AI Embassies: A New Frontier in Cyber Domain

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Article Info	Abstract
	Background: The world is rapidly becoming more intelligent, and AI is penetrating many fields, including international affairs. Based on this, we will soon witness the emergence of a new generation of embassies, namely AI embassies. **Aims:** This article answers the main question: "What are the prerequisites and requirements for using AI in embassies?" **Methodology:** This research, conducted using a qualitative approach and socio-technical theory, examines changes around embassies and operational experiences in this area and concludes that ambassadors need to align with modern developments to succeed in their diplomatic missions. **Findings:** The research findings indicate that a comprehensive and accurate understanding of the developments in the host country and benefiting from AI suggestions for developing relations with the government and people of the host country are among the advantages of AI embassies. Security issues and the need for skilled human resources are some of the challenges of AI embassies. Finally, the main achievement of this article is to provide an operational framework for the responsible use of AI in embassies. **Conclusions:** Designing and implementing an artificial intelligence strategy, ensuring data quality and security, empowering embassy staff, and continuous monitoring and evaluation are the most critical components of this proposed framework.

1. Introduction

Traditionally, diplomats stationed in embassies and consulates worldwide have undertaken diverse tasks, most notably fostering common ground to enhance bilateral relations through dialogue and gathering strategic intelligence for their home governments. A century and a half ago, sailing vessels served as diplomatic communication channels, later replaced by steamships. Diplomatic messages were then transmitted via telegraph, telephone, and airmail. Over time, these methods evolved, and the communications revolution introduced tools like email and the internet to diplomats (Grech, 2006: 4).

Consequently, before the advent of information and communication technology, states interacted through traditional diplomacy. However, this process has changed increasingly. The entry of artificial intelligence (AI) into the realm of embassy operations has the potential to revolutionize diplomacy and citizen services. This technology will soon transform the way embassies operate and how citizens expect governments to serve them. Understanding these changes and aligning with them is essential for optimizing resources and increasing the efficiency and effectiveness of diplomatic missions, as well as developing relations between the sending country and the government and people of the host country.

Major and even minor global powers are rapidly adopting AI to increase the speed and quality of their embassies' tasks and services. Accordingly, awareness and understanding of the functions of AI in this area and planning for it are key necessities for all countries that seek to have a suitable position in the international competitive arena.

In this regard, the purpose of this research is to examine the limited global experiences in this field and introduce the emerging generation of AI embassies, their strengths and weaknesses. Finally, practical solutions for implementing smart embassies will be presented, due to its exploratory nature.

Researchers have also written articles and books about AI and its role in various fields, including in the field of diplomacy and International Relations. For example, Russell and Norvig (2003) comprehensively and widely used textbooks in the field of AI. It covers fundamental concepts, algorithms, and applications of AI in a comprehensive manner. Goodfellow, Bengio and Courville (2016) specifically focuses on deep learning and serves as a comprehensive reference for researchers and students looking to specialize in this area. Salehi et al. (2024) works on high and low trustworthy AI-enabled decision support systems.

Hale and Katz (2016) provide a comprehensive overview of digital diplomacy, exploring its history, key concepts, and challenges. Manor (2018) argues that none of the terms employed thus far in the context of digital technologies and diplomacy are sufficient. He proposes "the digitalization of diplomacy" in reference to the impact of digital

technologies on diplomacy. Engtoft Meldgaard and Fletcher (2024) explore the new diplomatic role of tech companies, who design and own the platforms through which diplomacy is practiced.

Horowitz (2018) argue that how broader AI-driven economic and societal changes could affect international security. Dehghani Firuzabadi and Chehrazad (2023) have analyzed and evaluated the role of AI in international relations. Lee (2018) discusses the geopolitical implications of AI development, particularly between the US and China. It provides insights into how AI could shape future international relations.

Vacarelu (2021) concludes that without established protocols governing the use of AI in diplomatic environments, there is a significant risk of destabilizing diplomatic operations. TamunoMiegbam and Bariledum (2022) recommend that diplomats in the modern era should be trained in the use of technology in diplomacy. This can be achieved through seminars and conferences. They specifically propose the creation of a specialized fund for African diplomats to enable them to utilize the latest advanced technologies in their diplomatic activities, similar to their counterparts in the Western world. Bano, Chaudhri and Zowghi (2023) delve into the dual nature of advancements in AI and explore the challenges and opportunities presented by this emerging technology.

Roumate (2021) has edited a book comprises a collection of articles that discuss the impact of digitalization and AI on diplomacy and global governance. This research adopts a legal, social, economic, and political perspective on emerging phenomena related to digitalization and AI, and offers a set of policy solutions and actions to address the malicious use of AI. Kissinger, Schmidt and Huttenlocher (2021) explore how AI is reshaping our relationships with knowledge, politics, and the societies we inhabit. Molaee and Kafi (2023) introduce the emerging concept of AI diplomacy, outlining its foundations, goals, functions, and challenges. They subsequently propose strategies to position Islamic Republic of Iran as a leader in this domain.

In summary, the reviewed research indicates that researchers worldwide have recognized the significance of AI in diplomacy and foreign policy, conducting numerous studies on the subject. However, these studies primarily focus on the broader impacts of AI on national power, diplomatic tools, and issues. None of them delve specifically into how AI influences embassy operations. Consequently, the current research, which aims to examine this specific aspect, offers a novel and innovative contribution to the field.

2. Theoretical framework
This paper employs the sociotechnical theory (STT) to analyze the subject matter. Introduced between the 1950s and 1960s by researchers at the Tavistock Institute of Human Relations in London, STT is a

systems approach based on two fundamental assumptions: first, organizations are systems where changes in one part leads to changes in other parts; second, organizations interact with their environments and are in a state of constant change, influencing and being influenced by their surroundings. In the realm of diplomacy, STT emphasizes that if the social and technical characteristics of diplomatic missions are considered as a combination of interdependent components within a complex system, the structure and functioning of diplomatic activities can be better understood and improved. Thus, STT posits that there are interdependent technical-social relationships in diplomatic activities, and understanding this relationship is key to successful diplomacy. In this context, changes in one domain (technical or social) while neglecting the other often lead to the failure of diplomatic activities (TamunoMiegbam & Bariledum, 2022: 58).

Within this theory, a sociotechnical system comprises multiple subsystems that interact and ensure the success of a diplomatic mission. Sociotechnical systems are divided into social and technical components. The social system components include individuals (diplomats), infrastructure (embassy), culture (home country and host country), processes (how diplomatic activities are conducted), and goals (the objectives of the diplomatic mission as determined by the governing government). The technology component in an STS also includes software and hardware that work together for the effectiveness of the diplomatic mission (Raven et al., 2012: 64).

Figure 1. Schematic view of socio-technical theory
Source: University of Leeds: https://business.leeds.ac.uk, 2024

Based on this, each embassy employs individuals with specific capabilities who work within a physical infrastructure towards its

objectives, follow processes, utilize technology, and share specific cultural assumptions and norms. None of these components alone leads to the success of an embassy (Geels, 2010: 496-7). Therefore, in the modern era, increasing the efficiency and effectiveness of diplomatic activities requires understanding the transformations of the new social environment and emerging technologies, including AI, and making appropriate and purposeful use of both.

3. Method
Given the nature of this research, the researcher has naturally opted for a descriptive-analytical approach. In descriptive-analytical studies, researchers not only portray the existing state of affairs but also delve into the reasons behind these conditions, explaining how and why the issue and its dimensions came to be (Hafiznia, 2023: 53). Considering the theoretical nature of this research, data collection will be conducted through note-taking on academic documents and written works.

4. Results
This article, which lacks hypothesis due to its exploratory nature, explains the issue that the world is rapidly becoming more intelligent, with AI penetrating numerous domains, including international affairs. The convergence of technological advancements such as smart sensors, high-speed computers, algorithms, and AI has presented foreign ministries and embassies with entirely new challenges. Consequently, a new generation of embassies, namely AI embassies, is on the horizon. This paper examines the experiences of employing AI in embassies and concludes that ambassadors need to align with these modern developments to succeed in their diplomatic missions. Research findings indicate that AI-powered embassies can offer several advantages, including: increased speed and quality in consular affairs, facilitated communication with citizens, a comprehensive and accurate understanding of developments in the host country, and access to practical recommendations and suggestions from AI to enhance prestige, credibility, and influence among the nation and develop relations with the host government. Furthermore, the application of this technology in embassies can significantly assist ambassadors and embassy experts in identifying new threats and opportunities in bilateral relations. While AI embassies have not yet become widespread or replaced traditional embassies, the move towards realizing this new generation of embassies will soon become a key and attractive priority for foreign policy institutions and ambassadors. However, AI embassies also face challenges such as security issues, privacy concerns, excessive reliance on technology, and the need for skilled human resources to manage and develop these systems. Nonetheless, the rapid growth and penetration of AI in various fields, including diplomacy, and the benefits of utilizing this technology in embassies are so significant that

ambassadors are likely to move towards implementing this project. Ultimately, this paper proposes a framework for the responsible use of AI in embassies. Developing an AI strategy for each embassy, assessing risks and benefits, selecting appropriate technology, ensuring data quality and security, empowering embassy staff, and continuous monitoring and evaluation are the most critical components of this proposed framework.

5. Discussion
5.1. Environmental changes surrounding embassies
According to socio-technical theory, the social and technical features of diplomatic missions should be considered as a combination of interdependent components within a complex system. With this approach, it appears that the emergence and widespread use of AI technology have transformed the technical and social environments of embassies. In the technical realm, the growing importance of automation, machine learning, intelligent negotiation, and forecasting in multilateral political processes is rapidly complicating the diplomatic arena. In this era, access to vast amounts of data is comparable to access to extensive hydrocarbon resources, and companies compete for greater access to resources while state actors vie for control over large and successful companies. Under such circumstances, diplomats must employ a significant level of technical expertise in negotiations to shape new international norms.

Numerous efforts are underway to introduce algorithms into the heart of the diplomatic profession; diplomatic reports and activities are increasingly conducted in the digital realm, indicating that diplomacy is becoming a function of data. With each passing day, more countries and organizations (such as the United Nations or the European Union) require data processing, leading to the development of AI (Magdin, 2019).

Currently, AI has significantly transformed the field of consular services. The review of visa applications and the assessment and decision-making processes regarding their issuance are among the issues that have undergone a fundamental transformation through automation. The same applies to legal advisory systems, document preparation and translation, and the classification and organization of diplomatic issues; these functions will become largely automated in the foreseeable future, directly shaping diplomatic behaviors. Embassies are inevitably becoming vast sources and databases of data on their diasporas, utilizing this information for various purposes.

Currently, negotiation bots are becoming increasingly prevalent and are being utilized in various legal processes, ranging from interviews

for recruiting foreign ministry personnel[1] to evaluating the costs and benefits of agreements[2]. Diplomatic bots have proven to be time-saving in multilateral negotiations such as climate change agreements, and by offering a range of solutions; they prevent political negotiations from reaching deadlocks. Therefore, AI diplomacy envisions a future where diplomatic negotiations are simplified by delegating secondary or time-consuming tasks to bots, while significant political processes, or 'high politics', are still managed by human diplomats.

AI technology has also fundamentally transformed the operating environment of embassies in the social realm. As modern political communication becomes increasingly concise and fast-paced, and digital automation tools bombard audiences with information at unprecedented levels, some traditional diplomatic customs and communications are becoming obsolete (Unver, 2017). This is because online diplomacy based on AI has no relation to traditional hierarchical, one-sided, or secretive structures. In the age of algorithms, all parties involved in a political or diplomatic process, from foreign ministers to junior experts, have equal access to data sources (including social media) and can analyze data and forecast developments.

On the other hand, citizens, who are the target audience of diplomats and embassies, are experiencing new conditions due to increased interaction with and dependence on AI technology, and their expectations and demands are also changing. The target audience of embassies is now using technology in their daily lives that can answer their various questions in different areas and analyze and predict future developments for them. AI, which is available to the general public in various forms, can create images, videos, and other types of content for audiences and give them the power to play a role in the international arena. This technology can also perform many of citizens' intellectual and physical tasks through intelligent robots. Naturally, people who understand and use this level of technology will have different socio-political approaches than previous generations, and their expectations of the government and the ruling system in general, and the diplomatic apparatus in particular, will be different from the past (Šucha & Gammel, 2021: 14-15).

Given the changing external socio-technical environment in which

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1. For more information, see: Antony J. Blinken at the AI for Accelerating Progress on Sustainable Development Goals Event, (SEP 18, 2023), Us department of state: https://www.state.gov.

2. The Chinese Foreign Ministry has been using AI systems for years to analyze and make decisions about the issues it faces. For example, this institution has used AI in the decision-making process for foreign investment in relation to the "Belt and Road Initiative", a $900 billion investment project with high political, economic, and environmental risks. For more information, see: Hillman, Jennifer, Sacks, David. (March 2021). China's Belt and Road: Implications for the United States. https://www.cfr.org.

embassies operate, it is impossible for their internal socio-technical characteristics to remain static and continue operating as they have in the past. In this era of new technological and social developments, successful embassies will not only monitor and control the development of AI but will also discover suitable algorithms for their systems and use them to categorize and organize documents, prioritize objectives, and identify patterns in their reporting and planning structures. Of course, this process also requires increased speed and creativity. This approach prepares diplomacy and foreign policy to align with new developments, while the fundamental tools of foreign policy remain largely unchanged. Therefore, the key to a successful embassy is 'effective adaptation'; effective adaptation of embassy functions and foreign policy tools to new technical and social developments, if implemented well, is sufficient for progress and even for achieving a leadership role in AI in the international community (Scott et al., 2018: 11-13). Table 1 outlines the most significant impacts of AI on embassy environments and operations.

5.2. From virtual embassies to smart embassies

When discussing smart embassies, the closely related concept of 'virtual embassies' often comes to mind. Although both generations of these embassies owe their existence to advancements in technology, there are fundamental differences between them. As the name suggests, virtual embassies are designed within the digital realm. While these embassies still require diplomats, these diplomats are stationed in their home countries and interact with the destination country through electronic communication. Virtual diplomats must possess specific skills related to communication, virtual interactions, and the requirements of digital writing. Virtual embassies can complement the functions of physical embassies. They are particularly useful for small and developing countries with limited resources to establish physical embassies. Additionally, they can be highly beneficial in contexts with significant security concerns.

Virtual embassies offer users an immersive, graphical experience, providing a visual representation of a country's capabilities. Through advanced animation techniques, a high level of quality can be achieved. These embassies also enable virtual interactions between diplomats and visitors. Virtual embassies can perform a wide range of functions, essentially replicating most of the capabilities of physical embassies.

While virtual embassies offer significant advantages, issues such as security, ownership, and national sovereignty remain critical challenges. Cyber attacks pose one of the most significant threats to virtual embassies.

Table 1. Changing the socio-technical system of embassies in the age of AI

	Effects on the technical environment	Effects on the social environment	Effects on the embassies
The effects of artificial intelligence on the embassy environment	• Proliferation of automation	• Transformation of traditional diplomatic customs and communications	**Changes in goals** • Leveraging data and AI to enhance embassy performance
	• Prevalence of advisory and negotiating robots	• Growing public awareness of international affairs • Changing society's expectations of diplomats and embassies	**Changes in personnel** • Needs for diplomats with technical expertise
	• Data accumulation in embassies and the growing need for its processing	• Increased role of subnational and transnational actors in international relations	**Changes in structure** • Shifting the hierarchical structures • Altered recruitment processes • Modified roles and responsibilities
	• Diminishing efficiency of legacy technical infrastructure	• Shifting international norms and laws	**Changes in technology** • Upgrading embassy technical infrastructure
	• The ability of AI to interact with citizens and political parties of the host country • AI's capability for report generation • AI's capacity to draft speeches and negotiation texts for ambassadors • AI's ability to analyze and evaluate the current and future conditions of the host country		**Changes in culture** • Prioritizing creativity, innovation, and learning **Changes in processes** • Reducing bureaucratic processes • Emphasis on speed • Monitoring AI development in other countries • Developing tailored algorithms to increase embassy efficiency

Source: research findings

Consequently, there has been limited international adoption of these embassies, with only a few countries, such as Sweden and the Maldives, establishing them. Sweden launched its virtual embassy in 2007, modeling it after its physical embassy in the United States. Sweden dubbed this virtual embassy the "second home of Sweden" and implemented various activities commonly associated with physical embassies, including interior design, furniture, and the promotion of cultural traditions, cuisine, and seasonal events. However, Sweden discontinued operations in late 2012 to evaluate the project's outcomes (Bengtsson, 2011: 118).

The Maldives, a small island nation in the Indian Ocean primarily known for tourism, has been undergoing rapid economic, social, and political development. As part of this progress, the Maldives experimented with establishing a virtual embassy. The design of the Maldivian virtual embassy incorporated overwater bungalows, a distinctive feature and iconic symbol of the country. This virtual embassy served as a gateway for new global interactions, enabling this small nation to actively participate in international relations through the use of advanced communication technologies (Naeimabadi et al., 2015: 4-8).

While virtual embassies offered an intriguing concept for managing diplomatic and consular relations, the rapid advancement of technology introduced a new generation of embassies: AI-powered embassies. These are essentially traditional, physical embassies that leverage AI to enhance services, analyze data, and interact with citizens. AI-powered embassies utilize chat bots to answer frequently asked questions and provide initial support, and employ AI technology to analyze vast amounts of data, identify trends, and offer insights to diplomats. Machine translation is also facilitated by AI to enable communication with citizens in their native languages.

Although there are distinct differences between virtual embassies and AI-powered embassies, the key point is that the technologies used in these two generations of embassies are complementary and can enhance each other's effectiveness. Just as AI has the potential to enhance other emerging technologies such as 3D printing, the Internet of Things (IOT), virtual and augmented reality, or cloud computing, these digital technologies can also support AI in maximizing the impact of a project. For instance, an AI project aimed at streamlining procurement management in an embassy could leverage IOT sensors and virtual reality displays. Therefore, advancements in digital transformation are complementary to AI in the context of smart embassies (Bjola, 2020: 13-14).

Table 2. The differences between the virtual embassy and the AI embassy

AI embassy	Virtual embassy
These embassies are created in real space	These embassies are created in virtual space
These are real embassies	Complement the function of real embassies
Diplomats are stationed in the host country	Diplomats are stationed in their own country
Many functions of the embassy are performed by AI; But the ambassador and experts are the final decision makers	All the tasks of the ambassador and embassy experts are performed by themselves and in cyber space
The interaction between citizens and the embassy is through chat bots	Interaction between diplomats and visitors is virtual
These are based on different capabilities of AI	These are based on visualization and advanced animation techniques
These are subject to AI data manipulation	These are under the threat of cyber attacks
Diplomats need to know how AI works, its benefits and risks	Diplomats need skills related to the field of communication and interactions in the virtual world
Integrating AI systems with the existing systems of embassies is costly and time-consuming	Establishing these embassies is relatively easy and inexpensive

Source: research achievements

5.3. Practical experiences; an opportunity to learn

One of the most effective methods for comprehending and analyzing the precise mechanisms through which AI influences embassy operations is by examining practical experiences in this domain. Currently, there is a paucity of information regarding how AI is utilized within embassies, as well as the opportunities and challenges this technology presents for ambassadors and diplomats. Occasionally, media reports emerge concerning countries' adoption of AI in this context; however, these reports are often inaccurate. For instance, the Republic of Estonia, located in Northern Europe, inaugurated the world's first "data embassy" in Luxembourg in 2017. Unlike a traditional embassy, this data embassy does not serve a diplomatic purpose. Instead, it functions as a cloud data center supporting Estonia's e-government networks. The data embassy represents a pioneering initiative that relocates a government's critical servers to a secure diplomatic location, enabling Estonia to continue providing essential administrative services online even in the face of cyber attacks on its electronic infrastructure or territorial occupation. This allows the government to engage with its citizens and Diaspora in matters such as voting, paying taxes, receiving benefits, and conducting administrative tasks (Rice, 2019).

While Estonia's data embassy embodies a 21st-century strategy for ensuring government continuity and enhancing governance efficiency through the use of 'new technologies, it is distinct from an AI-powered

embassy and is primarily designed as a contingency measure.

In 2022, Ireland introduced its first AI Ambassador as part of the country's national AI strategy. While Irish officials have used the term "AI Ambassador", a review of the role's responsibilities reveals that this new position is not designed to manage relations with another country. Instead, its primary objective is to develop, promote, and facilitate strong public trust in AI, particularly among the younger generation, thus serving a domestic function[1].

The United Arab Emirates' (UAE) utilization of AI within its embassies aligns more closely with the focus of this research. In 2024, the UAE Ministry of Foreign Affairs announced the launch of its first smart mission in South Korea, in line with the country's "UAE National AI Strategy" and "Government Services Strategy". The mission's goal is to provide 24/7 comprehensive consular services to Emirati citizens using cutting-edge technologies, including AI. Although the UAE government has provided a detailed overview of the services this smart embassy will offer to Emirati citizens[2], it has not elaborated on the specific ways in which AI capabilities will be harnessed.

The reality is that, based on available information and news reports, no country has yet established an embassy fully equipped with AI. Furthermore, nations that have taken initial steps in this direction have not disclosed the specifics of their experiences using AI tools. However, the United States stands as an exception. Not only has the US leveraged AI technology to advance the objectives of its embassies in other countries but it has also publicly outlined this process. This transparency provides valuable insights into the challenges and opportunities of employing AI in embassies, which is the focus of this research.

The U.S. Advisory Commission on Public Diplomacy holds quarterly meetings to inform the American public about the country's public diplomacy activities worldwide. In a meeting held on June 14, 2023, Alexander Hunt, Public Affairs Officer at the U.S. Embassy in Guinea-Bissau, revealed that they had begun using Open AI's Chat GPT, an AI-powered chat bot, since December 2022 and had benefited significantly from it.

According to Hunt (2023), the U.S. Embassy initially used AI solely within its press team to draft media summaries. This enabled press and media specialists to produce daily media summary drafts within minutes. They quickly realized that Chat GPT was a powerful tool and

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1. For more information, please refer to: Artificial Intelligence (AI) Ambassador, Report on first year of activity, (2023), Department of Enterprise, Trade and Employment Gov.ie: https://enterprise.gov.ie/en/publications/ai-ambassador-report-on-first-year-of-activity.html.
2. For more information, please refer to: MoFA launches first Smart Mission abroad…, (28/5/2024), Ministry of Foreign Affairs : https://www.mofa.gov.ae/en/mediahub/news/2024/5/29/29-5-2024-uae-korea.

could be utilized by all embassy departments. Consequently, the embassy began using AI for various tasks, including drafting speeches, press guidance, project proposals, and social media posts.

The efficiency of AI in these tasks prompted U.S. embassy officials in Guinea to explore other AI tools that could aid in processing images, videos, and audio, such as creating graphics, producing video clips, removing noise, editing photos, and more.

The Public Affairs Officer at the U.S. embassy in Guinea emphasized that using Chat GPT is beneficial for long-term embassy management, as large language models (LLMs) [1] create an organizational memory by retaining information from each chat interaction. As the model is trained and provided with resources, it can improve its outputs and responses over time.

Chat GPT can analyze and generate text in almost any language. You can give it instructions in one language, but tell it to produce something in another. So, U.S. embassy officials in Guinea used this technology to create press guides for local staff in some of the less common languages like Guerze, Pular, or Susu, and the results were satisfactory for them.

According to Hunt (2023), U.S. embassy officials in Guinea gradually realized that the better the input they gave to the AI, the better the output. As a result, they trained their team to be very precise when writing questions and instructions and to always try to consider how the AI responses will be used, who the target audience is, and in what format and shape the final result will be used. For example, they noticed that if they told the AI to "write a speech for International Women's Day", it would produce a very general answer that might not appeal to their audience in Guinea, but if they gave it a more specific instruction, they would also get more accurate answers. For example, instead of the simple and short sentence above, ask it to "write a speech for the U.S. ambassador to Guinea for a diplomatic reception, the audience is mostly women, it should be five minutes long, refer to the speeches of prominent historical women in Guinea and a quote from a prominent American woman, and the tone of the speech should be friendly and informal."

With such a request, the AI provided a much stronger text that resonated better with the audience because it referred to the speech of some of the prominent women in Guinean history, such as "Hadja Mafory Bangoura", which was influential and a very good starting point.

Of course, the U.S. embassy in Guinea only considers the texts provided by AI as a draft to be reviewed, and a cohesive and trained

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1. Large Linguistic Models (L.L.M.) are artificial intelligence systems designed to understand, produce, and respond to human language. They are called "big"; because they contain billions of parameters that allow them to process complex patterns in language data.

team reviews these drafts and must verify all the details that Chat GPT provides. However, they found that the texts provided by AI are great for getting started in many areas.

The U.S. embassy has also trained Chat GPT to do its media summaries. They did this by giving it the template of their media work in the Guinea embassy as an example and telling it, "We want to create a channel like this sample to prepare media summaries."

Following this AI training, the model confirms, 'Yes, I understand how your media summaries are formatted.' Notably, the U.S. embassy utilizes Chat GPT-4, the most recent GPT model, which features an add-on exclusive to Pro accounts. This add-on enables the model to process links if provided (other GPT models without Pro accounts cannot process embedded links). Consequently, the embassy's media department employs an add-on named Link Reader. This tool reads links and generates media summaries precisely in the embassy's required format.

Even so, the U.S. embassy currently does not entirely rely on AI-generated summaries. A dedicated media specialist, who has previously read all these articles, meticulously reviews them. However, their task has been significantly simplified. Previously, drafting summaries in French and translating them into English was time-consuming. Now, they have a starting point and merely need to review the prepared text.

Another advantage of Chat GPT for the U.S. embassy in Guinea is its ability to create an organizational memory over time. This feature can be beneficial for newly assigned officers or current embassy members seeking a summary of significant developments in the host country or attempting to understand the local context. For instance, the U.S. embassy asks Chat GPT to "provide a report on the social, economic, and political situation in Guinea based on the media summary information shared with it thus far. Additionally, include political actors, factions, figures, and any conflicts among them. Also, assess progress towards a civilian transition and public perception of the ruling political leaders."

Since Chat GPT's data is only up to 2021, it cannot provide up-to-date information unless it has been fed new data over time. However, the articles and information the U.S. embassy has provided to the AI in recent months have formed its institutional memory regarding Guinea. As a result, Chat GPT can generate an insightful report on current events in Guinea. While the information it provides is subject to review, this report enables embassy members to stay informed about developments in Guinea over the past four months, a valuable achievement.

The U.S. Embassy in Guinea, based on its experience using Chat GPT, has identified several critical shortcomings. First, while Chat GPT is a large language model, it is neither sentient nor conscious. It is also not a precise database or even a reasoning engine. This means it

confidently produces content that appears credible, yet its information may be inaccurate, inappropriate, or biased. Consequently, the embassy has trained its team to be vigilant about its generated content.

The embassy's public relations officer concluded from this practical experience that Chat GPT and generative AI, at this stage, merely augment human capabilities rather than replace them. Therefore, we should consider co-creating content with this technology, in the same way we use tools like Excel for complex data analysis or Google Translate to eliminate the need for manual translation.

Chat GPT generates approximately 60% of the content, leaving human personnel to dedicate their time and cognitive capacity to three tasks: first, clearly articulating their needs and providing a prompt that elicits the best output from the AI; secondly, meticulously reviewing the accuracy, style, content, and bias of its reports; and finally, incorporating their observations or analyses gained from interacting with audiences in the subject area, which can enhance the quality of the final report (Hunt, 2023).

Based on this, the U.S. experience in using generative AI in embassies seems like a novel and highly instructive phenomenon. However, it's important to note that this selective and limited use of AI does not fully realize the concept of an AI-powered embassy. To form such an embassy, a more widespread use of various AI capabilities (such as facial recognition, speech recognition, analysis of diverse big data, pattern recognition, analysis and prediction, etc.) in both hardware and software operations of the embassy is necessary. Nevertheless, given the nascent nature of these AI-powered embassies, the limited experience of the United States can be a valuable starting point.

5.4. Potential functions of AI in embassies

The diverse capabilities of AI and the experiences of various countries, particularly the United Arab Emirates and the United States, in leveraging this technology within embassies demonstrate AI's potential to advance ambassadors' objectives in host nations across multiple domains.

Some of these beneficial applications include:

- **Providing high-quality, uninterrupted services to citizens.** AI-powered multilingual chat bots can offer 24/7 services to citizens, answering frequently asked questions and guiding them to appropriate resources. AI-driven systems can also analyze visa and passport applications to expedite processing (Klavins, 2018: 89).
- **Enhancing embassy security.** AI can bolster embassy network security by identifying and mitigating cyber threats in real time. Facial recognition systems can strengthen physical security by identifying unauthorized individuals.
- **Data collection and analysis.** AI-powered systems can gather and analyze large volumes of data, providing diplomats with a more

accurate and objective understanding of the host country's political and social environment. By analyzing vast quantities of news data, social media, and official reports, AI can streamline the data collection and analysis process for diplomats. Predictive algorithms can assist diplomats in analyzing political and social trends and forecasting future events in the host country (Bjola, 2020).

- **Improving crisis management.** In times of crisis in bilateral relations, AI can provide a rapid analysis of the situation, helping ambassadors and embassy staff to gain an accurate understanding of the host country's conditions and prepare to send realistic reports to headquarters and respond quickly and effectively. Machine learning algorithms can monitor global news sources, social media, and other data streams for months before a crisis to detect early warning signs of potential conflicts or crises in relations. This early detection can enable preventive diplomatic interventions and prevent the escalation or amplification of crises (Horowitz, et al., 2018:41).

- **Strengthening public diplomacy.** AI can facilitate more effective communication with host country citizens and the international community by generating targeted, multilingual content. AI-powered chatbots can shape public opinion in the host country by engaging in two-way interactions with audiences and enhancing the ambassador's and embassy staff's understanding of the host country's political, social, economic, and other conditions (William & Otto, 2022).

- **Increasing efficiency and saving time and costs.** By automating administrative and analytical tasks such as preparing speeches, media summaries, analyzing news and social media trends, and identifying and forecasting significant developments in the host country, AI can save diplomats' time and free up their resources for critical diplomatic activities. Furthermore, employing AI in areas such as visa and passport issuance can reduce embassy operating costs (Klavins, 2018: 74).

5.5. Challenges of implementing AI in embassies

Although AI has immense potential to improve the efficiency and effectiveness of embassy functions, leveraging this emerging technology presents several challenges that must be considered. Some of the most significant challenges include:

- **Data-related issues**. Embassies generate and receive vast volumes of data daily. Managing, processing, and analyzing this data requires robust infrastructure and advanced tools. The data is highly diverse, encompassing text, images, audio, and video, posing significant challenges for integration and processing. Data quality is another critical issue, as incomplete, duplicate, or inaccurate data can significantly impact analysis results. Additionally, Embassies generate and process large amounts of sensitive personal data.

Protecting the privacy of this data and adhering to relevant regulations is a significant challenge. Data security is a top priority, requiring robust measures to safeguard against unauthorized access, cyber attacks, and other security threats. Moreover, training AI models requires high-quality data, which may not be readily available for specific embassy tasks such as visa application processing or document translation (Varian, 2019: 213).

- **Technical challenges.** AI models have their own complexities, and implementing some of these models can be challenging and require significant technical expertise. Furthermore, the security level and reliability of AI systems are still questionable. The possibility of infiltration and sabotage by rival countries exists; they can interfere with the internal processes of AI systems in other countries during data processing and manipulate the assessments that diplomats receive from their AI assistants. Therefore, it is necessary to prevent potential errors and unauthorized access to data while considering these challenges (Gavrilovic, 2018). Moreover, integrating AI systems with existing embassy systems can be costly and time-consuming (Klavins, 2018: 75).

- **The challenge of excessive reliance on AI.** Excessive reliance on technology, especially AI in embassies, can pose serious risks. This reliance means complete dependence on AI systems to perform critical and sensitive embassy tasks without having backup plans or a full understanding of the limitations of these systems. Given the novelty of AI-powered embassies, the challenges in this area have not yet been thoroughly examined and analyzed; however, Zhai, Wibowo and Li (2024: 43-45) have addressed the risks of AI dependency in the education system, which can be adapted to the context of AI dependency in embassies. Key challenges include:

  - Vulnerability to cyber attacks. A successful attack can access all confidential information and disrupt embassy operations;
  - Neglecting the flaws of AI algorithms designed and trained by humans;
  - Increased opacity in embassy decision-making, leading to a decrease in public trust in the decisions made;
  - Dependence on the technical infrastructure that AI systems operate on (such as hardware, software, data, communications, processing technologies, algorithms, etc.) and the cessation of embassy activities in the event of problems with this infrastructure;
  - Decreased human skills due to over-reliance on AI, which can be problematic in emergency situations or when AI systems fail;
  - Loss of control: If AI systems become so complex that they are beyond human control, they may produce unexpected and even dangerous results.

As a result, Overreliance on AI (AI) technology can render embassies vulnerable to technical disruptions. Should technical issues arise, diplomatic operations may be compromised, potentially damaging international relations. To mitigate these risks, embassies should strike a balance between AI and human skills. At least for the present, AI should be considered a complement to human capabilities rather than a replacement. Furthermore, rigorous oversight of AI systems is essential, and these systems must be continuously evaluated and improved to ensure their effective functioning. Embassies must also strengthen cybersecurity by investing in robust security infrastructure to safeguard data and AI systems (Banafa, 2024).

- **Ethical and Societal Challenges**. A central concern in the ethics of AI is the deviation from principles of fairness, accountability, and transparency. AI models can exhibit biases, resulting in discriminatory or unjust outcomes. Moreover, the intricate nature of AI operations often hinders human understanding of their decision-making processes, limiting transparency. Data, a fundamental driving force behind AI applications, necessitates rigorous management to safeguard privacy and security. Challenges in this domain include unauthorized data usage, the risk of data breaches compromising individual identities, biases in data selection that perpetuate prejudiced AI model preferences, and the disorderly accumulation of data (Mollaee & Kafi, 2023: 155).

  The utilization of AI systems trained on biased or incomplete data can lead to flawed decision-making in various domains, including visa issuance, grant allocation, and policy formulation, thereby perpetuating societal stereotypes and prejudices. For instance, if an embassy's AI system bases visa decisions on nationality or ethnicity provides differential responses based on gender, race, or ethnicity, or prioritizes projects from specific countries or groups, it can perpetuate discriminatory practices. Furthermore, a clear framework for assigning accountability for decisions influenced by AI recommendations remains undefined. Consequently, determining liability in the event of errors or malfunctions arising from AI systems can be challenging (Zhai et al., 2024: 46). Given the absence of comprehensive regulations governing AI use in many countries, legal ambiguities abound. To address these challenges, it is imperative to establish robust internal and national regulations for data protection, coupled with a stronger adherence to international standards.

- **Challenges Related to AI Adoption. S**ome embassy staff may resist adopting new technologies such as AI. One reason for this resistance is the fear of job displacement, as individuals may worry that AI will replace their roles within the embassy. Furthermore, unfamiliarity with AI and its functionalities can hinder adoption; many staff members may be unaware of the benefits and capabilities of AI for

enhancing their work. Additionally, concerns about AI system errors and the potential for incorrect decision-making can erode trust among embassy staff. Moreover, employees may have privacy concerns related to the collection and use of their personal data by AI systems. The use of AI for performance monitoring can also lead to feelings of insecurity and decreased motivation among staff.

5.6. Framework for developing and implementing AI in embassies

Despite the aforementioned challenges, the potential benefits of AI in embassies are significant. With adequate investment in time, resources, and training, AI can significantly streamline embassy processes, enhance services to citizens, and reduce costs. Therefore, by overcoming challenges and using AI responsibly, embassies can leverage this technology to provide more efficient and effective services to their citizens.

The following framework is proposed to address the challenges of implementing AI in embassies and ensure its responsible use:

- **The design and implementation of an AI strategy:**
  - Define goals and objectives: Embassies should define a clear AI strategy with specific goals and objectives.
  - Attention to values: The strategy should align with the embassy's overall mission and values.
  - Attention to successful experiences: The strategy should also leverage successful experiences, standards, and domestic and international Strategic documents.
  - Involvement of all stakeholders: all Key stakeholders, including staff and government partners, should participate in the strategy development process.
  - Identify specific embassy needs: The strategy should pinpoint the exact requirements of the embassy and select AI applications that best address these needs.
  - Prioritize AI projects: The strategy should prioritize AI projects based on their importance and impact on embassy operations.

- **Risk and Benefit Assessment:**
  - Establish a specialized team: Before implementing any AI system, a specialized team should be formed to manage and develop AI systems.
  - Evaluate risks and benefits: Embassies must carefully assess the potential risks and benefits of using AI, including the potential impact on privacy, security, equity, and other ethical issues.
  - Mitigate risks: Appropriate methods should be employed to mitigate identified risks.

- **Selecting and Implementing Appropriate Technologies:**
  - Consult AI experts: Seek advice from AI experts during the selection and implementation phase.

- Provide necessary hardware: Procure suitable hardware such as powerful servers and high-speed networks to run AI systems.
- Select appropriate software: Choose specialized AI software that aligns with the specific needs and requirements of the embassy.
- Ensure reliability, security, and transparency: The technology used should be reliable, secure, and have a transparent system.
- Ensure fairness: Ensure that AI algorithms are fair and unbiased.
- Source from reputable providers: AI systems should be procured from reputable providers with a proven track record, whether domestic or international.

- Ensuring data quality and data security:

a) Data quality:

- Establish Clear Data Standards: Develop comprehensive data standards and guidelines to ensure consistency, accuracy, and completeness of information collected and stored.
- Regular Data Audits: Conduct periodic audits to identify and correct any inconsistencies, errors, or outdated data.
- Data Cleaning and Enrichment: Implement processes for data cleaning and enrichment to improve data quality and enhance its value for analysis.
- Data Governance Framework: Establish a robust data governance framework to oversee data management practices, including data ownership, access controls, and usage guidelines.

b) Data Security:

- Robust Access Controls: Implement strong access controls to limit access to sensitive data to authorized personnel only. Use role-based access control (RBAC) to ensure that individuals have only the necessary permissions.
- Data Encryption: Encrypt data both at rest and in transit to protect it from unauthorized access.
- Regular Security Assessments: Conduct regular security assessments and vulnerability scans to identify and address potential security risks.
- Incident Response Plan: Develop a comprehensive incident response plan to effectively respond to data breaches or security incidents.
- Employee Training: Provide regular security awareness training to all employees to educate them about best practices for data protection.
- Physical Security: Implement physical security measures to protect data centers and other facilities where sensitive data is stored.
- Regular Software Updates: Keep all software and systems up-to-date with the latest security patches to mitigate vulnerabilities.
- Classified Data Handling: Implement strict protocols for handling classified information, including encryption; secure

storage, and access controls.
- Collaboration with Home Country IT: Collaborate closely with the home country's IT department to ensure alignment with national security standards and best practices.

- Privacy and Security protection:
- Encrypt sensitive data to prevent unauthorized access.
- Utilize intrusion detection systems to identify and counter cyber attacks.
- Continuously update security systems to address emerging threats.
- Implement appropriate safeguards to protect AI-related data from unauthorized access, disclosure, and misuse.
- Ensure compliance with all relevant data privacy laws and regulations.

- Promoting transparency and accountability:
- Embassies should be transparent about how they use AI.
- Provide explanations about how AI systems function, the data used, and the decisions made.
- Establish processes for addressing and responding to concerns.

- Empowering employees:
- Train embassy staff to effectively use AI systems. This training should include understanding how AI works, its benefits and risks, and relevant ethical considerations.
- Encourage employees to study and research AI and its latest advancements.

- Continuous monitoring and evaluation:
- Embassies should continuously monitor and evaluate the performance of AI systems. This includes ensuring that systems operate as planned, achieve desired results, and minimize risks.
- Make necessary changes and improvements to the technology based on evaluation findings.

By adhering to this framework, embassies can utilize AI to improve citizen services, enhance operational efficiency and effectiveness, and foster positive developments in relations between their home country and the host country.

Table 3. AI in embassies

Artificial intelligence embassy requirements	• Continuous monitoring and evaluation
	• Empowering employees
	• Transparency and accountability
	• Protection of privacy and security
	• Data quality assurance
	• Choosing appropriate technology
	• Assessing risks and benefits
	• Defining an AI strategy

Source: research achievements

6. Conclusion

AI is transforming the operating environment of diplomatic activities. Algorithms and AI-powered chat bots are gradually finding their way into the diplomatic profession, facilitating a more accurate understanding of international conditions, the discovery of solutions to develop relations with governments, and influencing nations. Furthermore, the social environments in which embassies operate, along with the expectations and demands of citizens, have evolved due to their encounters with and utilization of AI. Under these circumstances, traditional embassies will no longer maintain their past efficiency and effectiveness. The success of ambassadors' missions will hinge on their understanding of these environmental changes and their transition towards a new generation of embassies.

AI embassies represent an innovation in diplomacy and foreign policy, offering a novel approach to international interactions through the capabilities of AI. Equipped with the ability to process vast amounts of data in a short time, analyze and predict events and trends, and facilitate multilingual communication, these embassies can play a significant role in improving and developing relations between countries.

Increasing the speed and quality of consular services, facilitating communication with citizens, achieving a comprehensive and accurate understanding of developments in the host country, and benefiting from practical AI recommendations to enhance prestige, credibility, and influence among the people and develop relations with the host government are among the advantages of AI embassies. Additionally, the application of this technology in embassies can significantly assist ambassadors and embassy experts in identifying new threats and opportunities in bilateral relations. While AI embassies have not yet become widespread or replaced traditional embassies, the trend towards realizing this new generation of embassies will soon become a key priority for foreign policy institutions and ambassadors.

Of course, AI embassies face challenges such as security issues, privacy concerns, over-reliance on technology, and the need for skilled human resources to manage and develop these systems. However, the rapid growth and penetration of AI in various fields, including diplomacy, and the benefits of using this technology in embassies are so significant that ambassadors are likely to pursue the implementation of this project.

AI embassies can serve as a bridge between governments and citizens and play a role in creating a safer and more connected world. However, to address the challenges of implementing AI in embassies and to ensure its responsible use, prerequisites and requirements are essential. Each embassy must develop its own internal strategy and a precise operational framework in this area. This research elaborates on the specifics and implementation details of such a framework.

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The author declared no conflicts of interest.

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References

Banafa, A. (2024). "The Rise of AI in Diplomacy and International Relations". https://www.linkedin.com. (Accessed on 18 Dec 2024)

Bano, M.; Chaudhri, Z. & Zowghi, D. (2023). "The role of generative AI in global diplomatic practices: A strategic framework". https://www.researchgate.net/publication/376618773. https://doi.org/10.13140/RG.2.2.20426.34249.

Bengtsson, S. (2011). Virtual Nation branding: The Swedish embassy in second life). *Journal of Virtual Worlds Research.* 4(2): https://doi.org/10.4101/jvwr.v4i2.2111,pp: 114-128.

Bjola, C. (2020). "Diplomacy in the Age of AI". Emirates Diplomatic Academy. https://www.geopolitic.ro/wp-content/uploads/2020/05/EDAWorkingPaper_ArtificialIntelligence_ENcopy.pdf. (Accessed on 10 July 2024)

Dehghani Firuzabadi, S.J. & Chehrazad, S. (2023). *AI and International Relations*. Mizan Press: Tehran, Iran. [in Persian]

Engtoft Meldgaard, A.M. & Fletcher, T. (2024). "Digital diplomatic representation: The rise of tech ambassadors". In C. Bjola & I. Manor (Eds.). *The Oxford Handbook of Digital Diplomacy.* Oxford University Press. https://doi.org/10.1093/oxfordhb/9780192859198.001.0001.

Gavrilovic, A. (2018). "Algorithmic diplomacy: Better geopolitical analysis? Concerns about human rights?". *DiploFoundation.* https://www.diplomacy.edu/event/webdebate-algorithmic-diplomacy-better-geopolitical-analysis-concerns-about-human-rights/. (Accessed on 10 July 2024)

Geels, F.W. (2010). "Ontology, socio-technical transitions (to sustainability), and the multi-level perspective". *Research Policy.* 39(4): 495-510. https://doi.org/10.1016/j.respol.2009.11.010.

Grech, O. (2006). *Virtual Diplomacy: Diplomacy of the Digital Age*. Master's Thesis, University of Malta. https://www.diplomacy.edu/wp-content/uploads/2021/06/23082010104529-Grech-Library.pdf. (Accessed on 1 Aug 2024)

Goodfellow, I.; Bengio, Y. & Courville, A. (2016). *Deep learning*. MIT Press: Massachusetts, United States.

Hafiznia, M.R. (2023). *An Introduction to Research Methods in the Humanities*.

Tehran: Samt Press. [in Persian]

Hale, T.M. & Katz, J.R. (2016). *Digital diplomacy: Power, Politics, and the Reinvention of Foreign Relations*. Oxford University Press.

Horowitz, M.C. (2018). "AI, international competition, and the balance of power". *Texas National Security Review*. 1(3): 36–57. https://doi.org/10.15781/T2639KP49.

Horowitz, M.C.; Scharre, P.; Allen, G.C.; Frederick, K.; Cho, A. & Saravalle, E. (2018). "AI and international security. Center for a New American Security". https://www.cnas.org/publications/reports/artificial-intelligence-and-international-security. (Accessed on 12 Aug 2024)

Hunt, A. (2023). "The use of AI in public diplomacy: ACPD official meeting". U.S. Department of State. https://www.state.gov/acpd-official-meeting-minutes-june-14-2023. (Accessed on 6 Aug 2024)

Klavins, D. (2018). "The transformation of diplomatic practice". In *The Centenary of Latvia's Foreign Affairs: Scenarios for the Future*. Latvian Institute of International Affairs: Riga, Republic of Latvia.

Kissinger, H.A.; Schmidt, E. & Huttenlocher, D. (2021). *The Age of AI: And Our Human Future*. Little, Brown and Company: Massachusetts, United States.

Lee, K.F. (2018). *AI Superpowers: China, the United States, and the Fate of the World*. Harper Business: New York, United States.

Magdin, R. (2019). "The great game, Through an AI lens". Oct. 8. https://www.usnews.com/news/best-countries/articles/2019-10-08. (Accessed on 6 Aug 2024)

Manor, I. (2018). *The Digitalization of Diplomacy: Toward Clarification of a Fractured Terminology*. Working Paper No. 2, Oxford Digital Diplomacy Research Group. http://www.qeh.ox.ac.uk/sites/www.odid.ox.ac.uk/files/DigDiploROxWP2.pdf. (Accessed on Aug 9, 2024)

Molaee, A. & Kafi, M. (2023). *AI Diplomacy: Challenges and Strategies for the Islamic Republic of Iran*. Office of Political and International Studies: Tehran, Iran. [in Persian]

Naeimabadi, S.; Bazrafkan, K. & Sarami, A.A. (2015). "The digital age and virtual embassies: A case study: Virtual embassies of Sweden and the Maldives". *International Conference on Architecture, Urban Planning, Civil Engineering, Art, and Environment*. https://sid.ir/paper/827896/fa. (Accessed on Aug 5, 2024)

Raven, R.; Schot, J. & Berkhout, F. (2012). "Space and scale in socio-technical transitions". *Environmental Innovation and Societal Transitions*. 4(1): 63–78. https://doi.org/10.1016/j.eist.2011.06.004.

Rice, N.F. (2019). "Estonia's digital embassies and the concept of sovereignty". *Georgetown Security Studies Review*. https://georgetownsecuritystudiesreview.org. (Accessed on Aug 9, 2024)

Roumate, F. (2021). *AI and Digital Diplomacy*. Springer Cham: Rabat (Morocco).

Russell, S.J. & Norvig, P. (2003). *AI: A modern approach*. Prentice Hall: *New Jersey.* 2nd ed.

Salehi, P.; Ba, Y.; Nayoung, K.; Mosallanezhad, A.; Pan, A.; Cohen, M.C.; Wang, Y.; Zhao, J.; Bhatti, Sh.; Sung, J.; Blasch, E.; Mancenido, M.V. & Chiou, E.K. (2024). "Towards trustworthy AI-enabled decision support systems: Validation of the Multisource AI Scorecard Table (MAST)". *Journal of AI Research*. 80: 1311–1341. https://doi.org/10.48550/arXiv.2311.18040.

Scott, B.; Heumann, S. & Lorenz, Ph. (2018). "Artificial Intelligence and Foreign Policy, Stiftung Neue Verantwortung Policy Brief". *SSRN*. https://www.interface-eu.org/storage/archive/files/ai_foreign_policy.pdf. (Accessed on Aug 2, 2024)

Šucha, V. & Gammel, J. (2021). *Humans and Societies in the Age of Artificial Intelligence*. Luxembourg: Publications Office of the European Union.

TamunoMiegbam, A. & Bariledum, K. (2022). "AI and diplomacy in the 21st century:

The African perspective". *Central Asian Studies.* 3(10): 1234-1245. https://doi.org/2660-5317.

Unver, A. (2017). "Computational diplomacy: Foreign policy communication in the age of algorithms and automation". *The Centre for Economics and Foreign Policy Studies (EDAM)*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3331640. (Accessed on August 12, 2024)

Vacarelu, M. (2021). "AI: To strengthen or to replace traditional diplomacy?". In F. Roumate (Ed.). *AI and digital diplomacy*. Springer: Berlin, Germany.

Varian, H.R. (2019). "AI, economics, industrial organization". In A. Agrawal, J. Gans, & A. Goldfarb (Eds.). *The economics of AI: An agenda*. University of Chicago Press: Chicago.

Williams, R. & Otto, L. (2022). "AI as a tool of public diplomacy: Communication between the United States and Iran". *Thinker.* 90(1): 101–112. https://doi.org/10.36615/thethinker.v90i1.1171.

Zhai, C.; Wibowo, S. & Li, L.D. (2024). "The effects of over-reliance on AI dialogue systems on students' cognitive abilities: A systematic review". *Smart Learning Environments.* 11(28): 38-53. https://doi.org/10.1007/s40561-024-00148-9.