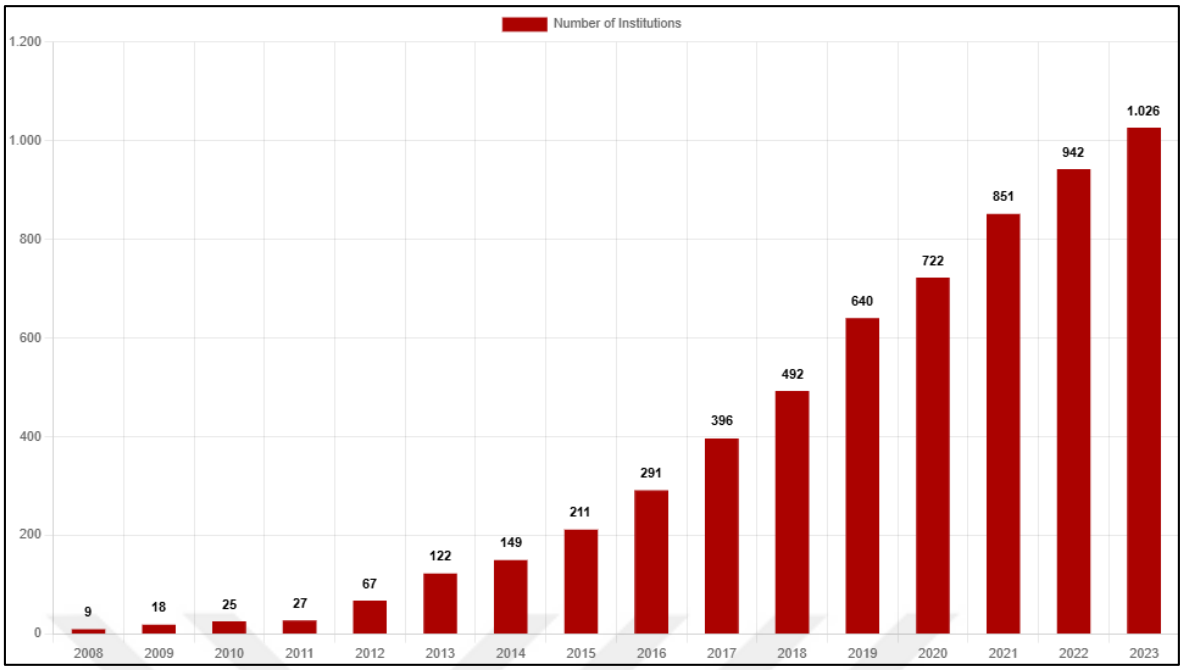


Figure 3.3. Development in the Number of Institutions Integrated Into the e-Government System Between 2008 and 2024

Source: Digital Transformation Office. (2024). e-Government Statistics 2024. https://cbddo.gov.tr/istatistikler/edevlet-istatistik-2024/

The e-Government system, which started serving with only 9 institutions in 2008, has shown significant growth over the years and reached 1,080 institutions as of 2024. This development demonstrates that public institutions have actively participated in the digital transformation process and placed importance on providing digital services.

Until 2012, the integration process proceeded relatively slowly; however, it accelerated after 2012. Especially from 2015 onwards, the integration process gained considerable momentum: the number of institutions increased from 492 in 2018 to 722 in 2020, 942 in 2022, and finally 1,080 in 2024. This growth indicates that e-Government has positioned itself as a central digital public service platform and has become a service delivery tool for almost every public institution.

The increase in the number of institutions allows citizens to carry out transactions with different institutions through a single digital platform, improving user experience and simplifying bureaucratic procedures. At the same time, it is an important indicator of the growing digital capacity of public institutions and the rising quality of service delivery.

> "Türkiye is above the world average according to the UN E-Government Development Index between 2008-2024. E-government development, which showed a gradual increase from the opening of the E-Government Gateway in 2008 until 2012, remained at its lowest level in 2012. It is seen that the largest increase was 20.6% from 2016 to 2018. Although there has been an 8.5% increase in the index score since 2018, it has been determined that Türkiye maintains its 53rd place among these years (Çankaya Kurnaz, 2024)."

Today, approximately 60 million people in Türkiye actively use the e-Government system. This figure is a concrete indicator that e-Government appeals to a wide user base and is a highly effective platform. In the future, it is expected that the range and quality of services offered by e-Government will diversify and improve further. To respond more effectively to the needs of both the government and citizens, this platform is continuously updated and made more efficient. In this context, e-Government will continue to exist as one of the most important tools in the digital transformation process.

3.2.2.2. State Organization Central Registration System (DETSİS)

Prime Ministry Circular No. 1991/17 aimed to align written communication within public institutions and organizations with technological developments and envisaged the creation of an automation coding standard accordingly. This initiative aimed to speed up correspondence among public institutions, facilitate document delivery, and enable efficient data sharing. Coordinated by the Prime Ministry, this regulation brought together all central, provincial, and overseas units of public institutions. In the initial phase, communication codes began to be used between institutions, laying the foundation of this system (Digital Transformation Office, n.d.).

Over time, parallel to technological advancements, electronic correspondence environments between institutions were established, and the infrastructure of the State Organization Database (DTVT) was further developed. With the Prime Ministry Circular No. 2011/1 published on February 10, 2011, the previous Circular No. 1991/17 was abolished, and a new system was decided to be established as the structure of the State Organization Database (DTVT). This new system aims to determine the hierarchical structures of public institutions and keep communication information up to date. Keeping data on a centralized platform has accelerated and facilitated data sharing between institutions (Digital Transformation Office, n.d.).

When the DTVT application was launched with Circular No. 2011/1, each institution was assigned a special identity code, and inter-institutional data sharing was enabled through these codes. Thanks to these codes, it became possible to organize the state organization within a centralized database. Every change recorded in the database is instantly processed in the system, and these operations are supervised by the Prime Ministry. One of the biggest innovations of DTVT is that each institution and unit is identified by a unique identity

number. This facilitated information sharing between institutions and ensured that all data was recorded in a standardized format (Prime Ministry, 2011).

DTVT is also structured to reflect the hierarchical organization of all branches of the state in the legislative, executive, and judiciary. This regulation strengthened coordination between institutions and allowed the effective use of the database. Additionally, every change made in the system is historically recorded and an archiving process is initiated. Thus, changes in organizational structures can be securely preserved (Digital Transformation Office, n.d.).

During the development process of DTVT, a new system called the State Organization Central Registration System (DETSİS) was launched in 2014. In this new system, instead of the identity codes for each institution and unit, 8-digit DETSİS numbers were used. Along with DETSİS, all units within the state organization were classified according to categories, status, and types. This system was developed to strengthen coordination between institutions and to provide access to statistical data related to the state organization (Digital Transformation Office, n.d.).

The greatest advantage of DETSIS is not only the hierarchical definition of the entire state organization but also the facilitation of storing and updating this data electronically. Additionally, DETSIS has been integrated with many public applications and has become widely used across various platforms, ranging from electronic document management systems to different databases. This integration has accelerated data sharing among public institutions and enabled the digitalization of state operations (Digital Transformation Office, n.d.).

The legal framework of DETSIS was strengthened with the "Regulation on Procedures and Principles to be Applied in Official Correspondences," published on February 2, 2015. This regulation made it mandatory for institutions to define and share their communication information electronically. In 2018, with a Presidential Decree, the legal basis of DETSIS was further consolidated, making it an essential part of digital transformation (Presidency, 2018).

As of 2022, DETSIS has been further reinforced by the Digital Transformation Office and has become one of the cornerstones of the "Digital Türkiye" vision. This process has facilitated the digitalization of public institutions and made data sharing more efficient (Presidency, 2022).

Finally, with changes made on March 28, 2025, the coordination for the digital definition of institutional processes within the state organization has started to be carried out by the Presidency General Secretariat (Presidency, 2025).

In conclusion, the evolution from Prime Ministry Circular No. 1991/17 to the development of DTVT and later DETSİS represents a significant advancement in the digital transformation of Türkiye's public institutions. By establishing standardized identity codes and centralized databases, these systems have greatly enhanced inter-institutional communication, data sharing, and organizational coordination. The integration of DETSIS with various public platforms and the strengthening of its legal framework have further solidified its role as a cornerstone of Türkiye's digital governance. With ongoing enhancements and recent shifts in coordination to the Presidency General Secretariat, these initiatives continue to support a more efficient, transparent, and modern public administration.

3.2.2.3. FATİH Project (2010)

The FATİH Project, announced by the Ministry of National Education in 2010, is an initiative aimed at increasing the use of technology in education. The project symbolizes both the conquest of Istanbul and transformation in education, with a vision to make fundamental changes in education through information technologies. Its core objectives include teacher training, enriching lessons with multimedia tools, and enabling students to develop independent learning skills. The project aims to create a major transformation in the education sector and to transform Türkiye into an information society (Akgül, 2015).

The pilot implementation began in 2010 in four schools and expanded in 2012 to 52 schools across 17 provinces, incorporating tablet computers for the first time. The project includes components such as providing each student with a tablet computer, installing interactive whiteboards in classrooms, and increasing teachers' digital skills. Additionally, the in-service training of 680,000 teachers was planned, and by 2012, more than 120,000 teachers had completed this training.

The FATİH Project not only aims to provide technological infrastructure but also to create equality of opportunity in education. It especially targets schools in socioeconomically disadvantaged regions to help reduce the digital divide. The project presents a significant opportunity for fundamental transformation in education and societal development (Education Reform Initiative, 2013).

In conclusion, the FATİH Project represents a comprehensive effort to integrate technology into Türkiye's education system, aiming to modernize teaching and learning processes. By providing digital tools such as tablets and interactive whiteboards, alongside extensive teacher training, the project seeks to foster independent learning and enhance educational equity—particularly in underserved regions. This initiative not only supports the development of digital skills among students and educators but also contributes to Türkiye's broader goal of becoming an information society, marking a transformative step toward the future of education.

3.2.2.4. Electronic Document Management System (EBYS)

The Ministry of Interior of the Republic of Türkiye is a public institution with a high volume of document traffic, placing great importance on information security and rapid access to information. Within this dynamic structure, traditional document management methods became insufficient, creating the need for a more advanced, faster, and secure solution. As a result of this need, the Electronic Document Management System (EBYS) was implemented within the scope of the e-Interior Project (Ministry of Interior, Directorate of Information Processing, n.d.).

The use of electronic document management systems in public institutions in Türkiye has been on the agenda since the early 2000s as part of digitalization policies. This process has progressed in parallel with e-government applications, supported by legal regulations that encouraged the widespread adoption of the system within institutional structures. Recent legislative changes have made the use of EBYS mandatory in public institutions. This obligation has required institutions to quickly adapt to systemic transformation. This digital transformation, which started with the goal of eliminating paper-based bureaucracy, has accelerated institutional adaptation (Tahtalıoğlu, 2018).

Digitally conducted business processes necessitate the creation, transmission, and use of documents in electronic form. Since document production in institutional workflows is directly related to task completion, transferring a task to another unit is only possible through the transfer of the related document. The digitalization of business processes naturally requires document processes to be transferred to digital platforms as well (Kandur, 2011).

With the implementation of EBYS, the Ministry has transferred its document management processes to a digital environment, achieving significant time and resource

savings. Centralizing documents has enabled end-to-end tracking of processes, improved reporting capabilities, and facilitated administrative supervision. The system has considerably shortened access time to information while ensuring the accuracy and reliability of documents more effectively.

Not only was the technical infrastructure established, but data standards were also developed to securely store all documents and process them consistently within the system. Thus, each unit requiring documents can rapidly access up-to-date and accurate information in a secure environment (Ministry of Interior, Directorate of Information Processing, n.d.).

With the directive issued by the Ministry of Interior on August 1, 2011, it became mandatory for all transactions and procedures to be conducted electronically within the scope of the e-Interior Project. Accordingly, document registration processes are fully performed in digital environments, and documents are initialed and signed with secure electronic signatures. Paper usage in internal correspondence within the institution has been completely eliminated, and documents are sent via electronic systems. All registration and reporting activities are managed through relevant modules in the system, thereby ending the practice of physical ledger keeping.

This digital transformation not only facilitated document management processes but also made significant contributions to environmental sustainability. Reducing paper consumption, eliminating the need for archiving space, and minimizing errors in manual processes demonstrate how strategic an investment EBYS is for the institution (Ministry of Interior, Directorate of Information Processing, n.d.).

In summary, the implementation of the Electronic Document Management System (EBYS) within the Ministry of Interior of the Republic of Türkiye represents a significant step towards modernizing public administration. By transitioning from traditional paper-based methods to a secure, efficient digital platform, the Ministry has enhanced information security, expedited access to documents, and optimized workflow processes. This digital transformation not only improves operational efficiency and administrative oversight but also supports environmental sustainability by reducing paper usage and physical storage needs. Overall, EBYS stands as a strategic investment that strengthens institutional capabilities and aligns with the broader goals of digital governance.

3.2.2.5. National Public Integrated Data Center (UKEVM)

In line with decision number 2013/104 taken at the 25th meeting of the Supreme Council for Science and Technology (BTYK), efforts have begun to establish the Turkish Public Integrated Data Center to eliminate the cost, security, and efficiency problems stemming from the fragmented structure of public institutions' data centers. The goal is to integrate data centers legally, technically, and administratively under a holistic model.

Supported by international examples (such as South Korea and the USA), this decision highlights the strategic importance of a centralized structure regarding cybersecurity, disaster recovery, business continuity, and public cloud services. It is predicted that with similar integration in Türkiye, resources will be utilized more efficiently and the digital government capacity will be strengthened (Supreme Council for Science and Technology [BTYK], 2013).

UKEVM is a high-security and sustainable data center designed to centrally and securely manage the IT infrastructure of public institutions. This structure eliminates the need for institutions to establish separate data centers, making resource use more efficient. Cybersecurity threats can be detected and prevented faster through the central system, and information security will be enhanced through standardized security protocols. Furthermore, cooperation among public institutions will increase, and more effective solutions to cyberattacks will be developed through shared experience and joint defense strategies. UKEVM will also contribute to the more economical and efficient delivery of IT services and the development of public IT strategies (Ministry of Transport and Infrastructure, n.d.).

In summary, the establishment of the Turkish Public Integrated Data Center (UKEVM) represents a critical step toward overcoming the challenges of fragmented data center infrastructures within public institutions. By adopting a centralized and secure model, Türkiye aims to improve resource efficiency, enhance cybersecurity, and ensure business continuity. Drawing on successful international examples, this integration supports stronger collaboration among public institutions and facilitates more effective responses to cyber threats. Ultimately, UKEVM is set to strengthen Türkiye's digital government capabilities and promote more sustainable and cost-effective IT service delivery across the public sector.

3.3. The 10th Development Plan Period (2014–2018)

The Grand National Assembly of Türkiye (TBMM) approved the Tenth Development Plan covering the 2014-2018 period in its 127th session held on July 1, 2013, prepared in accordance with Law No. 3067. With this decision, the plan officially came into effect and the related decision was recorded as Assembly decision number 1041 dated July 2, 2013 (Republic of Türkiye Ministry of Development [MD], 2013).

During the 10th Development Plan period, as of 2014, the presidency was transferred from Abdullah Gül to Recep Tayyip Erdoğan. Recep Tayyip Erdoğan served as Prime Minister until 2014, after which Ahmet Davutoğlu held the position until 2016, followed by Binali Yıldırım who served from 2016 to 2018. Throughout this period, the government continued to be led as a single-party administration by the Justice and Development Party (AKP).

3.3.1. Analysis of Contents and Goals in the 10th Development Plan

The introduction of the Tenth Development Plan presents it as a critical step towards Türkiye's 2023 goals, prepared in a period of ongoing global uncertainties. The plan offers a long-term and holistic development approach aimed at achieving a high level of welfare. It does not focus solely on economic growth but includes multidimensional goals such as the rule of law, information society, competitiveness, human development, environmental protection, and sustainability of resources. A human-centered development understanding was adopted, and the plan was prepared through a participatory method (MD, 2013).

The approach underlying the development plans is stated to focus on improving individuals' living standards, increasing society's overall welfare, and establishing a rights-based structure. Priorities in the planning process have been shaped around four main headings. Within this framework, it is emphasized that human-centered policies are important for strengthening the social structure of society, while economic development is envisioned to be supported by innovative production and structural transformation. Additionally, the plan highlights the importance of environmentally conscious and balanced spatial development, and at the international level, increasing collaborations that contribute to development goals is planned(MD, 2013).

The preparation of the plan involved wide participation, including contributions from academics, representatives from public and private sectors, NGOs, and local stakeholders.

Opinions were collected locally through Development Agencies, shaping the plan with contributions from more than seven thousand people (MD, 2013).

Under the title "Global Developments and Trends," the plan states that information today has become not only an economic but also a strategic value. In this context, innovation and technological developments are described as main elements of global competition. It is pointed out that production models based on scientific knowledge will be the fundamental driver of growth in the upcoming periods, and accordingly, research and development investments should not be left solely to the initiative of the private sector but also supported by public institutions (MD, 2013).

While it is stated that developed economies maintain leadership in research and development (R&D) and innovation in high value-added sectors, it is also noted that these countries have partially lost their competitive advantages in labor-intensive areas. In contrast, emerging economies such as China, India, and Brazil are developing knowledge-based production infrastructures and taking significant steps in this direction (MD, 2013).

Future technological advancements are expected to concentrate particularly around information technologies, automation systems, advanced manufacturing techniques, and health technologies. At the same time, it is emphasized that environmental sustainability and ethical principles are gaining increasing importance across many innovation fields ranging from digital communication to nanotechnology, biotechnology, and environmental technologies (MD, 2013).

From Türkiye's perspective, the rapidly changing global science and technology environment is seen as containing both opportunities and threats. With its young population, developing education system, and growing research capacity, the country is expected to increase productivity by transitioning to a knowledge-based production model. It is stated that if this transformation is successfully realized, Türkiye can move beyond the middle-income group and reach a higher income level (MD, 2013).

Under the heading of e-Government Applications in Public Services, a current situation analysis has been conducted. e-Government applications have made significant contributions to improving efficiency and effectiveness in public administration; they have laid the groundwork for delivering services with transparency, accountability, and participatory approaches. Thanks to these applications, citizens and businesses have largely been relieved of the time and cost burdens arising from public services (MD, 2013).

In line with the Information Society Strategy and Action Plan that came into effect in 2006, e-Government projects have been implemented. Within this scope, the e-

Government Gateway was launched, and by the end of 2012, nearly 600 services were integrated into this platform, reaching approximately 14 million users. Systems such as the Address Registration System and the Electronic Public Procurement Platform (EKAP) were established; the MERSİS and Turkish Identity Card projects have moved from pilot implementation to the dissemination phase. Digitalization steps have also been taken in many fields including justice, health, education, social security, law enforcement, and financial management (MD, 2013).

	2006	2012	2013	2018
Individuals Using e-Government Services (%)	26.7[2]	45.1	48.0	65.0
Enterprises Using e-Government Services (%)[3]	66.2	81.5[4]	85.0	90.0
Satisfaction Rate of e-Government Services (%)[5]	95.0[6]	94.4	97.5	98.0
Number of e-Govt. Gateway Registered User (Million Persons)	0.01	13.8	15.0	30.0
Number of Services Provided through e-Government Gateway	22[7]	547	700	3,000

Source: 2006 and 2012 data are from TURKSTAT and TURKSAT. 2013 and 2018 data are estimates of the Tenth Development Plan.
(1) The ratio of persons benefitting from e-government services to internet users of 16-74 age range.
(2) 2007 data
(3) The ratio of enterprises using e-government services to all enterprises having 10 and more employees.
(4) 2011 data
(5) The ratio of satisfied and medium level satisfied persons to total number of e-government services users.
(6) 2009 data
(7) December 2008 data

Figure 3.4. Developments and Objectives in e-Government (Presidency of the Republic of Türkiye, Strategy and Budget Department, 2014, p. 54)

Interest in e-Government services has increased at both individual and institutional levels, with the business sector using these services more intensively than citizens. In 2012, the satisfaction rate with e-Government services reached 94.4% (MD, 2013).

However, along with the development of the system, some problems have also emerged. Structural deficiencies within institutions, insufficient capacity of IT departments, and lack of human resources have caused disruptions in the implementation of e-Government projects. Furthermore, it has been noted that the existing procurement legislation is not sufficiently functional for ICT projects, and that the institutional capacities of public institutions need to be strengthened. Information security and the protection of personal data were emphasized as critical for the reliability and sustainability of e-Government services (MD, 2013).

An effective coordination mechanism is needed to ensure data sharing and interoperability among public institutions, and common standards and strategic approaches must be developed to deliver services in a more integrated and user-centered manner.

Additionally, making public data open and accessible aims to support the development of new services and products (MD, 2013).

The primary goal of the e-Government system is to provide services that are designed to meet the needs of all users, especially disadvantaged groups, accessible through various platforms, reliable, interoperable, integrated, and user-focused. In this process, the privacy of personal data and information security will be safeguarded, while promoting a public administration approach that is transparent, participatory, and accountable. The intended structure will both increase citizen satisfaction and ensure sustainability in the digitalization of public services (MD, 2013).

Under the heading of Science, Technology, and Innovation, during the Ninth Development Plan period, significant steps were taken to strengthen Türkiye's capacity in science, technology, and innovation. In this context, research and development (R&D) investments were increased, the private sector's contribution in this field grew, and research infrastructures were expanded. Additionally, there was an increase in the number of researchers; however, there remains a need for development in many areas (MD, 2013).

The share of R&D expenditures in GDP, which was 0.6% in 2006, rose to 0.86% by 2011. However, this ratio remained below both the EU average of 1.9% and the 2% target set in the Ninth Development Plan. In the same period, the number of full-time equivalent (FTE) researchers reached 72 thousand, falling short of the targeted 80 thousand. The number of FTE researchers per 10,000 employees was 30, which is considerably lower than the EU average of 70.3 (MD, 2013).

Research infrastructures in priority technology fields were strengthened at universities and public institutions, with approximately 2.4 billion TL resources utilized accordingly. 108 thematic advanced research centers have been established, and the establishment process of 65 centers is ongoing. These centers mainly focus on biotechnology, materials science, aerospace, defense industry, information-communication, and nanotechnology fields. Central research laboratories were completed in 20 universities, while work continues in 62 universities (MD, 2013).

It is necessary not only to increase resources allocated to R&D and innovation but also to use them more effectively. The commercialization of produced technologies, the establishment of interfaces for technology transfer, and the widespread promotion of innovative entrepreneurship stand out as needs. Moreover, public procurement should be restructured to encourage domestic technologies (MD, 2013).

To compete internationally in research and development (R&D), it is necessary to increase accreditation and standard-setting capacity. Research infrastructures should be diversified and sustainably used; a stronger cooperation structure between public and private sectors should be established. The development of the researcher workforce both quantitatively and qualitatively, especially increasing employment in the private sector, is required. Additionally, expanding regional and global joint projects, especially with EU countries, carries great importance (MD, 2013).

Under the heading of Science, Technology, and Innovation, in the Objectives and Targets section, the fundamental goal of science, technology, and innovation policies is to expand research and development (R&D) activities led by the private sector in order to increase Türkiye's global competitiveness. Accordingly, it is aimed to establish an ecosystem based on technology and innovation, to transform research outputs into economic benefits, to commercialize them, and to develop high-tech products with brand value. The ultimate goal is to increase the country's technology production capacity, strengthen domestic technologies, and achieve a strong position in the international market with high value-added products (MD, 2013).

Türkiye aims to restructure its science and technology policies in alignment with the private sector, result-oriented, and parallel to global trends. These policies aim to transform R&D into economic added value, increase high-tech products, strengthen university-industry cooperation, and support sustainable development based on technology foundations (MD, 2013).

The current situation analysis regarding Information and Communication Technologies (ICT) is stated in the plan as follows: In today's world, ICT plays a critical role in the economic growth of countries, increasing social welfare, and creating a qualified workforce. With the widespread use of mobile devices and the internet, the demand for information-based products and services has increased, and the transformation of countries into information economies has accelerated (MD, 2013).

Türkiye started its transition to the information society in 2003 with the "e-Transformation Türkiye Project" and, within this framework, implemented the first information society strategy and action plan between 2006 and 2010. According to the plan, significant developments have been achieved in fixed and mobile broadband internet access in recent years. The rate of individual internet usage, which was 30.1% in 2007, increased to 47.4% by the end of 2012. In the same year, the number of fixed broadband subscribers reached 7.8 million, fiber subscribers 645 thousand, and 3G mobile internet subscribers

exceeded 12.2 million. The rate of enterprises using the internet approached 95%. However, despite these developments, the effective and conscious use of ICT across all segments of society has not been sufficiently achieved. It has been stated that the digital divide needs to be closed, the competitiveness of the sector increased, and broadband services further improved in terms of speed, quality, and cost. The need for a strong sector structure in information technologies and for producing value-added software and services continues, and the shortage of qualified human resources in this sector remains a significant problem (MD, 2013).

Steps have been taken in the field of cybersecurity, and the Cybersecurity Board has been established within the Ministry of Transport and Infrastructure. However, legal regulations regarding the protection of personal data and national information security still need to be completed (MD, 2013).

In line with the goal of accelerating the transition to the information society, it is stated that the effective and widespread use of information and communication technologies across society will be ensured, and these technologies will be used as tools for creating qualified employment and transitioning to a knowledge-based economy. Additionally, it is emphasized that the development of high value-added components of these technologies within the country will be encouraged through the promotion of domestic production (MD, 2013).

In the field of broadcasting, the completion of the digital transformation, diversification of infrastructure and services, and the provision of public service broadcasting with content targeting different segments of society are aimed. To carry out the transition to the information society effectively, coordinated and complementary efforts involving all stakeholders will be realized. In this process, the new information society strategy and action plan will be adopted and implemented (MD, 2013).

The quality and accessibility of communication infrastructure will be increased; in particular, fiber and mobile networks providing high-speed internet connections will be expanded. The effectiveness of regulations in the field of electronic communications will be enhanced, and an environment of competition and cooperation in the sector will be supported. Türkiye aims to become an international data transmission hub (MD, 2013).

In public procurement, especially in large-scale projects such as the FATİH Project, domestic production support and the development of small enterprises will be considered. R&D and export supports for information and communication technologies will be efficiently implemented by focusing on identified priority areas (MD, 2013).

Smart city applications will be expanded in areas such as health, transportation, energy, construction, water, and disaster management; the digital infrastructure and capacities of cities will be strengthened. Awareness of the economic and social benefits of ICT use across society will be raised, and individuals' digital skills will be improved (MD, 2013).

The production of digital content such as mobile applications, digital games, software, and information technology services will be encouraged; the development of Turkish content on the internet will be ensured in terms of both quantity and quality. Legal frameworks in the areas of personal data protection and national cybersecurity will be completed (MD, 2013).

In summary, the Tenth Development Plan outlines a comprehensive and multidimensional approach to Türkiye's long-term development goals, especially in the face of global uncertainties. It prioritizes not only economic growth but also social welfare, environmental sustainability, and human-centered policies to improve living standards and strengthen societal structures. The plan underscores the critical role of innovation, science, and technology in driving economic transformation, emphasizing the need for increased research and development investments and stronger collaboration between public and private sectors.

The plan highlights significant progress in e-Government services, digital infrastructure, and ICT adoption, while recognizing ongoing challenges such as institutional capacity limitations, cybersecurity concerns, and the digital divide. It calls for improved coordination, data sharing, and the establishment of common standards to enhance public service delivery. The importance of developing qualified human resources, supporting domestic technology production, and expanding digital skills across society is also stressed.

Furthermore, Türkiye aims to build a knowledge-based economy by encouraging high-tech production, innovation commercialization, and integration into global research networks. Overall, the plan serves as a strategic framework to accelerate Türkiye's digital transformation, increase competitiveness, and ensure inclusive, sustainable development aligned with global trends and national priorities.

3.3.2. Application Areas and Implemented Projects

In recent years, Türkiye has made significant strides in integrating information and communication technologies (ICT) into public services, aiming to improve efficiency,

accessibility, and citizen participation. Various digital platforms and systems have been developed to address critical societal needs, from healthcare management and women's safety to secure inter-institutional communication and enhanced citizen-government interaction. Applications such as e-Nabız empower individuals by granting them direct access to their health information, fostering informed decision-making and active involvement in treatment processes. Similarly, KADES (Women's Emergency Support System) leverages technology to provide rapid assistance and reporting mechanisms for violence against women, significantly contributing to public safety.

At the institutional level, initiatives like KamuNet aim to secure data transmission among public entities, strengthening cybersecurity and ensuring reliable service delivery. The Digital Transformation Office, until its recent closure, played a pivotal role in coordinating Türkiye's digitalization efforts across public administration, focusing on emerging technologies like artificial intelligence and big data. Additionally, platforms such as CİMER facilitate transparent and efficient communication between citizens and the state, promoting democratic participation and enhancing public service quality. Collectively, these digital initiatives highlight Türkiye's commitment to modernizing governance, safeguarding citizen rights, and fostering a more inclusive, technology-driven public service environment.

3.3.2.1. e-Nabız

According to Article 56 of the Constitution, the state has the obligation to protect the physical and mental health of individuals. This duty has been assigned to the Ministry of Health by Article 2 of Decree Law No. 663. Within the same decree, the responsibility for determining policies, strategies, and standards related to health information systems belongs to the General Directorate of Health Information Systems. Within this legal framework, the Sağlık.Net Online and e-Nabız systems have been developed to increase efficiency at every stage of the health system, from preventive health services to treatment processes, ensure the secure storage of personal health data, and provide individuals with access to their health information. Thus, citizens can make informed decisions about their health, and efficiency is achieved in diagnosis and treatment processes, preventing resource waste. Protecting individual privacy, data security, and legal compliance are prioritized in the development of these systems. Due to the protection of individual health rights and their contribution to public finance, these applications hold strategic importance for public health (T.C. Ministry of Health, 2016).

The e-Nabız application aims to increase patients' active participation in the treatment process by allowing them to access their own health data, which is a significant advancement in modern medicine. Since uninformed patients cannot give informed consent, this access can reduce the information asymmetry between patients and doctors. However, the application also carries the risk of violating patient privacy; therefore, understanding the concept of privacy well and strengthening security measures is necessary to protect personal health information (İleri & Uludağ, 2017).

The use of the e-Nabız application is especially widespread among individuals with higher education levels, whereas awareness of the application is low in smaller and less populated districts. Due to less crowded health institutions in these districts, citizens' need for e-Nabız decreases. For chronic patients and frequent users of health services, however, the application provides significant benefits by facilitating health monitoring. Therefore, the Ministry of Health organizing public service announcements and training activities to increase awareness of e-Nabız will support reaching broader audiences. Overall, the use of information technologies in the health sector increases accessibility and satisfaction with services, making the widespread adoption of e-Nabız important (Yeşiltaş, 2018). In summary, e-Nabız represents a crucial step towards a more transparent, efficient, and patient-centered healthcare system in Türkiye, highlighting the importance of digital solutions in modern health management.

3.3.2.2. KADES (Women's Emergency Support System)

Advances in information and communication technologies are creating new opportunities in the delivery of public services. The use of these technologies is increasingly widespread in Türkiye, with particular attention to applications aimed at preventing violence against women. Projects such as the Women's Emergency Support System (KADES) and the Alo 183 Social Support Line have proven effective in preventing risks of violence and dangerous situations (Demir & Nalbant, 2023). As one of the significant steps to prevent crimes, the KADES application, launched on March 24, 2018, was developed by the General Directorate of Security to enable the rapid reporting of violence and crimes against women and children. Users who download KADES to their phones can instantly notify authorities about dangers they encounter. Additionally, through the "online reporting" system offered on the Ministry of Interior's website, citizens can file complaints and contribute to crime prevention (Kaplan & Yıldırım, 2022). According to data published on the Ministry of

Interior's official website, since its launch on March 24, 2018, the Women's Support Application (KADES) has reached a large user base. As of January 2025, the number of women who have downloaded the application to their mobile phones reached 7,830,000. Users have made a total of 1,480,000 reports via the application, and assistance has been provided to 920,000 women victims of violence. The application enables quick and effective intervention by allowing users to reach the 155 Police Emergency Call Center with a single button press using location information (Ministry of Interior, 2025). Overall, KADES has become a vital tool in enhancing the safety and empowerment of women, demonstrating how digital technologies can effectively support violence prevention and rapid response efforts.

3.3.2.3. KamuNet (Public Virtual Network)

With the General Directive No. 2016/28 issued by the Prime Ministry, the security of information technology services of public institutions has been aimed. Within this scope, it was decided to establish a new infrastructure to enhance the security of data transmission and processing for public institutions. This infrastructure, named KamuNet, aims to provide communication between institutions independently from the internet, securely, and protected against cyber attacks. Furthermore, it will facilitate the secure use of e-Government applications and enable the creation of common infrastructures. The project is carried out in cooperation with the Ministry of Transport, Maritime Affairs and Communications and Türk Telekom, and it has been stated that all public institutions should be included in this infrastructure (T.C. Prime Ministry, 2016). KamuNet plays a crucial role in strengthening the cybersecurity of public institutions, ensuring that data transmission and communication remain secure and reliable. By providing a dedicated network independent of the internet, it supports the seamless and safe delivery of e-Government services across Türkiye. This infrastructure is essential for protecting sensitive information and enhancing trust in digital public services.

3.3.2.4. Digital Transformation Office

Increasing global competition and efforts to achieve sustainable development goals require all stakeholders—including the public and private sectors, civil society, and academic circles—to conduct more integrated and effective cooperation. With the transition to the Presidential Government System in Türkiye, a faster and more efficient public

administration structure has been established; within this framework, digitalization activities carried out in various institutions have been centralized under the Digital Transformation Office (DTO) (Presidency of the Republic of Türkiye, Digital Transformation Office, n.d.).

The Digital Transformation Office, one of the offices affiliated with the Presidency, is responsible for directing and coordinating the digital transformation of the public sector. Established by Presidential Decree No. 1, which came into effect on July 10, 2018, this institution is authorized to carry out tasks such as the development of digital public services, projects in areas like artificial intelligence and big data, support for national technology production, and strengthening cybersecurity. The office is also positioned as a key institutional actor in making strategic decisions during Türkiye's digitalization process (Presidency of the Republic of Türkiye, 2018).

The Digital Transformation Office Presidency, established under Presidential Decrees, is a central structure responsible for guiding Türkiye's vision of digital public administration. The office leads the public digital transformation process within the strategy and policies defined by the Presidency. Its primary responsibilities include ensuring the effective delivery of Digital Türkiye (e-Government) services, strengthening inter-institutional cooperation, and creating a roadmap for public digital transformation. Furthermore, it promotes multi-stakeholder participation in the design and implementation of digital public services by developing partnerships with the private sector, universities, and civil society organizations. The strategic use of advanced technologies such as big data and artificial intelligence in public administration, and the widespread adoption of domestic and national digital solutions, are also among the office's priority areas.

Additionally, the office is authorized to provide technical opinions on project proposals related to public investments, monitor implementation processes, guide public institutions in digital technology procurement processes, and establish cost-effective strategies. Coordination of defining and managing government units in the digital environment is also part of its responsibilities. Beyond these duties, the Digital Transformation Office fulfills additional tasks assigned by the President (Presidency of the Republic of Türkiye, Digital Transformation Office, n.d.).

The office aims not only to transfer public services to digital platforms but also to increase efficiency in decision-making processes, strengthen public-private sector cooperation, and develop technological capacity through domestic and national solutions. Artificial intelligence, big data, national technologies, and cybersecurity form the core focus areas of the office, aiming to redefine public services in terms of transparency, speed, and

accessibility. As a strategic institution leading Türkiye's digitalization process, the Digital Transformation Office serves as the institutional bearer of the "Digital Türkiye" vision (Presidency of the Republic of Türkiye, Digital Transformation Office, n.d.). The concept of Digital Türkiye represents a new-generation public administration approach based on delivering public services digitally to citizens. The objective is to provide public services that are easily accessible, effective, uninterrupted, fast, and secure for individuals. With this digitalization process gradually replacing the traditional bureaucratic structure, it is aimed that every citizen can access public services effortlessly using the capabilities of information and communication technologies. Thus, the interaction between the state and individuals becomes more transparent, participatory, and user-centered (Presidency of the Republic of Türkiye, Digital Transformation Office, n.d.).

With Presidential Decree No. 183 dated March 28, 2025, Articles 527, 527/A, 527/B, 527/C, 527/Ç, 527/D, and 527/E in Presidential Decree No. 1 concerning the Digital Transformation Office were repealed. Accordingly, all regulations defining the duties, service units, and organizational structure of the office were removed from the legislation. This change indicates that the Digital Transformation Office has been closed (Presidency of the Republic of Türkiye, 2025).

The Digital Transformation Office served as a central institution driving Türkiye's strategic vision for a modern, digital public administration by integrating advanced technologies such as artificial intelligence and big data into governmental processes. Its establishment facilitated enhanced coordination among public institutions and promoted multi-stakeholder collaboration, which are critical for successful digital transformation. The office's closure, as indicated by the recent legislative repeal, represents a notable institutional change that may impact the continuity and coherence of ongoing digitalization efforts. This development necessitates the design of alternative governance mechanisms to sustain progress, ensure effective policy implementation, and maintain the momentum toward achieving a transparent, efficient, and citizen-centered public service delivery system in line with international best practices

3.3.2.5. CİMER (Presidency's Communication Centre)

CİMER is the abbreviation for the Presidency's Communication Centre and is a comprehensive public communication platform established to enable citizens to easily exercise their petition and right to information. Operating under the Presidency

Communication Directorate, this system receives applications electronically, directs them to the relevant public institutions, and ensures the follow-up of responses. Additionally, it serves as an interactive platform where citizens can convey their opinions and suggestions about public policies.

CİMER is a platform created to allow citizens to quickly and effectively communicate their opinions, suggestions, and complaints regarding the government. Applications are rapidly forwarded to the relevant institutions and monitored throughout the response process. The system aims to strengthen communication between citizens and the state while facilitating easier use of petition and information rights. CİMER informs the public with principles of transparency, speed, and accuracy, and evaluates the impact of public policies on society. By providing users with easy access, application tracking, and support services, it increases democratic participation and contributes to improving the quality of public services (Presidency's Communication Centre [CİMER], n.d.).

The Presidency's Communication Centre (CİMER) is one of the most important communication tools between the nation and the state. With the new government system in 2018, it transformed into a comprehensive platform allowing direct communication between the public and the Presidency. Besides enabling the exercise of petition and information rights, the system allows citizens to share their opinions and suggestions on public policies, covering a broad service network that includes about 60,000 public units. Formerly operating as the Prime Ministry Communication Center (BİMER), it was restructured under the name CİMER due to technological advancements and an increasing number of applications. In 2021, the number of applications to CİMER reached 6 million, a volume that necessitated better regulation of the service. Therefore, with the implementation of CİMER Regulation No. 5690 in 2022, the system's functioning and principles were officially defined (Presidency's Communication Centre, 2022).

The rising number of applications enhances the system's effectiveness, and the increase in information requests reflects positive developments in democratic awareness. Thanks to CİMER, state institutions can quickly analyze large and complex data, thereby contributing to policy development processes. CİMER holds a significant place among e-government applications, both improving service quality and increasing citizen participation in governance and trust in the state (Selvi, Ulucan & Eser Coşgun, 2019).

CİMER is a platform that facilitates citizens' online participation and raises digital citizenship awareness in line with digital governance principles. In Türkiye, projects like "Sharing the Dream of the Century of Türkiye" and "Participate in Governance" support

citizen engagement in governance. Demographic and application data regularly collected by CİMER are shared with public institutions; however, making this data publicly accessible is important for effective public opinion formation.

Because some complaints remain unresolved, independent monitoring of the process and transparent evaluation of responses could increase citizen trust. Moreover, inter-institutional cooperation to identify and report regional issues, with regular public release of these reports, would help society approach its problems more sensitively. Improving CİMER's user guidance system by adding tools like digital assistants could simplify application processes. Such approaches would contribute to broader participation and the establishment of more effective citizen-state relations (Dede, 2024).

CİMER exemplifies a significant advancement in fostering transparent, responsive, and participatory governance by bridging the communication gap between citizens and the state. As a comprehensive e-government platform, it not only facilitates the exercise of fundamental rights such as petitioning and access to information but also enhances democratic engagement by enabling direct public input on policy matters. The system's capacity to process and analyze large-scale citizen feedback supports evidence-based policymaking, reflecting a modern governance approach aligned with digital transformation principles. However, to fully realize its potential, further improvements in transparency, independent oversight, and technological enhancements—such as AI-driven user support—are essential. Strengthening inter-institutional collaboration and public dissemination of complaint data would foster greater trust and inclusivity, thereby reinforcing CİMER's role as a cornerstone of digital citizenship and participatory democracy in Türkiye.

3.4. The 11th Development Plan Period (2019–2023)

The Grand National Assembly of Türkiye (TBMM), within the framework of Law No. 3067 dated October 30, 1984, approved the Eleventh Development Plan covering the years 2019-2023 during its 105th session held on July 18, 2019. This decision was formalized with TBMM's resolution numbered 1225 on the same date (Presidency of Strategy and Budget Office [PSBO], 2019)

Between 2019 and 2023, which falls within the scope of the 11th Development Plan, the Presidential Government System was officially implemented in Türkiye, with Recep Tayyip Erdoğan serving as President. During this period, the office of the Prime Minister

was abolished. The government has since been administered under the Presidential Government System by the Justice and Development Party (AKP).

3.4.1. Analysis of Contents and Goals in the 11th Development Plan

The introduction section of the Eleventh Development Plan (2019-2023), prepared under the Presidential Government System, states that the plan offers a long-term vision for the future of Türkiye. It aims to meet the fundamental values and expectations of the people, strengthen the country's position in the international arena, and improve the quality of life for citizens (PSBO, 2019).

This plan represents the first five-year phase of a comprehensive 15-year strategy, targeting comprehensive transformations and breakthroughs in every sector. During this period, priorities include structurally transforming the economy based on sustainability and stability, achieving significant progress in education, and supporting technological development through the national technology initiative (PSBO, 2019).

The plan was designed considering the international environment characterized by increasing complexity in global cooperation, rapidly changing economic and political power balances, and the emergence of new centers of power among developed and developing countries.Worldwide, rising political, economic, and financial risks, increasing technological competition and protectionist tendencies, and rapid shifts in conflicts and alliances make it difficult for countries to maintain fixed positions in certain areas. On the other hand, global power centers are moving towards more strategic management of development and growth processes, strengthening their capacity in critical technologies, and acting in a planned manner in economic decisions. These developments increase the need for planned development processes, and the Eleventh Development Plan will serve as a guide for medium and long-term strategies that ensure the efficient use of economic and social resources (PSBO, 2019).

The plan aims to increase national productivity, gain international competitive advantage through the national technology initiative, and achieve economic and social development that creates higher added value. The rule of law, strong democracy, and protection of fundamental rights are accepted as the cornerstones of development; economic stability and sustainability, together with support for human, social, and spatial development, equitable distribution of welfare, and a lasting development orientation are among the priority goals (PSBO, 2019).

With the spread of digital technologies, cyber attacks have increased, leading countries to focus on strengthening technical and human resources for cyber defense. Additionally, while some countries advocate for freedom in the international sharing of digital data, others demand strict regulations to protect data privacy (PSBO, 2019).

Economic and geopolitical fluctuations worldwide increase uncertainties, thereby reinforcing the need for international cooperation and policy harmonization. To lay a solid foundation for Türkiye's development goals, it is necessary to take measures against the problems caused by global crises and to maintain an active and constructive role as an international actor in strengthening regional and global peace and ensuring shared prosperity (PSBO, 2019).

Türkiye has limited capacity compared to developed countries in many innovative technologies. To adapt to technological advances, it is crucial to increase the qualified workforce in priority sectors, disseminate technology to businesses, improve firms' innovation and organizational capabilities, support research and development (R&D) activities, and make financing mechanisms more effective. These goals are among the fundamental strategies to enhance the country's competitiveness within the scope of the Eleventh Development Plan (PSBO, 2019).

For national security, Türkiye needs to strengthen its capacity to develop technology in cybersecurity and data privacy, meet the demand for qualified human resources, complete its institutional structure, and keep the legislative infrastructure updated and flexible to prevent risks that technological developments may bring (PSBO, 2019).

Additionally, the need for vocational education and institutional reform aligned with new skills and working models required by technological transformation persists, and the young population offers a significant opportunity to support this transformation (PSBO, 2019).

Significant progress was made in R&D and innovation during the Tenth Development Plan period. R&D expenditures, as a percentage of GDP, increased from 0.82% in 2013 to 0.96% in 2017; support programs diversified; private sector R&D expenditures and the number of researchers increased. Furthermore, with the enactment of Law No. 6550 on Supporting Research Infrastructures in 2014, the spread and efficiency of infrastructures were enhanced. Nevertheless, the need to develop knowledge transfer, entrepreneurship, and commercialization activities that will convert R&D results into economic and social benefits continues (PSBO, 2019).

During the plan period, the use of information and communication technologies (ICT) by businesses, citizens, and institutions increased significantly. Broadband access, in particular, was expanded; broadband subscription rates rose from 42.5% in 2013 to 90.8% in 2018. During the same period, the length of fiber optic cables in Türkiye's communication infrastructure increased from 227,000 to 355,000 kilometers. The ICT sector grew in real terms, and there were significant increases in information technology exports. The number of startups operating in innovative areas such as e-commerce and digital gaming increased. However, the ICT sector still requires qualified human resources and effective policies to support especially software companies in growing and accessing international markets (PSBO, 2019).

Under the main heading of competitive production and productivity, the concept of digital transformation was included in the development plan for the first time. Within the subheading of digital transformation, it was stated that the primary goal is to accelerate digital transformation in order to increase productivity and competitiveness, especially in priority sectors. In this context, standards and interfaces that will strengthen information sharing and cooperation to support digitalization in the manufacturing industry will be developed. A Digital Transformation Platform for Industry will be established to coordinate this process, and permanent committees on digital education, data communication, and technological developments will be formed within the platform (PSBO, 2019).

Efforts will be made to disseminate international digital standards in our country and to establish local norms. A "Digital Transformation Terminology Dictionary" will be prepared to develop a common understanding. Additionally, the digital maturity levels of firms in priority sectors will be measured, and comparisons between firms will be made to predict the impacts of transformation investments in advance. To support businesses in the digitalization process, a digital application library containing technology solutions, best practices, educational content, and guide documents will be created. This will enable firms to better analyze the costs and benefits they face during digital transformation (PSBO, 2019).

Under the heading of Critical Technologies, the goal is set as achieving technological transformation in priority sectors and increasing national competitiveness by enhancing the capacity to develop original technologies and adapt existing technologies in critical technology areas expected to generate high added value in the future (PSBO, 2019).

At this point, some strategies and measures have been taken. In line with the National Technology Initiative, development plans will be prepared for artificial intelligence, the Internet of Things, augmented reality, big data analytics, cybersecurity, energy storage

solutions, advanced materials science, robotic systems, micro/nano/opto-electronics, biotechnology, quantum technologies, sensor technologies, and additive manufacturing methods. During this process, the necessary technical infrastructure will be established, qualified human resources will be trained, and the society will be directed towards these fields (PSBO, 2019).

Comprehensive technology roadmaps will be prepared for critical technology areas, taking into account the current status of human resources and the private sector's capacity for technology development and adaptation, technological development potential, and long-term supply-demand balances. To increase human resource capacity, the skills and expertise needed in critical technologies will first be analyzed in detail. Accordingly, interdisciplinary undergraduate and graduate education programs specializing in these fields will be implemented. Additionally, special support mechanisms will be established to send graduate students on scholarships to international educational institutions with high competence in these areas. Universities with specialized programs in critical technology fields will be encouraged to host part-time faculty and researchers from abroad who are experts in their fields (PSBO, 2019).

Within the scope of strengthening research infrastructure, the laboratories and research and development (R&D) facilities of universities specialized in critical technology fields will be developed according to the needs of technological research. To increase the private sector's capacity in these critical areas, special R&D support programs for innovative entrepreneurs will be created. If large-scale firms conduct R&D projects focused on critical technologies in partnership with public or university research institutions, part of the costs borne by the entrepreneur for the project will be covered by the state. Furthermore, cooperation for joint R&D projects, infrastructure usage, and human resource development activities in critical technology areas will be supported. Strategic countries for cooperation in critical technology areas will be identified, and bilateral and multilateral R&D and innovation collaborations between private sector-university and private sector-private sector will be encouraged with these countries (PSBO, 2019).

The primary goal in the fields of science, technology, and innovation is to develop the capacity to produce and utilize knowledge and to establish a dynamic and effective research-innovation ecosystem that supports high value-added products and services. In line with this goal, strengthening the role of universities in research and development (R&D) activities is of great importance. Universities' research infrastructures will be improved, and project budgets will be increased in both quantity and quality. Moreover, support and

coordination units will be established within the Higher Education Council (YÖK) to enhance collaboration and coordination among universities, aiming to implement projects that are compatible and effective with the Development Plan goals. To support high value-added R&D and innovation activities, Research University programs will be developed, and special support will be provided to these universities. In addition, foundation universities will be encouraged to allocate funds from student revenues to R&D expenditures (PSBO, 2019).

Effective use and widespread dissemination of research infrastructures are also among the priorities. Comprehensive inventory studies are being conducted to increase the accessibility of higher education institutions and public research infrastructures, ensuring more efficient use of resources. Legislation and support mechanisms are being strengthened to enhance the capacity of research infrastructures in critical technology areas. Additionally, the outputs and performance of these infrastructures are regularly monitored, and regulations encouraging the development of critical technology products are being implemented. Efforts are ongoing to redefine application and research centers and technological research centers under the Higher Education Law according to their different types. Centers falling outside this scope are planned to be supported through performance-based budgeting (PSBO, 2019).

Increasing the number and quality of R&D personnel is also an important part of the ongoing efforts. Policies such as increasing the employment of postdoctoral researchers at research universities and encouraging competent scientists abroad to work in Türkiye through the international leading researchers program are being implemented in this regard. Infrastructure and financial support are also provided to enable successful Turkish scientists abroad to participate part-time in education and research activities in the country. While the number of personnel in research infrastructures is being increased, measures are taken to facilitate the employment of foreign experts, and regulations are made for the employment of qualified R&D personnel at research centers affiliated with ministries. The number of experienced researchers in publicly supported R&D projects is increased by raising the number of scholarship recipients, and doctoral scholarship programs are improved (PSBO, 2019).

By increasing qualified human resources and research activities in basic sciences, graduate scholarship programs suitable for the needs of priority sectors and technology fields are being developed. Basic and applied research with high potential to create added value is encouraged, and national and international training and research activities are organized to develop researcher capacity in these fields (PSBO, 2019).

International cooperation also holds an important place. Especially, participation in European Union (EU) research and innovation programs is being increased with higher return rates. Promotion, capacity building, and rewarding activities for these programs are conducted, and alignment with national programs is ensured. Developing human resources for technology production from an early age is also prioritized. In this context, the Deneyap Technology Workshops are being expanded to provide technology education to tens of thousands of young people. Moreover, broader audiences will be reached through science workshops and mobile science exhibitions (PSBO, 2019).

In the field of polar research, Türkiye's international position is being strengthened, institutional capacity is increased, and preparations for establishing a base in Antarctica are being completed. In the aviation and space sectors, the National Space Program is being prepared and implemented to increase Türkiye's global competitiveness. The institutional capacity of the Turkish Space Agency is being developed to enhance its effectiveness. All these strategies and implementations serve the goals of ensuring sustainable progress in science, technology, and innovation, increasing international competitiveness, and supporting economic development in Türkiye (PSBO, 2019).

Under the heading of developing information and communication technologies, it is emphasized that the development and effective use of these technologies are among the key priorities for increasing the productivity level of the economy and strengthening its competitiveness.In this direction, the renewal and optimization of business processes through digital transformation is aimed. To reach these goals, the rapid and quality-wide dissemination of fixed and mobile broadband access infrastructures throughout the country has been adopted as a priority policy. The shared use of physical infrastructures will be encouraged to ensure more efficient evaluation of resources. The permitting processes regarding the installation and operation of electronic communication infrastructures will be improved and accelerated, and the regulation of critical elements such as fiber optic networks, base stations, and rights of way will be carried out (PSBO, 2019).

It is planned to implement broadband infrastructures in commercially unprofitable regions through state-supported investments, and obstacles to such investments will be removed considering regional differences. Providing access to settlements where mobile communication infrastructure does not exist is also among the priority activities. Regulations in the electronic communication sector will be periodically updated, considering technological developments and regional supply-demand differences, and the sector's adaptation to convergence trends will be aimed. New regulations will be made in areas such

as authorization, access, interconnection, user rights, and universal service in light of new technologies. The allocation of frequency resources will be carried out in accordance with international standards suitable for 5G and subsequent mobile communication technologies (PSBO, 2019).

To increase domestic production in the information and communication technologies sector, local value-added focused regulations will be applied in public procurements and contracts made with private operators. The needs of public institutions and the capacity of firms that can provide services will be aligned, small and medium-sized enterprises (KOBİ) and new startups will be supported, and a competitive market environment will be created. In this scope, procedures and principles will be determined and institutional procurement plans will be prepared to increase the domestic content rate in public ICT investments. In addition, domestic producers will be supported in 5G and advanced technology services, and certain localization requirements will be applied in providing these services (PSBO, 2019).

In satellite technologies, priority will be given to solutions developed with domestic resources, and Türkiye's satellite network's global coverage will be expanded. Alongside TÜRKSAT 5A and the TÜRKSAT 6A satellite, which is entirely developed with domestic capabilities, will be commissioned, and satellite communication capacity in air and sea territories will be increased through cooperation with international satellite operators (PSBO, 2019).

Türkiye will implement the necessary legal regulations and incentive mechanisms in line with the goal of becoming a regional center in data storage, processing, and transmission. The infrastructure and procedures required for the establishment of an Internet Exchange Point (IXP) will be created, and a regulatory framework and incentives supporting the development of the data center sector will be provided. Furthermore, cooperation in cloud services with countries having intensive commercial relations will be increased (PSBO, 2019).

To raise the maturity level of the domestic software sector, a sectoral data infrastructure will be established, software development standards will be widespread, and quality certifications will be encouraged. State incentives will be structured holistically to cover research and development (R&D), product development, and marketing processes. With the development of the open-source software ecosystem, the aim is to increase domestic added value and reduce security risks. Within this scope, the Türkiye Open Source Platform will be launched, where critical software needed by the public and private sectors will be developed through mass collaboration. At the same time, internationally recognized

certification programs and widespread online training models will be implemented to train software developers. A national policy will be determined for the development and widespread use of artificial intelligence technologies, and a roadmap will be prepared to increase AI production capacity and to use these technologies effectively across all economic sectors (PSBO, 2019).

To ensure national cybersecurity, institutional structures will be established and technical infrastructure strengthened. The cybersecurity strategy will be updated in alignment with the European Union's Network and Information Security Directive, and new cybersecurity standards will be developed in areas of need. Information security management systems will be established in critical infrastructures, and national security event response and coordination capacity will be increased through cyber intelligence sharing networks (PSBO, 2019).

In the cybersecurity ecosystem developed based on national solutions, new products and technologies will be developed through collaboration among public research institutions, universities, and the private sector, and the outputs of these projects will be shared as open source. Export incentives will be offered to firms operating in the cybersecurity sector. Comprehensive education and awareness programs will be organized to improve cybersecurity awareness and human resources in society, undergraduate and graduate programs in cybersecurity will be opened at universities, and curricula of existing IT programs will be developed (PSBO, 2019).

Safe use of the internet will be ensured, verification platforms will be supported against disinformation campaigns, and legal regulations will be updated in compliance with international norms. Necessary mechanisms will be established to ensure the legal validity of electronic transactions. Universal service policies will be applied to reduce inequalities in internet access based on age, income, region, and gender, and anti-digital divide campaigns and awareness-raising activities will be expanded (PSBO, 2019).

To support internet startups, accelerator centers will be established, which will act as bridges among universities, investors, and the business world. The transition to terrestrial digital broadcasting will be completed, broadcasting infrastructures will be centralized in certain locations to prevent visual pollution. Radio and television towers will be constructed, and ranking tenders will be held. Cooperation will be developed among the public sector, private sector, academia, and civil society organizations to create a digital transformation ecosystem. Research related to digital transformation will be supported; programs including

technical examinations, field studies, and academic projects will be conducted, and up-to-date data will be effectively used in national and international indexes (PSBO, 2019).

The main goal in the field of employment and working life is to provide decent job opportunities to all segments of society. Increasing the labor force participation of groups requiring special support, such as women and young people, is a priority. In this regard, the impacts of rapid developments in digital transformation and technology on the labor market are closely monitored, and the changes these developments bring to professions are regularly followed. Within this scope, field research is conducted to reveal the effects of digitalization on jobs and professions, and new skill and qualification needs are identified according to job groups, with this data being systematically analyzed (PSBO, 2019).

At the same time, vocational training programs and on-the-job trainings are being transformed into a flexible and innovative structure required by digital transformation, aiming to improve the digital skills of the workforce and enable adaptation to new job fields. Special training and course programs are organized especially for the development of workers in new professions emerging due to digitalization (PSBO, 2019).

Special strategies are also implemented to increase women's employment, strengthening education and support mechanisms aimed at developing women's professional skills in areas such as software, coding, and technology production. Additionally, efforts are made to increase women's economic activities on digital platforms, and various training programs and seminars are organized to empower women entrepreneurs in e-commerce (PSBO, 2019).

Under the heading of e-Government Applications in Public Services, the main goals are to provide public services with a citizen-oriented approach; modernize processes to make them more efficient, effective, and integrated; migrate services to electronic platforms; and expand access through the e-Government Gateway (PSBO, 2019).

Some Strategies and Practices to be implemented in line with this goal include carrying out e-Government projects with priority given to user needs to increase the efficiency of public administration; diversifying service delivery channels; and ensuring disadvantaged groups have access to these services. The scope of services offered on the electronic government portal will be expanded, and cost-effectiveness and security will be improved. Additionally, these services will be simplified and integrated to enhance the user experience. The number and quality of digital services belonging to local administrations will be increased, and providing services through different access channels such as mobile applications will be encouraged (PSBO, 2019).

New technologies such as artificial intelligence, cloud computing, big data, the Internet of Things, and blockchain will be utilized to increase transparency, accountability, and efficiency in public services. In this context, processes and infrastructures will be adapted to current technologies. The management and coordination of e-Government applications will be strengthened; under the framework of the Presidential Government System, these will be gathered under a single structure to increase effectiveness. Increasing cooperation and coordination between central and local governments is also targeted (PSBO, 2019).

The digital transformation capacities of public institutions will be developed by considering international technology trends, and the specialized human resources in IT units will be increased. For this purpose, the number of personnel who will build a career in IT expertise will be limited and qualified; trainings and guides will be prepared for the preparation and management of projects. Institutional maturity and competency models of the institutions will be developed and disseminated (PSBO, 2019).

By developing shared infrastructure and information systems to reach a sustainable structure, data sharing among public institutions will be facilitated. Accordingly, the e-Government Enterprise Architecture will be established, data standardization will be ensured, and a public data inventory and data dictionary will be prepared. A Central Service Design Platform will be set up to improve public business processes, and important projects (Integrated Data Center, e-Municipality Information System, National Geographic Information System) will be completed. The electronic identity card will be ensured to be used in all identity verification processes (PSBO, 2019).

In order to reduce bureaucracy and accelerate business processes, information, data, and document sharing among institutions will be done electronically and as much as possible without written correspondence. The National Electronic Messaging Platform will be implemented (PSBO, 2019).

Comprehensive measures will be taken to protect public institutions against cyber security threats and to ensure the confidentiality of personal data. Cybersecurity coordination will be centralized, information security management systems will be established, and regular audits will be conducted. Additionally, cyber security drills will be organized to increase preparedness levels (PSBO, 2019).

Public data will be made accessible as open data in accordance with the principles of transparency and accountability, respecting privacy principles, and necessary regulations

will be made for these processes. A National Open Data Portal will be established, and data anonymization standards will be determined (PSBO, 2019).

Cost-effectiveness, innovation, and support for domestic production will be ensured in IT product and service procurements. Technical standards of the products to be purchased by public institutions will be determined, and platforms will be established to carry out common and collective purchases electronically (PSBO, 2019).

The Eleventh Development Plan (2019-2023) sets a strategic framework for Türkiye's growth, focusing on economic transformation, technological innovation, and social development (PSBO, 2019). It emphasizes digital transformation, critical technologies like AI and cybersecurity, and the expansion of R&D and ICT infrastructure. The plan aims to improve productivity and competitiveness by fostering skilled human resources, enhancing public-private-university cooperation, and strengthening cybersecurity measures. Overall, it seeks to align Türkiye's development with global trends and technological progress.

Within the framework of the 11th Development Plan, strengthening Türkiye's research, innovation, and technology ecosystem is identified as a primary objective. Priority is given to increasing university R&D capacity, supporting high value-added projects, and improving research infrastructures. Developing qualified human resources, expanding international collaborations, and promoting technology education for youth are key components of the plan.

In the realm of digital transformation and information and communication technologies, emphasis is placed on expanding infrastructure, regulatory reforms, and supporting domestic production, particularly in critical technologies such as 5G and satellite systems. Türkiye's aim to become a regional data center is also reflected through efforts to develop internet infrastructure and the software sector, supported by standards and incentives.

Enhancing national cybersecurity capacity by strengthening technical and institutional structures, developing domestic cybersecurity products, and raising societal awareness constitute important elements of the plan. Internet safety will be ensured, digital access inequalities reduced, and digital entrepreneurship promoted.Employment policies focus on increasing labor force participation of women and youth by monitoring the impacts of digital transformation on the labor market and implementing appropriate training programs. Women's presence in technology and their roles in the digital economy are being actively supported.

Modernizing e-Government services by leveraging technologies such as artificial intelligence, big data, and cloud computing aims to improve the efficiency of public services, facilitate data sharing, and strengthen cybersecurity measures. Supporting domestic production in public procurement aligns with broader goals of economic transformation and sustainable growth.Overall, the 11th Development Plan articulates Türkiye's strategic vision for digitalization, technological advancement, and sustainable economic development.

3.4.2. Application Areas and Implemented Projects

Following the COVID-19 outbreak, Türkiye implemented several key digital initiatives to mitigate the pandemic's impact and advance its digital transformation agenda. The main applications that emerged during this period were especially shaped by the impact of the pandemic. The HES Code system was developed to control the spread of the virus in the health sector, while the EBA platform became prominent in facilitating remote access to education. Separately, Türkiye's National Artificial Intelligence Strategy was launched as part of long-term efforts to advance technological development and innovation.

3.4.2.1. HES Code System (Life Fits Into Home)

After the coronavirus outbreak that emerged in China in December 2019, countries began to take certain measures as the pandemic spread worldwide. The digital methods that countries were able to implement, depending on their level of development, and the applications created accordingly, have been quite effective in enabling these measures and adapting to normal life conditions. In this regard, the "Hayat Eve Sığar" (Life Fits Into Home) application, which was put into practice by our Ministry of Health as of May 2020, holds a very important place in protecting against the COVID-19 pandemic and taking necessary precautions. Starting from September 23, 2020, the use of the Hayat Eve Sığar (HES) code became mandatory for entry into public buildings in line with COVID-19 measures. According to the circular published by the Ministry of Health, the HES code control application officially came into effect in all government institutions as part of the normalization process. The purpose of this system is to minimize the spread of the virus by protecting public health (Ministry of Interior, 2020).

In addition to entry to public institutions, HES code checks were initiated during intercity travel, accommodation, and urban transportation. Thanks to the HES application,

individuals can see with whom they interacted during the day, examine risk levels in their surroundings on a map, and create special QR codes for venues. Additionally, they can obtain the required HES code for situations like travel and monitor quarantine processes when they are exposed or infected. The application also allows users to monitor the health status of people in their close environment (Alkış & Fındık Coşkunçay, 2021).

As of March 3, 2022, according to the related circular of the Ministry of Interior, the HES code query application will no longer be used for entry into public areas, institutions, and organizations. Based on the assessments of the Ministry of Health, the HES code application was terminated due to the progress in the pandemic (Ministry of Interior, 2022).

In summary, the "Hayat Eve Sığar" (HES) application was developed to track health risks and control the spread of COVID-19 by regulating safe access to public spaces and travel. It enabled users to monitor their contacts and quarantine status. The use of HES codes became mandatory for entry into public buildings but was discontinued in March 2022 as the pandemic situation improved. This system played a crucial role in Türkiye's pandemic response and public health protection during the critical period.

3.4.2.2. EBA (Education Informatics Network)

Within the scope of the FATİH Project, the dissemination of digital education tools was targeted, and the Education Informatics Network (EBA) platform was developed within this framework. EBA facilitated teachers' and students' access to digital content and provided an interactive learning environment. Initially, usage was based on voluntariness, but it increased as face-to-face education faced disruption risks, and the system's role in education became even more important. During this process, the Directorate General of Innovation and Educational Technologies supported the system's feasibility (Doğan & Koçak, 2020).

The COVID-19 outbreak that started in China in December 2019 created profound impacts worldwide, especially in health, as well as economic, social, educational, and psychological fields. Face-to-face education was suspended in about 190 countries, and approximately 91% of students turned to distance learning methods due to the global crisis. In Türkiye, the Ministry of National Education implemented distance education starting from the spring term of the 2019-2020 academic year through television broadcasts and the Education Informatics Network (EBA) platform (Can & Ozan, 2021).

From March 23, 2020, to February 19, 2021, the EBA platform was visited approximately 18 billion times and became the most preferred website in the education field

in 2020. During the 2020-2021 academic period, a total of 6,220 hours of live broadcasts were conducted on EBA TV's elementary, middle, and high school channels; recordings were made in 13 studios in Ankara and Istanbul. The total broadcast time during this period reached 12,415 hours. Throughout distance education, more than 10,000 lesson videos and approximately 1,000 extracurricular activity videos were prepared. Most of the lesson videos and a significant portion of the extracurricular content were created during this period. On the mobile application side, there were 28.2 million downloads on Android devices and 2.9 million on iOS devices. During the same period, millions of students and teachers actively used the EBA platform and the academic support application. Live lessons were recorded as approximately 165 million lesson hours across preschool, elementary, middle, and high school levels.

To facilitate access to education, 14,719 support points and 176 mobile support points were established, and 500,000 tablets with internet service were distributed to students (Ministry of National Education Directorate General of Innovation and Educational Technologies, 2021).

In summary, the EBA platform significantly contributed to maintaining educational continuity during the COVID-19 pandemic. It provided widespread access to digital learning resources and interactive content, supporting millions of students and teachers across Türkiye. The extensive use of live broadcasts, lesson videos, and mobile applications highlights its critical role in facilitating distance education during a period of unprecedented disruption.

3.4.2.3. National Artificial Intelligence Strategy (NAIS)

Starting from the late 1990s, various strategies have been implemented in Türkiye to establish an information society, and with the transition to the Presidential Government System in 2018, the importance given to digital transformation reached its highest level. During this process, the goal of a “Digital Türkiye” was strongly embraced at both political and administrative levels, focusing on increasing efficiency and global competitiveness through the use of digital technologies in economic, social, and public sectors. Additionally, due to fluctuations and structural changes in the world economy, the local production of critical technologies gained priority to enhance social welfare and ensure national security. In this context, policies aimed at strengthening Türkiye’s economic and technological independence, making breakthroughs in critical areas, and opposing scientific-technological

monopolies were shaped under the framework of the “National Technology Initiative” (Presidential Digital Transformation Office, n.d.).

Within this scope, the aim is to increase the use of artificial intelligence in all areas of social and economic life and to boost the local production of AI technologies. Thus, an economic structure that promotes innovation and emphasizes the value of data will be established, contributing to the shared goals of the Digital Türkiye vision and the National Technology Initiative (Presidential Digital Transformation Office, n.d.).

Artificial intelligence technology offers powerful data analysis and advanced infrastructure capabilities. Türkiye must accelerate its national technology initiative to avoid falling behind in this field. While AI creates significant opportunities in economic automation and digital transformation, national strategies must be developed to manage its risks. Countries worldwide approach AI with different priorities; some focus on economic growth and security, while others emphasize ethics and privacy issues. This leads to diverse approaches in research and applications (Önder, 2020, p. 100).

Despite many advantages in AI, some shortcomings are also apparent. These include inadequacies in public policies and legal regulations, the societal impact of workforce transformations, difficulties in data access, challenges in expert training, and the scarcity of AI research centers. These weak points are areas that require attention for the development of the AI ecosystem (Saygılı, 2020, p. 124).

Public administration cannot remain indifferent to this rapid technological change that affects individuals' lives. The increasing use of AI in the public sector offers many opportunities to governments but also brings challenges. The lack of flexibility in public institutions may hinder expected performance. Furthermore, rigorous and controlled regulations are necessary to protect citizens from algorithmic risks. AI, which significantly contributes to decision-making processes, must be supported by a solid legal infrastructure; however, preparing these regulations involves various obstacles. Despite all this, AI offers advantages such as increasing efficiency in public services, enhancing participation, and producing data-driven policies. The European Union leads in integrating technology into public administration and has developed guiding documents and practices. While the competition between the USA and China continues, the EU also takes important steps. Practices in EU countries vary, demonstrating AI’s potential in public administration. With increased capacity, the spread of AI applications and innovations in the public sector is expected to grow. Therefore, emerging opportunities and risks must be carefully evaluated as progress continues (Gezici, 2023).

In line with national digital transformation goals, the Eleventh Development Plan covering 2019-2023 and the 2021 Presidential Annual Program aim to develop AI efforts. In this context, the "National Artificial Intelligence Strategy (2021-2025)" has been prepared through collaboration between the public sector, private sector, civil society, and academia and will be published in official sources. To ensure effective implementation of AI policies and projects, a Steering Committee was established under the leadership of the Vice President, including the Head of the Digital Transformation Office and representatives from the Ministry of Industry and Technology. This committee will coordinate the implementation of strategies with the participation of relevant ministry officials and provide high-level monitoring (Official Gazette, 2021).

Türkiye's National Artificial Intelligence Strategy (NAIS), the country's first national strategic document in the field of artificial intelligence, has positioned Türkiye among the countries that have published such strategies. The strategy was prepared in alignment with the Eleventh Development Plan and the Presidential Annual Programs, consistent with the goals of Digital Türkiye and the National Technology Initiative. During its preparation, a comprehensive approach was adopted with contributions from public institutions, academia, the private sector, civil society, and international stakeholders.

The fundamental aim of NAIS is to create an agile and sustainable artificial intelligence ecosystem that enables Türkiye to generate value on a global scale. The strategy is built around six main priorities: training AI experts and increasing employment; supporting research, entrepreneurship, and innovation; expanding access to high-quality data and technical infrastructure; implementing regulations to support socioeconomic adaptation; strengthening international collaborations; and accelerating structural and workforce transformation.

In line with these priorities, 24 objectives and 119 measures have been identified, and a comprehensive governance system was established to advance AI activities on a common platform during the 2021-2025 period. The implementation of the strategy is managed by a Steering Committee led by the Vice President and supported by advisory and technical working groups. Action plans are regularly updated based on the decisions of the Steering Committee and monitored with evaluation reports issued every three months.

The plan, updated for 2024-2025 in line with the 12th Development Plan, takes into account developments and needs in the field of artificial intelligence. Thanks to the dynamic structure of the strategy, rapid responses can be given to risks and opportunities that may arise through stakeholder participation; the goal is to conduct AI projects ethically and

effectively, mature the ecosystem, and increase competitiveness (Presidential Digital Transformation Office, n.d.).

Within the National Artificial Intelligence Strategy, key competency areas emphasized include quality data, advanced skills, and robust technical infrastructure. The strategy aims to create a harmonized structure based on inter-institutional cooperation and holistic governance. Accordingly, education content and programs are being developed to increase qualified researcher and practitioner employment in AI across public institutions, the private sector, and academia; thematic trainings are being expanded to raise youth awareness on algorithmic and ethical issues.

Furthermore, innovative centers and funds are being strengthened to support AI startups, and research and development (R&D) activities are encouraged. The effectiveness of AI projects will be increased through inter-institutional data sharing and the development of secure infrastructures, while data quality and anonymized data sharing will be accelerated. Legal and administrative regulations will monitor the ethical and socioeconomic impacts of AI applications, and global standards will be adopted through support of international collaborations.

Guidelines will be prepared for structural and workforce transformation, trainings will be organized to impart new skills in public and private sectors, and certification systems will be developed to ensure the reliability of AI projects. All these steps will be implemented with comprehensive action plans coordinated by the relevant institutions (Presidential Digital Transformation Office, n.d.).

The strategy was created based on globally accepted principles of "trustworthy and responsible AI." Ethical standards and regulations adopted by international organizations such as the European Union, OECD, and UNESCO were taken into consideration to develop a perspective compatible with the global community. Accordingly, the ethical and legal aspects of AI applications will be studied, and active contributions will be made to developments on international platforms (Acar, 2021).

Smart technologies often develop rapidly in the private sector. Public administration is responsible for following these advances and adapting AI to public services. While heavy workloads reduce public employees' efficiency, technologies like automatic data entry and speech recognition can be solutions. Public institutions should assess the suitability of these technologies, and leaders must collaborate to make the best use of the opportunities provided by cognitive technologies (Önder & Saygılı, 2018).

Comprehensive research and development activities are necessary for the effective use of AI technologies in various fields in Türkiye. Moreover, AI studies must be approached with a national perspective that transcends political and governmental boundaries. Today, many countries consider AI a core element of their economic, political, and military strategies and invest heavily in this field. In light of this global trend, Türkiye must also evaluate AI with a nonpartisan and national consciousness (Yıldız & Kartal, 2023).

In summary, Türkiye has developed a National Artificial Intelligence Strategy that outlines priorities such as expert training, research support, data access, regulatory frameworks, international collaboration, and workforce transformation. The strategy includes detailed objectives and measures, with a governance system to oversee implementation. Efforts focus on creating an ethical, secure, and effective AI ecosystem across public and private sectors, aligned with national development plans and international standards.

3.5. The 12th Development Plan Period (2024–2028)

The Grand National Assembly of Türkiye (TBMM), in accordance with Law No. 3067 dated October 30, 1984, discussed and approved the Twelfth Development Plan covering the 2024-2028 period at its 15th session held on October 31, 2023. This decision entered into force with TBMM's resolution numbered 1396 dated October 31, 2023 (PSBO, 2023).

In the 12th Development Plan period, covering 2024 to 2028, Recep Tayyip Erdoğan continues to serve as President. The government structure remains under the Presidential Government System and is administered by the Justice and Development Party (AKP).

3.5.1. Analysis of Contents and Goals in the 12th Development Plan

The introductory section of the 12th Development Plan envisions a Türkiye entering the second century of the Republic, characterized by an environmentally friendly, disaster-resilient, technology-based production system, and focused on income justice. Prepared to contribute to the 2053 vision, the plan is structured around five main pillars: economic stability, competitive production, human-centered development, environmental sustainability, and democratic governance (PSBO, 2023). Within this plan, special emphasis

is placed on digitalization, with “digital government” addressed as a separate priority to enhance citizen-focused services and participation.

Development planning has been a crucial tool guiding economic and social progress in the past century. Although the influence of a free market economy increased after the 1990s, the state’s strategic planning role has reemerged, especially in response to global crises. Currently, both national and sectoral plans are critical for countries’ sustainable growth objectives (PSBO, 2023).

In Türkiye, development plans are prepared to set long-term goals and ensure the most efficient use of resources. Thanks to its current geopolitical advantages and young, dynamic population, Türkiye has significant opportunities in this process. However, the country also faces threats such as disruptions in global supply chains, pandemics, natural disasters, and energy-food crises (PSBO, 2023).

Against this backdrop, the Twelfth Development Plan (2024–2028) serves as a roadmap guiding Türkiye’s vision in the Republic’s second century. The plan centers on environmental sustainability, digital and green transformation, high value-added production, and societal welfare (PSBO, 2023).

- The plan is structured around five main themes:
- Stability and growth in the economy,
- Production focused on digitalization and environmental transformation,
- Strengthening human capital and expanding social welfare,
- Building disaster-resilient and sustainable living spaces,
- Public administration based on the rule of law and principles of effective governance (PSBO, 2023).

The preparation of the plan involved extensive participation from public institutions, civil society organizations, academics, and citizens. This participatory process shaped the plan, which will also serve as a guide for public institutions in determining strategic priorities. The implementation of the plan will be coordinated by the Presidency and monitored and evaluated annually (PSBO, 2023).

The Covid-19 pandemic accelerated digital transformation processes, prompting businesses to increase their technological investments. In particular, the demand for cloud technologies, data security, marketing automation, and digital infrastructure systems has risen significantly. Technologies such as big data analytics, the Internet of Things (IoT), and artificial intelligence, which have become critical for enhancing competitive power, enable

business processes to be conducted more effectively and efficiently. In this context, significant transformations are taking place in areas such as data privacy, digital skill development, automation systems, and supply chain management (PSBO, 2023).

Artificial intelligence technologies possess the potential to both complement human capacity and transform the structure of the workforce. However, these developments also bring potential social issues, such as employment contraction and income inequality. It is emphasized that these rapidly advancing technologies should be monitored not only through national regulations but also via international cooperation (PSBO, 2023).

Furthermore, cybersecurity is no longer just a digital issue but has become a direct matter of national security. Countries are increasing investments in this field, strengthening human resources, and prioritizing the development of domestic technologies. The integration of artificial intelligence and big data systems is reshaping cyber defense strategies (PSBO, 2023).

Blockchain technology stands out, especially with its capacity to ensure data security and transparency, and it is expected to find much broader applications in the future. In financial systems and digitalization have made transactions faster and more cost-effective, while central banks' digital currency projects are also gaining popularity (PSBO, 2023).

On the other hand, inequalities in access to digital opportunities are deepening, and the technological and economic control of digital platform companies is increasing disproportionately. This situation expands their capacity to influence individuals' behaviors and creates a stronger need for regulatory frameworks targeting digital technologies by public authorities (PSBO, 2023).

Today, rapidly advancing scientific and technological innovations, especially through disruptive technologies, create a wide impact ranging from production models to social structures; this situation confronts countries with the need to direct themselves toward appropriate technology choices and to adapt their economic strategies to this transformation .In this transformation, establishing strong collaborations between universities, the private sector, and public institutions, supporting open access to scientific data, adopting innovative financing methods, and increasing access to qualified human resources are critically important. At the same time, combating brain drain and promoting a participatory innovation culture are also necessary for sustainable development (PSBO, 2023).

Particularly, artificial intelligence, IoT, big data, blockchain, robotic systems, 3D printers, electric vehicles, and green hydrogen are among the technologies that stand out in green and digital transformation. Additionally, space technologies, quantum computing,

augmented reality, next-generation nuclear solutions, and carbon capture systems are also among the development areas attracting global attention (PSBO, 2023).

Among the factors influencing production decisions are digital technologies such as artificial intelligence, advanced robots, and IoT, as well as environmentally sensitive and socially responsible production approaches. Sustainable production models developed in response to the climate crisis are becoming increasingly important for international businesses. With the rise of the platform economy, the roles of producers, wholesalers, and retailers are observed to be merging. The development of e-commerce has made it necessary to develop multi-channel strategies where both physical and digital sales channels are used together, which has led to the emergence of more integrated and user-focused services (PSBO, 2023).

At the beginning of the Eleventh Development Plan, global economic fluctuations, sudden increases in exchange rates, and geopolitical tensions negatively affected the Turkish economy, causing a noticeable slowdown in growth. However, by mid-2019, recovery in financial markets and a decline in inflation enabled a revival in domestic demand (PSBO, 2023).

During this period, Türkiye took important steps to increase its research and development capacity. While research and development (R&D) expenditures as a share of GDP were 1.18% in 2017, they increased to 1.40% by 2021. As private sector R&D investments increased, various mechanisms aimed at expanding and improving the efficiency of research infrastructure were also implemented. Efforts to increase the international competitiveness of research units and universities, supported under Law No. 6550, continued. Nevertheless, the need to improve knowledge and technology transfer, entrepreneurship, and commercialization processes persists (PSBO, 2023).

The information and communication technology sector continued its growth during the plan period; the sector's value exceeded 11 billion dollars. By 2021, information technologies surpassed communication technologies for the first time. Notable developments were experienced especially in digital gaming and e-commerce, with domestic startups exceeding the billion-dollar threshold. During the same period, software exports also increased significantly, while fiber infrastructure length and mobile broadband services became widespread. However, despite the sector's growth, the need for qualified human resources continues (PSBO, 2023).

In the field of e-Government, services have increased significantly both in variety and number of users. As of 2023, 7,177 different public services were made accessible

digitally, and the number of mobile services reached 4,136. While citizens' interest in these services increased, according to TÜİK data, 68.7% of the population benefited from e-government services in 2022. Integrated solutions in areas such as working life, residency, and transportation have become widespread (PSBO, 2023).

Significant progress has also been made in education policies. Career stages have been defined for the teaching profession, the equipment of schools has been strengthened, and the infrastructure for distance education has been improved. Cooperation with the private sector in vocational and technical education has increased; public expenditures have risen at all levels of education. However, regional inequalities in education still retain their importance. The need for development continues in areas such as ensuring equal opportunities in learning environments, conducting teacher trainings based on quality, developing digital skills, and making the education system more resilient to crises (PSBO, 2023).

Finally, with the rapid technological changes worldwide, increasing economic, political, and health-related crises have increased uncertainty. This situation has made the guiding role of strategic plans even more important for Türkiye to gain resilience against future shocks (PSBO, 2023).

Under the title Long-Term Development Strategy within the Framework of the 2053 Vision, the development plan states the following: As we move toward 2053, the main dynamics shaping the world are economic inequalities, environmental problems, and geopolitical tensions. These factors lead to profound structural changes in the future global system, while also suggesting the possibility of a multipolar world order in which both cooperative and sharply competitive scenarios will coexist (PSBO, 2023).

In the upcoming period, while a decrease in the global influence of Western countries is observed, regions with young and rapidly growing populations such as Asia and Africa are expected to take a more prominent position on the global stage. This new order may contain more balanced and inclusive structures but could also create a ground open to hegemonic competitions that increase international tensions (PSBO, 2023).

Rapid developments in technology, especially through applications such as artificial intelligence, robotics, 3D production, augmented reality, and on-site manufacturing, are transforming traditional production-consumption patterns. This situation brings about a radical change in both economic structures and daily life habits. This transformation will deeply affect labor markets as well; many traditional professions will either completely disappear or be replaced by new job fields whose names are not yet known today. With the

widespread adoption of advanced technologies, human-centered competencies such as emotional intelligence, social skills, creativity, and leadership will be in higher demand. Therefore, lifelong learning and individual skill development will become one of the most critical necessities of the future (PSBO, 2023).

In this context, the understanding of education will also be reshaped; instead of merely transferring knowledge, skills such as accessing information, analytical thinking, problem solving, critical evaluation, and communication will become priorities. Innovative approaches such as virtual reality, AI-supported teaching, and personalized learning experiences will form the fundamental building blocks of the future education system. Despite the presence of technological infrastructure, the guiding role of teachers will continue to be important (PSBO, 2023).

In line with all these developments, Türkiye needs to make simultaneous progress in two areas to increase its competitiveness during this transformation process: First, a qualified education system that equips individuals with the knowledge and skills required for the future; second, strengthening the country's production infrastructure with advanced technologies and supporting it with innovative investments. Strategic steps to be taken in this direction will play a critical role in achieving the country's 2053 vision (PSBO, 2023).

Under the title 2053 Türkiye Vision, it is aimed that Türkiye will increase its effectiveness in knowledge and technology production and reach a strong position in international scientific competition during its development journey toward 2053. Accordingly, priority will be given to focusing on strategic fields such as basic sciences, artificial intelligence, robotic systems, biotechnology, quantum technologies, and space research, with the goal of training qualified research personnel. By increasing the number of experts at the doctoral level, the capacity for scientific production will be expanded, and Türkiye aims to become a science and research and development (R&D) hub both regionally and globally (PSBO, 2023).

In line with these objectives, innovative ventures will be supported to develop a research and technology-focused entrepreneurship ecosystem, and an inclusive technology infrastructure that excludes no one will be established. Within the framework of the long-term vision; it is aimed that at least five Turkish universities enter the world's top 100 rankings, rise to the top 10 in the global innovation league, and that R&D expenditures reach 4% of the gross domestic product (PSBO, 2023).

Additionally, Türkiye aims to be among the leading countries in space research. Within this scope, international collaborations will be increased, young people will be

directed towards space sciences, and infrastructure investments in areas such as observation, satellite technologies, and exploration systems will be realized. Thus, Türkiye will be positioned as a highly competitive country in the production and commercialization of space technologies.

Istanbul, which inspires Türkiye's 2053 vision, will continue its historic role as a bridge between civilizations, remaining a meeting point for science, culture, art, finance, tourism, and trade. Thanks to Istanbul's strong transportation infrastructure, cultural depth, and strategic location, the city will become one of the global centers of decision-making and influence in the future (PSBO, 2023).

Through the opportunities provided by technological advancements, cultural values will be preserved by contemporary methods and safely passed on to new generations. By also utilizing digital tools in cultural policies, Türkiye aims to elevate its cultural promotion to a global scale and become one of the leading countries in the cultural economy. In line with this holistic vision for the future, Türkiye will develop advanced capabilities in the field of security, implement effective strategies against global threats, and contribute to regional stability by adopting a peaceful foreign policy. Acting with a sense of historical responsibility, Türkiye will continue to take an active stance in establishing justice and defending the rights of oppressed peoples (PSBO, 2023).

Under the title Competitive Production through Green and Digital Transformation, it has been indicated that global economic, technological, and environmental developments have led to comprehensive changes in production structures, consumption habits, and business models, giving rise to both new risks and significant opportunities. Rapid advances in information and communication technologies, increases in commodity prices, supply security problems, and climate change are reshaping production chains and forcing countries to develop sustainable solutions. In this context, new policies that combine digitalization with environmental compliance come to the fore; high value-added production strategies gain greater importance (PSBO, 2023).

For Türkiye to successfully integrate into these changing global conditions, it must strengthen its digital infrastructure while accelerating the green transformation process. This transformation is not limited to technology investments alone; it also includes multidimensional steps such as training qualified labor, adopting environmentally friendly production models, and increasing high-tech exports (PSBO, 2023).

In a way that supports sustainable development and in line with the net zero emissions target by 2053, the widespread adoption of digital and environmentally

compatible technologies in strategic sectors such as industry, energy, transportation, and agriculture holds great importance. For this transformation process to be carried out effectively, financial incentives, training programs, and supportive infrastructure investments must be systematically planned and implemented (PSBO, 2023).

Under the heading Tax System Compatible with the Digital Age, it is stated that Türkiye's tax system will be restructured to adapt to the rapidly growing dynamics of the digital economy. This transformation aims to be compatible with international standards while simultaneously protecting the country's interests and making transactions conducted in the digital environment transparent. The spread of digitalization in taxation processes will contribute to preventing informal economic activities and will make the investment environment more attractive (PSBO, 2023).

To enable the rapid integration of the tax infrastructure with digitalization, both technological and human resources will be developed. Systems that accelerate information sharing among public institutions will be established, and the capacity of the digital tax administration will be increased. Within this scope, "contactless tax offices" that provide services entirely electronically without the need for physical documents will be implemented. To provide taxpayers with higher quality, accessible, and uninterrupted services, 24/7 active, real-time service delivery will be ensured by utilizing new communication technologies. Additionally, special regulations will be introduced for transactions involving cryptocurrencies and other digital assets; legal gaps in these areas will be closed. The fight against informal economic activities will be supported by advanced digital tools such as artificial intelligence and big data analytics; thus, more effective control and detection mechanisms will be activated to prevent tax loss risks. Active cooperation between public institutions and the private sector will be fundamental in this process (PSBO, 2023).

Under the heading Science, Technology, and Innovation, it is mentioned that comprehensive policies have been implemented to transform Türkiye's science and technology ecosystem into a more efficient, innovative, and cooperative structure that encourages knowledge production and increases the capacity to develop high value-added products and services. Accordingly, the training of qualified researchers is prioritized, and more opportunities are provided for postdoctoral researchers. The research capacities of universities are strengthened, and research universities are specially supported. Scholarship and support programs aimed at highly qualified human resources in basic sciences are expanded, and the administrative burdens on academics are reduced to enable them to focus more on scientific activities (PSBO, 2023).

	2022	2023	2028
Ratio of R&D Expenditures to GDP (%)	1.40[1]	1.55	2.05
Share of Private Sector in R&D Expenditures (%)	61.3[1]	62.0	67.0
The Number of R&D Personnel in Full-Time Equivalent (FTE)	221,811[1]	266,471	440,000
The Number of Researcher in Full-Time Equivalent (FTE)	168,879[1]	200,857	335,000
The Number of Full Time Equivalent (FTE) R&D Personnel with Doctoral or Equivalent Education	40,591[1]	47,965	85,000
The Number of Publications in Peer-Reviewed Journals	71,443[2]	76,000	110,000

Source: The data for the year 2023 are realization estimates and data for the year 2028 are Twelfth Development Plan targets.
(1) The data for 2021 are from TURKSTAT.
(2) The data for 2022 are from Scimago Journal and Country Rank.

Figure 3.5. Targets for Science, Technology and Innovation (Presidency of the Republic of Türkiye, Strategy and Budget Department, 2023, p. 126)

To develop a culture of science and increase awareness in society, it is aimed to increase young people's interest in science and technology from an early age; various workshops, competitions, and events are organized to spread scientific awareness. For the development of research infrastructures, existing research centers are being restructured based on performance criteria, and university-industry collaborations are strengthened by creating infrastructures and platforms for joint projects. Research and development supports are structured to be evaluated according to performance criteria and are focused on commercialization. Coordination and harmony among public institutions are increased, and the effective use of alternative financing sources is encouraged (PSBO, 2023).

The development of domestic technologies compatible with green and digital transformation is targeted, and strategic technology collaborations between the public sector, private sector, and universities are supported. Technology entrepreneurship is encouraged in this transformation process, and the effective transfer of knowledge and technology is ensured. Mechanisms facilitating information sharing among universities, research centers, and industry are developed, and the effectiveness of Technology Transfer Offices is increased to support licensing and commercialization activities (PSBO, 2023).

Innovative entrepreneurship is supported by providing financing and mentorship to early-stage technology firms, increasing venture capital resources, and encouraging large companies to support these startups. Within the scope of international cooperation and global integration, participation in joint projects and programs in research and development with the European Union and other countries is ensured, integration into international research networks is increased, and bilateral or multilateral scientific collaborations are supported. Original solutions are developed in strategic technology fields such as health, space, semiconductor

technologies, and polar sciences; infrastructure, human resources, and project supports are provided for future technologies such as artificial intelligence, quantum technologies, hydrogen energy, and renewable energy. Finally, the social impacts of technological developments are analyzed, and the interaction between social sciences and technical disciplines is increased. These studies are supported by scientific reports and analyses that will contribute to strategic decision-making processes (PSBO, 2023).

Under the heading Information and Communication Technologies, the aim is to increase domestic production in information and communication technologies, to enhance economic competitiveness through the widespread and efficient use of these technologies, and to reduce external dependency in the medium term. It is targeted that electronic communication infrastructures will be sustainable and competitive through cooperation between the public and private sectors. A roadmap will be created in this field with the National Broadband Strategy, and the service and operating models of publicly owned companies will be renewed to make infrastructure management holistic. Regulations will be made together with stakeholders to increase competition (PSBO, 2023).

The widespread deployment of fast, reliable, and cost-effective fixed and mobile broadband infrastructures will be prioritized. Infrastructure permit processes, passage rights, and shared usage mechanisms will be developed, and public burdens will be alleviated. Internet Exchange Points will be established, and uninterrupted communication will be ensured through the rapid establishment of telecom infrastructure in disaster situations. State-supported broadband infrastructures will be built in commercially inaccessible areas, and mobile infrastructures will be expanded considering regional differences. Domestic product and service development will be supported to increase the domestic share in the sector; software standards will be disseminated, and research and development (R&D) processes will be encouraged. Public procurement will be improved, and domestic criteria will be strengthened (PSBO, 2023).

The transition to next-generation mobile technologies will be effectively managed, and old infrastructures and frequencies will be evaluated according to sectoral needs. The 5G authorization process will be completed, and preparations for 6G will be made. The nationwide expansion and localization of satellite-based broadband services will be ensured (PSBO, 2023).

The National Cybersecurity Strategy will be updated, and legislation and institutional structures will be strengthened by taking into account international norms and directives. Cyber threat intelligence will be increased, and early detection and prevention of threats will be ensured through artificial intelligence and big data analytics. Information security management will be established in critical infrastructures, and standards will be developed. Domestic cybersecurity

solutions will be supported to increase international competitiveness, test infrastructures will be developed, and the use of domestic products in public institutions will be widespread. Qualified cybersecurity experts will be trained, career opportunities will be improved, educational content will be developed, and societal awareness will be increased (PSBO, 2023).

A detailed analysis of the human resource gap in the sector will be conducted, and training and reskilling programs will be developed. Integration of domestic software developers abroad into the sector will be ensured, and professional standards will be published. Digital literacy will be widespread, and the ecosystem will be strengthened to develop and disseminate advanced digital technologies. Fundamental technologies in artificial intelligence will be supported, cooperation among the public sector, private sector, and universities will be increased, international connections will be strengthened, and the legal infrastructure will be updated (PSBO, 2023).

Under the heading Digital Government, the main aim is to increase the delivery of digital public services in a user-oriented, inclusive, and effective manner. At this point, some policies and practices have been foreseen. The design and delivery of digital services will be renewed, and processes will be optimized. Integrated digital platforms, especially the e-Government Gateway, will be developed, and the digitization of municipal services will be standardized. Standards will be established for accessibility, security, and user satisfaction of services, and automation will be increased in public processes. The National Geographic Information System will be strengthened to ensure integration among digital infrastructures. In addition, the performance of digital services will be transparently reported, and citizens' opinions will be gathered. Workshops will be established where relevant stakeholders come together for service design (PSBO, 2023).

	2022	2023	2028
Individuals Using e-Government Services (%)[1]	68.7	73.9	80.0
The Number of e-Government Gateway Registered Users (Million)	61.7	64.0	70.0
The Number of Services Provided through e-Government Gateway (Cumulative)	6,754	7,400	9,000
The Number of Integrated Services Offered through e-Government Gateway (Cumulative)	4	5	20
The Number of Mobile Services Offered through e-Government Gateway (Cumulative)	3,862	4,300	7,000
e-Government Services Satisfaction Rate (%)[2]	95.3	96.3	98.0

Source: The data for the year 2023 are realization estimates and data for the year 2028 are Twelfth Development Plan targets.
(1) TURKSTAT survey data for the years 2022 and 2023, which expresses the ratio of those who benefit from e-Government services among individuals aged 16-74.
(2) The ratio of satisfied and moderately satisfied users in total e-Government users.

Figure 3.6. Targets for Digital Government (Presidency of the Republic of Türkiye, Strategy and Budget Department, 2023, p. 246)

The management capacity of the digital government will be increased, and strategic planning will be carried out; inter-institutional coordination will be strengthened. Digital architecture and compatible institutional transformation models will be developed, and information technology audits will be improved. Basic digital indicators will be determined, performance will be monitored, and research programs on digital public administration will be initiated (PSBO, 2023).

The quality and quantity of public IT personnel will be increased according to needs, a competency framework will be established, and employment models will be developed. A digital government academy and working networks will be established for education and experience sharing. Cost-effectiveness, security, and domestic production will be supported in public institutions' IT procurement; cloud computing usage will be widespread, and the use of open-source software will be accelerated. The competencies of public IT firms will be increased, and technology clustering will be encouraged (PSBO, 2023).

According to Türkiye's 12th Development Plan, the country is aiming not only for economic growth but also for a comprehensive transformation focused on sustainability, technology, and social justice. This plan envisions Türkiye in its second century as a nation defined by a green and digitalized production and development model. Particularly, integrating digitalization and environmental transformation into production processes alongside economic stability is seen as a critical step to enhance Türkiye's global competitiveness.

Improvements in education support this human-centered development vision. However, ongoing regional disparities highlight that there is still significant work to be done to ensure equal opportunities in education. The future education system's shift from mere knowledge transfer to prioritizing analytical thinking, problem-solving, and digital skills reflects the urgent need to adapt to rapidly changing technologies and labor markets.

Technology and innovation lie at the heart of this transformation, reflecting Türkiye's ambition to become a regional and even global player in science and R&D by 2053. Investments in areas such as artificial intelligence, robotics, and space research aim to strengthen the country not only economically but also scientifically and technologically. In this context, developments such as digital tax systems, cybersecurity, and the digitalization of public services stand out as concrete steps toward modernizing the state infrastructure.

Furthermore, Istanbul's role in this vision goes beyond being a metropolitan hub—it symbolizes Türkiye's aspiration to become a global center for culture, art, science, and trade. This highlights the country's desire to preserve its historical legacy while strengthening its strategic position for the future.

Finally, Türkiye’s stance on foreign policy and regional stability, as reflected in the plan, adopts a peaceful and justice-oriented approach. This indicates that Türkiye aims to be a responsible actor not only within its borders but also on the regional and global stage.

In summary, Türkiye’s 12th Development Plan offers a comprehensive roadmap for shaping the country’s future with multi-dimensional goals such as technological transformation, environmental sustainability, equal educational opportunities, and democratic governance. However, the success of this vision largely depends on the resolute and inclusive implementation of policies aligned with these objectives.

CHAPTER 4: COMPARATIVE EVALUATION OF DIGITAL TRANSFORMATION POLICIES IN DEVELOPMENT PLANS

4.1. Content and Quantitative Content Analysis of Concepts Related to Technology and Digitalization in Development Plans

In this section of the thesis, how the concepts of digitalization, technology, and some related terms have changed discursively in development plans, how they have been strategically addressed, and how many times these concepts appear in each development plan are compared.

Within the scope of content analysis, it will be explained how the content of the concepts has changed and how the relevant concept has transformed in each development plan. Additionally, this part will analyze in which directions the conceptual goals in the development plans have remained consistent and in which directions they have undergone change.

In the simple quantitative content analysis part, the numerical changes of certain concepts were observed and compared based on the current texts of the 8th, 9th, 10th, 11th, and 12th development plans. This comparison will analyze both how the language of the development plans has changed and how much the importance of the digitalization process has evolved within the framework of development plans. No software was used in the quantitative content analysis part; only a simple counting method was applied to analyze how many times the relevant concept was used in the existing documents.

4.1.1. Content Analysis

When the table of contents of the development plans is primarily examined, it is seen that in the Eighth Development Plan, the eighth chapter under the main title “Development Goals and Policies Related to Social and Economic Sectors” addresses the topics in two places: “Improvement of Science and Technology Capability” and “Information and Communication Technologies”.

Unlike other development plans, the Ninth Development Plan is structured differently in terms of content. In the Ninth Development Plan, under the main title “Increasing Competitiveness,” the topics “Development of Research and Development (R&D) and Innovation” and “Dissemination of Information and Communication

Technologies" are addressed, and under the main title "Improving the Quality and Efficiency of Public Services," the topic "Dissemination and Enhancement of e-Government Applications" is discussed in three separate places.

In the Tenth Development Plan, in the second chapter titled "Plan Goals and Policies," the topics are addressed in four places: "e-Government Applications in Public Services," under "Innovative Production, Stable High Growth" the sections "Science, Technology, and Innovation" and "Information and Communication Technologies"; and in the third chapter titled "Priority Transformation Programs" under the main heading "Technology Development and Domestic Production Program through Public Procurement."

In the Eleventh Development Plan, under the second chapter titled "Plan Goals and Policies," the topic is addressed in six places: under "Competitive Production and Productivity," the section "Digital Transformation, R&D and Innovation, Critical Technologies"; under "Sectoral Policies," the sections "Science, Technology and Innovation" and "Information and Communication Technologies"; and under "Rule of Law, Democratization and Good Governance," the subsection "Good Governance" includes "e-Government Applications in Public Services."

In the Twelfth Development Plan, under the second chapter titled "Competitive Production with Green and Digital Transformations," various sectors are discussed. In this section, under the heading "Sectoral Policies," the titles "Science, Technology and Innovation" and "Information and Communication Technologies" are covered. Under the main heading "Democratic Good Governance Based on Justice," the subheading "Digital Government" appears, resulting in a total of three subheadings and one main heading being addressed.

In this context, when comparing the development plans, it is observed that in the Eighth Development Plan, the focus was solely on technological innovation; in the Ninth Development Plan, research and development (R&D) and innovation began to be included separately in the development plans, and the concept of e-Government was also introduced in the plans. Periodically, it can be seen in the second chapter of the thesis that the e-Government application process was initiated under the Ninth Development Plan; at this point, e-Government became a parallel implementation alongside the Ninth Development Plan.

In the Tenth Development Plan, there was no separate heading for R&D; however, the topics of e-Government and technology continued. In the Eleventh Development Plan,

in addition to all the concepts included in the Eighth, Ninth, and Tenth Development Plans, the concept of digital transformation was also addressed separately.

In the Twelfth Development Plan, the conceptual framework changed further, as observed in the content section. At this point, the heading "Competitive Production with Green and Digital Transformation", which covers all sectors, was added, drawing attention to the integration of sustainability and digital transformation. Apart from these, the concept of e-Government was not included as a separate heading in the development plan; instead, the concept of digital government was added.

From this perspective, the Ninth Development Plan is a critical turning point regarding the concept of e-Government; during the Tenth Development Plan period, the existing system was maintained; with the Eleventh Development Plan, the concept of digital transformation began to be addressed; and with the Twelfth Development Plan, this process evolved into the concept of digital government.

In a way, this transformation can be tracked throughout the thesis as starting with the e-Türkiye Initiative. It can be stated that the e-Türkiye Initiative gradually transformed into the e-Government concept, which in turn evolved into the understanding of digital government.

4.1.1.1. Science and Technology

The title Science and Technology is addressed commonly in the 8th, 10th, 11th, and 12th Development Plans. However, this title does not appear as a separate heading in the 9th Development Plan. When comparing the development plans within the framework of the concept of science and technology, it is observed that in the 8th Development Plan, this title is included under the main heading "Development Goals and Policies Related to Social and Economic Sectors"; in the 10th Development Plan under "Innovative Production, Stable High Growth"; in the 11th Development Plan under "Competitive Production and Productivity"; and in the 12th Development Plan under "Competitive Production with Green and Digital Transformation."

The change in these main headings alone shows that the purpose of science and technology has shifted from socio-economic development to innovative and competitive production, and from there, with the prominence of the sustainability concept in today's world, towards the goal of green and digital transformation.

In the 8th Development Plan, under this subject heading, it was stated that sufficient resources were not allocated for R&D expenditures and that the number of researchers was inadequate; at this point, it was expressed that science and technology centers would be established. Additionally, the necessity of creating the legal infrastructure required for technoparks and technology development zones was emphasized, and it was stated that the National Aerospace Organization would be established.

In the 10th Development Plan, it was noted that important steps had been taken during the period of the 9th Development Plan, but R&D investments had not reached the targeted level. Within this framework, not only an increase in resources but also the efficient use of resources was emphasized. The commercialization of produced technologies and the use of public procurement as an incentive in this process were expressed as necessary. Additionally, increasing the country's technology capacity, strengthening domestic technologies, and gaining competitive power in the international market were among the fundamental goals.

In the 11th Development Plan, the primary goal in the field of science, technology, and innovation remained the same as in previous plans: offering high value-added products and services. Accordingly, it was emphasized that cooperation with universities is necessary, and it was stated that certain resources would be allocated to universities to support R&D and innovation activities. Publicly supported R&D projects, increasing the number of scholarship holders, and improving doctoral scholarship programs were among the targeted implementations. Within this scope, the expansion of Deneyap Technology Workshops aimed at the technological development of thousands of students was planned. Furthermore, preparations for establishing a base in Antarctica to strengthen Türkiye's international position within the scope of polar research were mentioned, alongside the preparation of the National Space Program and the enhancement of the capacity of the Turkish Space Agency.

Similarly, the 12th Development Plan envisaged the development of high value-added products and services, increasing the number of qualified researchers, and the continuation of state support in these fields. However, unlike previous plans, the development of technologies compatible with green and digital transformation was identified as a fundamental objective. In this context, increasing the effectiveness of technology transfer offices and supporting licensing and commercialization activities were emphasized. Additionally, it was stated that original solutions were developed in areas such as space, semiconductor technologies, and polar sciences; alongside this, qualified human

resources and project supports were provided for future technologies such as artificial intelligence, quantum technologies, hydrogen energy, and renewable energy.

A common goal across all development plans is observed to be the development of high value-added products and services, increasing the number of qualified researchers, and the state providing economic support in this area. The 8th Development Plan mentioned the establishment of the National Aviation and Space Organization; in the 11th Development Plan, it was stated that a base would be established in Antarctica to strengthen Türkiye's international position and that the capacity of the Turkish Space Agency would be enhanced.

From this perspective, it is observed that each development plan is connected to one another and that each plan, in terms of core issues, serves as a continuation of the previous one. In the current 12th Development Plan, the main aim is sustainable development and digital transformation; it has been emphasized that the country should progress not only in technologies such as artificial intelligence and space sciences but also in sustainable technology.

When a general analysis is made, it can be said that sustainability will occupy a much more important place in development plans for future periods.

4.1.1.2. Information and Communication

The heading of information and communication has been addressed in all development plans. In the 8th Development Plan, it was stated that rapid progress was made in software, hardware, and content areas along with developing technologies; accordingly, new applications emerged in the fields of telecommunications and broadcasting. During the plan period, the aim was to increase competitive power and to raise economic and social welfare in the relevant sectors. The need for progress in mobile communication and internet access was emphasized; it was also pointed out that developments in information and communication technologies carry the risk of violating personal rights, and therefore necessary legal measures should be taken.

In the 9th Development Plan, the goal was to increase competition in the electronic communications sector, and to provide fast, secure, and cost-effective access to information through advanced infrastructure services. It was stated that individuals' access to the internet should be increased during the transition to the information society, and various actions would be implemented in line with the Information Society Strategy. Furthermore, it was emphasized that the software sector had started to play an effective role in the information

technologies field, necessary strategies would be applied in this area, and Türkiye's international position would be strengthened.

In the 10th Development Plan, it was noted that Türkiye had taken a step towards the information society process with the e-Transformation Türkiye Project in 2003, and that significant progress had been made in recent years regarding broadband internet access. However, it was emphasized that effective and conscious use was not at a sufficient level, infrastructure was neither high quality nor cost-effective, and there was also a shortage of qualified human resources. This plan also stated that important steps had been taken in the field of cybersecurity, the Cybersecurity Board was established within the Ministry of Transport and Infrastructure, and legal regulations were needed regarding the protection of personal data. It was expressed that digital transformation in broadcasting, increasing efficiency in electronic communications, the widespread implementation of projects such as the FATİH Project, smart city applications, and technological developments beneficial to the public should be encouraged.

In the 11th Development Plan, the main objective was to increase economic efficiency and competitive power. Accordingly, it was stated that critical elements such as increasing broadband access, fiber optic infrastructure, base stations, and right of way needed to be regulated. Frequency resources and the existing electronic communication infrastructure were planned to be adapted to 5G and post-5G mobile communication technologies, and it was emphasized that international standards would be followed throughout this process. It was highlighted that the public sector would support private sector investments, and that the Türksat 5A and 5B satellites, as well as the domestically developed Türksat 6A satellite, would be put into service. Additionally, the establishment of the Türkiye Open Source Platform was announced, and it was stated that domestic software would be developed through public-private partnerships. A roadmap would be prepared to popularize artificial intelligence technologies in production processes, and to prevent issues such as gender inequalities that might arise during this process, training and seminars for women entrepreneurs would be organized.

In the 12th Development Plan, in addition to the above goals, it was stated that internet exchange points would be established in accordance with current needs, and that telecommunication infrastructure would be ensured to provide fast and uninterrupted service during disasters. The 5G technology foundations laid in the 11th Plan would continue in this plan period with 6G studies, and it was emphasized that developments in the field of cybersecurity needed to be sustained. Moreover, the spread of digital literacy, cooperation

between the public sector, private sector, and universities in the field of artificial intelligence, strengthening international connections, and aligning the legal infrastructure with these technologies were also targeted.

Information and communication technologies have been addressed in development plans with an increasingly strategic and holistic approach; while infrastructure development and digital access were prioritized initially, recent plans have focused on advanced digital transformation areas such as artificial intelligence, cybersecurity, and domestic software production. In each new plan, shortcomings of previous periods have been attempted to be remedied, and the goal has been to transform technological advancements into societal benefits.

4.1.1.3. Research and Development

Although the content of R&D (Research and Development) is present in all development plans, this concept has not been addressed under an independent heading in each plan. Therefore, the approach of the development plans to R&D should be comparatively evaluated based on how the R&D concept is used throughout the plan texts.

In the 8th Development Plan, it was emphasized that the resources allocated to R&D activities in past years were insufficient, and this situation could hinder the implement ability of the plan. In line with Türkiye's 2023 targets, it was stated that R&D expenditures needed to be increased to enhance the competitiveness of the Turkish industry. Within this scope, it was targeted to raise the share of R&D expenditures in GDP to 1.5%.

During the period of the 9th Development Plan, it was indicated that as of 2002, the share of R&D expenditures in GDP was 0.67%, and this ratio was highlighted as quite low compared to developed countries. It was stated that financial support mechanisms such as tax exemptions would be introduced to encourage R&D activities. Accordingly, the target was to increase the share of R&D expenditures in GDP to 2% by 2013.

In the 10th Development Plan, it was expressed that as of 2011, the share of R&D expenditures in GDP had risen to 0.86%. However, despite this increase, it was emphasized that this level was still considerably behind the European Union averages. It was stated that R&D activities needed to be improved both quantitatively and qualitatively, and necessary supports should be provided to compete internationally in this field. At the end of the plan, it was projected that the share of R&D expenditures in GDP would be 1.80% by 2018.

During the period of the 11th Development Plan, it was observed that R&D expenditures increased as of 2017, but they never reached the targeted level. In this period, the goals included increasing the number of R&D personnel, strengthening cooperation between universities, public institutions, and the private sector, and diversifying R&D activities. It was planned that the share of R&D expenditures in GDP would reach 1.8% by 2023.

In the 12th Development Plan, it was noted that as of 2021, R&D expenditures had reached the level of 1.40%. For this period, the new target was set at 2.05% for the year 2028. With this plan, it can be seen that R&D activities are approached from a multidimensional perspective, not only in terms of economic competition but also linked to green transformation, digitalization, and sustainable development goals.

A common observation across the development plans is that the targeted R&D expenditure ratios have never been fully achieved in any plan period. In every plan, the importance of R&D activities has been emphasized and the need to allocate more resources to this area has been stated. However, in practice, either public and private sector investments have been insufficient, or these investments have not been at a scale to sufficiently incentivize activities. Furthermore, it can be said that the R&D production capacity of universities and research institutions has remained limited compared to developed countries.

In conclusion, although Türkiye's development plans on R&D have continuously set new targets, it is understood that fundamental factors such as structural capacity strengthening, resource efficiency, improvement in human capital quality, and policy continuity have been lacking to realize these goals.

4.1.1.4. e-Government and Digital Government

Although the e-Government content has not been explicitly included as a direct heading in all development plans, from the 9th Development Plan onward, policies in this area have been systematically addressed. In the 9th Development Plan, under the heading of "widespread adoption and activation of e-Government applications," it was stated that one of the main objectives was to provide public services more efficiently, transparently, and accessibly. Within this scope, restructuring of public administration was targeted; it was emphasized that many public institutions, including local governments, should be integrated into the existing system, and that the e-Government system should be restructured in compliance with international standards.

In the Tenth Development Plan, it was stated that during the previous plan period, the time and cost burdens for citizens and businesses arising from public services were reduced, approximately six hundred services were launched, and by 2012, the number of e-Government users had reached 14 million. In this period, elements such as personal data protection and information security were prioritized in the delivery of e-Government services.

The Eleventh Development Plan emphasized the necessity of delivering public services with a citizen-centric approach; it aimed to increase the number and quality of services and strengthen accessibility to public services through mobile applications. Furthermore, to enhance transparency, accountability, and efficiency in services, it was indicated that next-generation digital technologies such as artificial intelligence, cloud computing, big data, the Internet of Things, and blockchain would be utilized. Projects facilitating data sharing among public institutions and strengthening data flow between central and local administrations were planned during this period.

With the Twelfth Development Plan, the term "e-Government" was replaced by "digital government." In this new era, the primary goal was defined as delivering digital public services in a user-focused and efficient manner. Within this framework, the quality and number of public IT personnel were planned to be increased, and the establishment of a Digital Government Academy was proposed to provide training for this personnel. Additionally, supporting public IT companies, enhancing data management and advanced data analytics capacity to facilitate inter-institutional data sharing, and completing national and institutional data dictionaries were targeted. Strengthening the legal infrastructure for artificial intelligence and analytics projects and thereby developing reliable digital public services were also among the important goals of this period.

From the Ninth Development Plan onward, e-Government has been systematically addressed to increase efficiency, transparency, and accessibility in public services; subsequent plans have highlighted the number of services, data security, and mobile access. With the Twelfth Plan, this approach evolved into the concept of "digital government," aiming to provide user-focused and integrated public services through technologies such as artificial intelligence and advanced data analytics.

4.1.1.5. Digital Transformation

The content on digital transformation in Türkiye began to appear in development plans both as a separate chapter and as a policy concept especially starting from the 11th Development Plan. During this period, digital transformation was addressed with the aim of increasing productivity and competitiveness in priority sectors. In particular, emphasis was placed on digital transformation in the manufacturing industry. Within the scope of the plan, it was envisaged to establish a Digital Transformation Platform in Industry; under this platform, permanent committees would be created for digital education, data communication, and technological developments. Additionally, the preparation of a Digital Transformation Terminology Dictionary was planned in order to adopt international digital standards in Türkiye and to develop a common digital understanding. Alongside these developments, it was emphasized that the knowledge levels of both public institutions and private sector enterprises regarding digitalization needed to be increased.

The 12th Development Plan, on the other hand, offers a multidimensional approach by addressing the concept of digital transformation not only in the context of economic competitiveness but also through the lens of environmental sustainability. The plan is structured around five main themes, one of which is directly defined as digitalization and environmentally focused production. This approach highlights that technological advancements at the global level, rapid progress in information and communication technologies, and dynamics such as climate change necessitate holistic policies that integrate digitalization with environmental compatibility

The Development Plan also states that Türkiye must strengthen its digital infrastructure to adapt to this transformation process, and it is equally essential to make this infrastructure compatible with sustainable development goals. In this context, the widespread adoption of sustainable development and digital-environmentally compatible technologies by 2053 is among the country’s long-term objectives.

A comparative analysis of these two development plans is important in demonstrating the discursive evolution of the digital transformation concept. While the 11th Development Plan defined digital transformation primarily as an industry and technology-based modernization process, the 12th Development Plan integrates this process within the context of climate change and sustainable development, treating digital transformation not only as an economic but also as an environmental and social transformation. Thus, the concept of digital transformation has been redefined within a broader framework that

includes not only technological advancement but also a development understanding compatible with green transformation.

4.1.2. Quantitative Analysis

Following the content analysis, this section of the thesis employs a quantitative analysis method. Without using any digital analysis tools, data obtained through a simple manual word count performed on the existing development plans is presented in the table below. When evaluated alongside the qualitative findings from the content analysis, this table quantitatively reveals the visibility and frequency changes over time of digital transformation–focused concepts within the development plans. Therefore, this table can be considered a complementary data set that concretizes the direction and intensity of conceptual change following the content analysis.

Table 4.1. Word Frequency of Selected Digital Governance Terms in Türkiye's National Development Plans (2001–2028)

Development Plans / **Concepts**	**8th**	**9th**	**10th**	**11th**	**12th**
Research and Development (R&D)	48	50	84	106	106
Technology	229	110	240	298	405
Digital	1	0	3	86	267
Digital Transformation	0	0	0	39	81
e-Government	0	10	36	23	20
Digital Government	0	0	0	0	12
Number of Pages	252	101	212	198	253

This quantitative analysis of the usage of digital transformation-related concepts in Türkiye's national development plans covering the period from 2001 to 2028 clearly demonstrates the increasing strategic importance of digitalization. Firstly, the frequent presence of the terms "R&D" and "Technology" throughout all development plans indicates that Türkiye consistently and sustainably maintains a science- and technology-based development approach. Particularly from the 11th development plan onward, there is a noticeable increase in the usage of the term "Technology." This rise is a concrete indicator of Türkiye's growing emphasis on R&D investments and technology development to support economic and social development. Therefore, the focus on R&D and technology reflects not only a textual increase but also a shift in policy and implementation priorities.

The visibility of the concept of digitalization in the texts shows an even more dramatic increase. While the term “digital” appeared only once in the 8th development plan and did not appear at all in the 9th plan, its usage began to increase rapidly from the 10th plan onward. In the 11th and 12th development plans, the term appears 86 and 267 times respectively. This rise indicates that digitalization has become a central and prioritized issue within Türkiye’s development strategies. The growing adoption of digital technologies in economic, social, and administrative fields has significantly amplified the importance of this concept. The sharp increase in the use of the term “digital” also signals a strategic transformation in public policies aimed at developing digital infrastructure, enhancing digital skills, and expanding digital services.

The term “Digital Transformation” first appeared meaningfully in the 11th development plan, and its usage nearly doubled in the 12th plan. This indicates that digitalization has evolved beyond being merely a technological innovation to become the foundation of comprehensive structural changes and strategic objectives. The rise of the concept of digital transformation reflects Türkiye’s effort to radically renew the ways of working in both public and private sectors, service delivery, and management models. In this context, digital transformation is not only a technical term but also a fundamental paradigm shift in planning and implementation processes.

The term “e-Government” held an important place in the 9th and 10th development plans, peaking in usage during the 10th plan. However, a decline in its frequency is observed in subsequent plans. This decline suggests that digitalization strategies have evolved toward more inclusive and transformation-oriented concepts. Accordingly, the term “Digital Government” appeared for the first time in the 12th development plan, representing a broader vision beyond e-Government. It encompasses the integration of digital technologies into public administration and the migration of governance processes to digital platforms. This conceptual shift shows that Türkiye aims for much more than e-Government applications, embracing digital governance and comprehensive digital transformation of public services as strategic priorities.

Although the data have not been normalized by the total number of pages in the plans, the magnitude of the increase in the usage of these concepts in the 11th and 12th development plans suggests that digitalization and digital transformation have gained significant relative as well as absolute prominence in the texts. The rapid rise in terms carrying the “digital” prefix clearly demonstrates that technology-based structural transformations occupy a central role in Türkiye’s development strategies. This indicates that digitalization is

embraced not only as a means of improving technological infrastructure but also as a driving force behind profound changes in economic growth, public administration, education, healthcare, and other social sectors. In conclusion, the growing visibility of digital transformation concepts in Türkiye's development plans concretely reflects the country's process of adapting to the digital age and taking strategic steps in this field.

4.2. Examination of Türkiye's International Position Based on Eurostat's Latest Data Within the Context of Digitalization Concepts

In this section, Türkiye's international position within the framework of digitalization concepts will be examined based on the most recent data from Eurostat. During the analysis process, data related to all countries in the Eurostat database were presented graphically, and Türkiye's position was evaluated in comparison with these countries. Additionally, the content analysis of policies implemented in line with Türkiye's development plans will be discussed in an international context alongside the relevant indicators.

Within the scope of the "Science and Technology" heading featured in the development plans, indicators related to human resources in science and technology will be analyzed to reveal Türkiye's capacity and international standing in this field. In relation to the "Information and Communication Technologies" heading, household internet access levels and individual internet usage rates will be comparatively assessed.

In the context of the "R&D and Innovation" concept, Türkiye's international ranking will be analyzed based on the ratio of R&D expenditures to Gross Domestic Product (GDP), and a comparative evaluation will be provided by examining country-level research and development expenditures.

Another prominent topic in the development plans, "e-Government" applications, will be analyzed according to Eurostat data, focusing on individuals' levels of access to public services via websites.

Finally, within the framework of the "Digital Transformation" concept, individuals' digital competence levels will be examined, and Türkiye's international position in this area will be evaluated based on comparative data provided by Eurostat.

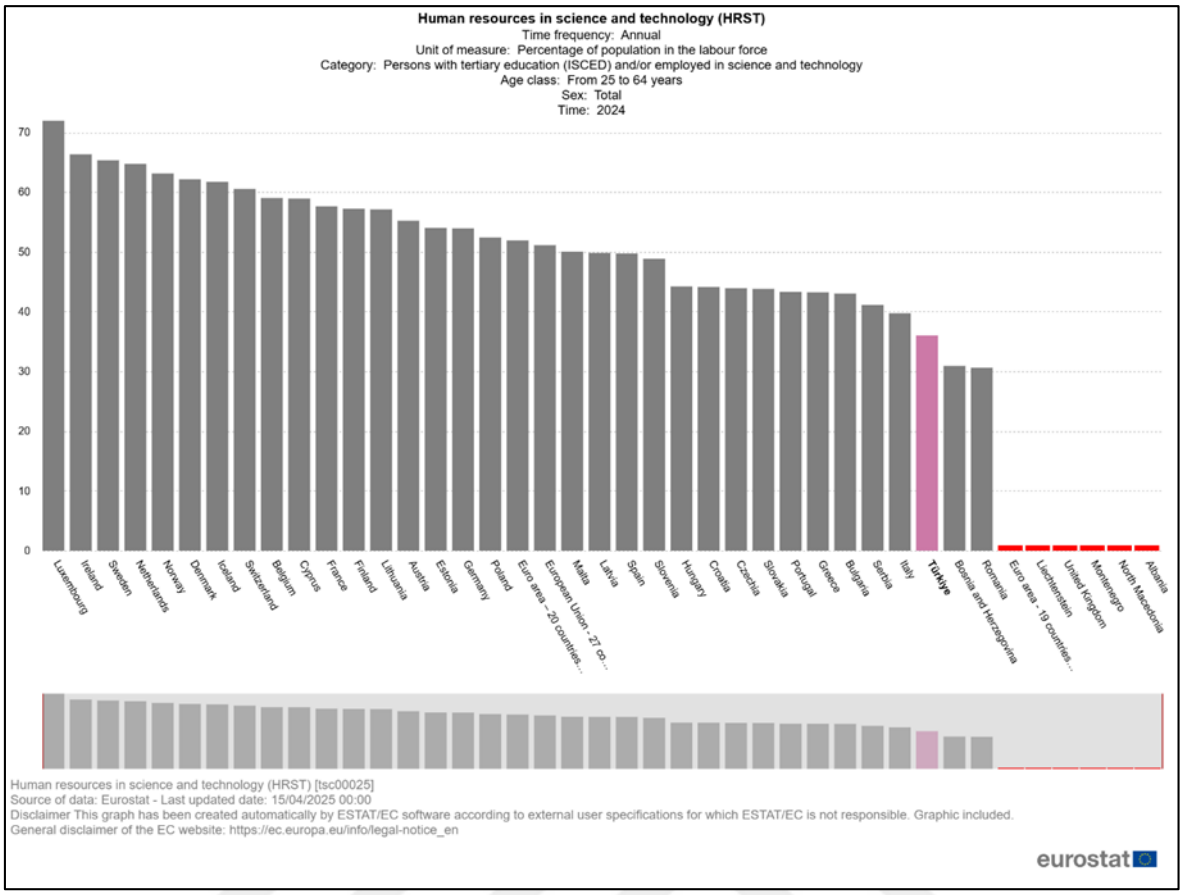


Figure 4.1. Human Resources in Science and Technology (HRST) (Eurostat, 2025)

The development of human resources in the field of science and technology has been one of the priority goals throughout the development plans, both quantitatively and qualitatively. The necessity of this goal is clearly demonstrated by the graph presented above.

The graph shows the proportion of individuals aged 25-64 with a bachelor's degree or higher in science and technology relative to the total population, presented in an international comparative context. According to the data, Türkiye ranks 31st out of 33 countries and is positioned well below the European Union average. This situation indicates that Türkiye's human resources in this field are insufficient both numerically and qualitatively.

When the targets set in the development plans are evaluated alongside Eurostat data, it becomes evident that Türkiye must strengthen its human resources in science and technology to enhance its competitiveness. The first step in this direction should be to reach the European Union averages.

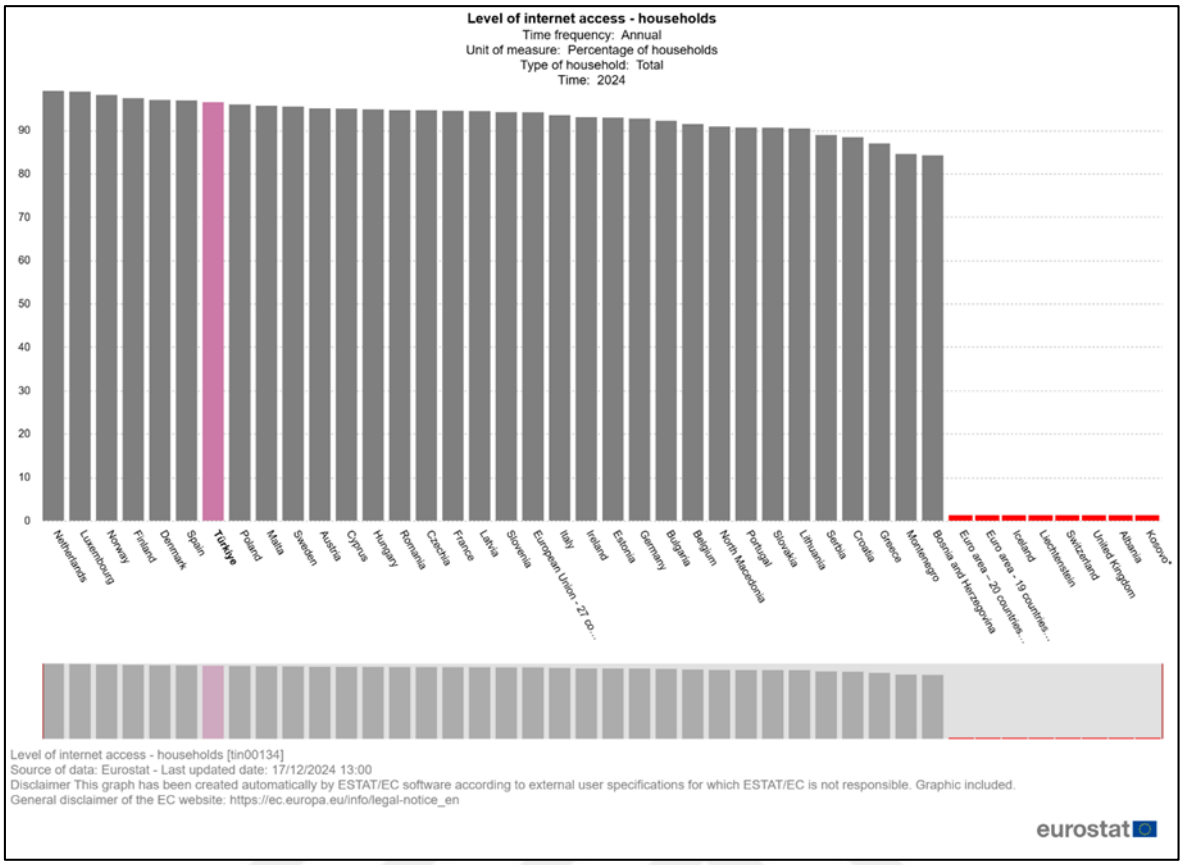


Figure 4.2. Level of Internet Access in Households (Eurostat, 2024)

In today's modern world, access to information and communication opportunities are among the fundamental dynamics of economic and social development. Accordingly, the strengthening of internet infrastructure, increasing access speed, and improving communication facilities have been identified as priority goals in the development plans.

The graph presented above shows the household internet access rates in an international comparative context. According to the data, Türkiye ranks 7th out of 33 countries and has reached a level above the European Union average. Based on these data, it is evident that Türkiye has made significant progress in internet access and holds a relatively strong position at the international level in this area.

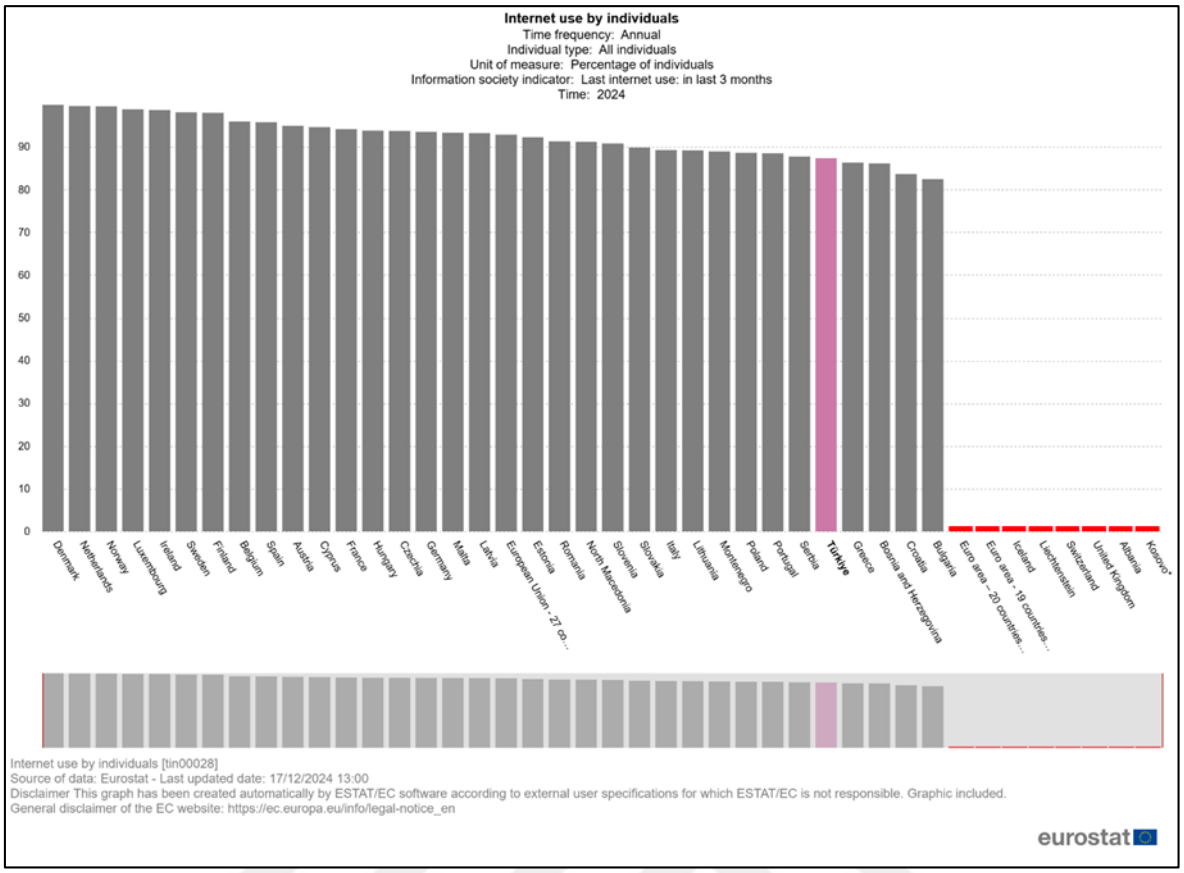


Figure 4.3. Level of Internet use by Individuals (Eurostat, 2024)

According to the 2024 Eurostat data, the proportion of individuals using the internet in Türkiye during the last three months of 2024 was approximately 80%, a rate significantly behind the European Union (EU) average and many developed European countries. Türkiye's position as the fourth from the bottom in the chart indicates that, despite infrastructural improvements in the digital transformation process, there are still serious deficiencies in individual internet usage. Developing countries such as Romania and Bulgaria, which rank ahead of Türkiye, offer a notable point of comparison in this context.

This situation reveals that although internet access has become widespread, structural barriers such as differences in digital literacy levels, economic inequalities, device accessibility, and regional disparities continue to limit individuals' internet usage. Therefore, for digital transformation policies to succeed, increasing infrastructure investments alone is not sufficient; comprehensive strategies aimed at enhancing digital inclusion must also be developed.

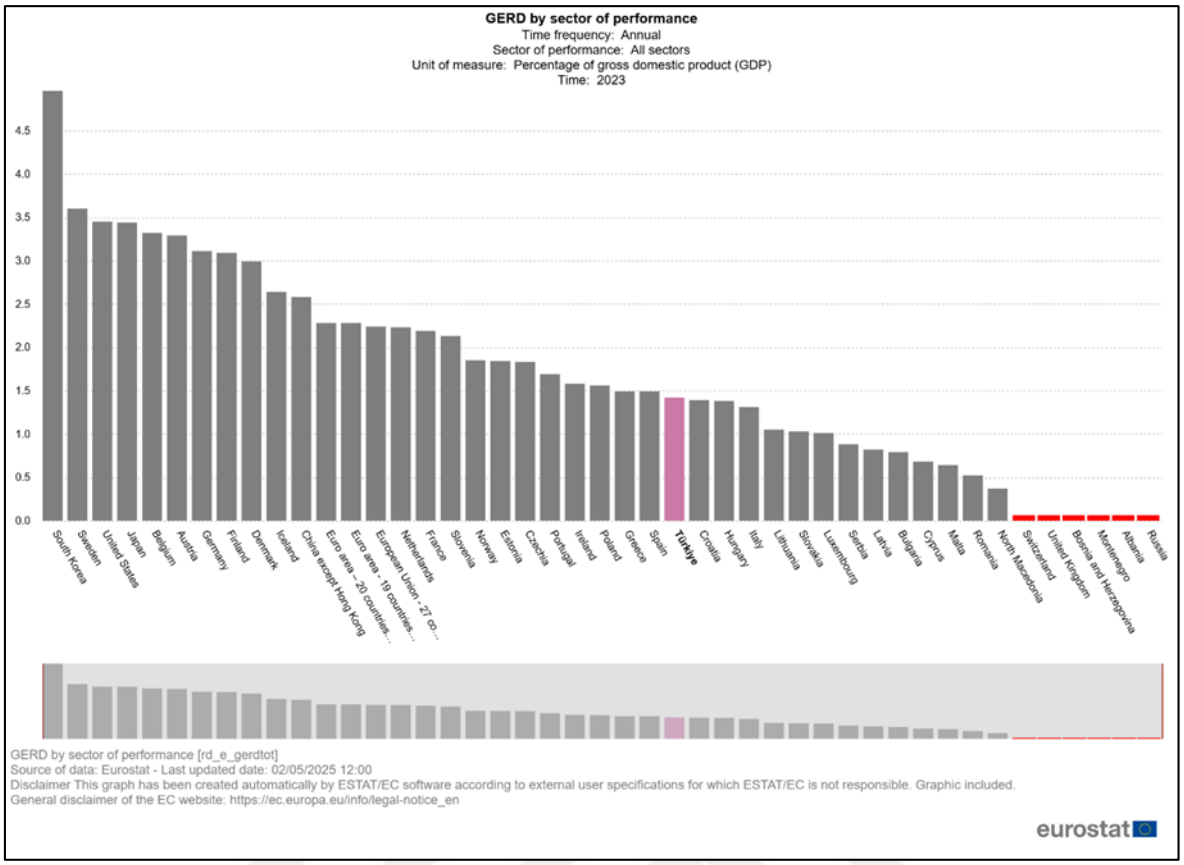


Figure 4.4. Gross Domestic Expenditure on Research and Development (R&D) (Eurostat, 2025)

R&D has consistently been among the priority goals in the development plans; however, it is observed that these goals have not been implemented regularly and effectively in Türkiye. In international comparisons, Türkiye's share of R&D expenditures within the Gross Domestic Product (GDP) remains significantly below the standards of European Union countries. According to Eurostat and other international data sources, Türkiye ranks 23rd out of 36 countries in R&D spending, which is an important indicator of structural deficiencies in this area.

In today's world, where technology and digitalization are rapidly advancing, countries are compelled to increase their R&D investments. In this context, Türkiye must first reach the EU average and subsequently aim for the levels of developed and technology-leading countries such as the United States, China, South Korea, and Sweden. Accordingly, increasing investments in R&D activities, activating incentives, and developing sustainable policies are critically important both for raising the welfare level of the public and enhancing international competitiveness.This strategic approach will be decisive for Türkiye's adaptation to the global digitalization process and its goals of technological independence.

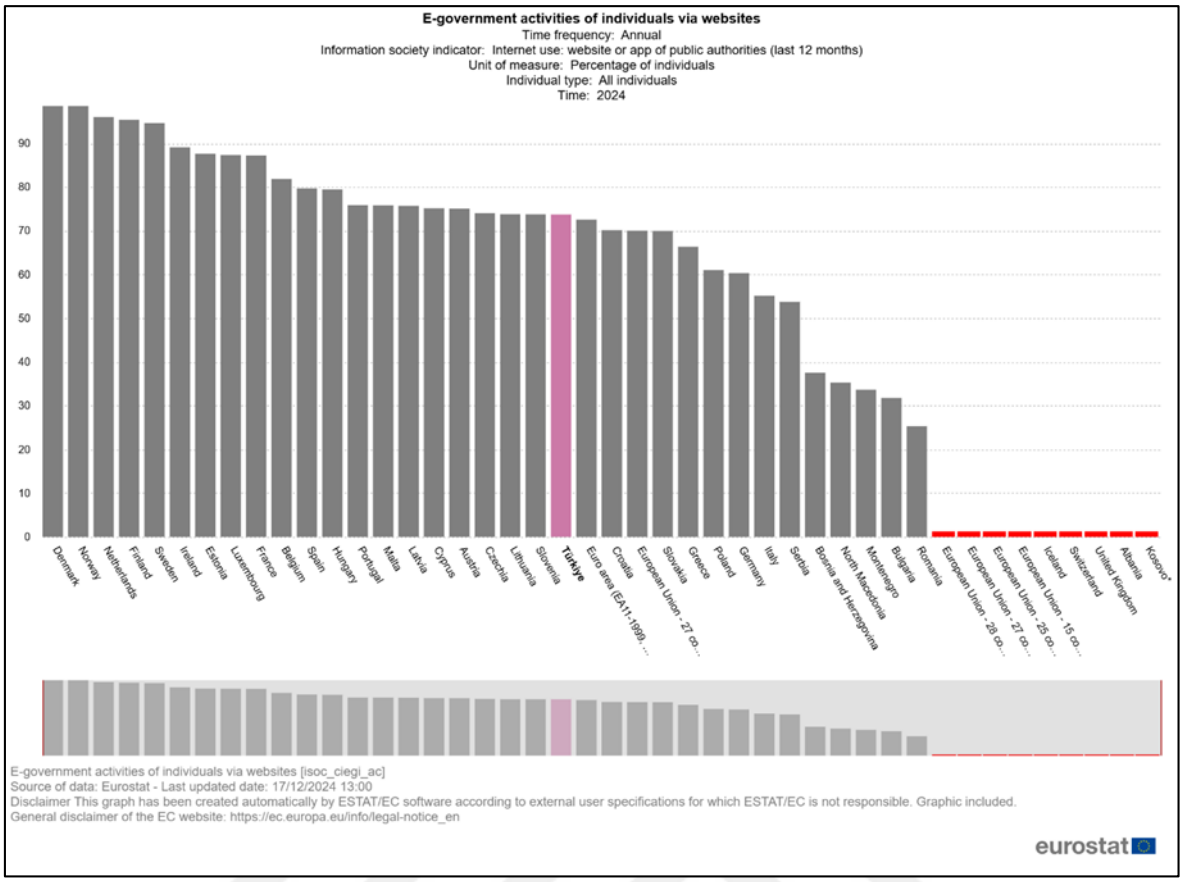


Figure 4.5. E-Government Activities of Individuals Via Websites (Eurostat, 2024)

According to 2024 data, when examining individuals' access rates to e-Government services via websites, Türkiye ranks 21st among 35 countries. The e-Government access rate in Türkiye varies between 70% and 80%, which is above the European Union average and generally reflects a moderate position.

Although this indicates that Türkiye has made significant progress in access to digital public services, it also reveals that further advancements are still necessary. Especially in terms of digital inclusivity and the effectiveness of services, it is important for Türkiye to develop strategic policies aimed at increasing e-Government usage rates, thereby facilitating citizens’ access to public services.

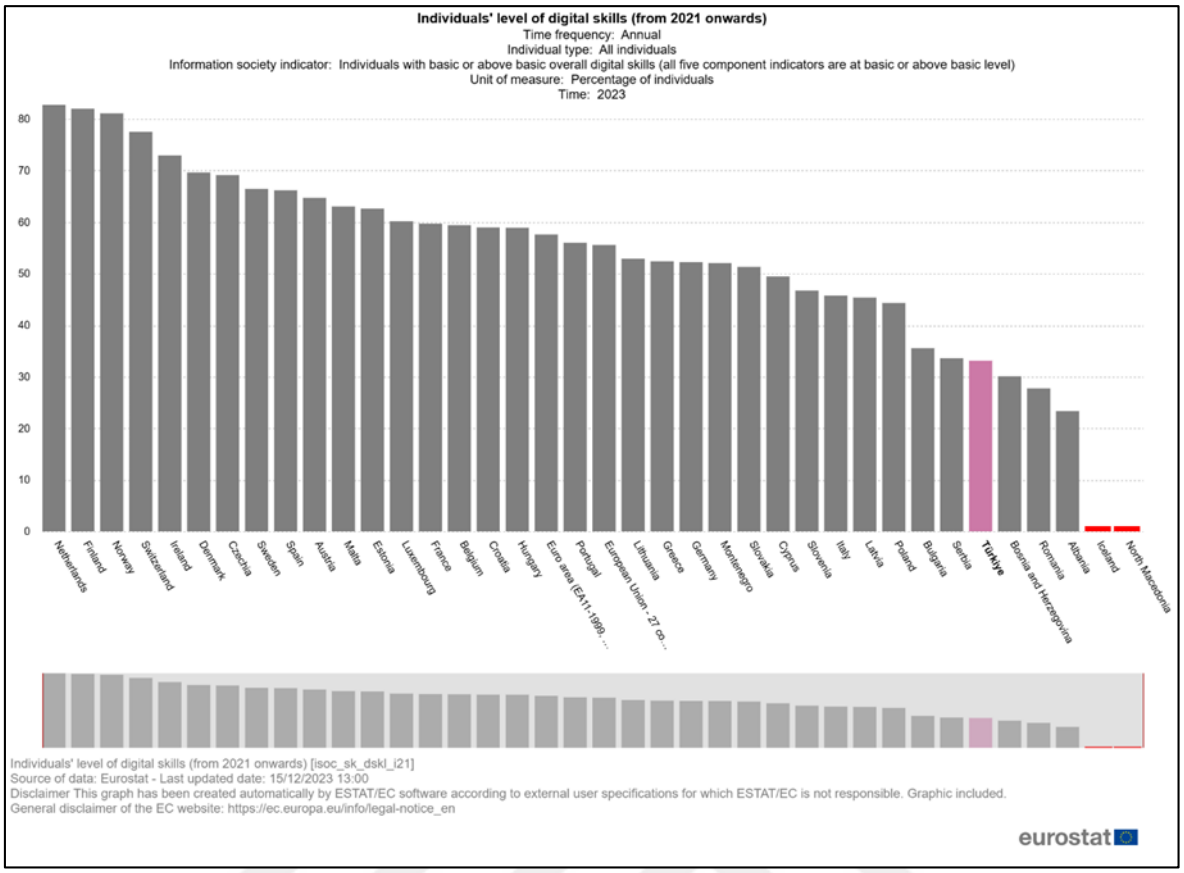


Figure 4.6. Individuals' Level of Digital Skills (from 2021 onwards) (Eurostat, 2023)

The concepts of digital transformation and digitalization have become fundamental components of the economic and social structure in the information age, with their growing importance. According to Eurostat data based on 2023, in an international comparison among 36 countries, Türkiye ranks 33rd in digital skills. This indicates that individuals' digital competencies in Türkiye are significantly behind those of European Union countries as well as other countries included in the comparison

This situation has been clearly identified in the development plans, which emphasize the need to promote digital literacy. In this context, it is aimed to accelerate the process of developing digital skills through integrated cooperation among universities, public institutions, and the private sector by offering comprehensive training programs and establishing incentive mechanisms. Thus, the goal is to overcome Türkiye's lag in digital skills and ensure active participation in the digital transformation process.

CHAPTER 5: CONCLUSION

This study comprehensively analyzes how Türkiye's five development plans covering the period 2001-2028 have been structured from the perspective of digital transformation. The research examines the discursive evolution of digital public policies, their relationship with implemented projects, and Türkiye's level of digitalization through multi-dimensional international comparisons. The five development plan periods were evaluated within conceptual and practical frameworks using content analysis, descriptive, and quantitative methods.

Firstly, the study investigates how digital transformation is articulated in development plan documents through key concepts such as "research and development (R&D)," "technology," "e-Government," "digital transformation," and "digital state." Quantitative data obtained via simple frequency counts reveal a significant increase in the usage of the digital transformation concept, particularly from the 10th Development Plan onward. This finding indicates that digitalization has gradually gained prominence in Türkiye's development policies. Furthermore, the 11th and 12th Development Plans define digital transformation not only as a technological necessity but also as a strategic priority integrated with green transformation and sustainable development goals.

Secondly, the projects implemented during the development plan periods were analyzed. Digital initiatives such as MERNIS, UYAP, FATİH, E-Nabız, CİMER, HES, and EBA were assessed in alignment with their respective plan periods. These projects not only facilitated the digitalization of public services but also enhanced citizen-state interaction, contributing significantly to transparency, accessibility, and efficiency in public administration. In particular, the widespread adoption of the e-Government Gateway has eased access to public services and become a cornerstone of the digital public administration approach.

A notable development in the latest development plan is the increasing association of digital transformation content with the concepts of "green transformation" and "sustainability." In the 12th Development Plan, digitalization is characterized not only as a process focused on efficiency and service quality but also as a strategic approach supporting environmental sustainability. In this context, digital technologies are expected to play a transformative role in reducing carbon footprints, optimizing resource use, and delivering environmentally friendly public services. This approach aligns with global policy

frameworks such as the European Green Deal and demonstrates Türkiye's integrated perspective on digitalization and environmental responsibility. Consequently, the scope of digital public policies has expanded beyond administrative dimensions to incorporate ecological considerations.

Findings from content analysis reveal how digitalization concepts have evolved over time in the development plans. While initial plans included more general, technology-centered expressions regarding digitalization, subsequent periods introduced adaptive and concrete targets linked to future-critical themes such as "green transformation," "artificial intelligence," and "sustainability." This discursive progression indicates that digitalization is perceived not merely as a technical reform but as a structural and cultural transformation.

International comparisons based on Eurostat data show that Türkiye's level of digital transformation remains below the European average. Although Türkiye lags behind many European countries in key indicators such as internet access, participation in digital services, and digital skills, the strategic goals set forth in the development plans and the implementations tracking these goals reveal the country's potential in this area. Nevertheless, realizing this potential requires strengthening digital infrastructure, enhancing the digital competencies of human resources, and ensuring policy continuity in public administration.

Despite the picture revealed by Eurostat data, Türkiye's adaptation to digital government applications has progressed at a notably rapid pace compared to many European countries. In particular, the widespread digitalization of public services has enabled transactions to be completed more quickly, with bureaucratic hurdles significantly reduced. Through the integrated services offered via the e-Government Gateway, citizens in Türkiye can easily carry out a wide range of official procedures online. In contrast, in some European countries such as Germany, certain state procedures are still conducted via postal mail, and digital integration remains more limited. This demonstrates that Türkiye, in terms of the accessibility and speed of digital public services, sometimes performs above the European average.

However, this evolutionary process produces not only positive outcomes such as faster service delivery and increased efficiency but also risks that compel the state to redefine human rights, privacy, and security. With digitalization comes an expanded capacity for data collection, processing, and analysis—offering governments a powerful tool for governance while also heightening the potential for intrusion into individuals' private lives. Digital

transformation, therefore, is not merely a matter of technological modernization; it is a governance challenge that requires the clear definition of legal and ethical boundaries.

Findings from this research reveal that development plans increasingly incorporate areas such as cybersecurity, data protection, and the safeguarding of personal rights. This demonstrates that in a digitalizing world, it is not enough for the state to merely enhance its technological capacity; it must also adopt a prudent approach that preserves the delicate balance between national security and individual freedoms. Particularly in areas such as artificial intelligence, big data analytics, and the Internet of Things, strengthening mechanisms of transparency, accountability, and citizen participation is essential for both democratic legitimacy and societal trust.

In the global race for digital transformation, Türkiye must take proactive steps not only in technical infrastructure and service diversity but also in upholding the rule of law, human rights standards, and security strategies. In this regard, future iterations of development plans should address the societal impacts of digitalization more comprehensively and develop concrete policy tools for issues such as cyber threats, information security, data privacy, and algorithmic neutrality.

The process of digitalization for Türkiye is not merely a matter of technological advancement; it is a security-and-rights equation that requires the state to rebuild its governance reflexes. In future policymaking, a strategic approach that is inclusive and prudent one that maintains a sensitive balance between digital capacity and the responsibility to protect human dignity will be the key to ensuring that digital transformation remains sustainable and socially legitimate.

The study also identifies that the implementation of digital public administration policies in Türkiye has sometimes faced delays and fragmentation due to institutional capacity, legal infrastructure, and coordination deficiencies. This situation indicates that the targets specified in the development plans have not always been achieved at the desired level in practice.

In conclusion, Türkiye's digital transformation process has gained both strategic and implementation-oriented dimensions within the framework of development plans. Digitalization has evolved from being merely a technology investment to a comprehensive structural transformation redefining public administration. However, for this transformation to be sustainable and effective, priority should be given to the following areas:

- **Continuity and coordination of policies:** Strategies defined in each development plan period should be complementary to one another, and inter-institutional

coordination must be strengthened. Additionally, the necessary financial and institutional investments must be secured to realize the targets outlined in the plans.

- **Enhancement of human resource capacity:** Training technically equipped, competent, and visionary human resources essential for digital public administration is critically important. Especially, achieving the targeted levels of productive human capital in R&D and allocating adequate public budget resources for this field will directly affect the country's development trajectory.
- **Data management and security:** Effective, transparent, and secure management of public data forms the foundation of the digital state. Legal regulations in the field of cybersecurity should be enacted, awareness regarding data security increased, and institutionalization processes accelerated.
- **Raising the digital literacy level of society:** Comprehensive education and awareness programs are vital to ensuring citizens' access to digital services and their effective use of these services. Supportive policies should be developed and implemented to close the digital divide.

The analyses presented in this study not only elucidate the developmental trajectory of digital public administration policies from past to present but also shed light on strategic directions to be followed in the future. This thesis offers a comprehensive and data-driven evaluation for policymakers and serves as an important resource to guide Türkiye in achieving its digitalization objectives.

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