As a Public Diplomacy Component Technology Management Policy and Technology Transfer Offices of Turkey

Süleyman Turgut

Technology Transfer Office, OSTİM Technical University, Ankara, Türkiye, ORCID: 0000-0003-1466-402X

Abstract

This study examines the intersection of Turkey's National Technology Management Policy and its public diplomacy initiatives, highlighting the critical role of technological advancement in shaping the country's international influence and soft power. Public diplomacy, defined as a multifaceted instrument for managing relationships and influencing foreign public opinion, has evolved to encompass various strategies aimed at promoting national interests and values. The integration of Science, Technology, and Innovation (STI) policies within Turkey's national development framework is essential for enhancing its technological capabilities and competitiveness on the global stage. The establishment of Technology Transfer Offices (TTOs) in Turkish universities serves as a pivotal mechanism for facilitating the transfer of knowledge and technology between academia and industry, thereby stimulating innovation and economic growth. This relationship underscores the broader impact of TTOs on Turkey's innovation ecosystem and their contribution to public diplomacy by showcasing the nation's advancements in technology. Furthermore, Turkey's centralized approach to policy formulation and its strategic response to global challenges, such as the COVID-19 pandemic, illustrate the effective coordination of technology management and public diplomacy efforts. Overall, this analysis emphasizes that Turkey's commitment to integrating technology management policies within its public diplomacy framework is a vital strategy for enhancing its international reputation and influence. By leveraging its technological advancements, Turkey can effectively promote its values and foster collaboration with other nations, thereby solidifying its position as a key player in the global arena.

1. Introduction

Public diplomacy has emerged as a critical instrument for states seeking to enhance their international standing and influence through the strategic management of cultural and political communication. Defined as a multifaceted approach to understanding and influencing foreign public opinion, public diplomacy encompasses a range of activities aimed at advancing national interests and values on the global stage. It serves as a vital component of soft power, enabling countries to cultivate relationships, shape perceptions, and mobilize actions that align with their foreign policy objectives. The evolution of public diplomacy reflects the increasing importance of cultural engagement and strategic communication in international relations, highlighting its role in fostering mutual understanding and cooperation among nations. In the context of Turkey, the National Technology Management Policy plays a significant role in shaping the

country's public diplomacy efforts. This policy framework is designed to promote the production, diffusion, and application of scientific and technological knowledge, aligning with national goals and enhancing Turkey's technological capabilities. The integration of Science, Technology, and Innovation (STI) policies within national development planning not only fosters innovation but also contributes to Turkey's international reputation, particularly in sectors such as healthcare and technology. For instance, the adoption of electronic health records in Turkish hospitals has been highlighted as a technological advancement that enhances Turkey's public diplomacy by showcasing its achievements in healthcare technology. Moreover, the establishment of Technology Transfer Offices (TTOs) in Turkish universities underscores the strategic importance of technology transfer initiatives in stimulating innovation and economic development. TTOs facilitate the transfer of knowledge and technologies between academia and industry, thereby contributing to the country's competitiveness and technological advancement. This relationship between technology management and public diplomacy is crucial, as it enables Turkey to leverage its technological capabilities to enhance its international image and influence. By effectively managing its technological resources and promoting its innovations, Turkey can strengthen its public diplomacy efforts and position itself as a key player in the global arena. In summary, public diplomacy serves as a vital tool for states like Turkey to advance their interests and values internationally. The interplay between technology management policies and public diplomacy initiatives highlights the importance of fostering innovation and showcasing technological achievements as a means of enhancing a country's global standing. As nations navigate the complexities of international relations, the strategic integration of technology and public diplomacy will continue to play a pivotal role in shaping their influence and reputation on the world stage.

2. Public Diplomacy & National Technology Management Policy

Public diplomacy is a multifaceted instrument used by states, associations of states, and various actors to understand cultures, attitudes, and behavior, manage relationships, and influence opinions and actions to advance their interests and values (White, 2015). It involves the management of international political communication in accordance with the interests of foreign action and policy (Manfredi-Sánchez, 2022). Public diplomacy is also considered as one of the most important elements of soft power that states use to promote their values and ideas (Namuq & Al-BAYATI, 2021). It encompasses activities undertaken by a national government to inform and influence foreign public opinion and attitudes in order to advance its foreign policy goals (Mazumdar, 2020). The concept of public diplomacy has evolved over time. Initially, it was defined as the cultivation of foreign public opinion by governments (Pavón-Guinea, 2023). However, it

has now come to mean an instrument used to build and manage relationships, understand cultures, influence thoughts, and mobilize actions to advance interests and values (Doncel-Martín et al., 2022). This evolution reflects the changing nature of international relations and the increasing importance of soft power and cultural diplomacy in shaping foreign policy. Public diplomacy is closely related to the concept of soft power, which emphasizes the ability to persuade and create reputation, as well as cultural and institutional attractiveness. It involves the use of various tools, including corporate social responsibility, digital diplomacy, and cultural exchange programs, to enhance a country's international standing and influence. Furthermore, public diplomacy is no longer a separate instrument of diplomacy but is deeply intertwined with other dimensions of international relations, such as cultural diplomacy and soft power. In practice, public diplomacy takes various forms, such as educational policies, cultural exchange programs, and diplomatic gifts, all aimed at fostering goodwill and enhancing a country's image abroad. It also involves engaging with foreign societies and governments to build mutual understanding and trust, thereby contributing to the overall objectives of foreign policy. In conclusion, public diplomacy is a dynamic and essential component of contemporary international relations, encompassing a wide range of activities aimed at influencing foreign public opinion, building relationships, and advancing a country's interests and values on the global stage.

The National Technology Management Policy refers to the public policies implemented by governments to promote the production, diffusion, and application of scientific and technological knowledge to achieve national goals (Jia et al., 2020). It encompasses a set of decisions taken by a government, through appropriate laws and regulations, to orient the harmonious development of information transfer activities to satisfy the information needs of a country (Alemna, 1999). Additionally, the integration of Science, Technology, and Innovation (STI) policy within the overall framework of national development planning is crucial for the advancement of a country's technological capabilities (Oladeji & Adegboye, 2019). These policies are designed to foster innovation, research, and development within a country, aiming to enhance its technological capabilities and competitiveness on the global stage. They also play a significant role in shaping the direction of technological progress and its integration into the broader national development agenda. In conclusion, the National Technology Management Policy is a strategic framework that guides a country's approach to science, technology, and innovation, with the aim of achieving national development goals and enhancing its technological capacity.

The relationship between Technology Management Policy and Public Diplomacy is multifaceted and interconnected. Technology Management Policy, which encompasses the public policies implemented by governments to promote the production, diffusion, and application of scientific and

technological knowledge to achieve national goals, plays a crucial role in shaping a country's international image and influence. Public diplomacy, on the other hand, involves the management of international political communication to advance a country's interests and values. The relationship between these two concepts can be understood through the lens of strategic communication, soft power, and international relations. Public diplomacy is based on a complex relationship between the government, the media, and public opinion Gilboa (2008). It involves efforts to establish and maintain mutually beneficial relationships with strategic publics that can affect the national interest (Steane et al., 2022). In this context, Technology Management Policy can significantly influence a country's public diplomacy efforts by shaping its technological capabilities and innovation landscape. The integration of Science, Technology, and Innovation (STI) policy within the overall framework of national development planning is crucial for the advancement of a country's technological capabilities. This technological advancement can enhance a country's international standing and attractiveness, thereby contributing to its public diplomacy objectives.

Furthermore, public diplomacy is closely related to the concept of soft power, which emphasizes the ability to persuade and create reputation, as well as cultural and institutional attractiveness. Technology Management Policy can contribute to a country's soft power by fostering innovation, research, and development, which in turn enhances its international reputation and influence. The use of various tools, including digital diplomacy and cultural exchange programs, to enhance a country's international standing and influence is also part of public diplomacy. Technology, especially digital technology, plays a crucial role in modern public diplomacy efforts, and a country's technological capabilities, driven by its Technology Management Policy, can significantly impact its digital diplomacy initiatives (Zamanli, 2022). Moreover, public diplomacy is considered as one of the most important elements of soft power that states use to promote their values and ideas. In this context, a country's technological advancements, driven by its Technology Management Policy, can serve as a demonstration of its values and ideas, thereby contributing to its public diplomacy objectives. The promotion of a country's technological achievements through public diplomacy initiatives can enhance its global image and influence. In conclusion, the relationship between Technology Management Policy and Public Diplomacy is characterized by the influence of technological capabilities on a country's international image, soft power, and strategic communication efforts. A country's technological advancements, driven by its Technology Management Policy, can significantly contribute to its public diplomacy objectives by enhancing its international standing, attractiveness, and influence.

3. Technology Management Policy as a Public Diplomacy component

The evaluation of Technology Management Policy as a component of Public Diplomacy is a complex and multifaceted endeavor. The relationship between these two concepts is crucial in shaping a country's international image, influence, and soft power. The integration of Science, Technology, and Innovation (STI) policy within the overall framework of national development planning is crucial for the advancement of a country's technological capabilities (Oladeji & Adegboye, 2019). This technological advancement can enhance a country's international standing and attractiveness, thereby contributing to its public diplomacy objectives ("China's Digital Public Diplomacy during the 2022 Beijing Winter Olympics", 2022). Furthermore, the digital aspect of public diplomacy is increasingly important in the modern era. China's Digital Public Diplomacy during the 2022 Beijing Winter Olympics highlights the significance of digital diplomacy in shaping the national image and enhancing its soft power ("China's Digital Public Diplomacy during the 2022 Beijing Winter Olympics", 2022). Similarly, Russia's Foreign Policy and Public Diplomacy emphasize the role of public diplomacy in creating a positive reputation and brand for the country, thereby increasing its soft power potential (Simons, 2020). These examples underscore the importance of technology management policies in leveraging digital tools for public diplomacy initiatives. Moreover, the Science and Technology Policy for Nigeria's Development Planning emphasizes the interrelations between STI and national development, highlighting the role of technology management policies in driving sustainable development and economic growth (Oladeji & Adegboye, 2019). This underscores the potential of technology management policies to contribute to a country's public diplomacy by showcasing its advancements in science and technology as a means of enhancing its international reputation and influence. Additionally, Public Diplomacy in Strengthening India: Vietnam Relations emphasizes the role of public diplomacy in maintaining the stability and development of bilateral relations, highlighting the importance of strategic communication and relationship-building in international affairs (Nga & Quang, 2021). In this context, technology management policies can play a significant role in enhancing a country's public diplomacy efforts by showcasing its technological achievements and fostering collaboration with other nations. In conclusion, the evaluation of Technology Management Policy as a component of Public Diplomacy underscores the interconnectedness of these concepts in shaping a country's international image, influence, and soft power. The integration of technology management policies within public diplomacy initiatives can significantly contribute to a country's efforts to advance its interests, values, and international standing. These references provide insights into the role of technology management policies in shaping a country's international image, influence, and soft power, thereby highlighting their significance as a component of public diplomacy.

4. Turkey's National Technology Management Policy

The National Technology Management Policy of Turkey plays a significant role in shaping the country's international image, influence, and soft power. Turkey has a president-directed national policy network, which underscores the centralized approach to policy formulation and implementation Bakır (2020). This centralized approach is crucial in aligning technology management policies with the country's strategic objectives, including those related to public diplomacy. The adoption rates of electronic health records in Turkish hospitals and their relation to hospital sizes highlight the role of technology in the healthcare sector. The results of such initiatives are used by the Turkish Ministry of Health to disseminate the nationwide benefits of electronic health record functions, showcasing Turkey's technological advancements in the healthcare domain (Kose et al, 2020). This not only contributes to the country's public diplomacy efforts by highlighting its achievements in healthcare technology but also enhances its international reputation in the healthcare sector. Furthermore, Turkey's response to the COVID-19 pandemic, characterized by a centralized approach involving the President, the Ministry of Interior, the Ministry of Health, and the SAB as central players, demonstrates the country's ability to leverage technology and policy coordination in managing a global crisis (Oztig, 2022). This response reflects Turkey's technological capabilities and crisis management strategies, which can significantly influence its international standing and public diplomacy efforts. In addition, the establishment of the Turkish Space Agency and the appointment of the Scientific and Technological Research Council of Turkey (TÜBİTAK) as the main organization responsible for coordinating space-based activities underscore Turkey's advancements in space technology and it's potential impact on the country's international image and influence (Ercan & Kale, 2017). The evaluation of Technology Management Policy as a component of Turkey's public diplomacy highlights the interconnectedness of technology, policy, and international relations. Turkey's technological advancements, crisis management strategies, and space exploration initiatives contribute to its public diplomacy objectives by showcasing its achievements, capabilities, and contributions to global challenges. These initiatives not only enhance Turkey's international reputation but also position the country as a significant player in the global technological landscape. The role of Technology Transfer Offices (TTOs) within Turkey's National Technology Management Policy is significant in fostering innovation, knowledge exchange, and economic development. TTOs play a crucial role in facilitating the transfer of technologies and knowledge between universities, research institutions, and industry, thereby contributing to the country's technological advancement and competitiveness. The evolving state-of-the-art in technology transfer research emphasizes the contingent effectiveness of TTOs, where their role in developing and transferring technology is recognized by policy superiors, leading to increased funding or other resources Bozeman et al. (2015). This underscores the importance of acknowledging the impact of TTOs within the policy framework and their contribution to national socio-economic development. Empirical evidence from Turkish export companies highlights the impact of technology transfer on innovation and firm performance, emphasizing the role of TTOs in organizing activities to increase technological development (Çinar et al. 2020). This demonstrates the pivotal role of TTOs in driving technological advancement and fostering a culture of innovation within the Turkish business landscape. Furthermore, the drivers of patent performance of University Science Parks in Turkey include TTOs, emphasizing their significance in promoting intellectual property rights and technology commercialization (Ünlü et al, 2022). TTOs serve as intermediaries between science, policy, industry, and the public, becoming indispensable in the technology transfer process (Sinell et al, 2018). The critical analysis of building technology transfer capacity in Turkish universities underscores the significant government funding received by university technology transfer since 2012, highlighting the strategic importance of TTOs in leveraging resources for technology transfer initiatives (Ranga et al, 2016). The role of TTOs in facilitating the successful transfer of technologies and knowledge between universities and industry is emphasized, indicating their potential to play al significant role in stimulating innovation and economic development (Fai et al, 2018). This underscores the broader impact of TTOs on the country's innovation ecosystem and economic growth. In conclusion, TTOs play a pivotal role within Turkey's National Technology Management Policy by serving as key facilitators in technology transfer, innovation, and knowledge exchange. Their impact extends to fostering economic development, promoting intellectual property rights, and driving technological advancement, thereby contributing to Turkey's competitiveness and growth in the global technological landscape.

5. Research Methodology

The research methods employed in the study of Turkey's public diplomacy and technology management policies primarily involve qualitative analysis, which includes a comprehensive review of existing literature, policy documents, and case studies. This approach allows for an in-depth understanding of the interrelations between technology management, public diplomacy, and their implications for Turkey's international relations. The qualitative nature of the research enables the exploration of complex relationships and the contextual factors influencing the effectiveness of Technology Transfer Offices (TTOs) and technology policies in Turkey. Data sources for this research include government reports, academic publications, and case studies that detail the operations and impacts of TTOs within Turkish universities and industries. These sources provide empirical evidence of the role TTOs play in facilitating technology transfer and innovation, as well as insights into the broader implications of

technology management policies on public diplomacy. Additionally, international examples of public diplomacy efforts, such as China's digital diplomacy during the 2022 Winter Olympics, are referenced to draw parallels and highlight best practices that Turkey could adopt. The evaluation and analysis of the data will be conducted through thematic analysis, focusing on identifying patterns and themes related to the effectiveness of TTOs and the impact of technology management policies on public diplomacy. This method allows for the synthesis of findings across different contexts and the extraction of actionable insights that can inform policy recommendations. Furthermore, the analysis will consider the strategic communication aspects of public diplomacy, examining how technology management can enhance Turkey's soft power and international standing. By integrating these various elements, the research aims to provide a comprehensive understanding of how Turkey can leverage its technological advancements to strengthen its public diplomacy efforts and international relations. In summary, the research employs qualitative methods, utilizes diverse data sources, and applies thematic analysis to evaluate the interplay between technology management policies and public diplomacy in Turkey.

6. Empirical Data / Case Studies on Turkey's National Technology Management Policy and TTOs in Public Diplomacy

Turkey's National Technology Management Policy has significantly influenced its public diplomacy by enhancing the country's soft power and shaping its international image. This policy emphasizes technological innovation and development as key components of Turkey's foreign relations strategy, thereby allowing the nation to project a modern, progressive image on the global stage. The integration of technology into public diplomacy efforts has enabled Turkey to engage more effectively with foreign audiences, particularly through digital platforms. One of the primary ways in which Turkey's National Technology Management Policy has impacted public diplomacy is through the promotion of a "Turkish model" of governance and humanitarian response, particularly in the context of the Syrian refugee crisis. Çevik and Sevin argue that Turkey has framed its response to this crisis as a demonstration of its benevolence and efficiency compared to the international community, thus enhancing its soft power and public image (Çevik & Sevin, 2017). This framing not only serves to bolster Turkey's reputation but also positions it as a leader in humanitarian efforts, which is a crucial aspect of effective public diplomacy. Moreover, the emphasis on technology and innovation in Turkey's public diplomacy aligns with broader trends observed in global diplomacy, where countries are increasingly leveraging digital tools to engage with international audiences. The rise of digital diplomacy, as discussed by Kalachishvili, highlights how technological advancements have transformed diplomatic practices, allowing states to communicate more directly and effectively with foreign publics (Kalachıshvili, 2023). This

shift is particularly relevant for Turkey, which has utilized social media and other digital platforms to disseminate its narratives and engage with diverse audiences, thereby enhancing its diplomatic outreach. Additionally, Turkey's focus on education and cultural diplomacy, as noted by Donelli, has been instrumental in fostering positive perceptions of the country abroad. By promoting its cultural heritage and educational initiatives, Turkey has sought to build stronger ties with other nations, which is a critical element of its public diplomacy strategy (Donelli, 2019). This approach not only helps to mitigate the negative impacts of domestic political challenges but also reinforces Turkey's image as a culturally rich and welcoming nation. Furthermore, the integration of technology into public diplomacy efforts has facilitated more interactive and participatory forms of engagement. As highlighted by Huang, the historical-discursive analytical method can be applied to understand how Turkey's public diplomacy institutions have evolved to incorporate modern communication strategies that resonate with global audiences (Huang, 2021). This evolution reflects a broader trend in which states are adapting their diplomatic practices to leverage technological advancements, thereby enhancing their effectiveness in the international arena. In conclusion, Turkey's National Technology Management Policy has profoundly impacted its public diplomacy by fostering a narrative of innovation and benevolence, enhancing its soft power, and facilitating more effective engagement with global audiences through digital platforms. This multifaceted approach not only strengthens Turkey's international image but also positions it as a key player in the evolving landscape of global diplomacy.

International technology transfer initiatives have played a crucial role in shaping international relations by fostering economic development, enhancing industrial capabilities, and facilitating cooperation among nations. These initiatives are particularly significant in the context of developing countries, where technology transfer can bridge gaps in technical knowledge and infrastructure, thereby influencing diplomatic ties and economic partnerships. One notable example of technology transfer influencing international relations is China's approach to industrial restructuring through international technology transfer. Shuyuan and Ma highlight that under China's "New Normal" economic policy, international technology transfer has been pivotal in driving the transformation and upgrading of its industrial structure. This process has not only facilitated the modernization of China's industries but has also positioned the country as a significant player in global supply chains, thereby enhancing its diplomatic leverage and economic partnerships with other nations (Shuyuan & Ma, 2016). The authors argue that the successful integration of foreign technologies has led to improved productivity and competitiveness, which in turn strengthens China's position in international negotiations and collaborations. Similarly, the Regional Comprehensive Economic Partnership (RCEP) has established provisions related to technology transfer that significantly impact

international scientific and technological cooperation among member states. Sun's empirical study indicates that these provisions, which include aspects like absorptive capacity and international personnel mobility, have fostered closer ties between developing economies within the RCEP framework. This cooperative environment not only enhances technological capabilities but also promotes diplomatic relations among member countries, as they work collaboratively to address common challenges and leverage shared technological advancements (Sun, 2024). The findings underscore the importance of structured technology transfer agreements in facilitating international cooperation and enhancing diplomatic relations. Moreover, the construction sector in developing nations has also seen significant impacts from international technology transfer initiatives. Waroonkun and Stewart discuss how many developing countries have engaged in technology transfer to improve their infrastructure capabilities. However, they note that despite these efforts, there is often a sustained reliance on foreign firms due to the challenges in fully assimilating and utilizing the transferred technologies (Waroonkun & Stewart, 2007). This dynamic can lead to complex diplomatic relationships, as countries navigate the balance between dependence on foreign expertise and the desire for self-sufficiency in technology and infrastructure development. In addition, the role of technology transfer in enhancing productivity and innovation is evident in the context of Taiwan's industrial growth. Branstetter and Chen's analysis reveals that technology transfer, combined with research and development (R&D) efforts, has significantly contributed to productivity growth in Taiwanese industries. This synergy between technology transfer and local innovation capabilities has allowed Taiwan to strengthen its economic position and diplomatic relations, particularly with countries seeking to engage in trade and investment partnerships (Branstetter & Chen, 2006). In conclusion, technology transfer initiatives have profound implications for international relations by enhancing economic capabilities, fostering cooperation, and shaping diplomatic ties. Countries that effectively leverage technology transfer not only improve their industrial competitiveness but also enhance their standing in the global arena, facilitating stronger diplomatic relationships and collaborative efforts.

Technology transfer initiatives have yielded measurable outcomes across economic, technological, and diplomatic dimensions, significantly influencing international relations. These outcomes can be observed through various case studies and analyses that highlight the impact of technology transfer on development, productivity, and international cooperation. Economically, technology transfer has been shown to enhance productivity and foster economic growth, particularly in developing countries. For instance, the study by Zhong indicates that foreign technology transfer positively impacts firm productivity, especially in regions with varying levels of economic development (Zhong, 2022). This relationship underscores the importance of technology transfer as a catalyst for economic advancement, which can lead to improved trade

relations and investment opportunities between nations. Furthermore, the research by Chhetri emphasizes the role of foreign direct investment (FDI) as a significant driver of economic growth in developing countries, highlighting how FDI facilitates technology transfer and enhances local capabilities (Chhetri, 2022). This economic interdependence often translates into stronger diplomatic ties, as countries seek to maintain favorable conditions for investment and technology exchange. Technologically, the outcomes of technology transfer initiatives are evident in the advancements in local innovation systems and capabilities. The work of Yiblet discusses how partnerships within the BRICS framework have led to enhanced technological collaboration, particularly in African countries (Yiblet, 2024). Such collaborations not only improve technological capacities but also foster a sense of shared purpose and mutual benefit among participating nations, thereby strengthening diplomatic relations. Additionally, the systematic literature review by Zanello et al. Reveals that technology transfer contributes to the creation and diffusion of innovations in developing countries, which is crucial for building sustainable economic systems and enhancing global competitiveness (Zanello et al, 2015). This diffusion of technology can lead to the emergence of new industries and sectors, further solidifying the technological foundation of international partnerships. Diplomatically, technology transfer initiatives often serve as tools for fostering cooperation and building alliances. The Belt and Road Initiative (BRI) exemplifies this, as it emphasizes technology transfer as a core component of its strategy to enhance economic development and connectivity among participating countries (Raslan, 2024). The BRI not only facilitates infrastructure development but also promotes knowledge sharing and capacity building, which can lead to stronger diplomatic relationships. Moreover, the findings of Cunningham et al. Highlight how university-focused technology transfer policies can stimulate regional innovation and entrepreneurship, thereby enhancing the diplomatic standing of countries that invest in education and research (Cunningham et al, 2019). By positioning themselves as leaders in technology transfer, nations can enhance their soft power and influence in international forums. In summary, technology transfer initiatives yield measurable outcomes that significantly impact economic growth, technological advancement, and diplomatic relations. These initiatives not only enhance local capabilities and foster innovation but also create opportunities for countries to collaborate and build stronger international partnerships.

7. Evaluation of Turkey's Centralized Approach to Policymaking

Turkey's centralized policy-making approach significantly shapes its Technology Management Policy by establishing a framework that emphasizes top-down decision-making, rapid implementation, and alignment with national strategic objectives. This approach is characterized by a concentration of authority within the executive branch, particularly under the

governance of the Justice and Development Party (AKP), which has reinforced authoritarian features in policy-making processes (Öztığ, 2022). The implications of this centralized approach are multifaceted, impacting the formulation, implementation, and effectiveness of technology management initiatives. One of the primary outcomes of Turkey's centralized policymaking is the swift execution of technology management strategies that align with national priorities. The AKP's governance model allows for decisive action in areas deemed critical for national development, such as defense technology and information and communication technologies. This is evident in initiatives like the National Technology Initiative, which aims to enhance domestic production capabilities and reduce dependency on foreign technologies. The centralized nature of decision-making facilitates the allocation of resources and prioritization of projects that support Turkey's strategic goals, particularly in sectors such as defense and aerospace (Elswah & Howard, 2021). Moreover, the centralized policy-making framework has implications for stakeholder engagement in technology management. Öztığ notes that the low level of inclusion in policy-making processes can lead to disconnect between government objectives and the needs of various stakeholders, including industry players and academia (Öztığ, 2022). This lack of inclusivity may hinder the effectiveness of technology transfer and innovation initiatives, as the perspectives and expertise of key actors are often overlooked. Consequently, while the centralized approach allows for rapid decision-making, it may also result in policies that are less responsive to the dynamic needs of the technology sector. In addition, Turkey's centralized approach influences its international technology management policies and diplomatic relations. The government often utilizes technology transfer agreements as tools for enhancing bilateral relations, particularly with countries in the Middle East and Africa. By positioning itself as a technology provider, Turkey seeks to strengthen its soft power and foster cooperative relationships through technology-sharing initiatives (Çevik, 2019). This strategy aligns with the broader goals of Turkey's foreign policy, which emphasizes the importance of economic partnerships and regional influence. Furthermore, the emphasis on a centralized policy framework has implications for the evaluation and accountability of technology management initiatives. As noted by Danziger and Schreiber, the Turkish Ministry of Foreign Affairs has adopted a digital diplomacy approach that reflects the centralized nature of its governance (Danziger & Schreiber, 2021). This approach not only serves to project Turkey's image abroad but also allows for greater control over the narrative surrounding its technology initiatives. However, the focus on centralized messaging can sometimes obscure the complexities and challenges faced in the implementation of technology management policies. In conclusion, Turkey's centralized policy-making approach significantly shapes its Technology Management Policy by facilitating rapid decision-making and resource allocation while also presenting challenges related to stakeholder engagement and responsiveness. This framework allows Turkey to pursue its

strategic objectives in technology management, enhancing its international standing and fostering diplomatic relationships, albeit with potential limitations in inclusivity and adaptability.

Turkey's centralized policy-making structure has produced several positive outcomes in terms of international relations and public diplomacy. This approach allows for swift decision-making, coherent strategic direction, and the ability to mobilize resources effectively, which can enhance Turkey's standing on the global stage. One significant positive outcome is the ability to implement foreign policy initiatives rapidly and decisively. The centralized governance model enables the Turkish government to respond quickly to international crises or opportunities, as seen in its involvement in the Syrian conflict. Zulham et al. discuss how Turkey's centralized defense management has allowed it to establish itself as a key player in regional security dynamics, fostering relationships with both NATO and Russia (Zulham et al., 2020). This agility in policymaking enhances Turkey's diplomatic leverage, allowing it to navigate complex geopolitical landscapes effectively. Additionally, Turkey's centralized approach has facilitated the establishment of strategic partnerships, particularly in the context of its relations with Azerbaijan. The historical and cultural ties between the two nations have been leveraged through a centralized foreign policy that emphasizes mutual interests in energy and security ("The Flourishing Economic and Political Relations of Turkey & Azerbaijan: An Overview after 30th Diplomatic Anniversary", 2023). This relationship not only strengthens Turkey's regional influence but also serves as a model for its diplomatic engagements with other countries in the Turkic world and beyond. Moreover, the centralized policy-making structure has allowed Turkey to pursue a clear narrative in its public diplomacy efforts. By controlling the messaging and strategic objectives, the government can project a cohesive image internationally. Gafarli notes that Turkey's pursuit of strategic autonomy has led to a more assertive foreign policy, which is crucial for enhancing its diplomatic relations with major powers (GAFARLI, 2023). This narrative control helps Turkey to position itself as a regional leader, capable of mediating conflicts and fostering cooperation among diverse actors. The centralized structure also enables Turkey to prioritize technology transfer and innovation as key components of its foreign policy. By focusing on high-technology exports and partnerships, Turkey aims to enhance its economic competitiveness while simultaneously strengthening diplomatic ties with countries that are willing to engage in technology sharing. This is particularly relevant in the context of Turkey's relationships with countries in Central Asia and the Middle East, where technology transfer initiatives can serve as a foundation for deeper economic and political collaboration. However, the specific implications of these initiatives require further exploration in the context of Turkey's broader foreign policy goals (Hovsepyan, 2023). Furthermore, Turkey's centralized approach has implications for its soft power strategy. By actively engaging in humanitarian efforts and development aid, Turkey has positioned itself as a benevolent actor in international

relations. This is particularly evident in its response to the Syrian refugee crisis, where the government has utilized its centralized decision-making capabilities to coordinate aid and support initiatives effectively (Zulham et al., 2020). Such actions enhance Turkey's image abroad and contribute to its public diplomacy efforts, fostering goodwill and strengthening bilateral relations. In conclusion, Turkey's centralized policy-making structure yields several positive outcomes in international relations and public diplomacy. The ability to implement policies swiftly, establish strategic partnerships, control narratives, prioritize technology transfer, and engage in humanitarian efforts enhances Turkey's diplomatic standing and fosters cooperative relationships with other nations.

While Turkey's centralized policy-making approach has yielded several positive outcomes in terms of international relations and public diplomacy, it also presents notable downsides that can hinder effective governance and public engagement. These downsides include reduced local autonomy, limited stakeholder participation, potential inefficiencies, and risks of authoritarianism, which can adversely affect both domestic and international perceptions of Turkey. One significant downside of a centralized approach is the erosion of local autonomy and the capacity of local governments to respond effectively to regional needs. Kuyucu highlights that the excessively centralized nature of public administration in Turkey can lead to institutional conflicts and increased transaction costs, as local governments struggle to coordinate with central authorities Kuyucu (2020). This disconnect can result in policies that are not well-suited to local contexts, ultimately undermining the effectiveness of initiatives aimed at fostering development and innovation. The lack of local input can also diminish the legitimacy of government actions, leading to public discontent and resistance. Moreover, the limited inclusion of civil society and other stakeholders in the decision-making process can stifle innovation and responsiveness. Öztığ points out that the hierarchical bureaucratic structure in Turkey often excludes key actors, such as professional associations and local experts, from meaningful participation in policy formulation (Öztığ, 2022). This exclusion can result in policies that do not adequately address the complexities of the issues at hand, leading to ineffective or poorly designed initiatives. The lack of diverse perspectives can also hinder the government's ability to adapt to changing circumstances, both domestically and internationally. Another potential downside is the risk of inefficiencies arising from a top-down approach. Centralized decision-making can lead to bureaucratic delays and a lack of flexibility in responding to emerging challenges. Hermansson notes that the disjointed political-administrative system in Turkey can hinder effective communication and collaboration between central and local authorities, particularly in disaster management contexts (Hermansson, 2018). Such inefficiencies can undermine the government's ability to respond to crises effectively, affecting public trust and international credibility. Furthermore, the centralization of

power can foster an environment conducive to authoritarianism, which can have detrimental effects on Turkey's international relations. The increasing concentration of power within the executive branch has raised concerns about democratic backsliding and the erosion of civil liberties (Tepe & Alemdaroğlu, 2021). This authoritarian trend can alienate potential allies and partners, as countries may be hesitant to engage with a government perceived as undemocratic. The perception of Turkey as an authoritarian state can also impact its soft power and public diplomacy efforts, as nations may be less inclined to support or collaborate with a government that does not uphold democratic values. In conclusion, while Turkey's centralized policy-making approach has facilitated rapid decision-making and strategic coherence, it also presents significant downsides, including reduced local autonomy, limited stakeholder participation, potential inefficiencies, and risks of authoritarianism. These challenges can hinder effective governance and adversely affect Turkey's international relations and public diplomacy efforts.

8. Policy Implications and Recommendations

The findings regarding Turkey's public diplomacy and technology management have significant implications for future policy decisions. The integration of technology management policies with public diplomacy efforts is essential for enhancing Turkey's international image and soft power. A well-coordinated approach that aligns technological advancements with public diplomacy can bolster a nation's influence and attractiveness on the global stage. This alignment is crucial for Turkey as it seeks to navigate complex international relations and enhance its standing through strategic communication and relationship-building. Moreover, Turkey can strategically develop its public diplomacy through advancements in technology management and Technology Transfer Offices (TTOs). TTOs serve as vital intermediaries that facilitate the transfer of knowledge and technology between universities and industry, which is crucial for fostering innovation and economic development. By enhancing the capacity and effectiveness of TTOs, Turkey can better leverage its scientific and technological advancements to promote its values and ideas internationally, thereby strengthening its public diplomacy efforts. The establishment of a robust national technology management policy that supports TTOs can create synergies between technological innovation and public diplomacy, ultimately enhancing Turkey's global influence. To enhance the effectiveness of TTOs and technology policies in strengthening Turkey's international relations, several recommendations can be made. First, increasing government funding and support for TTOs is essential to ensure they have the necessary resources to operate effectively and foster collaboration between academia and industry. Additionally, implementing training programs for TTO personnel can improve their capabilities in technology commercialization and intellectual property management, which are critical for successful technology

transfer. Furthermore, Turkey should prioritize the development of digital diplomacy initiatives that utilize its technological advancements to engage with international audiences effectively. By doing so, Turkey can not only showcase its innovations but also build meaningful relationships that enhance its soft power and international standing. In conclusion, the integration of technology management policies with public diplomacy efforts is vital for Turkey's strategic development. By enhancing the capacity of TTOs and leveraging technological advancements, Turkey can significantly improve its international relations and public diplomacy outcomes.

9. Conclusion

In conclusion, the interplay between Turkey's National Technology Management Policy and its public diplomacy initiatives underscores the significance of technological advancement in shaping the country's international image and influence. As public diplomacy evolves into a multifaceted instrument for states to promote their values and interests, Turkey's strategic focus on technology management plays a pivotal role in enhancing its soft power. The integration of Science, Technology, and Innovation (STI) policies within national development planning not only fosters innovation but also positions Turkey as a competitive player on the global stage, thereby advancing its public diplomacy objectives. The establishment of Technology Transfer Offices (TTOs) within Turkish universities further exemplifies this relationship, as these entities facilitate the transfer of knowledge and technology between academia and industry, contributing to the nation's technological capabilities and economic development. By showcasing its advancements in various sectors, particularly in healthcare technology through initiatives like the adoption of electronic health records, Turkey enhances its international reputation and demonstrates its commitment to leveraging technology for public diplomacy. Moreover, the centralized approach to policy formulation and implementation, as seen in Turkey's response to global challenges such as the COVID-19 pandemic, highlights the effectiveness of coordinated efforts in utilizing technology to bolster public diplomacy. This strategic alignment between technology management and public diplomacy not only enhances Turkey's global standing but also fosters collaboration with other nations, ultimately contributing to a more robust and influential international presence. In summary, Turkey's commitment to integrating technology management policies within its public diplomacy framework serves as a vital strategy for enhancing its soft power and international influence, showcasing the importance of innovation and technological advancement in contemporary international relations

References

Niu, Y. (2022). China's Digital Public Diplomacy during the 2022 Beijing Winter Olympics. *Journal of Political Science Research*, *3*(1), 44-53. https://doi.org/10.23977/polsr.2022.030107

Kayani, F. N. (2023). The Flourishing Economic and Political Relations of Turkey & Azerbaijan: An Overview after 30th Diplomatic Anniversary. *Eurasian Journal of Social Sciences*, *11*(2), 68-74. https://doi.org/10.15604/ejss.2023.11.02.003

Alemna, A. (1999). The impact of new information technology in Africa. Information Development, 15(3), 167-170. https://doi.org/10.1177/0266666994239868

Bakır, C. (2020). The Turkish state's responses to existential covid-19 crisis. Policy and Society, 39(3), 424-441. https://doi.org/10.1080/14494035.2020.1783786

Bozeman, B., Rimes, H., & Youtie, J. (2015). The evolving state-of-the-art in technology transfer research: revisiting the contingent effectiveness model. Research Policy, 44(1), 34-49. https://doi.org/10.1016/j.respol.2014.06.008

Branstetter, L. and Chen, J. (2006). The impact of technology transfer and r & d on productivity growth in Taiwanese industry: microeconometric analysis using plant and firm-level data. Journal of the Japanese and International Economies, 20(2), 177-192. https://doi.org/10.1016/j.jjie.2005.11.001

Chhetri, H. (2022). Foreign trade, foreign direct investment and economic growth in Nepal. Janapriya Journal of Interdisciplinary Studies, 11(1), 75-93. https://doi.org/10.3126/jjis.v11i1.51648

Cunningham, J., Lehmann, E., Menter, M., & Seitz, N. (2019). The impact of university focused technology transfer policies on regional innovation and entrepreneurship. The Journal of Technology Transfer, 44(5), 1451-1475. https://doi.org/10.1007/s10961-019-09733-0

Çevik, S. (2019). Reassessing turkey's soft power: the rules of attraction. Alternatives Global Local Political, 44(1), 50-71. https://doi.org/10.1177/0304375419853751

Çevik, S. and Sevin, E. (2017). A quest for soft power: turkey and the Syrian refugee crisis. Journal of Communication Management, 21(4), 399-410. https://doi.org/10.1108/jcom-04-2017-0042

Çinar, Ö. Altuntas, S., & Alan, M. (2020). Technology transfer and its impact on innovation and firm performance: empirical evidence from Turkish export companies. Kybernetes, 50(7), 2179-2207. https://doi.org/10.1108/k-12-2019-0828

Danziger, R. and Schreiber, M. (2021). Digital diplomacy: face management in mfa twitter accounts. Policy & Internet. https://doi.org/10.1002/poi3.269

Doncel-Martín, I., Catalan-Matamoros, D., & Elías, C. (2022). Corporate social responsibility and public diplomacy as formulas to reduce hate speech on social media in the fake news era. Corporate Communications an International Journal, 28(2), 340-352. https://doi.org/10.1108/ccij-04-2022-0040

Donelli, F. (2019). Persuading through culture, values and ideas: the case of turkey's cultural diplomacy. Insight Turkey. https://doi.org/10.25253/99.2019ev.04

Elswah, M. and Howard, P. (2021). Where news could not inspire change: trt world as a party broadcaster. Journalism, 23(10), 2079-2095. https://doi.org/10.1177/14648849211033444

Ercan, C. and Kale, I. (2017). Historical space steps of turkey: it is high time to establish the Turkish space agency. Acta Astronautica, 130, 67-74. https://doi.org/10.1016/j.actaastro.2016.10.019

Fai, F., Beer, C., & Schutte, C. (2018). Towards a novel technology transfer office typology and recommendations for developing countries. Industry and Higher Education, 32(4), 213-225. https://doi.org/10.1177/0950422218780614

Gafarli, O. (2023). Relations with Russia in the context of turkey's policy in constructing its 'strategic autonomy'. Uluslararası İlişkiler Dergisi, 20(79), 33-50. https://doi.org/10.33458/uidergisi.1358280

Gilboa, E. (2008). Searching for a theory of public diplomacy. The Annals of the American Academy of Political and Social Science, 616(1), 55-77. https://doi.org/10.1177/0002716207312142

Hermansson, H. (2018). Challenges to decentralization of disaster management in turkey: the role of political-administrative context. International Journal of Public Administration, 42(5), 417-431. https://doi.org/10.1080/01900692.2018.1466898

Hovsepyan, L. (2023). The main factors underpinning turkey–china relations: the 'turkic world' narrative and its implications for future relations. China Report, 59(4), 456-472. https://doi.org/10.1177/00094455231188100

Huang, Z. (2021). A historical–discursive analytical method for studying the formulation of public diplomacy institutions. Place Branding and Public Diplomacy, 18(3), 204-215. https://doi.org/10.1057/s41254-021-00246-y

Jia, Y., Liu, C., Chen, Y., & Zhu, Q. (2020). The construction of science and technology innovation policy design framework—take Shandong province as an example. Journal of Industry-University Collaboration, 2(1), 34-48. https://doi.org/10.1108/jiuc-08-2019-0015

Kalachishvili, M. (2023). Digital age of diplomacy and its impact on foreign policy. HUM, 12(1). https://doi.org/10.31578/hum.v12i1.515

Kose, I., Rayner, J., Birinci, S., Ulgu, M., Yilmaz, I., & Guner, S. (2020). Adoption rates of electronic health records in Turkish hospitals and the relation with hospital sizes. BMC Health Services Research, 20(1). https://doi.org/10.1186/s12913-020-05767-5

Kuyucu, T. (2020). The great failure: the roles of institutional conflict and social movements in the failure of regeneration initiatives in Istanbul. Urban Affairs Review, 58(1), 129-163. https://doi.org/10.1177/1078087420957736

Manfredi-Sánchez, J. (2022). Thinking about Latin American public diplomacy. Latin American Policy, 13(1), 6-19. https://doi.org/10.1111/lamp.12242

Mazumdar, A. (2020). India's public diplomacy in the twenty-first century: components, objectives and challenges. India Quarterly a Journal of International Affairs, 76(1), 24-39. https://doi.org/10.1177/0974928419901188

Namuq, B. and Al-BAYATI, M. (2021). Employing digital diplomacy in foreign policy: Israel as a model IAGS. https://doi.org/10.7176/iags/90-05

Nga, L. and Quang, T. (2021). Public diplomacy in strengthening India: Vietnam relations. India Quarterly a Journal of International Affairs, 77(2), 289-303. https://doi.org/10.1177/09749284211005012

Oladeji, S. and Adegboye, A. (2019). Science and technology policy for Nigeria's development planning. Journal of Education Society and Behavioural Science, 1-12. https://doi.org/10.9734/jesbs/2019/v32i430182

Oztig, L. (2022). Policy styles and pandemic management: the case of turkey. European Policy Analysis, 8(3), 261-276. https://doi.org/10.1002/epa2.1155

Pavón-Guinea, A. (2023). « it's the context, stupid»: the european union's public diplomacy in times of ontological insecurity. Communication & Society, 291-309. https://doi.org/10.15581/003.36.2.291-309

Ranga, M., Temel, S., Ar, İ., Yeşilay, R., & Sukan, F. (2016). Building technology transfer capacity in Turkish universities: a critical analysis. European Journal of Education, 51(1), 90-106. https://doi.org/10.1111/ejed.12164

Raslan, R. (2024). Climbing up the ladder: technology transfer-related policies in the context of the belt and road initiative. Utrecht Law Review, 20(1), 19-43. https://doi.org/10.36633/ulr.922

Shuyuan, X. and Ma, H. (2016). Analysis on the impact of international technology transfer on china's industrial

restructuring and upgrading. International Journal of Innovation Management and Technology, 7(3), 86-89. https://doi.org/10.18178/ijimt.2016.7.3.650

Simons, G. (2020). Russian foreign policy and public diplomacy: meeting 21st century challenges. Vestnik Rudn International Relations, 20(3), 491-503. https://doi.org/10.22363/2313-0660-2020-20-3-491-503

Sinell, A., Iffländer, V., & Muschner, A. (2018). Uncovering transfer – a cross-national comparative analysis. European Journal of Innovation Management, 21(1), 70-95. https://doi.org/10.1108/ejim-01-2017-0006

Steane, N., Hwang, E., & Coluccello, S. (2022). South Korea's public diplomacy actors in Uzbekistan. European Journal of Korean Studies, 95-124. https://doi.org/10.33526/ejks.20222201.95

Sun, Y. (2024). The impact of the depth of technology transfer type provisions in regional trade agreements on international science and technology cooperation - an empirical study based on rcep member countries. 61-67. https://doi.org/10.2991/978-94-6463-408-2_8

Tepe, S. and Alemdaroğlu, A. (2021). How authoritarians win when they lose. Journal of Democracy, 32(4), 87-101. https://doi.org/10.1353/jod.2021.0054

Ünlü, H., Temel, S., & Miller, K. (2022). Understanding the drivers of patent performance of university science parks in turkey. The Journal of Technology Transfer, 48(3), 842-872. https://doi.org/10.1007/s10961-022-09929-x

Waroonkun, T. and Stewart, R. (2007). Modeling the international technology transfer process in construction projects: evidence from Thailand. The Journal of Technology Transfer, 33(6), 667-687. https://doi.org/10.1007/s10961-007-9043-1

White, C. (2015). Exploring the role of private-sector corporations in public diplomacy. Public Relations Inquiry, 4(3), 305-321. https://doi.org/10.1177/2046147x15614883

Yiblet, F. (2024). Unlocking new opportunities: brics partnership and its implications for economic development in African countries. Journal of Entrepreneurship and Business Innovation, 11(1), 37. https://doi.org/10.5296/jebi.v11i1.22012

Zamanli, E. (2022). Intensification cycle in digital diplomacy. Kne Social Sciences, 70-86. https://doi.org/10.18502/kss.v7i2.10278

Zanello, G., Fu, X., Mohnen, P., & Ventresca, M. (2015). The creation and diffusion of innovation in developing countries: a systematic literature review. Journal of Economic Surveys, 30(5), 884-912. https://doi.org/10.1111/joes.12126

Zhong, P. (2022). The impact of foreign technology transfer on firm productivity. https://doi.org/10.2991/aebmr.k.220405.274

Zulham, M., Saragih, H., Ambarwati, R., & Silitonga, T. (2020). Turkey's involvement in the Syrian conflict from a defense management perspective. Ajis Academic Journal of Islamic Studies, 5(2), 81. https://doi.org/10.29240/ajis.v5i2.1915