International Journal of Engineering and Geosciences
https://dergipark.org.tr/en/pub/ijeg
e-ISSN 2548-0960

The transformation from e-government to e-land administration in Türkiye: A SWOT-based assessment analysis

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Keywords
e-government
e-land administration
public management
SWOT analysis

Research Article
DOI: 10.26833/ijeg.1152715

Received:02.08.2022
Revised: 23.03.2023
Accepted:27.03.2023
Published:08.05.2023

Abstract

The advantage of the developing information and communication technology in terms of both time and cost in service delivery has accelerated the use of these technologies in public administration. With this change, the concept of e-government has taken its place in the literature and has begun to be used in different fields (such as health, safety, tax, education) in many countries. Land management is one of these areas. The Land Registry and Cadastre Directorate and many other public institutions have started to provide many services through e-government within the scope of land management. Thus, the foundations of the transition to e-land administration began to be laid. This study aims to determine the necessary strategies for transition to e-land administration considering the role of the e-government platform in the provision of public services relating to land management in Turkey. Therefore, the current e-service structure related pertaining to land management has been analyzed with the SWOT technique. Thus, the strengths and weaknesses of the existing structure system were revealed. Besides, the opportunities and threats faced by this structure were identified. As a result of the analysis, various suggestions were made for the institutional policies that should be implemented in the transition to e-land administration.

1. Introduction

Rapid information and communication technologies (ICT) developments in recent years have significantly affected social life [1]. With this change, "production and management of information" has come to the fore in the information society instead of "production of material products", which is at the forefront of the industrial society [2]. With the developing information technologies, the citizen-state relationship gains a new dimension in this context [1]. With the rapid increase in internet usage and widespread worldwide since the 1990s, it is seen that a new market understanding in which electronic commerce is widely used has emerged. The fact that electronic commerce is more economical, efficient, and faster in terms of time and cost has accelerated the adaptation of this concept to public administration. Thus, the concept of e-government has taken its place in the literature. As a natural consequence of this, the transfer of public services to digital media has come to the fore, especially in developed western countries. For this reason, the states had to be more interested in the internet.

Today, using ICT as a tool in the provision of government services is becoming more and more common in the world. These applications, called e-government, provide their users with efficiency, savings, and convenience while simultaneously saving time and strengthening transparency, efficiency, and citizen-oriented service for management. Together with developments in the world, it also increased interest in the concept of e-government in Türkiye quickly. Since the 1990s, computer and internet usage rates have increased due to the investments made in the informatics infrastructure and some state institutions have started to provide their services in digital environments. Especially since the 2000s, many plans and projects of various institutions such as health, safety, tax, and education have been offered via e-government. Land administration is one of these areas. In particular, the General Directorate of Land Registry and Cadastre, which

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Cite this article
Pak, D. N. B., Kırtıloğlu, O. S., Kayalık, M., & Polat, Z. A. (2023). The transformation from e-government to e-land administration in Türkiye: A SWOT-based assessment analysis. International Journal of Engineering and Geosciences, 8(3), 290-300

operates under the Ministry of Environment and Urbanization, and many other public institutions have started to offer many services through e-government within the land management [3-4]. Thus, the foundations of the transition from e-government to e-land administration began to be laid. However, it would be wrong to limit the concept of e-government to the use of information technology. E-government also refers to the distribution of services whose external and internal relations are constantly renewed (innovation), the active participation of citizens in management and supervision processes, and the governance transformation [5]. Public institutions have now started seeing the citizens they serve as a customer, and their priority is to provide customer-citizen satisfaction in their services. Therefore, public institutions must provide new services to citizens more quickly and easily [6] by constantly monitoring and controlling the services offered through e-government. Factors that may affect corporate performance positively or negatively should be considered to increase citizen satisfaction. The aim of this study was to determine the strategies needed in Türkiye in the transition to e-land administration in the provision of public services by introducing the role of the e-government platform for land administration.

For this reason, the existing e-service structure related to land management was analyzed with SWOT technique, the strengths and weaknesses of the existing structure were revealed, and opportunities and threats from the external environment were identified. As a result of the analysis, various suggestions were made for the institutional policies that should be implemented in the transition to e-land administration.

A general introduction to the subject has been made in the first part of the study. In the second part, E-government and E-Land management are discussed, and development processes are mentioned. The third part of study examined the historical development of e-government structure in Turkey is examined. In the fourth part, the services provided by institutions related to land management in Turkey have been identified. In the fifth part, these services are classified according to various criteria, and the current status of this e-service structure is analyzed with the SWOT technique. In the fifth part of the study, the current system is discussed in terms of its strengths and weaknesses with potential opportunities and threats faced. The last part of the study presented results, assessments, and recommendations.

2. e-government and e-land administration concepts

2.1. e-government concept

Citizens are faced with much bureaucracy in various services provided by the government in the classical state understanding. Citizens are faced with a much bureaucracy in various services provided by the government in the classical state understanding. Simple procedures become complex structures for employees, and as a result, many staff and civil servants are hired to run jobs. In addition, numerous forms and signatures may be required for simple transactions, and transactions can take many months [7].

Today, the rapid development and dissemination of information technologies (especially internet access) have led to the transformation of the traditional state structure into a faster and more flexible state model [8]. Especially towards the end of the 90s, the E-government management model started to be used in terms of public administration [8-9]. E-government is an effective and fast way of doing all kinds of public transactions using information and communication technologies [10-11]. It is means saving time and money for both the public and the citizens.

The characteristics of the traditional state and e-state are given in Table 1 comparatively. According to the Table 1, there have been radical changes in many areas such as the role of the citizen with e-government, the environment in which the service is provided, and the cost of the service. It is possible to say that the emerging and constantly changing social needs, low cost, fast and effective service expectations were caused by the emergence of e-government [12]. Thanks to the strategic use of information technologies in e-government management, it is possible to create a management that can meet the needs of the information society, bring citizens and institutions together in an electronic environment, and ensure efficiency, transparency and development [13].

There are four main internal and external aspects included in the structure of the E-government [8]: 1) the creation of a reliable and accessible government intranet and database for more influence and interoperability among governmental institutions; (2) providing a web-based service; (3) the application of e-commerce for more effectual government-based transaction procedures, such as procurement and contract; and (4) digital accessible democracy for greater transparency and accountability in government affairs. The various technologies have been applied to promote these primary characteristics of e-government, including digital data sahring and transferring, reciprocal voice response, email, Web-based service, and virtual reality [8].

2.2 e-land administration concept

The protection and use of the property right are the basic facts required to create an economically and socially sustainable land administration [15]. There is a direct interaction between the state and citizens / institutions as the protection and use of property rights in many countries are under state control. It determines this level of interaction with the decisions taken by states in this direction [16]. Cadastre and land management system [17] is one of the most intense areas where government and citizens / institutions interact directly. For this reason, the state provides various services related to land management to citizens through public institutions. In order for these services to take place, the citizen must make individual requests. Complex bureaucratic procedures frequently observed in the classical public administration, high service fee, and long application period prevent the citizens from getting

better service. Therefore, the transition to a sustainable land administration system (LAS) is progressing very slowly. With the new land management paradigm [18], the public institutions are encouraged to take up new opportunities for better management of service delivery and implementation LAS policy [19].

Table 1. The comparison of traditional government and e-government [14]

Traditional Government	e-government
Passive Citizen	Active-Customer-Citizen
Paper Based Communication	Electronic Communication
Vertical / Hierarchical Structuring	Horizontal / Coordinated Network Structuring
Data Upload by Institution	Data Upload by Citizen
Staff Response	Automatic Voice Mail, Call Center etc.
Staff Based Control Mechanism	Audit with Automatic Data Update
Uniform Service	Personalized / Differentiated Service
High Transaction Costs	Low transaction costs
Inefficient Growth	Productivity Management
One Way Communication	Versatile Communication
Nationality Relationship	Participation Relationship
Closed State	Open State

Improving and strengthening land administration systems through good policies, legal, institutional frameworks and digital-based applications using ICT are important for national government [20]. The discovering the useful use of the internet and other ICT are increasingly being utilised by public land administration institutions [21-22]. The use of these technologies provides an opportunity to serve better. Thus, while customer satisfaction increases, service delivery costs decrease [21]. However, it is very difficult to design these systems as part of e-land administration.

To propose applicable models and guidelines for e-land administration services, Kalantari et al. [19] emphasize that it is necessary to analyze country experiences and good practices, and identify difficulties and impacts. Australia and the Republic of Korea are examples of countries that have successfully implemented e-land administration. More than ten online land information services have been set up in Australia, covering country arrivals. Australian citizens can easily access information related to land online via web-based services.

Korea Land Information System (KLIS) is one of the main applications of the Republic of Korea's e-government, recognized worldwide as one of the top land information systems [23]. The application was designed to be able to fulfill 530 different procedures in nine land-based areas. It has gathered transparency, efficiency, reliability, and better service for the Republic of Korea's citizens [23]. Many countries recognize the importance of delivering citizen-centric services [19]. They provide a unique and helpful interface for citizens to access all government services.

3. Implementation of e-government in Türkiye

The beginning of transition to e-government in Turkey is based in the 1980s. In this period, while the economic policies gained a more liberal direction, the first studies on the change in the state structure started. Between 1990 and 2000, technology and science policies started to be reformed, and the transition to e-government applications was realized [24]. During this period, the worldwide transformation based on information and technology has affected Türkiye in a very intense way.

Prime Management Information System Center (PMISC) was established to operate e-government activities more efficiently in Türkiye [25]. Subsequently, the e-European initiative launched by the European Union with the member countries and proposed to the candidate countries is referenced. In this respect, after 2000, the e-Turkey Initiative Action Plan was launched. It is plan covering the 2003-2004 e-Transformation Turkey Project Short-Term Action Plan was followed [26]. E-government studies were carried out between 2006-2010 in a comprehensive policy such as the Information Society Strategy and Action Plan. The 2014-2018 draft of the Information Society Strategy and Action Plan, which can be described as the second phase of the Information Society Strategy, which also includes e-government studies, was prepared by the Ministry of Development and shared with the public [27].

As a result of the studies summarized above, an important step has been taken in e-stateization. With the effect of these developments, public administrations within the central government have started to offer some services through e-government [28]. Today, almost all central government units have large e-government projects. The most important of these projects can be listed in Table 2 [28]. The number of services offered via e-government is increasing day by day. According to e-government statistics, while the number of services provided in 2009 was 162, this number reached 6821 in 2023. The institutions that contribute the most to this number of services are "Central Public Institutions", "Municipalities", "Private Institutions" and "Universities", respectively.

The reasons such as the fact that e-government is a universal phenomenon, and that studies are carried out in every country required the determination of indices related e-government and comparisons with other countries. The United Nations (UN) is one of the important institutions calculating E-government

Development Index. It is one of the important institutions calculating the United Nations (UN) e-government Development Index. According to the index made biennially by the UN, the countries' index score is calculated to be a value in the range of 0 to 1. The index value of 1 indicates that the country's e-government development level is high. In calculating the index, three different variables are used: service coverage and quality, human resources, and the status of the telecommunications infrastructure [29]. Turkey's place in the world ranking for e-government applications is changing depending on the development of e-government services. According to various corporate e-government development rankings, Türkiye is usually located in the middle row. Turkey's e-government Development Index and world ranking by years are given in Table 3. According to Table 3, e-government development index has increased gradually and reached the top ranks in the world ranking in recent years due to the services provided over e-government infrastructure. It is development was also evident in the provision of services related to land management. In addition, many public institutions develop various projects for land management and provide services to citizens through e-government.

Table 2. The most popular e-government projects in Türkiye

Name of project	The institution that developed the project
Central Population Statistics Project (MERNİS *in Turkish)*	Ministry of the Interior
Identity Sharing System (KPS *in Turkish*)	Ministry of the Interior
MOBESE Projects	General Directorate of Security
Tax Offices Automation Project (VEDOP *in Turkish*)	Ministry of Finance
National Judicial Network Project (UYAP *in Turkish*)	Ministry of Justice
e-Consumer (e-Services) Project	Ministry of Industry
Information Processing Center Project (BİMER *in Turkish*)	Prime Ministry
e-Declaration and MEDULA Projects	Ministry of Labor and Social Security
MEBSİS and e-School Project	Ministry of National Education

Table 3. e-government development index and ranking by years in Türkiye

Year	e-government development index	The world ranking	Total number of countries
2008	0.48	76	192
2010	0.47	69	183
2012	0.52	80	190
2014	0.54	71	193
2016	0.59	68	193
2018	0.71	53	193
2020	0.77	53	193
2022	0.79	48	193

4. e-government-based land administration services in Türkiye

The user interface and system login screen of the application developed for e-government is given in Figure 1. E-government consists of "e-services", "Institutions", "Municipalities", "Companies" and "Quick Solution" sections (Figure 1a). Inquiry, application, and payment processes related to the service provided in the "e-services" section are carried out. In the "Institutions" section, services and contact information of official institutions are provided. In the "Municipalities" section, the contact information of the municipalities and the services they provide are listed. Invoices and subscriptions are made in companies in the "Companies" section.

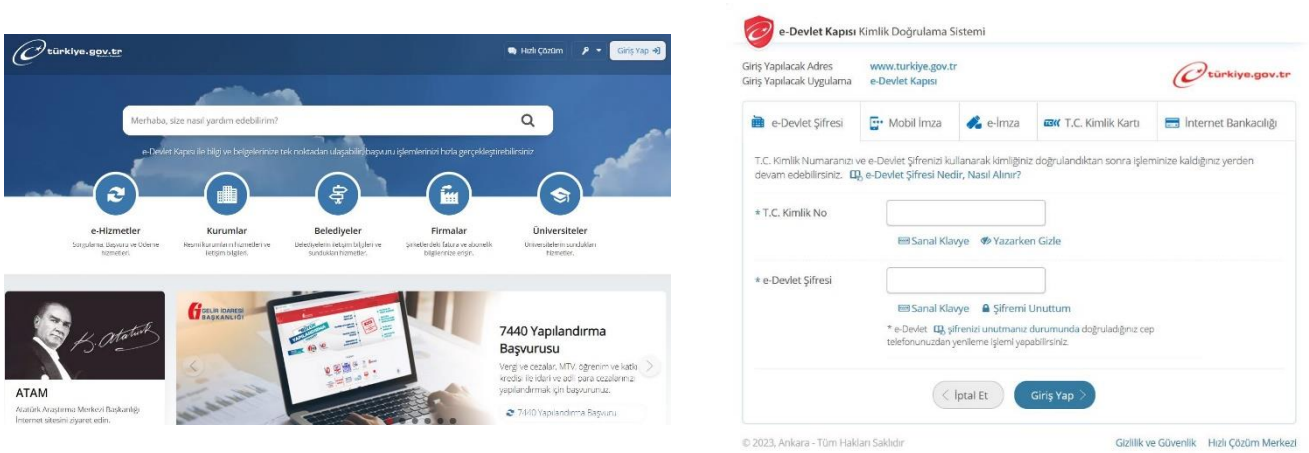

Figure 1. (a) E-government user interface and (b) login the system

The "Quick Solution" section conveys complaints, suggestions, questions and requests regarding the services provided. Alternative entryways to the system are presented in the e-government entry section (Figure

1b). "E-government password", "mobile signature", "e-signature", "T.C. ID card “and” “internet banking information” can be entered. E-government is increasing in use due to its practical use and easily accessible structure.

For this reason, many public institutions have started offering services through this system. Many institutions, especially those dealing with land management, have begun to transform their services into a structure that can be offered via e-government. Among these institutions the Ministry of Agriculture and Forestry (9 services), Ministry of Justice (1 service), Natural Disaster Insurance Institution (1 service), General Directorate of Forestry (1 service), General Directorate of Land Registry and Cadastre (8 services) and many municipalities (4 services) comes to the fore. The e-services and explanations provided by these institutions are given in Table 4.

Table 4. Institutions taking part in land administration and their e-services

Name and Abbreviation of institution	Name of the E-Service	Definition of E-Service
Ministry of Agriculture and Forestry (MAF)	Investigation of Possible Agricultural Lands to Exclude from Agriculture	Using this service, you can get information on whether the agricultural land you own can be taken out of agriculture.
	Land Consolidation Distribution Inquiry	Using this service, you can view the current and past hang lists of your real estate subject to land consolidation and view the status of your immovables before and after consolidation on the map.
	Farmers register system	It is possible for the farmers registered in the system by the relevant ministry to question their agricultural land and agricultural products.
	Completed Land Consolidation Distribution Inquiry	With this service, you can list the projects of any neighborhood/village where land consolidation is done and view the details.
	Application for Expropriation in Protected Areas	With this service, you can request the expropriation of the real estate in the protected areas.
	Application for Right of Easement in Forest Qualified Areas in National Parks	Opinions may be requested to establish the easement right, except for the strict permits for tourism purposes in forests in the national parks.
	Final Permit application in Forest Qualified Areas in National Parks (e. g. Pre-application, Application, transfer, cancellation)	Permits given in the fields of "pre-application", "application", "transfer," and "cancellation" in forest-qualified areas in national parks can be questioned.
	Tourism Facility Application in Forest Qualified Areas in National Parks	With this application, tourism facility application can be made in forest-qualified areas in national parks.
	Application for Activity Permit Certificate in Wetlands (Real and Legal Person)	With this application, an application can be made for the Permit Certificate required for the Activity in Wetlands.
Ministry of Justice (MJ)	Certificate of inheritance inquiry	With this application, the certificate of inheritance required to share the heritage can be questioned.
Natural Disaster Insurance Institution (NDII)	Earthquake insurance policy inquiry	With this application, an inquiry can be made regarding the policy related to real estate with earthquake insurance.
General Directorate of Forestry (GDF)	Application for Forest Cadastre, Land that has lost its forest quality, Property Dispute, technical error, Renewal, Forest Boundary determination processes.	With this service, applications can be made for the Forest Cadastre, Land that has lost its forest quality, Property Dispute, technical error, Renewal, Forest Boundary determination processes
General Directorate of Land Registry and Cadastre (GDLRC)	Inquiry of Land Registry Information	With this application, you can query the information about the real estate(s) you have.
	Land Registry and Cadastre Fee and Revolving Funds Inquiry and Payment application	With this application, you can inquire about the amount of Fee, and Revolving Capital requested for the Land Registry and Cadastre transactions and made your payments.
	Document verification with an electronic document management system	With this application, the accuracy of the documents issued by the institution can be checked.
	Real estate declaration application	With this application, you can ensure that the real estate you own are registered by entering the necessary information.
	Real estate sales process application	With this application, you can initiate the necessary pretreatments for the sale of real estate you have.
	Land Registry Document	With this application, you can access information about your real estate registered in the land registry
	TUSAGA-Active System User Operations	With this application, you can use the system by registering to TUSAGA-Active System
	Web title transactions (Includes 46 different transactions)	With this application, applications for 46 different transactions can be made.
Municipalities (M)	Land market value inquiry	With this application, the market value of the land's land can be queried.
	Inquiry on Unfinished Zoning Plan	With this application, you can access information about zoning plans that have not been finalized yet.
	Council Decision Inquiry	With this application, Council decisions taken by the relevant municipality can be questioned.
	Zoning status	With this application, information about the zoning status in the location of the real estate can be accessed.

5. Swot analysis of e-government-based land administration services in Türkiye

The easiest way to reveal the current situation and expectations of a sector, an activity, or a company is to perform a SWOT analysis by experts on that subject [30]. The term SWOT is an acronym for the first letters of four words in English. These are Strengths, Weaknesses, Opportunities, and Threats [31]. SWOT analysis is a technique used to identify the strengths and weaknesses of a sector, an activity, or a firm and identify opportunities and threats from the external environment [32-33].

In the literature, various studies using SWOT analysis have been conducted in the process of developing and evaluating the e-government process [34-41]. SWOT analysis has been frequently used in studies on land management. Polat et al. [42] identified strategies that may be necessary to implement the 2034 cadastral vision Turkey. Yan et al. [43] used the SWOT technique to make strategic planning in land consolidation. Halla [44] used SWOT technique to determine the stages of urban planning in Tanzania. Steudler and Williamson [45] analyzed the development of the land administration system in Sweden using the SWOT technique.

Paudel and Thapa [46] used the SWOT technique to determine the competencies of local institutions in land management. Strategic planning is needed to establish sustainable e-services related to land management in Turkey. For this, the strengths and weaknesses of the existing structure and external threats and opportunities must be determined with the SWOT technique. Thus, it will be ensured that strategies suitable for the e-land administration goals of the country are determined.

In this context, a current situation analysis was carried out to assist the e-service process in land management using SWOT analysis. For this, the services provided through e-government related to land management are classified in terms of their characteristics according to various criteria. Explanations about the criteria used in the classification are listed in Table 5, and the result of the classification is listed in Table 6.

Table 5. Explanations of the criteria used in Table 6

Name of e-service	Code	Explanation
E-Service Delivery Level (SDL)	A	Questioning information: gives the applicant information about the service
	B	Application Inquiry: Includes querying the result of an application made for a service
	C	Making an application: Contains only the application process for a service
	D	Completion of all stages: It includes application and finalization stages related to a service or all stages of questioning and concluding information.
E-Service Access Level (SAL)	E	All natural persons can access/query/ apply.
	F	All legal persons can access/query/ apply
	G	Only real persons registered in the system or associated with the service can access
	H	Only legal persons registered in the system or associated with the service can access
E-Service Access Costs (SAC)	K	Paid service
	L	Free service
	M	The application is free but requires a revolving fund/fee/ service fee for the transaction.
Service Access Time (SAT)	N	24/7 access
	P	Access to a specific date/time
E-Service Inquiry Output (SIO)	R	Text (Includes words and numbers)
	S	Map/Image (Includes .KML, .KMZ, JPEG, .TIFF, .PNG, .GIF formats)
	T	Form (.doc, docx, .xls, .xlsx., .pdf)
E-Information and Documents Required for Accessing or Completing the Service (IDS)	U	Requires credentials (e.g., Name-Surname, identity number)
	V	Requires Contact Information (e.g., Phone, mail address)
	W	Requires real estate Information (e.g., Layout, block, parcel number)
	X	Requires location information (e.g., Address, Province-District-Neighborhood, Coordinate)
	Y	Requires other information (eg document code, document number, serial number, date of decision)
	Z	No information required

5.1. Strengths

The five main strengths are determined as follows:

5.1.1. Having a user-friendly interface

The E-government application is designed with a user-friendly interface. Through this interface, citizens easily and quickly benefit from the e-services offered by many institutions. Due to its user-friendly design, the citizen can query a lot of information via e-government and make a pre-application for some transactions.

5.1.2. Providing alternative access

E-government application entered many personal information. Citizens can log in to the e-government system using one of "e-government password", "mobile signature", "e-signature", "T.R. ID card", or "internet banking".

5.1.3. Reducing service cost

Services offered through e-government are realized at a lower cost than normally provided services.

5.1.4. Reducing bureaucracy and paperwork

Many of the services provided by institutions are not performed at any time due to bureaucratic procedures. In addition, various documents are requested in paper form during these processes. Thanks to the e-service offered through e-government, bureaucratic procedures reduced stationery costs.

5.1.5. Access to the service free of charge and at any time

There is no charge for public services provided through e-government. Citizens can access these services at any time.

5.2. Weaknesses

The three main weaknesses are determined as follows:

5.2.1. Not being able to complete every transaction 100% electronically

Only the preliminary application of some transactions is accepted through e-government. For the rest of the procedure, it is necessary to go to the institution.

5.2.2. Incomplete integration of e-service providers into the system

Not all public institutions, municipalities and companies have been able to switch to the e-government system. This weakens the holistic approach in e-service delivery related to land management.

5.2.3. The failure of all citizens to fully utilize e-service

The number of e-government users reached 33 million in 2017, 39 million in 2018, and 44 million in 2019. Turkey is considered to be about 83 million of population; even if the observed increase in the use of E-services, complete success has not been achieved yet.

5.3. Threats

The four main threats are determined as follows:

5.3.1. Cyber-attacks on e-services

Cyber-attacks on e-services cause service disruption and endanger public and personal data security.

5.3.2. Privacy and security gaps

Providing services in an electronic environment brings security risks. Failure to fully protect the personal data of citizens using the service endangers e-service.

5.3.3. Confidence problem

One of the reasons for not benefiting from e-government services sufficiently is the trust problem that citizens have in an electronic environment. To minimize this problem, it is necessary to prevent the risks that cause the problem of trust in the services and to prevent virtual attacks and information leaks that may come from outside.

5.3.4. Low level of computer literacy

The level of computer literacy has not reached the desired level, and the distribution of citizens with computer literacy is not geographically homogeneous, which causes the e-service not to be used sufficiently.

5.4. Opportunities

The five main opportunities are determined as follows:

5.4.1. Developments in information and communication technologies

With the developments in ITC, access to the desired information can be provided independently of time and place. In this way, services related to land management are provided electronically and monitored by citizens.

5.4.2. The increasing desire for public institutions to provide e-services

The spread of e-government and its success in providing services have been preferred by many institutions. According to the Ministry of Environment and Urbanization data, 5180 different services are offered through the e-government Gateway. Of these, 2600 are state institutions, 2123 are municipalities, 403 are private institutions, 54 are water and sewerage services.

5.4.3. The increase in the e-government development index

Because of the services offered via the e-government infrastructure in Türkiye in recent years, the country's e-government development index has been increasing (see Table 3).

5.4.4. Increased e-government usage

As of July 2017, approximately 33 million users benefited from 2165 services provided by 332 institutions [47]. However, it should not be forgotten that these numbers are not constant, and the number of users, institutions, and services increase daily.

5.4.5. Opportunity to convey ideas, complaints, and requests regarding e-service delivery

Citizens can convey their requests, ideas, complaints, and requests to the relevant institutions through the e-government Gateway.

The strengths and weaknesses originating from the internal environment and opportunities and threats originating from the external environment mentioned above are summarized in Table 7 as the SWOT matrix.

Table 6. Comparison of land management-based e-services

Name of Institutions*	Name of E-Service	E- Service Delivery Level (SDL)				E- Service Access Level (SAL)				E- Service Access Costs (SAC)			E- Service Access Time (SAT)		E-Service Inquiry Output (SIO)			Information documents required for accessing or completing the E-service (IDS)					
		A	B	C	D	E	F	G	H	K	L	M	N	P	R	S	T	U	V	W	X	Y	T
MAF	Investigation of agricultural lands to exclude from agriculture	✓				✓					✓		✓		✓					✓	✓		
	Ongoing land consolidation distribution inquiry	✓						✓			✓		✓		✓	✓							✓
	Farmers register system	✓	✓					✓			✓		✓		✓								✓
	Completed land consolidation distribution inquiry	✓				✓					✓				✓						✓		
	Application for expropriation in protected areas			✓		✓					✓		✓		✓	✓	✓		✓		✓		
	Application for right of easement in forest qualified areas in national parks			✓		✓					✓		✓		✓				✓		✓		
	Permit application in forest qualified areas in national parks			✓		✓					✓		✓		✓		✓		✓		✓		
	Tourism facility application in forest qualified areas in national parks			✓		✓					✓		✓		✓	✓	✓		✓		✓		
	Application for activity permit certificate in wetlands			✓		✓	✓				✓		✓		✓		✓	✓			✓		
MJ	Certificate of inheritance inquiry	✓				✓					✓		✓		✓			✓					
NDII	Earthquake insurance policy inquiry	✓				✓		✓			✓		✓		✓								✓
GDF	Application for forest cadastre, land that has lost its forest quality, property dispute, technical error, renewal, forest boundary determination processes.			✓		✓	✓								✓		✓	✓	✓		✓		
GDLRC	Inquiry of land registry information	✓						✓			✓		✓		✓	✓							✓
	Land registry and cadastre fee and revolving funds inquiry and payment				✓			✓			✓	✓	✓	✓	✓			✓				✓	
	Document verification with electronic document management system	✓				✓					✓		✓		✓							✓	
	Real estate declaration application	✓				✓					✓		✓		✓		✓		✓	✓	✓		
	Real estate sales process application			✓				✓			✓		✓		✓		✓	✓				✓	
	Land registry document	✓						✓			✓		✓		✓		✓	✓					
	TUSAGA-active system user operations				✓						✓		✓		✓	✓	✓	✓	✓		✓	✓	
	Web title transactions (Includes 46 different transactions)		✓	✓				✓			✓		✓		✓		✓	✓	✓	✓	✓	✓	
M	Land market value inquiry	✓				✓					✓		✓		✓						✓		
	Inquiry on unfinished zoning plan	✓				✓					✓		✓		✓						✓		
	Council decision inquiry	✓				✓					✓		✓		✓						✓	✓	
	Zoning status	✓				✓					✓		✓		✓	✓				✓	✓		

Table 7. SWOT analysis results for e-service-based land management

Internal factors	**Strengths**	**Weaknesses**
	➢ Having a user-friendly interface ➢ Providing alternative access ➢ Reducing service cost ➢ Reducing bureaucracy and paperwork ➢ Access to the service free of charge and at any time	➢ Not being able to complete every transaction 100% electronically ➢ Incomplete integration of e-service providers into the system ➢ The failure of all citizens to fully utilize E-service
External factors	**Opportunities**	**Threats**
	➢ Developments in information and communication technologies ➢ The increasing desire for public institutions to provide e-services ➢ The increase in the E-government development index ➢ Increase in e-government usage ➢ Opportunity to convey ideas, complaints and requests regarding e-service delivery	➢ Cyber-attacks on e-services ➢ Privacy and security gaps ➢ Confidence problem ➢ Low level of computer literacy

3. Discussion

In this study, the presentation of the services related to land management through the e-government platform was evaluated by SWOT analysis. There are many benefits of service delivery via e-government. The most powerful aspects of the e-government structure are lowering service costs, reducing bureaucracy and paperwork, providing continuous service, and providing access at any time and place.

Although it is constantly evolving, the e-government structure has some weaknesses. The weaknesses of this structure are that all institutions operating within the scope of land management are not fully integrated into e-government, the number of services provided is insufficient, and only some of the transaction steps of some services are carried out electronically. Again, not all of our citizens can benefit from these services yet shows that the e-government structure is not known enough.

Some security and privacy problems, some cyber-attacks that may occur in the digital environment are examples of dangerous situations that will prevent or slow down e-service delivery. In addition, the problem of citizens' trust in the electronic environment and the low level of computer literacy can be considered obstacles to the healthy execution of e-government applications.

Developments in information and communication technologies, increasing the tendency of public institutions to provide e-service, increasing e-government use every year, and considering suggestions, complaints and requests related to e-service are opportunities that will make the e-government platform more widespread. Particularly considering the suggestions, complaints and requests regarding the implementation indicates that the citizen plays a significant role in the design of the e-government. This situation has also led to the gradual increase in Turkey's e-government index. In this way, Turkey's worldwide e-government index ranking has become better.

Despite many positive developments, it is observed that various public institutions carry out independent studies on a number of similar services. For example, independent automation projects related to the same administrative and financial affairs of different institutions and organizations are far from effective and shareable. This situation causes the same job to be done more than once, thus wasting labor and resources. To prevent such inefficiencies, necessary e-government coordination efforts should be carried out more effectively. However, it is observed that the culture of electronic service delivery in public institutions and organizations is developing gradually. Therefore, this development is thought to play a facilitating role in e-government studies and the integration of services [27].

4. Conclusion and Suggestions

Turkey's e-government structure with various institutions for the provision of public services (e.g., public institutions, municipalities, corporations) are in cooperation. In this context, the e-government structure has become a dynamic sector that constantly improves the quality of its services by diversifying the services offered.

The land is a scarce social resource directly related to shelter, nutrition, and property. Hence the importance of the land management sector is increasing both in the world and Turkey. Reaching the advanced level of service delivery in an electronic environment and approaching world standards will contribute to the transition to sustainable e-land management in Türkiye. Especially the Ministry of Forestry and Agriculture, the General Directorate of Land Registry, and Cadastre and Municipalities are among the leading e-service institutions related to land management.

This study shows a certain level of culture in e-service in public institutions and organizations, and the studies carried out are following a more positive course daily. In order for e-service to reach the ideal level, weaknesses of e-government and e-land management should be developed, and threats should be eliminated. Various suggestions are needed for this. These suggestions are as follows:

- For the services carried out on the web to be used and accepted efficiently by the citizens, e-government and e-Land management services should provide users with vast opportunities and user satisfaction [48].
- The lack of equal access to information and communication technologies prevents the use of e-government and e-Land management services. Necessary precautions must be taken to minimize the negativities caused by this situation [25].
- National policies and programs should be revised to integrate into e-government and e-Land management practices [49].
- Applications should be organized as “disabled friendly” [50].
- One of the reasons for not getting enough e-government services is the problem of trust. To minimize this problem, it is necessary to prevent risks that cause a problem of trust in services and to prevent virtual attacks and information leaks that may come from outside [51].
- Some administrative and legal regulations need to be made for the widespread use of e-government services by citizens and institutions [25].
- In our country, although the rate of household access to the internet and mobile technology is high, some individuals do not use computers and do not have this skill. For this reason, services should be provided to improve computer literacy [51].

If these suggestions are taken into consideration, it will reach the level of offering all services through e-Land administration, taking into account the demands and needs of citizens and other sectors of public institutions soon.

Acknowledgement

This article was produced in the master's thesis titled "Analysis of E-government Based Applications Related to Land Administration".

Author contributions

Derya Nur Bolat Pak: Conceptualization, Methodology, Data curation, Writing, Original draft preparation, **Osman Sami Kirtiloğlu**: Writing, Reviewing and Editing, **Mert Kayalik**: Visualization, Editing and Original draft preparation, **Zeynel Abidin Polat**: Writing, Reviewing and Editing.

Conflicts of interest

The authors declare no conflicts of interest.

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