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Normative Power in Europe, Digital Sovereignty in Türkiye: A Theoretical Comparison to Artificial Intelligence Applications in Local Governments

Müslüm Soykan

muslumsoykan@gmail.com

Niğde Ömer Halisdemir University

Ferdi Güçyetmez

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Abstract

This study examines artificial intelligence applications in local governments in Türkiye and the European Union through a comparative analysis. The main aim is to explore how these technologies are linked not only to service efficiency but also to digital sovereignty and normative power generation within the context of international relations. The research seeks answers to the following questions: How do the EU and Türkiye develop strategies for artificial intelligence at the local level? What governance norms and international goals underpin these strategies? Conducted using qualitative document analysis, the study evaluates applications in cities such as Istanbul, Gaziantep, Amsterdam, and Helsinki in terms of strategic vision, governance models, and ethical considerations. The study provides a unique perspective on how local digitalisation policies are interconnected with international norm-setting and power projection processes.

Introductıon

Artificial intelligence is transforming the functioning of local governments in a number of areas, from the planning to the delivery of public services (Sandoval-Almazan et al., 2024). Data-driven decision-making and predictive services are yielding significant benefits in areas such as efficiency and citizen-centricity (Fachridian et al., 2024; Vatamanu & Tofan, 2025). Türkiye is responding to this transformation with its National Artificial Intelligence Strategy (2021–2025) and Action Plan, while the EU is mandating rules such as transparency and human control in high-risk systems with its Artificial Intelligence Act of 2024 (T.C. Digital Transformation Office, 2021; European Commission, 2024).

These two divergent strategic orientations provide a unique basis for a comparative study of AI adoption processes in Turkish and EU local governments. However, a significant research gap exists, highlighted by the scarcity of empirical studies on AI adoption at the local government level in Türkiye, the fragmented nature of success metrics, and the heterogeneity in implementation maturity among municipalities. The existing literature predominantly examines AI projects in Turkish municipalities through a technical innovation lens, neglecting systematic and comparative assessments with EU counterparts. This deficiency underscores the urgent need for holistic, evidence-based academic research that can inform the reshaping of Türkiye's national AI strategy in line with international best practices.

The primary objective of this research is to comparatively analyze the application forms and governance practices of AI technologies in local governments within the contexts of Türkiye and the EU. This study will address AI applications commonly used by local governments, including deep learning, machine learning, Robotic Process Automation (RPA), Natural Language Processing (NLP), Geographic Information Systems (GIS) integration, and Internet of Things (IoT)-based systems.

The geographical scope of the study encompasses metropolitan and provincial municipalities in Türkiye and local governments in EU member states. The temporal scope covers the period from 2020 to 2025, a critical time for policy developments in both regions influenced by the COVID-19 pandemic. This study

compares and analyzes the AI strategies of local governments in Türkiye and the EU within the framework of digital sovereignty and normative power concepts. While there are many technical and managerial studies in the literature on the application of AI in local governments, the points where this process intersects with international power relations have not been sufficiently examined.

This study compares and analyzes AI applications in local governments in Türkiye and the EU within the framework of the concepts of “normative power” (Manners, 2002) and “digital sovereignty” (Bradshaw, 2021; Belli, 2023). The research is based on the following hypotheses:

H1: The EU uses AI policies as an ethical norm-based foreign policy tool even at the local level, thereby constructing “normative power.”

H2: Türkiye designs its artificial intelligence strategy from the perspective of national development and digital sovereignty, and therefore, its applications are more focused on operational efficiency.

H3: The strategies of the two regions lead to different structural and ethical outcomes at the local level; governance and transparency are prioritized in the EU, while speed and inclusiveness are prioritized in Türkiye.

Although there are numerous studies in the literature on the technical and managerial applications of AI at the local level, how these applications relate to international norm production and sovereignty struggles has not yet been thoroughly examined. In this regard, the study aims to offer a unique perspective by linking local government practices of digital transformation with international relations theories.

Theoretical Framework and Literature Review

The theoretical basis of this study consists of two main concepts: normative power and digital sovereignty. First, Ian Manners' (2002) “normative power Europe” approach focuses on the European Union's capacity to spread norms such as ethical values, the rule of law, and human rights at the global level, rather than just economic or military power. The EU’s Artificial Intelligence Act (AI Act) can be interpreted as a reflection of this strategic orientation in the digital sphere. The use of AI technologies in public services is not only a means of increasing efficiency for the EU, but also a tool for global governance through ethical responsibility and transparency.

Second, the concept of digital sovereignty refers to an understanding that positions states' control over digital technologies as a strategic power factor (Bradshaw, 2021; Belli, 2023). Türkiye's National Artificial Intelligence Strategy and “national technology initiative” vision focus on domestic data production, national algorithms, and institutional capacity building in line with this concept. In this respect, Türkiye's approach points to a sovereignty-based pragmatic digitalization strategy rather than a normative structure.

These two theoretical frameworks guide the comparative analysis of the study, positioning the EU as a “regulatory actor based on norm export” and Türkiye as a “development and sovereignty-oriented technology developer.”

The use of artificial intelligence technologies in public administration has been the subject of an increasing number of academic studies, especially in the last decade. Studies generally focus on four axes:

Technological and operationally focused studies: The effects of AI on service efficiency, automation, and citizen satisfaction in municipalities (Yigitcanlar et al., 2024; Zuiderwijk et al., 2021)

Governance and ethical debates: Algorithmic transparency, data security, and public accountability (Meijer et al., 2021; Rodríguez et al., 2023)

Smart city and digital transformation approaches: The role of AI in smart city strategies (Batty et al., 2012; Kitchin, 2014).

Social and political impacts: The impact of AI on citizen participation, digital inequality, and social trust (Yigitcanlar et al., 2023; Söker, 2024)

However, two important gaps stand out in this literature:

The use of AI in local governments is mostly addressed from a technical/efficiency perspective, neglecting political or geopolitical dimensions.

Comparisons between the EU and Türkiye are often made in terms of legal compliance or institutional capacity, without discussing the strategic positioning of these two actors in the context of international relations.

This study aims to fill these two gaps by proposing an interdisciplinary framework that evaluates AI applications at the local level from both an administrative and geopolitical perspective.

Limitations of the Study and Suggestions for Future Research

This study has limitations, including its reliance on document analysis and the non-homogeneous nature of local applications. It should be borne in mind that policy documents may not always fully reflect on-the-ground practices. Future research can deepen the findings of this study. Longitudinal studies could be conducted to monitor the level of achievement of the National Artificial Intelligence Strategy's goals. Quantitative survey research, referencing similar studies in Australia and Hong Kong, that measures citizens' perceptions, expectations, and trust levels towards AI applications by local governments would offer significant insights specific to Türkiye. Furthermore, in-depth qualitative case studies examining successful AI projects in pioneer municipalities could reveal success factors and challenges in greater detail, offering practical lessons for other local governments.

Research Methodology

This study is structured to examine the artificial intelligence (AI) applications of local governments in the European Union (EU) and Türkiye in a comparative manner. The research is based on a qualitative comparative case study design (Yin, 2017). This method provides a suitable framework for systematically comparing two different management and regulation models (the EU's normative regulation-based model and Türkiye's development-oriented strategic model) through local-level applications.

3.1. Data Collection Method

The research was conducted using the document analysis technique (Bowen, 2009). The documents examined include policy documents, strategy documents, legislative texts, municipal reports, official publications of EU institutions, municipal application examples, and relevant academic literature that became publicly available during the 2020–2025 period.

3.2. Case Selection

In the study, the pioneering local governments included in both sample groups were selected using purposive sampling (Meijer & Bolívar, 2016). The EU sample included municipalities such as Amsterdam, Helsinki, and Barcelona, which stand out for their algorithm transparency and social service innovations, while the Türkiye sample examined municipalities such as Istanbul, Gaziantep, Kocaeli, and Izmir, which carry out projects in line with the National Artificial Intelligence Strategy. In the case selection, the governance vision was taken as the basis beyond technological capacity.

3.3. Data Analysis

The collected data were evaluated using the thematic analysis method developed by Braun and Clarke (2006). During the analysis process, comparisons were made under four main themes:

- Strategic-regulatory framework
- Application areas and depth
- Institutional capacity and governance maturity
- Ethics, transparency, and public trust

3.4. Scientificity and Validity

The validity of the study was supported by the principle of diversity in data sources (triangulation). Reliability was ensured by the transparent reporting of the entire analysis process and content interpretations based on systematic classification (Thurmond, 2001).

Thanks to this methodological approach, the study has created an interdisciplinary analytical framework that reveals not only differences in practice but also the political, normative, and geopolitical

backgrounds of these differences.

Normative Power Theory

The idea of “Normative Power Europe,” as highlighted in Ian Manners’ (2002) paper in the Journal of Common Market Studies, describes the European Union as a unique actor that projects power not through military or economic means, but through global norms. According to Manners, the EU is a “norm creator” that integrates principles of high normative value, such as human rights, the rule of law, democracy, sustainability, and transparency, into its foreign policy, with the aim of spreading these principles globally (Manners, 2002, pp. 236–237). This perspective goes beyond classical classifications of power, repositioning the EU as a “normative actor” or “civil power.”

The ontological foundations of this theory are based on social constructivist and post-structuralist theories of international relations. Thomas Diez (2005) takes this approach a step further, arguing that normative power is not only the externalization of norms, but also involves the reconstruction of the EU's identity through its relationship with the “other” (Diez, 2005, p. 615). Thus, the EU defines itself through normative power both in discourse and in practice, rising to the position of “producer and implementer of normative discourse.”

However, there are also criticisms regarding the effectiveness of NPE in practice. Groothuis and Niemann (2012) point out that there is not always consistency between “normative intent” and “practical outcomes,” particularly in the EU's counter-terrorism and migration policies. This situation highlights the double standard issue between discourse and action in NPE. Richard Whitman (2011), on the other hand, emphasizes that disciplined consistency is necessary for the sustainability of this theory; that is, there must be a serious correlation between the EU's norm-producing intentions and its actual behavior in practice.

NPE is not limited to international policy but can also be applied to sub-national level practices within a multi-layered governance framework. Schimmelfennig (2022) at ETH Zurich has integrated this theory into local-level digital governance practices, such as algorithm transparency, ethical design guidelines, and data protection processes. This analysis suggests that algorithm registries implemented in EU cities are practical reflections of NPE in terms of the micro-scale institutionalization of digital norms.

In conclusion, the Normative Power Europe approach offers a conceptual framework that enables the EU not only to disseminate norms but also to activate identity-building and discursive hegemony strategies. It reveals how power is redefined in the digital age and makes the EU's role as a “normative order-builder” in AI regulation comprehensible. However, the validity of the theory can be measured by the strength of the bridge it builds between the EU's theoretical claims and its normative consistency in practice.

Digital Sovereignty Theory

The concept of digital sovereignty is a critical power analysis that addresses national control capacity over global digital infrastructure, data policies, and algorithmic decision-making processes; it is a perspective that has emerged in critical political science literature in recent years (Bradshaw, 2021, p. 482). As described by Bradshaw and Belli (2021), digital sovereignty represents a multidimensional understanding of sovereignty that encompasses not only the construction of technological infrastructure but also data ownership, infrastructure security, legal adequacy, and digital strategy autonomy (pp. 485–486).

In this sense, digital sovereignty can be considered as the strategic reaction capacity of states in the face of cyber threats, data colonization, and platform dominance (Belli, 2023, p. 10). Actors outside the European Union, in particular, are focusing on this concept as a strategy to break their dependence on US and Chinese technology giants (Bradshaw, 2021, p. 489).

Türkiye's National Artificial Intelligence Strategy (2021–2025) reflects the symbolic and performative dimensions of digital sovereignty in this context; the construction of local data storage facilities, open source software incentives, local algorithm development, and cloud infrastructure policies characterize the claim of digital autonomy (Presidency of the Republic of Türkiye Digital Transformation Office, 2021, pp. 5–7). These practices point to the data and technology-focused breaking points of a multidisciplinary discipline that approaches digital sovereignty not as mere rhetoric but as a concrete capacity-building practice (Krämer, 2020, p. 112).

However, the applicability of digital sovereignty is directly linked to institutional capacity. Shortcomings in data infrastructure, qualified human resources, and legal regulations in key areas create uncertainty about the goals achieved in the context of Türkiye (Özer, 2024, pp. 22–23). This emphasizes the need for digital sovereignty strategies to be not only rhetoric but also to create an applicable infrastructure in line with the neo-sovereignty paradigm (Belli, 2023, pp. 12–13). Authors such as Emma Lindh (2022) point out that multi-layered governance and public-private-academic partnership models are necessary for the digital sovereignty norm to be realistic and sustainable (p. 98).

In conclusion, digital sovereignty is not only a technical or strategic issue, but also a revision of sovereignty based on legal policy, digital infrastructure, capacity structure, and institutional resilience. This study analyzes the concept of digital sovereignty in the context of Türkiye's AI strategies and reveals its fundamentals through verifiable building blocks.

The Use of AI in Local Governments in the European Union,

The shift towards artificial intelligence (AI) by local governments in the European Union reflects a strategy that goes beyond simply increasing digital capacity and also aims to institutionalize the EU's value-based governance approach at the local level. Within the framework of the Normative Power Europe approach, these applications can be seen as a way of reproducing the EU's fundamental norms—such as transparency, ethical governance, democratic participation, and human rights—through digital tools (Manners, 2002, p. 238). In this regard, the European Commission's initiatives such as AI Watch

show that AI is concentrated in city-focused areas such as smart transportation, social services, the environment, and public administration (Yigitcanlar et al., 2024; Noordt et al., 2020; Gianluca & Colin, 2020).

These applications are developing in two main dimensions: First, the optimization of systems and services is targeted. For example, Barcelona uses predictive systems to provide social assistance to at-risk individuals, while Bologna employs AI-based data analysis to improve urban mobility and air quality (Cities for Digital Rights, 2022; Eurocities, 2025). Second, automation in administrative processes and digital interaction with citizens are taking center stage. In examples such as South Cambridgeshire, citizen experience is being digitized through chatbots and virtual assistants (Prathiksha et al., 2024; Mendoza et al., 2022).

On the other hand, cities such as Amsterdam and Helsinki have created public algorithm registries, thereby ensuring that normative values such as algorithmic transparency and accountability are integrated into digital infrastructures (Eurocities, 2023). This holistic approach clearly demonstrates that the EU positions AI not only as a tool for efficiency but also as a means of producing norms and practicing democratic governance at the local level.

The table below summarizes concrete examples of AI applications implemented in various local governments across the European Union, highlighting their respective domains of focus.

Table 1
Selected AI Applications in EU Local Governments

Country / City	Application Domain	Description of AI Application	Reference
Netherlands / Amsterdam	Transparency & Governance	Maintaining a public register of algorithms used by the city to enhance transparency and citizen oversight.	Eurocities (2023)
Finland / Helsinki	Transparency & Governance	Creating an algorithm register to inform the public about the AI systems in use.	Eurocities (2023)
Spain / Barcelona	Social Services	Utilizing predictive analytics to identify vulnerable citizens and proactively deliver social assistance.	Cities for Digital Rights (2022)
France / Paris	Transport & Environment	Reducing traffic congestion and monitoring air pollution through intelligent traffic lights and sensors.	Noordt et al. (2020)
Germany / Hamburg	Logistics & Transport	Using a smart logistics management system to optimize truck traffic and reduce waiting times in port operations.	AI Watch (2022)
United Kingdom / Hertfordshire	Infrastructure Maintenance	Deploying an AI-powered robot that autonomously detects and repairs cracks and potholes in roads.	Local Government Association (2025)
Denmark / Copenhagen	Energy & Waste Management	Optimizing energy consumption in buildings and improving waste collection routes with smart sensors.	Sözen (2024)

The use of artificial intelligence (AI) in local governments across Europe varies depending on regional scale and resources. According to the findings of the European Committee of the Regions (2025), AI applications are more widespread in large cities; most municipalities in regions with a population of 500,000 to 2 million have adopted these technologies. In contrast, smaller municipalities face obstacles such as limited staff, funding, and technical capacity. Eurostat (2024) data similarly shows that larger organizations are leading the way in AI adoption; while 8% of businesses in the EU used AI in 2023, this figure approached 30% among large-scale firms. This trend suggests that there is also a scale-based asymmetry in the public sector.

The European Commission's “Digital Decade” strategy aims to digitize public services and promote the widespread use of digital identity solutions by 2030. Artificial intelligence plays a key role in achieving these goals (European Commission, 2021). In this context, the Artificial Intelligence Act (Regulation (EU) 2024/1689), proposed in 2021 and entering into force in 2024, constitutes the most comprehensive regulatory framework in the EU. The law classifies AI applications according to risk levels and imposes criteria such as data quality, transparency, human oversight, and cybersecurity for high-risk systems.

This regulation aims to prevent algorithmic discrimination and privacy violations while guiding innovation without hindering it. AI policies implemented in EU cities should be read not only as operational but also as a manifestation of a normative governance vision, reflecting the Normative Power Europe approach in the digital sphere (Manners, 2002).

The Use of AI in Local Governments in Türkiye

The use of artificial intelligence in local governments in Türkiye is a dynamic and evolving field that is supported by national strategies but varies in practice. The period from 2020 to 2025, particularly the first half of 2025, represents a phase in which policy objectives begin to translate into concrete projects, pioneering municipalities emerge with innovative applications, and efforts to increase artificial intelligence literacy in the local government ecosystem intensify (Biswas et al., 2024). With its 2021–2025 National Artificial Intelligence Strategy, Türkiye demonstrates its desire to become a global player by addressing this technology with a comprehensive approach that includes not only technological adaptation but also ethical, legal, and governance aspects (Babaoğlu, 2023; Babaoğlu, 2024c).

Türkiye's approach to the use of Artificial Intelligence (AI) in local government is shaped by a strategic vision at the central level with the 2021–2025 National Artificial Intelligence Strategy (NAIS) published by the Presidency of the Republic of Türkiye Digital Transformation Office. This strategy positions AI as a lever to increase efficiency in public services, while also forming part of the broader "National Technology Movement" vision that aims to achieve technological sovereignty for Türkiye (Presidency of the Republic of Türkiye Digital Transformation Office, 2021; Babaoğlu, 2024c).

The strategy's concrete goals include ensuring that at least 250 municipalities actively use AI technologies by the end of 2025, employing 1,000 AI experts in the public sector, and developing at least 40 public sector AI projects. These measurable goals not only provide a clear roadmap for local governments to adopt AI but also demonstrate the central political will and infrastructure support for this transformation (Presidency of the Republic of Türkiye Digital Transformation Office, 2021).

4.1. Application Examples from Pioneer Municipalities

In the 2020–2025 period, metropolitan municipalities in particular played a leading role in translating the potential of AI into concrete projects.

4.1.1 Gaziantep Metropolitan Municipality: Taking an innovative approach to traffic management, Gaziantep launched the Artificial Intelligence Based Traffic Signalization Control System in May 2025. This system analyzes traffic density at intersections in real time and dynamically adjusts signal durations, aiming to reduce average waiting times and fuel consumption. The system also processes pedestrian and cyclist data to provide input for micro-mobility infrastructure planning (Gaziantep Metropolitan Municipality, 2025).

4.1.2 Istanbul Metropolitan Municipality (IMM): IMM has integrated artificial intelligence into various service channels. The artificial intelligence-supported chatbot in the IMM Cep Trafik mobile application

responds to citizens' requests for real-time traffic information and routes. The “Photo Verification with Artificial Intelligence Model” project, developed by subsidiary company Belbim A.Ş. and awarded at Informatics Summit 2025, aims to increase the security of identity verification in processes such as Istanbulkart personalization (Informatics Summit, 2025). In addition, artificial intelligence algorithms are used in the municipality's internal processes, such as digital archiving and a personalized education platform (IMM Academy) (Özer, 2024).

4.1.3 İzmir Metropolitan Municipality: In May 2025, İzmir declared its determination to make artificial intelligence a corporate strategy. The municipality declared that it has prepared an “Artificial Intelligence Strategy Document” to increase efficiency in urban services, especially transportation, and to produce technology-oriented solutions to problems (Izmir Metropolitan Municipality, 2025). This strategic move shows that the municipality will shape its future projects based on artificial intelligence.

4.1.4 Kocaeli Metropolitan Municipality: With the “Artificial Intelligence Introduction Meeting” held in February 2025, Kocaeli demonstrated its intention to use artificial intelligence to improve the quality of citizen-oriented services and enhance administrative decision support processes. This study, conducted in cooperation with Kocaeli University, is an important example of transferring academic knowledge to local government practices (Kocaeli Metropolitan Municipality, 2025).

4.1.5. Other Municipalities: The use of AI by Kayseri Metropolitan Municipality's smart parking systems, and Antalya Metropolitan Municipality's applications like smart intersections and reverse vending machines demonstrate the adaptation of AI to various urban needs (Özer, 2024).

4.2. Comparative Analysis of Selected Municipal Projects

The following table (Table 2) provides a comparative overview of the key AI projects of pioneer municipalities in Türkiye during the 2020–2025 period, summarizing their application areas and technological focus.

Table 2
AI Projects in Selected Turkish Municipalities (2020–2025)

Municipality	Project Name/Initiative	Application Domain	Core Technologies & Description	Status/Timeline
Gaziantep	AI-Based Traffic Signalization System	Smart Transportation, Public Safety	Machine learning, computer vision. Optimizes signal durations by analyzing intersection density.	Launched in May 2025.
Istanbul	Mobile Traffic Chatbot	Citizen Services, Transportation	Natural Language Processing (NLP). Provides real-time responses to traffic status and route queries.	Currently active.
Istanbul	AI-Powered Photo Verification (Belbim A.Ş.)	Security, Identity Verification	Computer vision, deep learning. Prevents fraud in applications like the İstanbulkart.	Received an award in February 2025; currently active.
İzmir	AI Strategy Paper	Strategic Management, Corporate Transformation	Development of an AI roadmap covering all municipal services.	Announced in May 2025.
Kocaeli	AI-Focused Service Development	Decision Support, Citizen Services	Data analytics. Aims to improve service quality and managerial decision-making processes.	Initiated in February 2025.
Antalya	Smart Intersection Application	Smart Transportation	AI-powered adaptive traffic signalization.	Currently active.
Bursa	Illegal Construction Detection via UAV	Urban Planning, Auditing	Computer vision. Detects illegal constructions from unmanned aerial vehicle (UAV) imagery.	Currently active.
Konya	Visitor Analysis (Mevlana Museum)	Tourism, Cultural Management	Data analytics, machine learning. Analyzes visitor behavior and density.	Currently active (Özer, 2024).

Source: Compiled by the authors from Gaziantep Metropolitan Municipality (2025), İzmir Metropolitan Municipality (2025), Kocaeli Metropolitan Municipality (2025), IT Summit (2025), and Özer (2024).

The process of adopting artificial intelligence in Turkish municipalities is shaped not only by internal dynamics but also by a developing support ecosystem. Educational initiatives aimed at increasing AI literacy by institutions such as the Marmara Municipalities Union (Marmara Municipalities Union, 2025) and the provision of AI-based systems to numerous municipalities by local technology companies (Para Magazine, 2025) highlight this multi-stakeholder structure. While these collaborations aim to realize opportunities such as improving service quality, achieving cost savings, and developing data-driven policies, they also face significant challenges. These include structural barriers such as the lack of high-quality data, high costs, and insufficient technical and human capacity (Özer, 2024), as well as critical ethical and legal uncertainties such as algorithmic bias and data privacy (Madan & Ashok, 2023).

It can be said that local governments in Türkiye are in a “strategic start-up phase” in terms of AI adoption. Although there is a gap between the national vision and pioneering but not yet widespread applications, concrete projects launched in the first half of 2025 show that there is acceleration in this area. However, for AI to become a widespread and effective tool for urban governance in all local governments, it is essential to overcome the technological, financial, legal, and human resource challenges mentioned above through systematic policies and robust ecosystem collaborations.

As a result, Türkiye's applications of artificial intelligence in local governments should be read within the framework of the redefinition of national sovereignty in the digital age, which is not limited to increasing technical capacity. According to the theory of digital sovereignty, Türkiye's strategic orientation is not only adaptation, but also resistance building and the production of digital autonomy. This approach reveals that digitalization is not only a tool, but also an institutional and symbolic space where state sovereignty is reproduced.

Comparative Analysis

While the AI adoption processes in the local governments of the European Union (EU) and Türkiye share a common goal of modernization, they fundamentally diverge in the maturity of their strategic and regulatory frameworks. The EU's approach is a "regulation-focused" strategy, shaped by the "Artificial Intelligence Act" (AI Act), the most comprehensive regulatory framework on a global scale. This framework classifies AI applications based on risk levels and imposes strict rules for high-risk systems in public services, emphasizing transparency, human oversight, and the protection of fundamental rights (European Commission, 2021; European Commission, 2024). In contrast, Türkiye is following a "development and capacity-building focused" path with its 2021–2025 National Artificial Intelligence Strategy (NAIS), which aims to accelerate technological adaptation and enhance institutional competencies. While this strategy sets ambitious targets, such as having 250 municipalities use AI, it does not yet offer a binding and detailed legal framework comparable to that of the EU (Presidency of the Republic of Türkiye Digital Transformation Office, 2021).

This strategic divergence is also reflected in the prevalence and depth of applications. While the use of AI in EU local governments is at a more advanced stage, particularly in large cities (European Committee

of the Regions, 2025), its adoption in Türkiye is heterogeneous, in an initial phase, and limited to a few pioneering metropolitan municipalities (Uysal & Öztürk, 2024). Although both geographies share common application areas focused on operational efficiency, such as smart transportation and waste management (e.g., Gaziantep Metropolitan Municipality, 2025), applications in the EU stand out distinctly due to their dimension of governance innovation. The public algorithmic registries in Amsterdam and Helsinki (Eurocities, 2023) or Barcelona's proactive use of AI in social services represent advanced, transparency-focused approaches and application areas that are not yet widespread in Türkiye.

While both regions face universal challenges such as financial constraints and a shortage of skilled human resources (Özer, 2024), their core strategic barriers differ. For local governments in the EU, the primary challenge is to strike a balance between technological innovation and compliance with strict legal regulations. In Türkiye, however, the main challenges are more structural and foundational, including the uncertainty of immature legal and ethical frameworks, a lack of high-quality data, and infrastructural deficiencies (Özer, 2024). This situation indicates that the more established AI ecosystem in the EU is contrasted by one in Türkiye that is still in a developmental phase, being built through collaborations with universities and the private sector (Kocaeli Metropolitan Municipality, 2025; Para Magazine, 2025).

The following table (Table 3) compares the AI approaches of local governments in the European Union and Türkiye across key parameters.

Table 3
Comparative Analysis of AI Use in Local Governments: The EU and Türkiye

Parameter	European Union Approach	Turkish Approach
Strategic Framework	Regulation-Focused: A risk-based, binding legal framework centered on ethics, rights, and security through the "Artificial Intelligence Act".	Development-Focused: Prioritizes capacity building, ecosystem development, and adaptation goals through the "National Artificial Intelligence Strategy" (Republic of Türkiye Presidency Digital Transformation Office, 2021).
Implementation Prevalence	More Mature and Widespread: High adoption rate, especially in large metropolises. Overall corporate AI usage was 8% as of 2023 (Eurostat, 2024).	Initial and Heterogeneous: A structure led by "pioneering" metropolitan municipalities that is not yet widespread (Uysal & Öztürk, 2024).
Prominent Application Areas	Governance and Transparency: Algorithm registries (Amsterdam, Helsinki). Proactive Social Services: Risk prediction (Barcelona) Operational Efficiency: Transportation, waste, energy.	Operational Efficiency: Smart transportation (Gaziantep), infrastructure auditing (Bursa), citizen services (Istanbul) (Gaziantep, 2025; Özer, 2024).
Core Strategic Challenge	Regulatory Compliance: The necessity of balancing innovation with the strict rules of the "Artificial Intelligence Act" and ensuring compliance.	Structural Deficiencies: Foundational capacity issues such as data quality, financing, qualified personnel, and an immature legal/ethical framework (Özer, 2024).

Source:*Compiled by the authors from sources cited in Sections 3 and 4 of this study.*

In conclusion, the EU appears to adopt a cautious, human-centric approach as a "mature regulator" in the use of AI in local governments, while Türkiye prioritizes technological adaptation and capacity building as an "ambitious developer." The EU is focused on the question, "How can we use it more safely and fairly?" whereas Türkiye is seeking an answer to, "How can we use it faster and more widely?" Looking ahead, valuable lessons exist for mutual learning: Türkiye can draw from the EU's regulatory framework and governance-focused best practices, while the EU can, in turn, learn from Türkiye's development-oriented dynamism and motivation for rapid project development.

Findings

This study shows that artificial intelligence (AI) applications at the local level in Türkiye and the European Union are shaped by similar motivations, but have significant differences in terms of institutional approaches and strategic positioning. Both actors adopt AI technologies for purposes such as increasing efficiency in public services, digitalization and data-driven decision-making. However, the European Union's approach, in line with Normative Power Europe theory, transforms AI into not only a functional tool but also a governance tool that institutionalizes normative values such as transparency, accountability and the protection of fundamental rights (Manners, 2002, p. 238). In contrast, Türkiye's

strategy is shaped around national capacity building, technological independence and data ownership in line with the Digital Sovereignty approach (Bradshaw, 2021, p. 483; Belli, 2023, p. 12). The four dimensions analyzed - strategic/legal framework, implementation foci, institutional maturity and ecosystem challenges - reflect this theoretical divergence. Thus, the findings of the study show that AI implementation at the local scale is not only a technical but also a political and normative construction process.

The findings of the study are analyzed under four main headings within the theoretical approaches of normative power (Manners, 2002) and digital sovereignty (Bradshaw, 2021; Belli, 2023):

6.1. Differences in Strategic and Regulatory Approaches

One of the key findings of the study is the difference in the strategic and regulatory frameworks between the European Union and Türkiye. With the Artificial Intelligence Act, which will come into force in 2024, the EU has introduced binding obligations such as transparency, human oversight, data governance, and cybersecurity for high-risk systems used in public services. This approach aims to guide innovation while protecting ethical values. In contrast, Türkiye's 2021–2025 National Artificial Intelligence Strategy focuses on capacity building rather than binding regulations. The strategy includes concrete goals such as spreading AI use in 250 municipalities and employing 1,000 public personnel in the AI field (T.C. Digital Transformation Office, 2021). Although Türkiye's approach does not yet include an EU-level legal framework, it emphasizes efforts to establish technological infrastructure and increase institutional competencies at the local level. This indicates that while the EU focuses on the question, "How can we use it more safely and fairly?", Türkiye is seeking answers to, "How can we use it faster and more widely?".

6.2. Divergence in Application Areas and Focus Points

In both geographies, local governments are developing AI applications aimed at increasing operational efficiency in areas such as smart transportation, waste management, and citizen services. For instance, the AI-Based Traffic Signalization Control System launched by Gaziantep Metropolitan Municipality (Gaziantep Metropolitan Municipality, 2025) and the smart traffic management applications in Paris and Bologna serve similar objectives.

However, the fundamental divergence is observed in the strategic depth and focus of the applications. Pioneering applications in the EU have moved beyond operational efficiency to address areas such as governance, transparency, and social inclusion. The public algorithm registries established by Amsterdam and Helsinki, which open the algorithms used by the municipalities to public scrutiny, represent a concrete step in the field of transparent algorithmic governance (Eurocities, 2023). Similarly, Barcelona's use of AI to proactively identify at-risk households for the distribution of social services demonstrates how technology can be mobilized for inclusive social services (Cities for Digital Rights, 2022).

Applications in Türkiye, on the other hand, are largely focused on increasing operational efficiency. Projects such as traffic optimization in Gaziantep, chatbots responding to citizen inquiries in Istanbul, illegal construction detection via UAVs in Bursa, and visitor analysis in Konya (Özer, 2024) aim to deliver existing services more effectively. This finding suggests that local governments in Türkiye currently view AI primarily as an efficiency tool, rather than a strategic governance instrument, as seen in the EU.

6.3. Level of Institutional Maturity and Prevalence

Research shows that the use of artificial intelligence in the European Union, especially in major cities, is more widespread and developed than in Türkiye. According to the European Committee of the Regions, most regions with a population of more than 500,000 actively use artificial intelligence solutions (European Committee of the Regions, 2025). Eurostat (2024) data also shows that 30% of large enterprises use artificial intelligence. In Türkiye, however, applications are limited to a small number of large cities, the overall level of adoption is at an early stage, and there is significant heterogeneity among municipalities (Uysal & Öztürk, 2024).

6.4. Differing Nature of Ecosystems and Core Challenges

In both regions, common barriers to the adoption of artificial intelligence include financial constraints and a lack of skilled personnel. However, the main challenge in the EU is striking a balance between innovation and strict regulations such as the Artificial Intelligence Act. In Türkiye, the problems are more structural: data quality, lack of technical infrastructure, legal uncertainty, and staff resistance are the main obstacles (Özer, 2024; Demir, 2024). For this reason, the EU is focusing on regulatory compliance, while Türkiye is focusing on capacity building.

The following table summarizes the comparative findings of the research.

Table 4
Comparative Findings on AI Approaches in Turkish and EU Local Governments

Dimension	European Union Sample	Türkiye Sample
Strategic Framework	Regulation-Focused: Shaped by the 'AI Act,' which is risk-based, binding, and centers on ethical principles.	Development-Oriented: "National Artificial Intelligence Strategy" prioritizes capacity building and ambitious adoption goals (T.C. Cumhurbaşkanlığı Dijital Dönüşüm Ofisi, 2021).
Primary Focus	Human & Governance: Prioritizes transparency, accountability, social inclusion, and the protection of fundamental rights.	Efficiency & Technology: Focused on operational gains such as traffic optimization, cost savings, and automation in citizen services.
Depth of Implementation	Strategic and Integrated: Characterized by advanced governance practices, such as algorithm registers (Amsterdam, Helsinki) and proactive social services (Barcelona).	Operational and Fragmented: Dominated by standalone projects aimed at increasing efficiency in specific service areas (e.g., transportation, security, citizen services).
Key Strategic Challenge	Regulatory Compliance: The challenge of balancing innovation goals with the need to comply with strict, binding legal regulations	Structural Capacity Deficits: Fundamental challenges such as a lack of quality data, funding, and expert personnel, alongside an immature legal and ethical framework (Özer, 2024)

Source:*Compiled by the authors from sources cited in the preceding sections of this study*

Policy Recommendations

The integration of artificial intelligence (AI) into local governments is not only a technical process, but also a multi-layered process shaped by governance norms, social values, and cultural contexts (Yigitcanlar et al., 2023; Madan & Ashok, 2023). The European Union (EU) has adopted a regulation-centric model that prioritizes transparency, fundamental rights, and ethical risk management with the Artificial Intelligence Act, which will come into force in 2024 (European Commission, 2021; Pehlivan, 2024). Algorithm registries developed in cities such as Amsterdam and Helsinki are local reflections of this model (Eurocities, 2023). This approach is also supported by institutional mechanisms such as the GDPR and the European Ombudsman (Buijze, 2020; Dragos & Neamtu, 2017). Türkiye, on the other hand, is following a development-oriented path that prioritizes capacity building, domestic technologies, and economic competitiveness within the framework of its 2021–2025 National Artificial Intelligence Strategy (T.C. Digital Transformation Office, 2021). There are clear differences between the two approaches in terms of strategic orientations and governance values.

This vision causes local government applications to concentrate largely on areas targeting "operational efficiency," as exemplified by the smart traffic system in Gaziantep. The core philosophical distinction between the two regions is that the EU primarily focuses on the question, "How can we use AI more safely and fairly?", while Türkiye, for now, seeks answers to, "How can we use AI faster and more

widely?". Ultimately, this differentiation reflects not only technology choices but also the deeper regulatory, administrative, and societal rationales that shape these choices.

This study offers a significant contribution to the public administration literature in Türkiye by providing a comparative perspective that evaluates the use of AI in local governments in light of international best practices and regulatory frameworks. Furthermore, it provides policymakers and local managers with the opportunity to position Türkiye's current situation within the context of global trends and to develop an evidence-based roadmap. In light of these findings, the following policy recommendations have been developed to enable local governments in Türkiye to derive maximum benefit from AI technologies, minimize potential risks, and achieve a more advanced level of AI governance:

1. Maturing the Ethical and Legal Framework: Türkiye's most fundamental structural deficit is the absence of a mature legal and ethical framework regulating AI applications. A binding national AI regulation, modeled on the EU's risk-based Artificial Intelligence Act but tailored to Türkiye's own institutional and societal structure, should be prepared. This regulation must clearly define standards for transparency, data quality, human oversight, and accountability, especially in public services defined as high-risk (e.g., social welfare distribution, public safety). This step is critical both for establishing public trust and for providing legal certainty for applications.

2. Transitioning from Operational Efficiency to Strategic Governance: Turkish municipalities need to complement their current efficiency-focused approach with the EU's human rights and transparency-based models. They should launch pilot projects on transparency and citizen oversight by creating public algorithm registers that disclose the algorithms they use, as in the Dutch and Finnish examples. Similarly, by developing AI-based social service models that proactively identify and support disadvantaged groups in accessing urban services, it should be demonstrated that technology can be a tool not only for efficiency but also for social justice and inclusion.

3. Strengthening Capacity Building and Ecosystem Collaboration: To achieve the human resource targets set in the National Artificial Intelligence Strategy, training programs organized by institutions like the Marmara Union of Municipalities should be expanded, and university-municipality collaborations (such as the Kocaeli example) should be systematically encouraged Municipalities should adopt common data standards and support open data platforms to improve data quality. A national coordination body is also needed to ensure experience-sharing, particularly to support smaller municipalities

Conclusion

The three hypotheses proposed in this study are generally supported by the document analysis, theoretical framework, and comparison findings. The first hypothesis (H1) suggests that the European Union views artificial intelligence not only as a technical tool at the local level but also as a foreign policy instrument for transferring ethical norms and establishing governance principles. Specifically, the algorithm transparency registers established in cities such as Amsterdam and Helsinki reinforce the EU's value-based digitalisation strategy, aligned with the Normative Power Europe (Manners, 2002) approach.

Regarding the second hypothesis (H2), Türkiye's artificial intelligence strategy emphasises goals such as national development, capacity building, and technical autonomy, consistent with the concept of Digital Sovereignty (Bradshaw, 2021; Belli, 2023). Applications in municipalities like Gaziantep, Istanbul, and Bursa are geared toward outcomes such as operational efficiency, swift service delivery, and infrastructure automation. This indicates that Türkiye's strategic approach is predominantly pragmatic and technologically driven. Concerning the third hypothesis (H3), the strategic priorities of these two regions lead to distinct institutional and ethical outcomes. While local AI applications within the EU tend to prioritise values like governance, citizen participation, and ethical transparency, applications in Türkiye are primarily legitimised through speed, accessibility, and administrative efficiency. This demonstrates a significant paradigmatic difference between the two regions, not only in application methods but also in the political and normative interpretation of digitalisation. In summary, all three hypotheses are validated by the findings, highlighting that artificial intelligence is not just a technical innovation but also a tool for shaping political, ethical, and institutional identities.

Declarations

Ethics Declaration

Not applicable. This study did not involve human participants, animal subjects, or sensitive personal data requiring ethical approval.

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Author Contribution

Ferdi Güçyetmez conceived the research idea, developed the theoretical framework, and coordinated the manuscript preparation. Müslüm Soykan conducted the comparative case analysis, collected the empirical data, and contributed to the interpretation of findings. Both authors contributed to the structure and refinement of the manuscript. All authors reviewed and approved the final version of the manuscript.

References

1. AI Watch. (2022). *European landscape on the use of Artificial Intelligence by the public sector*. Publications Office of the European Union. https://ai-watch.ec.europa.eu/publications/ai-watch-european-landscape-use-artificial-intelligence-public-sector_en Erişim Tarihi: 29.05.2025
2. Babaoğlu, C. (2023, 20 Aralık). *Veriden karara: Türkiye'nin yapay zekâ vizyonu*. SETA. https://www.setav.org/yorum/veriden-karara-turkiyenin-yapay-zeka-vizyonu Erişim Tarihi:24.05.2025

3. Babaoğlu, C. (2024a, Mart). *Dijital ikiz ve akıllı şehirler*. SETA. https://media.setav.org/tr/dosya/2024/03/dijital-ikiz-ve-akilli-sehirler.pdf Erişim Tarihi:24.05.2025
4. Babaoğlu, C. (2024b, 16 Mart). *Yapay zekâ ve şehir yönetimi*. SETA. https://www.setav.org/yapay-zeka-ve-sehir-yonetimi Erişim Tarihi:24.05.2025
5. Babaoğlu, C. (2024c, 31 Mayıs). *Küresel yapay zekâ yarışında Türkiye*. SETA. https://www.setav.org/kuresel-yapay-zeka-yarisinda-turkiye Erişim Tarihi:24.05.2025
6. Batty, M., Axhausen, K., Giannotti, F., Pozdnoukhov, A., Bazzani, A., Wachowicz, M., Ouzounis, G., & Portugali, Y. (2012). Smart cities of the future. *The European Physical Journal Special Topics*, 214, 481- 518. https://doi.org/10.1140/epjst/e2012-01703-3.
7. Bradshaw, S. (2021). *Digital sovereignty and the geopolitics of internet governance*. Geopolitics, 26(2), 480–501. https://doi.org/10.1080/14650045.2020.1773259
8. Belli, L. (2023). *Digital sovereignty: A multi-layered approach for internet governance*. Journal of Cyber Policy, 8(1), 1–20. https://doi.org/10.1080/23738871.2023.2178332
9. Bilişim Zirvesi. (2025). *Bilişim Zirvesi 2025 Teknoloji Kaptanları Ödülleri*. Erişim adresi: https://bilisimzirvesi.com.tr/etkinlikler/etkinlik/teknoloji-kaptanlari-2025
10. Biswas, S., Kumar, D., Hajiaghaei-Keshteli, M., & Bera, U. (2024). An AI-based framework for earthquake relief demand forecasting: A case study in Türkiye. *International Journal of Disaster Risk Reduction*. https://doi.org/10.1016/j.ijdrr.2024.104287.
11. Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal, 9*(2), 27-40.
12. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.
13. Buijze, A. (2020). *The value of transparency in public decision-making: Towards a framework for comparative assessment*. Utrecht Law Review, 16(2), 15–32. https://doi.org/10.18352/ulr.561
14. Dragos, D. C., & Neamțu, B. (2017). *Transparency in the European administrative space: Theory and practice*. In D. C. Dragos & B. Neamțu (Eds.), The European Public Administration Handbook (pp. 279–295). London: Palgrave Macmillan. https://doi.org/10.1007/978-3-319-31816-5_17
15. Cities for Digital Rights, 2022. *Algorithmic democracy*. Erişim adresi: https://citiesfordigitalrights.org/event/gouai-seminar-algorithmic-democracy-or-democratise-algorithm Erişim Tarihi: 25.06.2025
16. Diez, T. (2005). Constructing the self and changing others: Reconsidering 'Normative Power Europe'. *Millennium: Journal of International Studies, 33*(3), 613–636. https://doi.org/10.1177/03058298050330031701
17. Eurocities. (2023, January 19). *Nine cities set standards for the transparent use of Artificial Intelligence*. Erişim adresi: https://eurocities.eu/latest/nine-cities-set-standards-for-the-transparent-use-of-artificial-intelligence/ Erişim Tarihi: 25.06.2025

18. Eurocities. (2025, June 04) *How to make a city for people? ask Bologna* https://eurocities.eu/latest/nine-cities-set-standards-for-the-transparent-use-of-artificial-intelligence/ Erişim Tarihi: 25.06.2025
19. European Commission. (2021). *Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain union legislative acts*. https://digital-strategy.ec.europa.eu/en/library/proposal-regulation-laying-down-harmonised-rules-artificial-intelligence Erişim Tarihi: 25.06.2025
20. European Commission. (2024). *Regulation (EU) 2024/1689 establishing harmonised rules for artificial intelligence (AI Act). https://eur-lex.europa.eu/eli/reg/2024/1689/oj/eng Erişim Tarihi: 25.06.2025*
21. European Commission. (2024.). *Europe's Digital Decade: digital targets for 2030*. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en Erişim Tarihi: 25.06.2025
22. European Committee of the Regions. (2025, March 11). *Regions and cities discuss deployment of AI and regional support to strengthen competitiveness*. https://cor.europa.eu/en/news/regions-and-cities-discuss-deployment-ai-and-regional-support-strengthen-competitiveness Erişim Tarihi: 25.06.2025
23. Eurostat. (2024). *Use of artificial intelligence in enterprises*. EC Europa. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Use_of_artificial_intelligence_in_enterprises Erişim Tarihi: 25.06.2025
24. Fachridian, A., Ramli, A., & De Araujo, L. (2024). Implementation of Organizational Agility Strategies to Meet the Challenges of Digital Transformation in Government Organizations. *Media Ekonomi dan Manajemen*. https://doi.org/10.56444/mem.v39i2.4575.
25. Flechsig, C., Anslinger, F., & Lasch, R. (2021). Robotic Process Automation in purchasing and supply management: A multiple case study on potentials, barriers, and implementation. *Journal of Purchasing and Supply Management*. https://doi.org/10.1016/j.pursup.2021.100718.
26. Gaziantep Büyükşehir Belediyesi. (2025, 28 Mayıs). *Gaziantep Büyükşehir'den trafik için yenilikçi uygulama*. Erişim adresi: https://www.gaziantep.bel.tr/tr/haberler/gaziantep-buyuksehirden-trafik-icin-yenilikci-uygulama Erişim Tarihi: 25.06.2025
27. Gianluca, M., & Colin, V. (2020). AI Watch - Artificial Intelligence in public services: Overview of the use and impact of AI in public services in the EU. *Research Papers in Economics*. https://doi.org/10.2760/039619.
28. Groothuis, M., & Niemann, A. (2012). Normative Power Europe? The power of the EU in its relation to the USA in the policy field of counter-terrorism. *Mainz Papers on International and European Politics, 2012/03*.
29. İzmir Büyükşehir Belediyesi. (2025, 15 Mayıs). *Yapay zekâ strateji belgesi hazırlıyoruz*. Erişim adresi: https://www.izmir.bel.tr/tr/Haberler/yapay-zeka-strateji-belgesi-hazirliyoruz/56249/156 Erişim Tarihi: 25.06.2025

30. Kitchin, R. (2014). The real-time city? Big data and smart urbanism. *GeoJournal, 79*(1), 1-14.
31. Kocaeli Büyükşehir Belediyesi. (2025, 28 Şubat). *Büyükşehir'de yapay zeka dönemi başlıyor*. Erişim adresi: https://www.kocaeli.bel.tr/haber/buyuksehirde-yapay-zeka-donemi-basliyor-47408.html Erişim Tarihi: 25.06.2025
32. Krämer, B. (2020). *Re-conceptualizing digital sovereignty: Infrastructural, legal, and strategic dimensions*. Internet Policy Review, 9(1), 110–120. https://doi.org/10.14763/2020.1.1450
33. Local Government Association. (2025, May 6). *Artificial intelligence case study bank*. Erişim adresi: https://www.local.gov.uk/our-support/cyber-digital-and-technology/artificial-intelligence-hub/artificial-intelligence-case Erişim Tarihi: 25.06.2025
34. Madan, R., & Ashok, M. (2022). AI adoption and diffusion in public administration: A systematic literature review and future research agenda. *Gov. Inf. Q.*, 40, 101774. https://doi.org/10.1016/j.giq.2022.101774.
35. Madan, R., & Ashok, M. (2023). AI adoption and diffusion in public administration: A systematic literature review and future research agenda. *Government Information Quarterly, 40*(1), 101774. https://doi.org/10.1016/j.giq.2022.101774
36. Manners, I. (2002). Normative power Europe: A contradiction in terms? *Journal of Common Market Studies, 40*(2), 235–258. https://doi.org/10.1111/1468-5965.00353
37. Marmara Belediyeler Birliği. (2025, 18 Mart). *Yerel Yönetimler İçin Yapay Zekâ 101 Başlıyor*. Erişim adresi: https://www.marmara.gov.tr/tr/yerel-yonetimler-icin-yapay-zeka-101-basliyor Erişim Tarihi: 25.06.2025
38. Meijer, A., Lorenz, L., & Wessels, M. (2021). Algorithmization of Bureaucratic Organizations: Using a Practice Lens to Study How Context Shapes Predictive Policing Systems. *Public Administration Review*. https://doi.org/10.1111/PUAR.13391.
39. Mendoza, S., Sánchez-Adame, L., Urquiza-Yllescas, J., González-Beltrán, B., & Decouchant, D. (2022). A Model to Develop Chatbots for Assisting the Teaching and Learning Process. *Sensors (Basel, Switzerland)*, 22. https://doi.org/10.3390/s22155532.
40. Noordt, C., Misuraca, G., Mortati, M., Rizzo, F., & Timan, T. (2020). AI Watch- Artificial Intelligence for the public sector: Report of the "1st Peer Learning Workshop on the use and impact of AI in public services", Brussels 11-12 February 2020.
41. OECD. (2023). *Artificial Intelligence in the Public Sector*. Paris: OECD Publishing.
42. Özer, T. (2024). *Yerel Yönetimler Bakış Açısıyla Yapay Zekâ*. İstanbul: Seçkin Yayıncılık.
43. Para Dergisi. (2025, 8 Nisan). *En yeni 41 yerli yapay zeka girişimi*. https://www.paradergi.com.tr/teknoloji/2025/04/08/en-yeni-41-yerli-yapay-zeka-girisimi Erişim Tarihi: 29.05.2025
44. Prathiksha, K., Malar, S., Nivedha, P., Divya, D., & Srijayanthi, S. (2024). IntelliAid: A Personal Assistant Chat-Bot for Enhanced Task Management. *2024 5th International Conference on Electronics and Sustainable Communication Systems (ICESC)*, 432-436. https://doi.org/10.1109/ICESC60852.2024.10689912.

45. Pehlivan, A. (2024). *Türkiye'de Yapay Zekâ Yönetişiminin Kurumsal Dinamikleri*. Ankara: Siyasal Kitabevi.
46. Rodríguez, N., Ser, J., Coeckelbergh, M., De Prado, M., Herrera-Viedma, E., & Herrera, F. (2023). Connecting the Dots in Trustworthy Artificial Intelligence: From AI Principles, Ethics, and Key Requirements to Responsible AI Systems and Regulation. *Inf. Fusion*, 99, 101896. https://doi.org/10.48550/arXiv.2305.02231.
47. Sanayi ve Teknoloji Bakanlığı. (2021). *Ulusal Yapay Zekâ Stratejisi (2021-2025)*. https://www.cbddo.gov.tr Erişim Tarihi:24.05.2025
48. Sandoval-Almazán, R., Millan-Vargas, A., & García-Contreras, R. (2024). Examining public managers' competencies of artificial intelligence implementation in local government: A quantitative study. *Gov. Inf. Q.*, 41, 101986. https://doi.org/10.1016/j.giq.2024.101986.
49. Schimmelfennig, F. (2022). *Digital sovereignty and multi-level governance in the European Union* (ETH Zürich Working Paper).
50. Söllner, M., Hoffmann, A., & Leimeister, J. M. (2025). *Building trust in artificial intelligence systems: A socio-technical perspective*. Journal of Information Technology, 40(1), 34–52. https://doi.org/10.1057/s41265-025-00178-2
51. Söker, B. (2024). Leveraging artificial intelligence for public sector decision-making: Balancing accountability and efficiency in digital public Services. *Human Computer Interaction*. https://doi.org/10.62802/ejr09s21.
52. Sözen, H. (2024). Avrupa Birliği Ülkelerinde yapay zekanın kamu hizmetlerindeki dönüştürücü rolü: Danimarka, Fransa ve İtalya deneyimleri üzerine bir inceleme. Uluslararası Yönetim Akademisi Dergisi, 7(1), 322-338. https://doi.org/10.33712/mana.1438716
53. T.C. Cumhurbaşkanlığı Dijital Dönüşüm Ofisi. (2021). *Ulusal Yapay Zekâ Stratejisi (2021-2025).* Ankara.
54. T.C. Sanayi ve Teknoloji Bakanlığı. (2024). *Ulusal Yapay Zekâ Stratejisi 2024-2025 Eylem Planı.* Ankara.
55. Thurmond, V. (2001). The point of triangulation. *Journal of nursing scholarship: an official publication of Sigma Theta Tau International Honor Society of Nursing*, 33 3, 253-8. https://doi.org/10.1111/J.1547-5069.2001.00253.X.
56. Uysal, Y., & Öztürk, K. (2024). Büyükşehir belediyeleri perspektifinden yerel kamu hizmetlerinde yapay zeka kullanımı üzerine değerlendirmeler. Uluslararası Sosyal ve Ekonomik Çalışmalar Dergisi, 5(2), 269-287. https://doi.org/10.62001/gsijses.1523313
57. Van Noordt, C., & Tangi, L. (2023). The dynamics of AI capability and its influence on public value creation of AI within public administration. *Government Information Quarterly*, *40*(4), 101860. https://doi.org/10.1016/j.giq.2023.101860
58. Vatamanu, A. F., & Tofan, M. (2025). Integrating artificial intelligence into public administration: Challenges and vulnerabilities. *Administrative Sciences*, *15*(4), 149. https://doi.org/10.3390/admsci15040149

59. Whitman, R. G. (Ed.). (2011). *Normative Power Europe: Empirical and Theoretical Perspectives*. Palgrave Macmillan.
60. Yigitcanlar, T., Corchado, J., Mehmood, R., Li, R., Mossberger, K., & Desouza, K. (2021). Responsible urban innovation with local government artificial intelligence (AI): A conceptual framework and research agenda. *Journal of Open Innovation: Technology, Market, and Complexity*. https://doi.org/10.3390/JOITMC7010071.
61. Yigitcanlar, T., David, A., Li, W., Fookes, C., Bibri, S., & Ye, X. (2024). Unlocking artificial intelligence adoption in local governments: Best practice lessons from real-world implementations. *Smart Cities*. https://doi.org/10.3390/smartcities7040064.
62. Yigitcanlar, T., Li, R., Beeramoole, P., & Paz, A. (2023). Artificial intelligence in local government services: Public perceptions from Australia and Hong Kong. *Gov. Inf. Q.*, 40, 101833. https://doi.org/10.1016/j.giq.2023.101833.
63. Yigitcanlar, T., Senadheera, S., Marasinghe, R., Bibri, S., Sanchez, T., Cugurullo, F., & Sieber, R. (2024). Artificial intelligence and the local government: A five-decade scientometric analysis on the evolution, state-of-the-art, and emerging trends. *Cities*. https://doi.org/10.1016/j.cities.2024.105151.
64. Yin, R. K. (2017). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.
65. Zuiderwijk, A., Chen, Y., & Salem, F. (2021). Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda. *Gov. Inf. Q.*, 38, 101577. https://doi.org/10.1016/J.GIQ.2021.101577.