International Journal of Applied Research in Management, Economics and Accounting (IJMEA)
ISSN 3023-4964
DOI: 10.63053/ijmea.38

Artificial Intelligence in Iran's Public Administration: Opportunities, Challenges, and Strategic Approaches for Governance Innovation

Mohammad Hossein Marzdar[1]
1.Master's degree in Business Administration with a specialization in Marketing from the University of Tehran,Iran.

ARTICLE INFO

Keywords:
Artificial intelligence
Public sector
Government departments
Policies
Transforming government services

ABSTRACT

Artificial Intelligence (AI) has become a powerful tool across various sectors, offering considerable promise for improving government operations, societal well-being, and economic growth. However, the lack of a clear consensus on its definition and scope limits its effective use in government contexts. This article delves into the diverse methodologies, objectives, and focuses within AI, with a particular emphasis on its potential to enhance human capabilities in high-stakes situations. While AI has already demonstrated tangible benefits, such as increased productivity in pioneering government agencies, the article examines the potential advantages and challenges of AI integration within the public sector. By addressing cross-disciplinary obstacles like language barriers and service delays, the study underscores the need for a comprehensive understanding of the risks, barriers, and incentives involved in utilizing AI for governmental purposes. The goal of this study is to shed light on AI's ultimate objectives, including manipulating objects, processing natural language, and improving reasoning capabilities. Furthermore, by analyzing both the advantages and drawbacks of AI in government services, this research highlights how AI can drive increased productivity, streamline processes, and reduce burdens. Organizational theory is used to address challenges and explore how AI's potential can be maximized within public services. This theoretical framework helps to better understand the benefits, opportunities, and hurdles in deploying AI in government services. The findings of the research offer insights into how AI could revolutionize public service delivery, spark innovation, and improve efficiency. The study raises important questions about the role of organizational theory in facilitating AI adoption in government, the difficulties faced by governments in integrating AI, and the potential benefits AI can bring to public service delivery. The research suggests a strategic approach to adopting AI in the public sector, emphasizing the need to consider organizational, ethical, and societal implications, while recognizing the transformative potential of AI in government service provision.

Introduction

1.1 Background

Artificial Intelligence (AI) has proven its value across various fields and applications, positioning itself as a potentially transformative tool for governments, societies, and economies. Despite the growing recognition of AI as an important technological and scientific advancement, it has not yet been fully embraced as a key innovation by political leaders and academic institutions. As a result, helping the public sector clearly define the scope and potential of AI remains a significant challenge. The study of AI has expanded significantly since the 1950s, and within this field, there is a broad spectrum of approaches, focuses, and long-term objectives. AI significantly enhances human abilities in providing digital support and making decisions in complex and high-stakes scenarios, particularly in industries where AI systems are integrated into industrial processes and equipment. Therefore, it is crucial for the public sector to fully harness AI's capabilities to maximize its benefits [15].

AI should not be perceived as a new and emerging technology; it is already in use and will undoubtedly play a larger role in the future. Government departments that have been early adopters of AI have already seen positive economic outcomes, particularly through increased productivity. Numerous public sector organizations stand to gain from the adoption of AI by public officials. For instance, AI can improve areas like drone navigation, prioritization of medical treatments, managing bail hearings, responding to citizen inquiries, designing public infrastructure, detecting fraud, selecting immigrants, and distributing social benefits. It is important to gain a deeper understanding of the risks, opportunities, challenges, and incentives associated with the use of AI in the public sector [16].

1.1.1 Explanation and Expansion, Including Implications for Iran:

1. **AI's Role Across Different Sectors:** AI is already being used in many sectors worldwide to improve efficiency and productivity, particularly in government services. In areas such as healthcare, law enforcement, and public administration, AI has the potential to revolutionize how services are provided, offering faster, more accurate decision-making processes. In Iran, similar benefits could be realized by applying AI to optimize sectors such as healthcare (e.g., better resource allocation and medical diagnostics), urban planning (e.g., smarter city management), and law enforcement (e.g., improving public safety and crime prevention).

2. **Challenges in Defining AI's Scope in the Public Sector:** One of the major hurdles in implementing AI within the public sector is the lack of clear definitions and frameworks for its application. This is not only an issue in global contexts but also in Iran, where the rapid development of AI technology outpaces the government's ability to regulate and apply it effectively. In Iran, addressing this gap would involve creating a clear AI policy framework, as well as fostering collaboration between government agencies, academia, and the private sector to establish best practices for AI deployment.

3. **AI as an Existing Technology:** AI should not be seen as a future innovation but as a technology that is already shaping various sectors. In countries like Iran, there is an opportunity to build on AI applications that are already in use globally and apply them locally to solve specific public sector problems. AI-driven improvements in areas such as transportation (AI-powered traffic management systems), public health (AI in diagnosing diseases), and social welfare (AI for efficient benefits distribution) could significantly benefit Iranian citizens.

4. **Potential Benefits for the Public Sector:** The public sector stands to gain tremendously from AI adoption in various domains. In Iran, AI could be particularly transformative in areas like:

    - **Healthcare:** AI could streamline the medical process, improving patient care and medical resource management.
    - **Public Infrastructure:** AI can be used in urban planning, optimizing the design and maintenance of public facilities such as schools, roads, and public transportation systems.
    - **Social Services:** AI could help in the efficient distribution of government benefits and support services to citizens, ensuring faster processing and reducing administrative burden.

5. **Risks, Opportunities, and Challenges in AI Adoption:** While the potential benefits of AI in the public sector are significant, the adoption of AI also presents various risks and challenges. These include concerns about privacy, data security, algorithmic bias, and the displacement of jobs. In Iran, these issues may be particularly relevant due to the challenges of data privacy regulations and the need for transparency in AI applications. Additionally, AI adoption in the public sector requires careful consideration of ethical issues, including the equitable distribution of benefits and ensuring that AI systems do not perpetuate societal biases.

6. **Recommendations for Iran's AI Adoption:** For Iran to effectively harness AI in the public sector, a few key strategies should be considered:

    - **Creating a Policy Framework:** A comprehensive and clear AI policy would help define the scope of AI applications within the public sector, setting standards for ethical usage and regulation [17].
    - **Investing in AI Research and Development:** Encouraging collaboration between academia, government, and the private sector will drive the development of AI systems tailored to Iran's unique challenges.
    - **Training and Education:** Public sector employees should be trained in AI technologies to ensure that they can effectively integrate AI into their work and use it to improve service delivery.
    - **Public Awareness and Trust:** Building public trust in AI technologies through transparency, accountability, and ethical standards will be essential for successful AI adoption in Iran.

In summary, while AI holds great potential for transforming the public sector in both global and Iranian contexts, successful integration requires careful planning, ethical considerations, and a focus on overcoming challenges related to regulation, privacy, and social equity.

1.2 Existing research

Research on the specific advantages and disadvantages of using AI in the public sector has been limited, with most studies instead focusing on the broader application of the technology across all sectors. Initial investigations into AI use in public services highlight a variety of interdisciplinary challenges, not only those directly linked to the technology itself. AI, defined as the study of how computers can learn and behave intelligently-such as solving problems and acquiring new skills-has attracted growing interest from both citizens and officials. The public sector, in particular, can leverage AI to address a range of issues, including but not limited to overcoming language barriers, reducing delays in service delivery, decreasing long waiting times, managing massive caseloads, and addressing high employee turnover rates. By doing so, AI has the potential to increase productivity, lower workloads, and streamline processes for government, the public sector, and society at large. AI research is focused on improving various competencies, such as object manipulation, natural language understanding, learning, planning, displaying information, and problem-solving. These long-term objectives are seen as crucial milestones in the field of AI.

To provide enhanced public services, several government agencies are making significant investments in AI research and development. Even basic research suggests that AI could significantly improve government programs, policies, and operations. By reviewing the relevant literature on the subject and applying organizational theory as a conceptual framework, we can better understand the benefits, challenges, and opportunities AI presents for enhancing government service delivery. This theory recognizes that different levels and institutions within the public sector often operate as distinct organizations, each with its own unique cultures and policies [11].

1.2.1 Expanded Explanation:

AI has the potential to drastically improve how government services are delivered, but research specifically focusing on the public sector has been relatively sparse. Most studies to date have been more generalized, exploring AI's application across various industries. However, the unique challenges and opportunities AI offers to government agencies require more focused exploration.

1. **Challenges in Public Sector AI Application:** The interdisciplinary nature of AI applications in the public sector means that it's not just about the technology; it's also about how it intersects with other social, cultural, and operational factors. For instance, addressing issues like language barriers and long waiting times requires not just technical AI solutions but also careful consideration of the organizational structures and workflows within government agencies. These non-technical barriers, such as entrenched bureaucratic practices or resistance to change, can hinder AI's adoption.

2. **Opportunities for AI in Government:** AI offers significant opportunities to enhance government efficiency. For example, it can automate mundane tasks, thus freeing up human resources for more complex and critical decision-making. AI could also help streamline the processing of large caseloads, which is particularly important in systems like immigration, welfare, or healthcare, where delays and inefficiency often lead to dissatisfaction. Additionally, AI-powered systems can improve citizen engagement by offering personalized communication and faster responses to queries, addressing public concerns in a more timely manner.

3. **Investments in AI Research:** Governments around the world are recognizing the potential of AI and are investing in its research and development. In the context of the public sector, even preliminary AI research has demonstrated that the technology can significantly improve government operations and policies. By automating certain administrative functions and improving the delivery of services, AI can help governments operate more effectively and efficiently, which is especially crucial in sectors like healthcare, education, and law enforcement.

4. **Organizational Theory and AI:** Organizational theory provides a useful lens through which to analyze AI adoption in the public sector. It helps explain how different government agencies operate within their own unique contexts-each with its own organizational culture, policies, and goals. For instance, a local government agency might have different operational constraints and challenges than a national health service or police department. Organizational theory allows us to understand how AI can be integrated into these different settings, considering not only the technological aspects but also the cultural and structural barriers that may exist within each organization [11].

1.2.2 Application to Iran:

In Iran, the use of AI in the public sector could be particularly beneficial, as many government services are often faced with challenges such as high demand, inefficiency, and delays. For instance, AI could help streamline processes in Iran's public health system by improving patient triage, automating administrative tasks, and reducing the time it takes to process claims and appointments. Similarly, AI could assist in the legal system by automating case management and improving the speed of processing legal documents, which could reduce the burden on an overworked judiciary.

However, Iran also faces specific challenges in implementing AI in the public sector. These include potential resistance to technological change, a lack of necessary infrastructure, and concerns over data privacy and security. Additionally, there is a need for a framework that addresses the integration of AI into Iran's public sector in a way that respects local cultural and regulatory contexts.

To effectively leverage AI, Iran could focus on investing in education and training to ensure that public sector employees are equipped with the skills needed to work alongside AI systems. Additionally, Iranian government agencies could collaborate with AI researchers and private tech firms to develop customized solutions for local problems. By understanding the unique challenges and opportunities that AI presents, Iran can begin to implement AI in a way that improves government services while also ensuring that these changes align with the country's social, cultural, and political landscape [1].

1.3 Research aim and questions

1. What are the key challenges faced when trying to implement AI in the public sector in Iran?

2. How can the application of AI improve the efficiency and effectiveness of public service delivery in Iran?

3. How can organizational theory guide the development of strategies to address challenges and fully leverage the opportunities AI offers in Iran's public sector?

1.3.1 Explanation with Relevance to Iran:

The research aims to explore how AI can act as a catalyst for innovation within Iran's public sector, offering potential solutions to common issues such as inefficiency, bureaucracy, and resource constraints. However, for AI to be successfully implemented, understanding the unique challenges faced by the Iranian public sector, including cultural, infrastructural, and regulatory barriers, is essential.

For instance, in Iran, there may be significant obstacles related to data privacy concerns, lack of skilled professionals, and resistance from public sector employees to adapt to AI-driven systems. Additionally, understanding how AI can be used to streamline processes such as citizen services, healthcare delivery, and legal procedures will be crucial.

Organizational theory, in this context, could offer valuable insights into how to design strategies that address these obstacles while maximizing the benefits of AI. By considering the distinct institutional cultures and operating structures within Iran's government agencies, it may be possible to create tailored solutions that optimize AI adoption for better governance and service delivery [2].

1.4 Novelty of the Paper:

This paper offers a unique contribution to the discussion surrounding artificial intelligence (AI) in government services by thoroughly reviewing and synthesizing existing research while making significant advancements in the field. Unlike previous studies, this paper specifically addresses the challenges and opportunities that arise with the adoption of AI in the public sector, providing strategic insights tailored to the complexities of government service delivery. What makes this paper innovative is its detailed analysis, strategic perspective, and clear identification of key advancements, positioning it as a standout work in the growing body of AI research in government services. The paper sets itself apart by focusing on issues such as language barriers, service delays, and interdisciplinary challenges, and it explicitly contrasts its findings with earlier research to highlight its original contributions. Additionally, by incorporating organizational theory as a conceptual framework, the paper moves beyond a basic exploration of AI's benefits and challenges, offering a deeper understanding of how AI can be strategically implemented in the public sector.

2. Literature review

2.1 Use of AI in the public sector

Building on prior research in public sector innovation and e-government, the proposed conceptual framework applies organizational theory to examine the opportunities and challenges of AI adoption in government services. It highlights the prerequisite enabling factors necessary for AI to generate meaningful impact. Emphasizing the significance of solid foundational components, this approach integrates lessons from previous technical impact assessments. Scholars critiquing existing frameworks for analyzing government ICT utilization have found them inadequate due to the lack of alternative metrics, data, or causal research linking ICT investment to tangible outcomes.

The expansive development of AI presents numerous possibilities, underscoring the need for strategic discernment in pursuing specific directions. This review emphasizes that AI's transformative power does not stem solely from the technology itself but from its applications and the way it reshapes existing paradigms, as Horowitz et al. argued. Contextual elements, such as demographic and cultural factors, influence the varied responses of local populations. In Iran, for instance, the adoption of AI in public services must account for factors such as linguistic diversity, bureaucratic structures, and the regulatory landscape.

When AI systems become accessible to the public, they introduce potential unforeseen behavioral changes, even among government employees. Quantifying AI's public impact is complex, surpassing the challenges acknowledged in earlier studies. Therefore, assessing AI's consequences requires a deep understanding of the specific AI system in question. To enhance comprehension, Iranian policymakers and the public should conduct comparative analyses of conditions before and after AI integration, similar to strategies employed in algorithmic studies. This approach, complementing traditional policy analysis methods, has proven particularly effective.

Our conceptual framework, intentionally theoretical rather than practical, aims to engage a critical mass of academics. Researchers analyzing AI's influence on Iran's public sector will examine key assumptions and evaluate their validity. Recent advancements in hardware and software have significantly contributed to AI's development, revealing its potential societal consequences. As data accessibility improves, AI systems become increasingly data-intensive and efficient. However, despite AI's transformative potential in Iran's public sector, governmental agencies require substantial support to achieve high performance and fully harness this technology.

Past studies on various forms of technological innovation reveal a crucial organizational requirement: the effective structuring and deployment of complementary resources to ensure success. The Iranian public has not yet witnessed substantial productivity gains despite the growing presence of AI-based initiatives. This highlights the urgent need to develop AI competencies and prioritize its integration. Strategic knowledge of AI implementation sites is essential for recommending infusion techniques and application procedures. Successful adoption in Iran's public sector and future prospects depend on proactive measures taken at the initial stages of technology implementation. Having explored the general use of AI in government, it is now essential to examine its key areas of impact on public services in Iran [3].

2.2 Benefits of AI implementation in government services

2.2.1 Unlocking potentials and mitigating risks

The previously outlined conceptual framework underscores the necessity of establishing enabling conditions for the effective implementation of AI. In this analysis, we examine the specific benefits that arise when these conditions are met, drawing insights from extensive research on public sector innovation and e-government development. By considering the findings of prior technical impact assessments, our analytical approach seeks to unravel the complexities associated with integrating AI into government services.

Existing research frameworks assessing the Iranian government's influence on Information and Communication Technology (ICT) have been found insufficient due to the absence of counterfactual metrics, relevant data, and studies demonstrating causal relationships, as highlighted by recent evaluations. While AI holds theoretical potential for transformative advancements, its impact depends on its practical application and its ability to disrupt existing systems. This contextual dependence leads to varied effects across different sectors and applications. As studies have shown, individual responses to AI also differ widely, shaped by personal background, cultural factors, and geographical location. Even government employees in Iran may exhibit behavioral shifts when AI systems become more prevalent, potentially influencing the data and processes upon which these systems rely.

Understanding and predicting public reactions to AI remains a significant challenge, as acknowledged in prior research. Consequently, conducting detailed impact evaluations of specific AI systems is essential. Systematic comparisons of policies and public administration before and after AI adoption are critical for gaining short-term insights into its effects, drawing parallels with methodologies used in algorithmic studies [16].

While our focus remains largely theoretical to engage a broad academic audience, it is crucial to critically assess common assumptions about AI's role in government operations in Iran. Recent advances in hardware and software, particularly in machine learning and data-driven AI systems, have propelled AI development. Despite its potential to revolutionize Iranian government agencies, challenges persist in achieving high performance and maximizing AI's benefits.

Addressing challenges identified in various forms of technological innovation, governmental organizations in Iran must effectively structure and deploy complementary resources. Although AI initiatives do not always guarantee superior outcomes, developing AI competence and fostering its adoption remain imperative. Successful AI implementation requires a strategic approach to identifying deployment sites and optimizing

integration techniques. Without taking the necessary preparatory measures, the government may face significant obstacles in adopting new AI-driven technologies.

The widespread use of AI in legislation and public services in Iran introduces new challenges for policymakers. Managing the risks and benefits of AI technologies falls on the shoulders of government officials, administrators, and decision-makers. The broader discussion surrounding AI adoption is framed as "AI governance," emphasizing administrative efficiency and the enhancement of public service delivery. At the same time, regulatory policies must focus on maximizing economic and social benefits. However, AI-related risks-including bias, fairness, privacy concerns, and maintaining democratic values-pose formidable challenges.

Effectively mitigating these risks in Iran's public sector is particularly complex due to an evolving policy environment, cautious public sentiment, and limited AI expertise among government personnel and institutions. Whether the approach involves implementing quality assurance measures for algorithmic decision-making, enforcing fair data disclosure regulations, or managing private-sector data policies, these challenges persist. A comprehensive review of AI research in government demonstrates that such challenges permeate all levels of AI application. Despite this, existing frameworks designed to mitigate these risks often remain overly abstract or technically complex, making their practical implementation in Iran's public sector difficult [15].

2.3 Challenges/obstacles associated with AI in the public sector

The findings in this section contribute to addressing the first research question. While AI offers numerous benefits for government services, its implementation is not without challenges. Recognizing and addressing these obstacles is essential for ensuring a smooth and effective integration of AI into Iran’s public sector. AI has the potential to serve as a catalyst for development, particularly in countries facing economic constraints. However, several critical challenges must be managed to unlock its full potential.

A significant challenge is the need for capacity-building, a crucial factor emphasized by global AI research. While AI can transform various aspects of public service delivery, Iran faces a shortage of experts capable of evaluating AI systems and their outcomes. This scarcity complicates the implementation process, making it essential for public organizations to deepen their understanding of AI-both in its technical dimensions and its broader societal and ethical implications [17].

The growing demand for AI talent has driven up starting salaries worldwide, making it difficult for the public sector-where budget constraints are more pronounced-to attract top-tier professionals. In Iran, limited recruitment budgets further exacerbate this issue, making it imperative for government agencies to develop strategies to nurture local AI expertise. Beyond hiring technical experts, successful AI integration requires close collaboration between technical personnel and non-technical government employees, such as procurement officials, policymakers, and department heads. These individuals must strengthen their knowledge of AI and data management to navigate the complexities of AI applications effectively. Developing technical literacy across different levels of government is a necessary step toward AI adoption.

Another major challenge is ensuring compliance with privacy laws and data protection regulations, a concern that has been highlighted in studies on AI governance. In Iran, legal frameworks governing AI functions are still evolving, requiring a more comprehensive and adaptive approach to privacy and data security. However, the challenge extends beyond legal comprehension—it affects government procurement processes, which are often slow and bureaucratic. Lengthy approval procedures, extensive contract obligations, and regulatory hurdles create barriers to the swift adoption of AI technologies. Iran’s government procurement landscape, like many others, struggles with inefficiencies that delay AI implementation. Streamlining these processes is crucial for fostering innovation in the public sector [18].

Small and medium-sized businesses (SMBs), which play a crucial role in Iran’s tech ecosystem, face additional obstacles in adapting to AI-driven government initiatives. Lengthy wait times and bureaucratic challenges make it difficult for these enterprises to plan recruitment and execute projects efficiently. As AI implementation

in government expands, SMBs must be provided with more accessible opportunities to participate in AI-related projects without facing prohibitive regulatory burdens.

Further research has indicated that technological barriers are not necessarily the biggest impediments to AI adoption in government-rather, organizational culture and resistance to change pose greater challenges. For Iran to unlock AI's full potential, a fundamental shift in how government institutions approach AI integration is needed. This requires fostering an AI-friendly organizational culture, updating workflows, and ensuring that AI applications align with the country's governance structure [19].

In summary, addressing AI integration challenges in Iran's public sector demands a holistic strategy that includes capacity-building, cross-sector collaboration, and significant improvements in procurement efficiency. By implementing comprehensive reforms, Iran's government can effectively harness AI to enhance public service delivery and governance, paving the way for a more efficient and technologically advanced public sector [18].

2.4 Current applications and case studies

Businesses and governmental institutions in Iran are increasingly investing in AI research and development, paving the way for AI integration across various public sector operations. However, this expansion presents significant challenges. Immediate action is necessary to educate both the public and government employees about the potential benefits of incorporating AI into administrative processes. Iranian government agencies must prioritize accountability and assess the impact of AI initiatives on national security and public well-being.

Key areas requiring governmental attention to foster the development of trustworthy AI include accountability and responsibility, necessitating policy reforms to ensure that AI systems can be held accountable—particularly in high-stakes applications such as healthcare, law enforcement, and financial regulation. Transparency is another crucial factor, as AI systems must be comprehensible and accessible to the public, allowing for scrutiny of their decision-making processes. Additionally, maintaining fairness and impartiality is essential to prevent AI from reinforcing biases that could lead to discrimination based on social, economic, or demographic factors [25].

Beyond ethical concerns, compliance with data protection and privacy regulations is imperative. While Iran does not follow global frameworks such as the General Data Protection Regulation (GDPR) or the California Consumer Privacy Act (CCPA), the country must develop robust national policies to safeguard citizens' data and ensure responsible AI use. Establishing clear guidelines for collecting, processing, and storing personal data within AI applications is essential to protecting individual rights.

Security and resilience are also critical factors in AI adoption. With increasing cyber threats, the use of secure software development practices, such as DevSecOps methodologies, is necessary to protect AI systems from potential attacks. Furthermore, ensuring scalability-where AI systems can handle a growing number of users without compromising accuracy or consistency-is a key factor for long-term success.

Despite challenges in securing adequate resources for AI research and development, improvements in AI accessibility in Iran are expected to facilitate broader adoption in the coming years. As investment in AI continues, Iranian policymakers must take proactive steps to ensure responsible AI implementation, balancing technological advancement with ethical, legal, and security considerations to build a more efficient and transparent public sector [25].

2.4.1 Case studies

Governments worldwide are leveraging AI to enhance public service delivery, with various case studies demonstrating the extent of AI implementation. Countries are investing heavily in AI to create more innovative and efficient public services. Similarly, Iran is exploring AI applications across multiple governmental

functions to improve service accessibility, streamline administrative processes, and enhance decision-making efficiency. Some key areas where AI is being applied in Iran's public sector include:

1. **Smart Taxation and Revenue Collection**

   AI-driven analytics help the tax administration identify discrepancies, detect fraud, and optimize tax collection while ensuring fair treatment for taxpayers. AI also facilitates automated dispute resolution and personalized tax recommendations based on financial data.

2. **Healthcare and Medical Services**

   AI is increasingly used in Iran's healthcare system for diagnosing diseases, optimizing hospital resource allocation, and predicting outbreaks of infectious diseases. Machine learning models assist in medical imaging analysis and early disease detection, improving patient outcomes.

3. **Traffic and Urban Planning**

   AI-powered traffic management systems analyze real-time data to reduce congestion and improve road safety. Smart cameras and AI algorithms enhance traffic law enforcement and facilitate intelligent urban planning.

4. **Judiciary and Legal Services**

   AI is being tested in legal applications to assist judges in case management, predict case outcomes, and analyze vast amounts of legal documents for more efficient decision-making.

5. **Public Security and Law Enforcement**

   AI-based surveillance systems help detect criminal activities, recognize suspicious behaviors, and improve emergency response times. Facial recognition and predictive policing are also being explored in certain security initiatives.

6. **Citizen Services and Chabot's**

   AI-powered virtual assistants and Chabot's provide quick and automated responses to citizen inquiries, reducing government response time and improving accessibility to essential public services.

7. **Environmental Monitoring and Disaster Management**

   AI is utilized to predict natural disasters, monitor air and water quality, and develop early warning systems for floods and earthquakes, helping authorities take preventive measures.

Iran's government continues to explore AI applications across different sectors, recognizing the transformative potential of AI in improving governance and service delivery. As AI adoption grows, the focus remains on ensuring ethical implementation, protecting citizen privacy, and fostering a sustainable AI ecosystem for the country's public sector.

2.4.2 AI in Government Service Delivery: An Organizational Theory Perspective in Iran

The organizational theory perspective provides valuable insights into the multifaceted impact of AI on government service delivery, recognizing that different government departments operate as distinct entities. Within this framework, artificial intelligence (AI) is identified as a potential catalyst for growth, offering opportunities for developing countries like Iran to address long-standing challenges through organizational

transformation. However, this transformative technology also presents several organizational challenges, particularly regarding workforce adaptation, training requirements, and capacity-building.

One major organizational challenge is the shortage of AI experts and professionals skilled in performance evaluation. Despite the increasing need for data-driven governance, acquiring the necessary AI expertise is not straightforward. The steep learning curve associated with AI and data management makes it difficult for public sector employees to adapt quickly. Additionally, the high salaries offered to AI specialists in the private sector create recruitment challenges for government institutions with limited budgets. According to organizational theory, the success of AI strategies in public administration depends on embedding AI expertise within government agencies—an area where many institutions in Iran still face gaps.

Another critical issue is the need for technical proficiency among non-technical government employees, including procurement officials, legislators, and department heads. These individuals must develop an understanding of AI ethics, data privacy regulations, and the practical implications of handling large volumes of sensitive information. Without adequate awareness of AI governance policies and regulations, the risk of mismanagement, data breaches, and ethical violations increases [26].

Furthermore, organizational theory highlights the challenges posed by the lack of clarity regarding AI-related laws and policies in Iran. Many government employees and decision-makers may not be fully aware of the evolving regulations surrounding AI, particularly in areas such as data protection and digital privacy. Addressing these knowledge gaps is crucial for ensuring AI's ethical and effective implementation in public services.

By applying organizational theory, Iran can better navigate these challenges and enhance AI integration in government service delivery. This requires investing in AI education, developing targeted training programs for public officials, and establishing clear policies to promote transparency and accountability in AI-driven decision-making. Overcoming these organizational barriers will be key to unlocking AI's full potential in transforming governance and improving public sector efficiency.

Current procurement practices in Iran’s public sector do not fully account for the commercial sector’s perspective on algorithms as intellectual property. Government agencies that procure pre-developed AI models may seek to modify and refine these technologies over time, requiring access to underlying data and system insights. Given the widespread adoption of AI-driven solutions in the software procurement process, it is reasonable to expect AI service providers to accommodate such requirements. However, the frequency of AI model updates and the government’s ability to integrate new data directly affect the long-term sustainability of AI solutions [26].

Additionally, Iran’s government procurement processes are often perceived as slow and complex, creating obstacles for AI adoption. Bureaucratic inefficiencies, such as lengthy approval processes following proposal submissions and the extensive contractual obligations required for implementation, hinder the seamless integration of AI technologies. Instead of focusing on identifying opportunities for AI-driven improvements, many procurement procedures prioritize rigid compliance requirements, delaying the adoption of innovative solutions.

Smaller AI service providers face even greater challenges in adapting to these processes. Extended waiting periods for government contracts make it difficult for startups and small enterprises to scale their operations efficiently. Many of these firms must make hiring commitments immediately after securing contracts, yet unpredictable approval timelines make workforce planning a major challenge. This creates a gap where large corporations with greater financial flexibility dominate AI procurement, limiting opportunities for smaller, potentially more innovative providers to contribute to Iran’s AI ecosystem.

Beyond technical considerations, the successful integration of AI in Iran’s public sector depends on fundamental changes in organizational culture and administrative practices. Simply acquiring AI tools is insufficient—government agencies must embrace a mindset that supports digital transformation, streamlines

procurement protocols, and fosters cross-sector collaboration. Without these adjustments, AI's full potential in enhancing public services and governance will remain unrealized [24].

2.5 Ethical Considerations and AI in Iran's Public Sector

The use of AI in Iran's public sector must be guided by fundamental moral principles and values to ensure responsible and fair implementation. Ethical considerations in AI refer to the commitment to transparency, accountability, fairness, and privacy in the development, deployment, and impact of AI technologies in government and administrative functions. As AI becomes more embedded in public services, addressing these ethical concerns is crucial to maintaining public trust and ensuring the equitable use of technology. Key ethical considerations in AI adoption in Iran's public sector include:

1. **Transparency and Explain ability**

   AI-driven decisions must be transparent and understandable to government officials and the public. Citizens should have access to explanations regarding how AI systems make critical decisions, particularly in sectors such as taxation, social services, and law enforcement.

2. **Accountability and Oversight**

   Government agencies must establish clear accountability frameworks to determine responsibility in cases where AI-driven decisions result in errors or biases. Ensuring that human oversight remains integral to AI implementation is essential for maintaining fairness and preventing undue reliance on automated decision-making.

3. **Fairness and Non-Discrimination**

   AI models must be designed to avoid biases that could lead to discrimination based on gender, ethnicity, socioeconomic status, or political views. Rigorous testing and ongoing monitoring are necessary to detect and mitigate any unintended biases in AI systems used for public services.

4. **Privacy and Data Protection**

   The use of AI in government services requires handling vast amounts of personal data. Iran must develop and enforce robust data protection regulations to prevent unauthorized access, misuse, or surveillance that infringes on citizens' rights. Establishing AI policies aligned with ethical data governance principles is crucial.

5. **Security and Cyber Resilience**

   AI systems used in public administration must be safeguarded against cyber threats, ensuring that sensitive government and citizen data remain protected from breaches, manipulation, or misuse. Secure development practices and regular security audits are necessary for AI-based government applications.

6. **Public Engagement and Trust**

   Ethical AI implementation should involve public dialogue and citizen participation. The Iranian government must ensure that AI policies and decisions are made with input from diverse stakeholders, including experts, civil society, and the general public, to build trust and legitimacy in AI-driven governance.

7. **AI for Public Good**

The adoption of AI should align with national development goals, focusing on enhancing public welfare rather than solely improving administrative efficiency. AI should be used to bridge social inequalities, improve access to essential services, and promote inclusive governance.

By integrating these ethical considerations into AI policymaking, Iran can ensure that AI contributes to a fair, secure, and transparent public sector while maintaining public confidence in government-led AI initiatives [21].

3 Theoretical Framework for AI Adoption in Iran's Public Sector

The organizational theory applied to evaluate the opportunities and challenges of AI adoption in Iran's public sector can be analyzed from multiple perspectives. These perspectives provide a structured approach to understanding how AI influences governmental operations, decision-making, and service delivery. The key theoretical dimensions include:

1. **Institutional Pressures and Public Expectations**

   Government agencies face increasing pressure to adopt AI to improve efficiency, transparency, and service quality. Public expectations regarding digital transformation, faster service delivery, and data-driven governance influence the pace and extent of AI adoption. However, balancing innovation with bureaucratic constraints remains a challenge.

2. **Government Regulation and Policy Compliance**

   AI implementation in Iran's public sector is shaped by national regulations, ethical standards, and international best practices. Regulatory frameworks must address issues such as data privacy, accountability, and security while fostering AI-driven innovation within legal and ethical boundaries. The evolving nature of AI policy in Iran plays a crucial role in determining its long-term impact.

3. **Technological Innovation and Infrastructure Readiness**

   The success of AI adoption depends on the availability of digital infrastructure, computing resources, and skilled personnel. Iran's technological landscape, including access to cloud computing, big data analytics, and AI research capabilities, directly affects the feasibility of AI integration in public administration.

4. **Stakeholder Collaboration and Cross-Sector Integration**

   Effective AI deployment requires collaboration between government entities, private-sector AI developers, academia, and civil society organizations. Public-private partnerships (PPPs) and research collaborations can enhance AI knowledge-sharing, policy formulation, and implementation strategies. Additionally, ensuring that AI benefits are distributed equitably across different sectors is critical.

5. **Resource-Based View (RBV) and Organizational Capacity**

   From a resource-based perspective, AI adoption depends on the availability and efficient allocation of financial, human, and technical resources. Government agencies must invest in workforce training, AI literacy programs, and talent development to build internal AI capabilities. Additionally, addressing budgetary constraints and optimizing resource allocation are key factors in sustaining AI initiatives.

By applying these theoretical perspectives, Iran can develop a structured approach to AI adoption in the public sector, ensuring that AI-driven transformation aligns with national priorities, regulatory frameworks, and public interests [21].

3.1 Role of Government Regulations and Societal Expectations in AI Adoption in Iran's Public Sector (Research Question 3)

In the organizational context of AI adoption, various governments worldwide, including the European Union (EU), Canada, and the United Kingdom, have established ethical guidelines to regulate AI applications in public administration. These comprehensive frameworks impose significant constraints on government AI usage, shaping the organizational landscape. However, similar structured regulations and guidelines are still evolving in Iran, creating challenges in aligning AI implementation with ethical, legal, and operational standards.

One of the key issues in AI governance is the resolution of conflicts related to public values. While AI adoption in Iran's public sector promises increased efficiency and automation, concerns regarding privacy, fairness, and accountability remain unresolved at both the meso (institutional) and micro (individual) levels of governance. AI experts and policymakers must bridge the gap between theoretical principles and real-world implementation to ensure AI applications align with public values and administrative objectives [20].

Governments often play a dual role in AI governance: as both a regulatory body and an AI user. While Iran's authorities emphasize monitoring AI ethics and adherence to national security policies, less attention has been given to evaluating the government's role as a direct technology adopter. As AI becomes increasingly integrated into Iran's public administration, a more structured regulatory approach is needed to ensure compliance with ethical and legal standards.

Existing research highlights gaps in understanding the challenges governments face in AI adoption. Comparative studies suggest that many governments struggle with optimal AI deployment, raising questions about how AI can be effectively utilized for maximum public benefit. In Iran, these uncertainties are compounded by regulatory ambiguity, limited AI expertise in government institutions, and concerns over algorithmic bias in decision-making [21].

To address these issues, Iran's government must focus on:

- **Developing comprehensive AI regulations** that ensure transparency, fairness, and accountability in public sector AI applications.
- **Enhancing inter-agency collaboration** to align AI governance policies across various ministries and departments.
- **Strengthening AI literacy and training** among policymakers, civil servants, and regulatory authorities to improve decision-making.
- **Encouraging research on AI governance** to identify barriers to implementation and propose solutions within the organizational theory framework.

By addressing these regulatory and societal expectations, Iran can build a more structured and responsible AI adoption framework, ensuring that AI-driven governance aligns with national priorities and ethical standards [20].

3.1.1 Internal Resources and Capabilities for AI Adoption

The **resource-based view (RBV)** provides a valuable perspective on AI adoption in Iran's public sector by emphasizing the role of internal resources and organizational capabilities. Public institutions exert significant influence over workforce development, technological infrastructure, and operational processes. Unlike tangible

assets, organizational capabilities include intangible factors such as institutional culture, decision-making processes, and employee expertise, all of which are critical to the success of AI-driven transformation.

In Iran's public administration, where frequent policy shifts and regulatory changes create a dynamic environment, AI adoption requires strong internal knowledge processes. Public sector managers must develop the ability to integrate, build, and reconfigure internal and external competencies to adapt to technological advancements. AI implementation demands **dynamic capabilities**, allowing institutions to respond effectively to shifting political, economic, and societal conditions [9].

Three key strategic dimensions for AI adoption in Iran's public sector include:

1. **Public Value Creation** – AI initiatives should align with national priorities, ensuring improved public service delivery while maintaining transparency and fairness.
2. **Legitimacy and Institutional Support** – Political backing and digital transformation policies must provide AI initiatives with credibility and sustained investment.
3. **Internal Competency Development** – Training programs and skill-building initiatives must equip government employees with AI literacy to ensure smooth adoption.

The successful deployment of AI in Iran hinges on the **integration of technological, organizational, and environmental factors**, ensuring that AI solutions generate meaningful value for society while being ethically and operationally sound [10].

3.2 Challenges in Acquiring and Developing AI Resources (Research Question 1)

The findings in this section address **the first research question**, which explores the **challenges associated with AI adoption** in government service delivery.

3.2.1 Inadequate or Missing Data

AI systems rely on **high-quality, representative data** for accurate training and decision-making. One of the significant challenges in Iran is **limited access to structured government data** or delays in its collection. A lack of data transparency or insufficient datasets can result in biased or inconsistent AI outputs, reducing the effectiveness of AI applications in areas such as taxation, healthcare, and law enforcement. To mitigate this, Iran's government must invest in **comprehensive data collection, standardization, and quality control measures [13].**

3.2.2 Outdated Infrastructure

AI models require **high-performance computing power** and **scalable infrastructure** to process vast datasets efficiently. However, many Iranian public sector organizations still operate on **legacy IT systems** that lack the speed and memory required for advanced AI applications. Without upgrading to **modern cloud computing and data analytics platforms**, AI adoption will remain limited in its effectiveness. Strategic investments in **cutting-edge AI infrastructure** are crucial for Iran's public sector to fully harness AI capabilities [14].

3.2.3 Adaptability to Existing Systems

AI integration is not as simple as adding a few software tools—it requires a fundamental evaluation of **existing IT systems, data storage facilities, and computational resources**. Iranian government agencies must **train employees on AI implementation**, troubleshooting issues, and recognizing signs of AI inefficiencies. A **smooth AI transition** requires expertise in adapting machine learning models to existing governmental workflows and regulatory frameworks [14].

3.2.5 Shortage of Skilled AI Professionals

Iran faces a shortage of **AI experts and data scientists**, making it difficult for public institutions to develop AI solutions in-house. Many government agencies lack AI specialists with expertise in **algorithm development, machine learning, and ethical AI governance**. To address this gap, Iran should:

- **Invest in AI education and specialized training** for government employees.
- **Collaborate with universities and research institutions** to cultivate AI talent.
- **Offer incentives for AI professionals** to work in the public sector rather than private firms.

3.2.6 Over-Reliance on AI Without Human Oversight

While AI enhances efficiency, **blind trust in AI-generated decisions** can be problematic. AI is only as reliable as the data it is trained on, meaning **flawed inputs will produce flawed outcomes**. Over-reliance on AI without **human review** may lead to **biased policy decisions, errors in automated processes, and potential ethical violations**. Ensuring **AI transparency and explain ability** is critical for minimizing the risks of AI misuse in public sector governance.

3.2.7 Budget Constraints and Funding Allocation

AI implementation requires significant **financial investment** in **training, infrastructure, and regulatory compliance**. However, **budgetary constraints** in Iran's public sector pose a challenge. Many agencies struggle to justify AI-related expenses, leading to **hesitation in adopting AI-driven solutions**. While some costs are inevitable, Iran can:

- Explore **low-cost AI solutions** and **open-source platforms**.
- Leverage **public-private partnerships (PPPs)** to co-fund AI projects.
- Optimize AI expenditures by **prioritizing high-impact government services [15]**.

3.3 Technological Innovation Systems (TIS) and AI Adoption in Iran's Public Sector (Research Question 3)

The findings in this section address **the third research question**, which explores how **organizational theory can help devise strategies to overcome obstacles** in AI adoption within the public sector.

3.3.1 Interaction Between Actors, Networks, and Institutions

In the context of **organizational theory applied to AI adoption**, innovation is viewed as a **dynamic process shaped by institutional structures and networks**. This aligns with the **Technological Innovation Systems (TIS) framework**, which defines an innovation system as **a network of actors interacting within a specific economic or industrial sector under a shared institutional infrastructure**. In the Iranian public sector, the TIS framework helps analyze **how AI technologies are developed, diffused, and utilized within government institutions**.

From an organizational perspective, **Technological Innovation Systems (TISs) are categorized based on the technologies they involve and the specialized fields they impact**. This shifts traditional **client-vendor relationships** into **collaborative problem-solving networks**, where AI developers, government agencies, and research institutions work together to implement AI-driven solutions. Within Iran's AI-driven innovation ecosystem, key actors include:

- **Government Institutions** – Ministries, regulatory agencies, and municipal governments responsible for policy implementation and AI regulation.
- **AI Vendors and Tech Companies** – Public and private sector organizations developing AI-based solutions for governance, finance, healthcare, and infrastructure.

- **Research Institutions and Universities** – Academic bodies contributing to AI research, algorithm development, and innovation strategies.
- **Financial Institutions and Investors** – Banks and funding bodies that support AI research and development projects in public administration.

The **organizational value chain** of AI adoption involves collaboration between these actors, yet **only specific stakeholders are directly involved in AI governance, while others influence the broader innovation system**. Applying organizational theory to AI adoption in Iran highlights **the strategic role of government institutions in facilitating collaboration, defining regulatory frameworks, and fostering AI adoption across multiple public sector domains [18].**

3.3.2 Innovation Functions and System Capabilities

While **structural components** form the foundation of any **Technological Innovation System (TIS) study**, recent research **focuses on innovation functions**, which determine the **creation and diffusion of AI technologies** in the public sector. The effectiveness of AI innovation in Iran depends on:

1. **AI Research and Development (R&D) Capacity** – The ability of Iranian universities, research centers, and private AI firms to generate **cutting-edge AI solutions for public administration**.
2. **Government Policies and Incentives** – Regulatory frameworks that support **AI adoption**, including funding, tax incentives, and strategic partnerships.
3. **Institutional Collaboration** – Cross-sector cooperation between **government agencies, research institutions, and private AI vendors** to develop **scalable AI solutions**.
4. **Public Awareness and Digital Literacy** – Educating policymakers, civil servants, and the general public about **AI benefits, risks, and ethical considerations**.
5. **AI Infrastructure and Implementation Readiness** – The availability of **cloud computing, big data analytics, and cybersecurity measures** to support AI-driven governance.

AI adoption in Iran's public sector requires a **well-functioning TIS**, where the **interplay between actors, networks, and institutions** creates a **self-reinforcing system** that encourages AI-driven innovation. However, challenges such as **bureaucratic inefficiencies, regulatory ambiguity, and resource constraints** must be addressed through **strategic reforms** to enhance AI adoption.

By leveraging **Technological Innovation Systems (TIS) theory**, Iran can design **effective AI policies, strengthen institutional cooperation, and foster AI-driven innovation**, ensuring **sustainable and responsible AI integration** in government service delivery [17].

3.3.3 Stakeholders' Collaboration and Their Role in AI Implementation in Iran's Public Sector

AI adoption in Iran's public sector is **influenced by various stakeholders**, including **government entities, private companies, academic institutions, and financial bodies**. These external players, networks, and institutions shape AI implementation at **multiple levels**, even if they are not directly part of the core **Technological Innovation System (TIS)**. Although Iran's **TIS for AI governance** is still evolving, **external environmental influences are critical** in shaping its development and adoption.

External Factors Influencing AI Adoption in Iran's Public Sector

The **TIS framework** highlights how **external factors** influence AI systems **upstream (green) and downstream (red)** during implementation. In Iran, **external stakeholders influence AI adoption** in the following ways:

1. **Government and Regulatory Bodies**
    - Define **AI policies, data protection laws, and ethical AI guidelines**.
    - Establish national AI strategies aligned with **economic and social goals**.
    - Provide **funding and incentives** for AI research and development.
2. **Academic and Research Institutions**
    - Conduct **AI research and development** to advance local AI capabilities.
    - Train **future AI experts** and build national AI competency.
    - Collaborate with **government agencies** to design AI-driven policy solutions.
3. **Private AI Vendors and Technology Firms**
    - Develop **AI-driven solutions** for government services (e.g., smart taxation, AI-based healthcare diagnostics, cybersecurity).
    - Provide **technical expertise** to support AI integration in public administration.
    - Engage in **public-private partnerships (PPPs)** to deploy large-scale AI initiatives.
4. **Financial Institutions and Investors**
    - Fund **AI startups and AI-driven public sector projects**.
    - Provide **venture capital and government grants** for AI research.
    - Facilitate AI's economic viability in **non-commercial sectors** such as healthcare, education, and governance.
5. **Civil Society and Public Engagement**
    - Advocate for **ethical AI policies** that ensure **fairness, transparency, and accountability**.
    - Raise awareness about **AI's societal impacts**, including its risks and benefits.
    - Encourage **citizen participation in AI governance** to build trust in AI-driven public services.

Iran's **AI ecosystem is still in its early stages**, meaning **government-driven AI initiatives** have a stronger influence than market-driven innovation. However, **interactions between the public sector, private firms, and academia** are crucial for AI expansion. As AI adoption grows, its impact on **business sectors, digital services, and automation** will increase, driving further technological advancements [19].

4. Types of Contexts in AI Adoption in Iran's Public Sector

Previous studies indicate that multiple contextual structures influence the formation and performance of **Technological Innovation Systems (TISs)**. In the context of AI adoption in **Iran's public sector**, understanding these **four types of contexts** helps policymakers and stakeholders navigate challenges and optimize AI integration [20].

4.1 Technological Context

- AI is part of a broader **technological network**, interconnected with **cloud computing, big data analytics, and cybersecurity**.
- AI solutions in **public administration, healthcare, transportation, and urban planning** depend on technological advancements.
- The **rate of AI development and application methods** impact AI's potential reach and scalability in government services.

4.2 Industry Context

- **AI adoption in Iran's industries**, including **finance, healthcare, and logistics**, influences public sector AI policies.
- **Public-private partnerships (PPPs)** are crucial for AI-driven economic development.
- Government institutions must **align AI policies with industry needs**, ensuring technological compatibility and regulatory compliance.

4.3 Geographical Context

- **Local and national factors**, such as **Iran's institutional framework and digital transformation agenda**, affect AI adoption.
- **Regional disparities** in AI infrastructure may create uneven AI implementation across different provinces.
- Examining **regional AI innovation hubs** and **performance gaps** can inform targeted investments in AI infrastructure.

4.4 Sectorial (Production and Consumption) Context

- AI adoption depends on **existing socio-technical configurations** in governance, law enforcement, taxation, and public services.
- The **interaction between AI developers, government agencies, and end-users** determines AI's success in administrative processes.
- The **public sector must ensure inclusivity**, preventing AI-driven inequalities and biases [21].

5. Conclusion

AI adoption in Iran's **public sector** is increasingly a **priority for policymakers**. As machine learning and automation evolve, AI-driven innovations promise **greater efficiency, streamlined decision-making, and improved public service delivery**. However, concerns regarding **job displacement, ethical risks, and AI's long-term societal effects** remain unresolved.

This study **applies organizational theory** to examine AI's **opportunities and challenges** in public administration, answering three key research questions:

5.1 Biggest Obstacles to AI Adoption in Iran's Public Sector

- The **lack of enabling conditions**, including **data accessibility, digital infrastructure, and AI expertise**.
- **Difficulties in assessing AI's consequences**, such as ethical risks and accountability gaps.
- **Challenges in quantifying AI's public impact**, particularly in sectors like law enforcement and social services.

5.2 How AI Enhances Public Service Delivery

- AI **improves efficiency**, reducing bureaucratic delays and enhancing service automation.
- AI enables **cost savings**, optimizing resource allocation and fraud detection.
- **Governance challenges** remain, including **ethical concerns, public accountability, and regulatory compliance**.

5.3 Role of Organizational Theory in Overcoming AI Challenges

- Organizational theory highlights **the need for cultural and procedural shifts** to integrate AI successfully.
- **Government procurement reform** is essential for **reducing bureaucratic inefficiencies in AI implementation**.
- **Training civil servants** in AI governance enhances **adoption readiness and risk mitigation**.

5.4 Contribution to AI Adoption Research in the Public Sector

- AI adoption must **align with Iran's Sustainable Development Goals (SDGs)**, ensuring **fairness, safety, and public trust**.
- The study extends existing AI governance models, emphasizing **public sector responsibility in AI oversight**.
- **Ethical AI guidelines** must be **operationalized** to prevent **bias, discrimination, and unintended harms**.

5.5 Future Research Directions and Study Limitations

- **Empirical analysis** is required to assess **government employees' AI adoption readiness**.
- AI policies must **consider international trends**, ensuring Iran's AI ecosystem remains **globally competitive**.
- The study highlights the need for **TIS lifecycle research**, examining how AI policies evolve over time.

Despite its **conceptual limitations**, this research contributes **substantially to AI governance discussions** in the **public sector**. Future studies should explore **AI's role in fostering public sector innovation**, balancing **efficiency with ethical responsibility**. The overarching goal is to **understand how AI can drive sustainable public service improvements while addressing societal concerns and governance challenges**.

References

1. **Mohammadi, M.** (2025). *Artificial Intelligence Adoption in Iran: A Comparative Analysis with Global Trends*. Journal of Technology Management, 14(2), 123–130.
2. **Sharif University of Technology, AI Strategy Center**. (2024). *Iran Artificial Intelligence Index 1403: A Comprehensive and Data-Driven Analysis*. Retrieved from aistrategy.tsc.sharif.ir.
3. **Rakhshai, A.** (2025). *The Role of Artificial Intelligence in Iran's Future: An Analysis of the National AI Document and Prospects*. AI Journal of Iran, 9(1), 45–53.
4. **Heyva AI Research Group**. (2023). *Artificial Intelligence in Iran: Status and Applications*. Retrieved from heyvaai.com.
5. **Amerandish Intelligent Systems**. (2024). *Iran's Position and Status in Artificial Intelligence: A Detailed Overview*. Retrieved from amerandish.com.
6. **Tavana News Agency**. (2024). *An Analysis of Artificial Intelligence Trends in Iran*. Retrieved from tavananews.ir.
7. **Hamrah Academy**. (2023). *The State of Artificial Intelligence in Iran: An Overview of 27 Leading AI Companies*. Retrieved from hamrah.ac.
8. **Karnakon**. (2023). *Applications of Artificial Intelligence in Iran: Six Domains Conquered by AI*. Retrieved from karnakon.ir.
9. **Economics Gate**. (2024). *Global AI Adoption Index and Iran's Position*. Retrieved from economicsgate.com.
10. **Peivast Magazine**. (2024). *Iran's AI Indicators Report 1403: Are We Lagging Behind?*. Retrieved from peivast.com.
11. **Majlis Research Center**. (2024). *AI Governance: Concepts, Dimensions, and Components*. Retrieved from rc.majlis.ir.
12. **International Relations Think Tank**. (2024). *Artificial Intelligence and Governance in Iran*. Retrieved from irthink.com.
13. **Mir Emadi, T., & Rahimi Rad, Z.** (2016). *Identifying System Failures in the Analysis of Technological Innovation Systems in Biofuel in Iran*. Science and Technology Policy Journal, 8(1), 27–41. Retrieved from ensani.ir.
14. **Majlis Research Center**. (2024). *AI Governance: The Role of AI in Enhancing Iran's Administrative System*. Retrieved from report.mrc.ir.

15. **Hooshio AI News**. (2024). *The Role of AI in Governance in Iran: From Theory to Practice*. Retrieved from hooshio.com.
16. **Sharif University of Technology AI Research Group**. (2024). *Iran Artificial Intelligence Index: A Comprehensive Data-Driven Report*. Retrieved from aistrategy.tsc.sharif.ir.
17. **Iran Academy of Science and Technology**. (2024). *The Future of AI in Iran: National Strategy and Challenges*. Journal of Science and Innovation, 10(3), 78–91.
18. **Zaheri, M. H.** (2023). *The Relationship Between AI and Governance in Iran*. Center for Development and Foresight Studies, 5(3), 45–60. Retrieved from cdrf.ir.
19. **Iran ICT Ministry AI Report**. (2023). *AI Governance in Iran: Legal and Policy Frameworks*. Retrieved from ict.gov.ir.
20. **Tavana News Agency**. (2024). *Analysis of AI Trends in Iran*. Retrieved from tavananews.ir.
21. **Iranian Journal of AI and Innovation**. (2024). *The Role of Artificial Intelligence in Digital Transformation in Iran*. AI Journal of Iran, 9(2), 34–48.
22. **Peivast Technology Review**. (2024). *Iran's AI Indicators Report 1403: Are We Lagging Behind?*. Retrieved from peivast.com.
23. **Heyva AI Research Group**. (2023). *Artificial Intelligence in Iran: Current Status and Applications*. Retrieved from heyvaai.com.
24. **Amerandish Intelligent Systems**. (2024). *Iran's Position and Status in Artificial Intelligence: A Detailed Overview*. Retrieved from amerandish.com.
25. **Karnakon AI Research**. (2023). *AI Applications in Iran: Six Sectors Transforming with AI*. Retrieved from karnakon.ir.
26. **Iran Economics Gate**. (2024). *Global AI Adoption Index and Iran's Competitive Position*. Retrieved from economicsgate.com.
27. **Islamic Humanities Knowledge Network**. (2023). *Artificial Intelligence Governance: Concepts, Dimensions, and Components*. Retrieved from ihkn.ir.
28. **Rakhshai AI Magazine**. (2023). *Exploring the Role of AI in Iran's Future: A Review of the National AI Document and Prospects*. Retrieved from rakhshai.com.
29. **Hooshio AI Think Tank**. (2024). *The Role of AI in Public Sector Innovation in Iran*. Retrieved from hooshio.com.
30. **Iranian Society for AI and Robotics**. (2024). *Artificial Intelligence in Government: The Iranian Experience*. Journal of Robotics and AI Research, 11(1), 55–68.