



Ethical Horizons in AI: Navigating Opportunities and Upholding Values in the MENA Landscape

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Abstract

Artificial intelligence presents immense opportunities to transform the Middle East and North Africa (MENA) region through advances in healthcare, environmental sustainability, economic inclusion, and more. However, the adoption of AI also poses risks if deployed unethically, as seen in biased facial recognition harming vulnerable populations. This paper analyzes AI's potential while assessing core ethical challenges in the MENA context. It spotlights perspectives from regional experts on grounding AI governance in cultural values, exemplified by initiatives like the UAE's AI ethics council. Proposed solutions include diversifying AI design teams, auditing for bias, and centering human needs in policymaking. Rather than resist progress, this talk empowers MENA nations to proactively shape an AI landscape that promotes human dignity, community, justice and participatory decision-making. Audiences will gain an understanding of strategies to realize AI's benefits through an ethical lens. The aim is to provide practitioners and policymakers with an actionable framework to develop and regulate AI systems that align with regional values and elevate society

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الذكاء الاصطناعي الأخلاقي في منطقة الشرق الأوسط وشمال إفريقيا: التوازن بين الابتكار والقيم الثقافية

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المستخلص:

يمثل الذكاء الاصطناعي فرصة تحوّل كبيرة لمنطقة الشرق الأوسط وشمال إفريقيا، من خلال ما يتبناه من تطورات في مجالات الرعاية الصحية، والاستدامة البيئية، والشمول الاقتصادي، وغيرها. ومع ذلك، يظل الاستخدام الأخلاقي للذكاء الاصطناعي تحديًا بالغ الأهمية، كما يتضح من حوادث التحيز الخوارزمي وممارسات المراقبة الضارة على مستوى العالم. يتناول هذا البحث الفرص والتحديات الأخلاقية المرتبطة ببنية الذكاء الاصطناعي في السياق الإقليمي، ويستند إلى رؤى لخبراء من المنطقة، مستعرضًا نماذج حوكمة متجددة ثقافيًا، مثل مجلس أخلاقيات الذكاء الاصطناعي في دولة الإمارات العربية المتحدة. يسلط التحليل الضوء على استراتيجيات محورية، منها تنويع فرق تصميم الذكاء الاصطناعي، وإجراء مراجعات منتظمة للتحيز، ودمج المبادئ الإنسانية في السياسات العامة. وبدلاً من مقاومة التقدم التكنولوجي، يدعو هذا الطرح إلى نهج استباقي قائم على القيم، يضمن الحفاظ على كرامة الإنسان، وتعزيز العدالة الاجتماعية، وتحقيق اتخاذ القرار الشامل. ويهدف إلى تزويد صناعات السياسات والممارسين بإطار عملي لتطوير وتنظيم أنظمة الذكاء الاصطناعي بما يتماشى مع القيم المجتمعية والأخلاقية الخاصة بالمنطقة.

1.Introduction

The advent of artificial intelligence (AI) in the Middle East and North Africa (MENA) region invites a multifaceted discourse, one that is informed by the profound insights of scholars such as Davies (2022) (1). Davies posits that the burgeoning capabilities of AI present unparalleled opportunities for growth and innovation. Yet, these advancements bring forth a spectrum of ethical dilemmas that must be addressed with foresight and responsibility. His work underscores the importance of a proactive stance in the ethical integration of AI, a sentiment that is particularly resonant within the MENA context.

As we contemplate the forward march of AI within the MENA region, the imperative to anchor our advancements in ethical reflection cannot be overstated. It is not enough to aim for technological milestones; rather, our ambition should be to foster technological ecosystems that nurture the human condition. Davies (2022) (1) argues for an approach to AI that is deeply attuned to the cultural and moral fibers that define a region. This perspective is especially pertinent in the MENA region, where advancements in AI must align with the historical and cultural ethos that has been its bedrock.

In essence, the pursuit of AI in the MENA region is a journey that intertwines the threads of innovation with the strands of timeless values. It is a delicate balance that calls for an ethical compass as much as it does for computational ingenuity. By embracing Davies' (2022) (1) call for ethical vigilance, we can ensure that AI serves as a catalyst for progress that is both meaningful and morally grounded, reflecting the noblest aspirations of MENA societies.

Overview of AI in a global context and its significance to MENA

In the grand tapestry of human endeavor, the emergence of artificial intelligence stands as a testament to our unyielding quest for progress. The global narrative of AI is not a linear tale of triumphs and innovations; it is an intricate mosaic of hopes, fears, aspirations, and ethical quandaries. As the world sits on the cusp of an AI revolution, the MENA region finds itself at a crossroads, where the paths of historical wisdom and futuristic vision converge (Kim et al., 2021) (2).

Throughout history, humanity has been enthralled by the cyclical rise and fall of empires, the ebb and flow of cultural movements, and the relentless pursuit of knowledge. Each cycle of innovation has been a mirror reflecting the society that fostered it, revealing both the brilliance of human creativity and the shadows of unintended consequences (Kim et al., 2021) (2). Today,

as AI reshapes the contours of daily life, economics, and governance on a global scale, it also casts new light on the perennial questions that have long animated philosophical inquiry in the MENA.

The global context of AI is a palimpsest, layered with the narratives of previous technological epochs: the steam engine, the telegraph, and the internet. Each, in turn, redefined the human experience, much as AI is poised to do. However, unlike these predecessors, AI has the potential to transcend its role as a mere tool, challenging our conceptions of intelligence, agency, and even consciousness.

For the MENA region, this new chapter in the annals of human ingenuity carries profound significance. Here, where the written word first took hold and algebraic formulas began to explain the cosmos, the promise of AI is weighed against a rich intellectual heritage. The region's historical contributions to science and philosophy imbue its engagement with AI with a sense of continuity, serving as a bridge from the golden age of scholarship to the digital renaissance of today.

Yet, as AI integrates deeper into the fabric of MENA societies, it elicits a critical examination of the values that will govern its ascent (Kim et al., 2021) (2). The seductive allure of AI-driven efficiency and innovation must be balanced with a vigilant appraisal of its social impact. The digital divide, the erosion of privacy, and the specter of autonomous weaponry are but a few of the contemporary issues that echo the age-old concerns of societal well-being and moral responsibility.

In considering the future of AI within the MENA region, one must also contemplate the cyclicity of power dynamics that technology can precipitate. Just as the printing press once shifted the locus of control over information, AI has the potential to centralize or democratize influence in ways that could redefine the geopolitical landscape (Kim et al., 2021) (2). The choices made by today's leaders and thinkers in the MENA region will not only shape the implementation of AI but will also resonate through the annals of history, influencing generations to come.

The narrative of AI in the MENA region is thus a complex interplay of past and future, a reflection on the cyclical nature of innovation and its societal ramifications. As the region grapples with the promises and perils of AI, it must draw upon its historical spirit of inquiry and ethical contemplation to navigate the uncharted waters of this digital odyssey. The story of AI in the MENA region, still being written, promises to be as thought-provoking and evocative as the rich tapestry of its past.

Statement of Purpose for the Paper

The aim of this study is to perform an exhaustive analysis of the transformative potential of artificial intelligence (AI) in the Middle East and North Africa (MENA) region. This analysis will focus on sectors including healthcare, environmental sustainability, and economic development. The paper acknowledges AI's dual nature, highlighting the potential benefits while also examining the ethical concerns that arise, particularly the threat of biased AI solutions that could disproportionately affect vulnerable groups.

In the healthcare sector, AI's potential in the MENA region is substantial. It is estimated that AI's contribution to the region could reach \$59 billion by 2030 (MedicaEx, 2023) (3). AI's role in revolutionizing healthcare systems is further highlighted by its applications in medical imaging and drug discovery, with the global AI in drug discovery market expected to grow significantly (Shamal Communications, 2023). The commitment to integrating AI technologies within the Middle East healthcare sector is further evidenced by investments such as the establishment of the Dubai Health Innovation Centre and the Saudi Arabian government's digital health initiatives (Mubarki, 2024). This research is driven by the need to understand both the opportunities and challenges presented by AI in the context of the MENA region, which possesses unique cultural and socio-economic landscapes. By engaging with insights from regional experts, the paper examines the integration of cultural values into AI governance frameworks, drawing attention to pioneering initiatives such as the AI Ethics Council in the United Arab Emirates.

The MENA region presents a unique cultural and socio-economic canvas that significantly influences the implementation and governance of AI technologies. It is imperative to understand the opportunities and challenges that AI introduces, particularly in the context of this diverse region. This understanding is critical for ensuring that the deployment of AI technologies aligns with regional values and contributes positively to societal goals.

One pioneering effort in this domain is the establishment of an AI ethics council in the United Arab Emirates, which underscores the region's proactive stance in integrating cultural values into AI governance. The council is an initiative aimed at guiding the ethical development of AI, ensuring that its deployment respects cultural norms and promotes social well-being. Supporting this analysis, the International

Development Research Centre (IDRC) has been instrumental in advancing research on responsible AI and data governance in the MENA region. The IDRC's initiatives focus on cultivating knowledge exchange, fostering networks of expertise, and shaping the governance of AI technologies to align with ethical

standards (International Development Research Centre, n.d.).

Furthermore, the Middle East Institute (MEI) recognizes the significant role of Saudi Arabia and the United Arab Emirates in the global discourse on AI governance. Both nations have shown their commitment to leading the technology industry by supporting global initiatives and incorporating a diversity of perspectives into the AI governance conversation (Soliman, 2023). (4)

In February 2022, AI Dojo was officially launched in Iraq, serving as a beacon of technological advancement with the aim of seamlessly integrating artificial intelligence into the nation's digital economy (AI Dojo, 2023) (5). This pioneering hub provides essential resources and guidance to individuals and organizations alike, fostering an environment where AI can flourish and contribute to the growth and modernization of local industries. By offering training boot camps, workshops, and AI software solutions, AI Dojo is not only equipping potential employees with the skills needed for the future but also enabling companies to harness the power of AI to innovate and compete on a global stage (AI Dojo, 2023). (2023)

The research on AI policy in the MENA region, funded by Google.org as part of its Digital Futures Project, is a prime example of how regional think tanks and academic institutions can contribute valuable insights into the responsible development of AI. By examining how AI can unlock local growth opportunities, these initiatives also aim to address societal challenges such as poverty and disease, while considering the implications for social equality and economic opportunity (Avni, 2023) (6).

The paper proposes a set of solutions aimed at mitigating the risks of AI bias and unethical use, including the diversification of design teams, implementation of bias audits, and the prioritization of human-centric approaches in AI policymaking. These recommendations aim to guide practitioners and policymakers in the MENA region toward the development and regulation of AI systems that not only adhere to regional values but also enhance societal well-being.

Ultimately, the paper seeks to offer a pragmatic framework that empowers MENA nations to engage with AI in a manner that upholds human dignity, communal integrity, justice, and participatory governance. It aims to provide the audience, comprised of AI practitioners and policy decision-makers, with strategic insights into leveraging the benefits of AI through an ethical prism, ensuring technology serves as a catalyst for positive societal transformation in the MENA region.

The Potential for AI to transform various sectors in MENA

Healthcare

In the ambit of healthcare within the Middle East and North Africa (MENA) region, artificial intelligence (AI) stands poised to engender a paradigm shift across multiple facets, including diagnostics, patient management, and healthcare infrastructure optimization. The integration of AI harbors the potential for transformative impacts on the precision of diagnostic processes, enhancing disease identification, most notably in oncological contexts. Furthermore, the implementation of such technologies is posited to restructure operational dynamics within hospital settings.

Concerning diagnostic precision, evidence suggests that AI-facilitated systems exhibit superior capabilities in medical image analysis when juxtaposed with conventional methodologies, thereby augmenting the process of pathology detection. With particular regard to oncology, the application of machine learning techniques encompasses neural networks and support vector machines, which have been employed effectively in breast cancer detection, diagnosis, categorization, and prognostication (Mahajan, Vaidya, Gupta, Rane, & Gupta, 2019). Additionally, deep learning constructs have increasingly become instrumental in expediting interpretative tasks undertaken by radiologists within the domain of breast cancer diagnostics, thereby curtailing the temporal demand of these professional activities (Mahajan et al., 2019).

Beyond the boundaries of clinical diagnostics, AI's influence permeates into the arena of hospital administration. Leveraging AI's predictive analytics, medical facilities are well-positioned to refine patient throughput management and forecast admission rates with commendable accuracy. Consequently, this precipitates a more judicious allocation of healthcare resources and contributes to a reduction in operational expenditures (Mahajan et al., 2019 (7)).

The implications of this are profound, extending beyond healthcare into the larger domain of governance. AI apparatuses, with their adeptness at sensing, projecting, and furnishing preemptive alerts, are equally transformative when applied to infrastructural entities and social security frameworks. Such advances considerably elevate the caliber of governance and enhance the management of social welfare operations (Mahajan et al., 2019) (7), reflecting a shift towards more responsive and efficient public service delivery.

This empirical synthesis underscores the burgeoning role of artificial intelligence as a catalyst for efficacy and efficiency within the MENA region's healthcare paradigm, showcasing its potential to redefine existing practices and contribute significantly to the advancement of medical science and patient care.

Environmental Sustainability

The MENA region faces significant challenges related to environmental sustainability, including water scarcity and extreme temperatures. Artificial intelligence (AI) can play a crucial role in addressing these challenges and promoting environmental sustainability in the region.

AI can be employed in various ways to monitor environmental conditions, predict weather patterns, and manage natural resources more efficiently. For example, AI-powered algorithms can optimize water usage in agriculture, reducing waste and conserving this precious resource. By analyzing data on soil moisture, weather conditions, and crop characteristics, AI can provide real-time recommendations on irrigation schedules and amounts, leading to more efficient water use (Vinuesa et al., 2020 (8)).

Furthermore, AI can contribute to the development of smart cities in the MENA region. Smart cities utilize advanced technologies, including AI, to create systems that minimize energy consumption and reduce the carbon footprint. AI can optimize energy usage in buildings, transportation systems, and infrastructure, leading to more sustainable urban environments. For instance, AI can analyze data on energy consumption patterns and adjust lighting, heating, and cooling systems accordingly, resulting in energy savings and reduced greenhouse gas emissions (Vinuesa et al., 2020 (8)).

Economic Development

The economic landscape of the MENA region can be transformed by leveraging AI to foster innovation, generate employment, and improve productivity. AI can streamline supply chains, enhance manufacturing processes, and introduce new levels of efficiency across various industries (PwC Middle East, n.d.). The deployment of AI technologies in sectors such as finance and tourism has the potential to spur growth, attract investment, and create new market opportunities (PwC Middle East, n.d.). By adopting AI, MENA countries can diversify their economies, reduce reliance on oil, and build resilience against economic uncertainties (PwC Middle East, n.d. (9)).

In the realm of economic development, the integration of AI into healthcare stands as a transformative force, particularly in refining diagnostic accuracy within the field of oncology. By leveraging machine learning techniques, AI enhances disease detection and prognosis, which in turn can lead to more effective treatment strategies and improved patient outcomes. This not only represents progress in public health but also contributes to economic growth by potentially reducing long-term healthcare costs and promoting workforce productivity through better health. Additionally, AI's role in streamlining hospital operations through predictive analytics can lead to

more efficient patient flow management and resource allocation. Such advancements in healthcare efficiency can further stabilize and improve the infrastructure for social welfare operations, potentially driving down costs and facilitating more equitable access to healthcare services. These improvements, catalyzed by AI, are poised to make significant contributions to the broader economic development by fostering a healthier, more productive society.

In addressing environmental sustainability challenges, such as water scarcity and extreme temperatures, AI emerges as a crucial component. Deployed to monitor and manage natural resources efficiently, AI-driven algorithms can optimize water usage in agriculture and contribute to the development of smart cities. These smart cities aim to minimize energy consumption and carbon emissions through the intelligent management of infrastructure systems.

For economic development, AI can act as a catalyst for innovation, job creation, and productivity enhancement. By streamlining supply chains and refining manufacturing processes, AI can help diversify the region's economy, prompt new market opportunities, and reduce reliance on oil, thereby fortifying the region against economic uncertainties.

Overall, the introduction of AI technologies into the MENA region has significant potential to transform practices across multiple domains, ultimately contributing to improved health outcomes, sustainable urban environments, and robust economic growth.

The Promise of AI in MENA

Advances in Healthcare Through AI

The healthcare sector in the Middle East and North Africa (MENA) region is entering a new phase of advancement with the adoption of artificial intelligence (AI). This technology is poised to significantly refine healthcare delivery by improving diagnostic accuracy, streamlining processes, and emphasizing patient-focused practices. Such integration of AI is expected to catalyze substantial improvements in healthcare outcomes and operational efficiencies across the region.

Advancements in machine learning, deep learning, and predictive analytics are reshaping medical diagnostics and treatment. AI applications range from virtual assistants that provide immediate medical responses to sophisticated diagnostic tools with superhuman accuracy (El-Jardali et al., 2023).

One of the significant impacts of AI in healthcare is its ability to process vast amounts of data and identify complex patterns that may be difficult for humans to discern. This capability enables earlier disease detection, personalized treatment plans, and tailored medicine based on individual patient's genetic makeup. In the MENA region, where genetic disorders are prevalent, AI can facilitate breakthroughs in genomics

research and improve the understanding and treatment of these conditions (El-Jardali et al., 2023).

In Iraq's healthcare sector, artificial intelligence (AI) and Internet of Things (IoT) technologies are making significant strides. A study conducted on the readiness level of healthcare professionals in both public and private Iraqi hospitals to utilize IoT technology revealed a strong inclination towards adopting these digital tools for managing the 2019-nCoV pandemic (Meri, Dauwed, Kareem, & Hasan, 2023). The research, which included 113 physicians and 99 pharmacists, demonstrated that IoT could facilitate patient follow-up by enabling rapid communication between medical staff and patient relatives. Moreover, remote monitoring techniques were found to be effective in measuring and treating 2019-nCoV, thereby reducing direct contact and decreasing the workload in healthcare industries (Meri et al., 2023).

The implications of this study are profound, as it suggests that Iraqi medical staff are fully prepared to embrace IoT technology, having become more digitally minded following the 2019-nCoV crisis. This readiness is expected to lead to spontaneous improvements in their knowledge and technical skills, in line with the diffusion of innovation perspective. The paper strongly advises healthcare policymakers to implement IoT technology nationwide, particularly to safeguard the lives of healthcare employees (Meri et al., 2023). The integration of IoT with other transformative technologies like cloud computing and AI may provide a wide range of applications during crises, further enhancing the capability of the healthcare sector to manage outbreaks effectively (Meri et al., 2023).

AI also plays a crucial role in enhancing patient experience and care. Telemedicine, powered by AI, provides access to high-quality medical advice and consultation for patients in remote or underprivileged areas. AI-driven chatbots and virtual health assistants offer 24/7 support, guiding patients through symptom checks, providing medication reminders, and answering general wellness questions. Furthermore, AI systems have been developed for prognosis prediction, which is particularly relevant for managing chronic diseases like diabetes and heart disease in the MENA region. These systems analyze patient records to predict disease progression, enabling preemptive measures and interventions that can save lives and resources (El-Jardali et al., 2023 (10)).

AI's impact extends to the operational aspects of healthcare as well. Hospital administration can benefit from AI's capabilities in optimizing patient scheduling and inventory management. By forecasting patient admissions and discharges, hospitals can improve staffing levels, bed availability, and overall quality of care, reducing wait times.

In the pharmaceutical industry, AI has the potential to expedite drug discovery and development processes. AI's analytical prowess allows for rapid screening of compound libraries, outcome prediction, and identification of candidates with higher success probabilities. This acceleration can bring novel treatments to patients faster, reducing time and costs. For instance, In the Iraqi healthcare sector, the introduction of artificial intelligence (AI) is poised to revolutionize the management and distribution of pharmaceuticals. The implementation of AI could significantly optimize the supply chain, ensuring the efficient delivery of necessary medications to patients across the country (Chatham House, 2022). By leveraging AI's advanced analytics, healthcare providers can better understand drug consumption patterns, which can lead to improved stock control and reduction in medication outages. Additionally, AI technologies have the potential to enhance the identification of counterfeit drugs, thus safeguarding the integrity of the pharmaceutical supply and ultimately protecting public health (Chatham House, 2022 (11).

Moreover, as Iraq continues to forge its path in integrating AI within its healthcare system, it will be crucial to maintain robust ethical standards. With the right ethical frameworks in place, AI systems can uphold patient privacy and data security, laying a foundation of trust and confidence in the use of these technologies (Chatham House, 2022) (11). The strategic deployment of AI not only promises to streamline operations but also contributes to transparency and improved healthcare outcomes, showcasing the positive impact AI could have on Iraq's medical community and its pharmaceutical industry as a whole.

The integration of AI in the MENA region's healthcare sector brings forth a wave of potential advancements that can redefine medicine. It not only improves health outcomes but also promotes a more equitable distribution of healthcare resources across the region. As MENA nations continue to invest in and integrate AI technologies into their healthcare infrastructures, they position themselves at the forefront of a global healthcare revolution, where technology and medicine merge to bring hope and healing (El-Jardali et al., 2023). (10)

AI's Role in Environmental Sustainability
Artificial Intelligence (AI) stands out as a key agent for fostering environmental sustainability within the extensive potential of the Middle East and North Africa (MENA) region. The MENA region, characterized by its harsh climates and natural resource scarcity, is increasingly finding AI to be an indispensable ally in crafting a greener, more sustainable future.

The implementation of AI in environmental management is multi-faceted, with applications ranging from predictive analytics in weather and climate monitoring to practical AI-driven solutions in urban planning and resource allocation. Advanced algorithms are capable of processing vast datasets that consider past weather patterns, satellite imagery, and real-time environmental sensor data to accurately predict environmental changes and extreme weather events (Chentouf & Allouch, 2022).

One of the most pressing issues in the region is water conservation. AI steps into this arena with smart irrigation systems that use sensors and machine learning to determine the optimal amount of water needed for agricultural land. By applying precise watering techniques, these AI systems conserve water while ensuring crops receive adequate moisture, which is crucial in a region where water is a scarce commodity. This not only supports environmental sustainability but also boosts agricultural productivity and economic stability (Chentouf & Allouch, 2022).

In urban centers, the concept of 'smart cities' is taking shape, propelled by AI innovations. These cities harness AI to streamline and integrate various urban functions, including traffic management, waste collection, and energy distribution, to achieve greater efficiency and lower carbon footprints. AI can dynamically manage the flow of traffic, reducing congestion and pollution. Waste collection can be optimized through AI systems that predict when bins will be full, streamlining collection routes and schedules. Similarly, by regulating the energy use in buildings and streetlights based on occupancy and natural light, AI contributes to significant reductions in energy consumption and emissions (Chentouf & Allouch, 2022). (12)

Renewable energy is another sector where AI makes an indispensable contribution. Solar and wind power generation can be notoriously unpredictable, but AI-driven predictive models can forecast energy output with high accuracy, ensuring a stable supply and enabling better integration with the grid. This enhances the viability of renewable energy projects, which is vital for reducing the environmental impact of the region's energy needs. Moreover, a potent application of AI exists within biodiversity preservation. Through image recognition and machine learning, AI can monitor fauna and flora populations, detect illegal logging or poaching activities, and assist in the management of protected areas. These technologies provide critical data for conservation efforts and create innovative strategies to protect the region's diverse ecosystems (Chentouf & Allouch, 2022). (12).

AI's role in environmental sustainability within the MENA region is expansive and continually evolving. By leveraging AI, countries in the MENA region are

not only addressing their immediate environmental challenges but are also positioning themselves as pioneers in sustainable practices globally. With careful implementation and ongoing innovation, AI has the capacity to leave an indelible mark on the environment, fostering a habitat that thrives both ecologically and economically.

Economic Inclusion and AI's Impact on Employment and Wealth Distribution

The narrative surrounding the introduction of artificial intelligence (AI) into economies often revolves around concerns of job displacement and uneven wealth distribution. However, across the (MENA) region, there is a promising outlook for AI to facilitate economic inclusion and positively influence employment and wealth distribution.

AI has the potential to generate new job opportunities in the MENA region by catalyzing industry growth, entrepreneurship, and the development of new markets. While there is a possibility that certain roles may become automated, AI also creates demand for unique skill sets, particularly in tech-driven sectors. Jobs focusing on AI development, data analysis, machine learning engineering, and cybersecurity are likely to see substantial growth. Thus, the workforce must adapt and acquire skills that are complementary to emerging AI technologies (Alonso, et al.)¹³.

In addition to job creation, AI provides tools that enable more inclusive financial services, which can lead to greater wealth distribution. For example, AI-powered Fintech Solutions offer personalized financial advice, credit scoring, and microloans that are accessible to populations previously underserved by traditional banking models (Alonso, et al., 2020) (13). These services enable individuals and small businesses to partake in economic activities, invest in growth, and improve their living standards.

Additionally, AI applications in education - such as personalized learning platforms - can democratize access to knowledge and skills training, allowing more people to adapt to the evolving demands of the labor market. This can reduce economic disparities and foster a more inclusive workforce equipped to engage with an AI-integrated economy.

The public sector also plays a pivotal role in ensuring that the benefits of AI are widely distributed. Through astute policies, investments in education, and incentives for industries to upskill their employees, governments can mitigate risks related to employment and ensure a more equitable wealth distribution. By fostering an environment that supports continuous learning and skills development, the MENA region can leverage AI as a tool to empower its population and bridge economic divides.

AI can even aid in identifying wealth gaps through data analytics, enabling policymakers to create targeted

programs aimed at improving economic conditions for disadvantaged groups (Rizk, 2019). Machine learning models assist governments and organizations in understanding complex patterns related to poverty, unemployment, and underemployment, contributing to more effective measures for economic inclusion.

To maximize the positive effects of AI on employment and wealth distribution, it is crucial for stakeholders within the MENA region to collaborate on strategies that align with local socio-economic goals. Private-sector initiatives, public-private partnerships, and educational reforms all play integral parts in shaping a future where AI acts as a catalyst for fair and inclusive economic prosperity (Rizk, 2019). (14)

The integration of AI into the MENA economy carries immense potential not only to accelerate economic growth but also to pave the way for a more inclusive and equitable distribution of wealth. As AI continues to evolve and permeate different sectors, the region stands poised to transform these advancements into opportunities for broad-based societal benefit, securing a prosperous future that capitalizes on the full spectrum of talents and contributions of its people.

Case Studies or Examples of Successful AI Applications in MENA

In the United Arab Emirates, AI technologies are being leveraged to transform various sectors, including healthcare, education, and transportation. One notable example is the implementation of AI in public services to streamline processes and enhance the efficiency of government services (Creation Business Consultants, n.d.) (15). The UAE's commitment to becoming a global AI hub is evident in its strategy to integrate AI systems across government services, thereby setting a precedent for other nations in the MENA region.

The UAE's foray into AI technology represents a larger commitment to innovation and technological progress within these countries. According to the paper published by Creation Business Consultants, AI is reshaping public services in the UAE by making them more efficient and user-friendly. This approach is part of the nation's ambitious plan to position itself as a leader in the field of AI globally.

Specific applications mentioned include streamlining bureaucratic processes, which typically reduces wait times for government services and enhances the citizen experience by delivering faster and more accurate services (Creation Business Consultants, n.d.). By automating certain tasks, AI enables government employees to focus on more complex and nuanced aspects of their work that require human judgment and creativity.

Education is another domain where the UAE is actively deploying AI, by personalizing learning experiences for students. Through adaptive learning software powered by AI, educational content can be

customized to fit each student's learning pace and style, enhancing the effectiveness of education systems and preparing future generations with high adaptability to fast-changing job markets.

In addition, ASI, formerly known as Digest.AI, has entered into a significant partnership with the UAE's Ministry of Education to implement an AI-powered tutoring system aimed at enhancing the nation's educational landscape (ASI, 2023). This initiative is part of the UAE's broader commitment to integrating advanced technology into education, ensuring its alignment with the latest global tech trends. The collaboration will introduce an accessible, high-quality educational platform for students, promising a transformative impact on learning by leveraging AI tutors to complement traditional teaching methods. This technological advancement is particularly noteworthy as it reflects the UAE's dedication to fostering innovation within its educational sector, as emphasized by His Excellency Dr. Ahmad Belhoul Al Falasi, the Minister of Education, during the World Government Summit of 2023 (ASI, 2023).

The strategic move by the UAE Ministry of Education, in partnership with ASI, is set to redefine the educational experience by facilitating a more personalized learning journey for students through AI. This partnership is a testament to the UAE's proactive approach in revolutionizing education to prepare for future demands and is a clear indication of the pivotal role AI is starting to play in the EdTech sector (ASI, 2023). As part of this initiative, the AI tutoring program will aim to provide individualized support to students, underscoring the importance of adaptive learning in achieving educational success.

In transportation, AI-powered systems lead to improved traffic management and safety, with smart traffic lights and autonomous vehicles being prominent examples of such technologies in use.

These AI implementations are crucial stepping stones towards fulfilling the UAE's broader AI strategy, which eyes economic diversification away from oil dependence. The ability to leverage AI effectively paves the way for not only more sophisticated government services but also for fostering an environment that encourages innovation and attracts investment.

The UAE's example demonstrates how proactive adoption of AI within public and private sectors can offer significant long-term benefits. As highlighted by this case study, the proactive and strategic adoption of AI technology by the UAE government could serve as a model for other nations in the region and globally, highlighting what is possible when government foresight meets technical capacity.

Saudi Arabia has taken significant strides in AI and has been recognized for its efforts, leading in the global AI

index with a well-articulated national AI strategy (AI-Monitor, 2023). This is a testament to the country's investment in developing AI capabilities, which includes partnerships with leading technology firms and substantial funding for AI research and application. It has also emerged as a leader in the global AI index, reflecting its commitment to becoming a powerhouse in artificial intelligence. The country's national strategy for data and AI aims to position Saudi Arabia as a global leader in data-driven economics (Upadhyay, 2023). This strategy is part of the broader Vision 2030 initiative, which views digital transformation as a key enabler for the nation's future development (Accenture, n.d.).

The Kingdom has not only set a foundation for its AI ambitions but has also actively sought partnerships with technology firms to advance its capabilities in this field. A notable move in this direction was the creation of a \$200 million fund by Saudi Crown Prince Mohammed bin Salman, aimed at investing in local and international firms specializing in advanced technology (RAND Corporation, n.d.). These efforts are complemented by the Saudi Data & AI Authority (SDAIA), established to foster a world-class AI ecosystem within the country (AI-Monitor, 2023).

In terms of market size, the Artificial Intelligence market in Saudi Arabia is projected to reach US\$1,512.00m in 2024, with an expected annual growth rate (CAGR) of 16.36%, leading to a market volume of US\$3,752.00m by 2030 (Omdena, 2022, para. 1) This growth is indicative of the country's dedication to integrating AI into various sectors of its economy.

Further, the Saudi Public Investment Fund (PIF) has strategically positioned itself within the American market, holding investments exceeding \$35 billion in a variety of sectors. Among these investments are significant stakes in retail giants such as Amazon and Walmart, as well as in the rideshare and food delivery company Uber Technologies (Lucente, 2022). The PIF's portfolio is not limited to these industries; it also encompasses major players in the gaming industry, reflecting Saudi Arabia's ambition to become a global gaming hub by 2030 (Stanton, 2023).

The Kingdom's advancements in AI are recognized globally, with Saudi Arabia ranking first in Tortoise Media's Government Strategy Index for Artificial Intelligence (Breakingviews, 2023). This accolade underscores the strategic importance the country places on AI as a cornerstone of its economic and technological growth. Saudi Arabia's leadership in the global AI index and its comprehensive national AI strategy demonstrate the country's resolve to harness the potential of artificial intelligence, positioning itself as a global leader in the field.

Therefore, the impact of AI on the economies of the MENA region is profound, with technology playing a crucial role in driving economic growth and diversification (Economy Middle East, n.d.). By adopting AI, countries in the region are not only improving productivity across industries but also creating new opportunities for innovation and entrepreneurship.

Startups in the MENA region are also making waves with AI innovations. Omdena's blog highlights several top AI startups in MENA that are addressing local and global challenges ranging from healthcare to climate change (Omdena, n.d.). These startups are a showcase of the region's growing talent pool and entrepreneurial spirit in the field of AI technology.

Ethical Challenges of AI Adoption

The Risk of Unethical AI Deployment

The adoption of artificial intelligence (AI) in the region presents a range of ethical challenges that mirror global concerns but also include unique regional considerations. One of the most significant impacts of AI in the MENA region is its potential to generate substantial economic value, with projections estimating a staggering \$320 billion by 2030 (Garcia, 2023). The AI market size in MENA was estimated at USD 11.92 billion in 2023 and is expected to grow rapidly, driven by efforts to create smart and sustainable urban environments (Grand View Research, n.d.).

However, this rapid growth brings forth several ethical dilemmas. AI technologies are not neutral; they can lead to inaccuracies, discriminatory outcomes, and embedded biases (UNESCO, 2023). There are serious questions about the social, political, and ethical implications of AI's massive adoption, including unjustified actions, opacity in decision-making processes, and concerns over autonomy and privacy (Mittelstadt, 2021). In the UAE, governance challenges such as data privacy, AI bias, accountability, and the need for international regulatory frameworks have been identified as key issues amid the AI boom (Abi Farraj, 2023)

Moreover, job displacement is a significant concern, with estimates suggesting that up to 45% of existing work in the Middle East could potentially be automated by 2030 (Haider, 2023). This underscores the importance of addressing workforce impact and reskilling as part of ethical AI adoption strategies. To ensure responsible AI integration, it is crucial to prioritize fairness and bias, trust and transparency, accountability, social benefit, and privacy and security. Businesses and policymakers worldwide and in the MENA region are encouraged to adopt ethical AI principles, which include setting policies that exceed legal requirements to prevent harm caused by AI (Maryville University, 2023). The European Union's active development of guidelines to protect privacy and

prevent bias, racism, and violence serves as an example for the MENA region to follow in policy-making related to AI (ME Council, 2023).

While AI promises significant benefits for the MENA region, it is imperative to navigate the ethical challenges carefully to ensure that the technology serves the greater good without compromising individual rights or societal values.

Case Study: Biased Facial Recognition and its Impact on Vulnerable Populations

Biased facial recognition technology poses significant risks to vulnerable populations in the MENA region, where it is increasingly used for access control in crowded and high-security areas such as airports and border crossings (Woods, 2023). The technology's inherent biases can lead to misidentification and discrimination, particularly against women and racial minorities (Baker, 2022). For instance, algorithms have been found to falsely identify Black women more frequently than other demographics, making them especially susceptible to algorithmic bias (Rauenzahn et al. 2021).

In the context of civil liberties, the deployment of facial recognition technology without consent has raised concerns about unwarranted surveillance and privacy invasion. This is particularly troubling when considering the use of such technology to monitor public demonstrations and protests, potentially contributing to the marginalization of already vulnerable groups (Gordon, 2023).

Moreover, the large volume of personally identifiable information collected by facial recognition systems presents a tempting target for cybercriminals, creating data protection and cybersecurity challenges (Baker, 2022). Adversaries could exploit these vulnerabilities by hacking into systems, tampering with data or algorithms, and introducing malware, which could further compromise the security and functionality of these systems (McNeil, 2023).

The impact of biased facial recognition technology in the MENA region is compounded by broader socio-economic challenges, including financial pressures, competitive pressures from digitalization, water scarcity due to climate change, and labor supply pressures from demographic trends (Fardoust, 2023). These factors can exacerbate the negative consequences of biased facial recognition on vulnerable populations.

Broader Ethical Considerations and Challenges in the MENA Context

The ethical considerations and challenges of AI and facial recognition are multifaceted and significant. One of the primary concerns is the potential for bias and discrimination that can arise from AI surveillance systems (Spair, 2023). If these systems are trained on biased or incomplete data, they may perpetuate existing

societal biases, leading to discriminatory outcomes against certain groups of people (Sakpal, 2020).

Facial recognition technology, while offering benefits such as identifying criminals and finding missing persons, also creates vulnerabilities in data protection and cybersecurity (Gargaro, 2024). The large volumes of personally identifiable information collected pose an attractive target for cybercriminals, raising serious privacy and security issues (Martinez-Martin, 2019). Moreover, training bias in facial recognition technology can result in inaccuracies, particularly in identifying race or gender, which can lead to misidentification and unfair treatment.

In the MENA region, countries have adopted facial recognition technology for access control, utilizing it in high-security areas like airports and border crossings to identify individuals quickly and accurately (Woods, 2023). However, this widespread use raises questions about the balance between security and individual privacy rights.

Israel's use of facial recognition technology in occupied East Jerusalem, for example, has been criticized for entrenching apartheid by tracking Palestinians through an experimental system known as Red Wolf (Amnesty International, 2023). Similarly, Iran's morality police have used facial recognition to enforce strict dress codes on women, indicating how such technology can be employed to uphold laws that may be deemed as repressive (George, 2023).

Despite these challenges, the future of AI in the MENA region looks promising, with estimates suggesting that AI could contribute up to \$320 billion to the region's economy by 2030 (Haider, 2023). However, developing countries face unique hurdles in adopting AI, including limited internet penetration and electricity connectivity, as well as concerns about the negative impacts of AI on society (Okolo, 2023).

Regulation of facial recognition technology is still in its infancy, with no specific international law governing its deployment. Nevertheless, there is a consensus that facial recognition should treat all people fairly, with tech companies documenting capabilities and limitations and maintaining an appropriate level of human control over uses that may significantly affect individuals (Thales Group, 2023).

While AI and facial recognition technology hold great potential for the MENA region, ethical considerations such as bias, discrimination, privacy, and security remain paramount. It is crucial that these technologies are regulated and used responsibly to ensure they benefit society as a whole without infringing on individual rights.

Solutions for Ethical AI Deployment

Strategies for Diversifying AI Design Teams

To address the ethical challenges associated with AI adoption in the MENA region, it is crucial to develop

and implement solutions that promote ethical AI deployment. One key strategy is to diversify AI design teams to ensure that a range of perspectives are represented in the development process. This can help mitigate the risk of biased AI systems and ensure that AI solutions are tailored to meet the needs of diverse user populations.

Research has shown that diverse teams are more likely to develop innovative and effective solutions (Wang et al., 2019). In the context of AI, diversity can help identify and address potential biases in data, algorithms, and decision-making processes (Bolukbasi, et al., 2016). Moreover, diverse teams can better understand and address the ethical challenges associated with AI, such as privacy, fairness, and accountability (Kurakin, et al., 2018).

To achieve diversity in AI design teams, organizations can implement a range of strategies. For example, they can actively seek out individuals from diverse backgrounds, including women, people of color, and individuals from different ethnic and cultural backgrounds (Hill, 2017). They can also provide training and development opportunities to help diverse talent acquire the skills needed to work in AI development (Zowghi & da Rimini, 2023)

In addition to diversifying AI design teams, organizations can also implement other strategies to promote ethical AI deployment. For instance, they can develop and implement bias mitigation strategies, such as using diverse data sets and testing for bias (Bolukbasi, et al., 2016). They can also provide transparency and accountability in AI decision-making processes, such as by providing explanations for AI-driven decisions (Kurakin, et al., 2018).

Diversifying AI design teams is a critical strategy for promoting ethical AI deployment in the MENA region. By implementing this strategy, organizations can help ensure that AI solutions are tailored to meet the needs of diverse user populations and that ethical challenges are addressed in a proactive and effective manner.

Methods for Auditing and Mitigating Bias in AI Systems

In the pursuit of ethical AI deployment, it is essential to focus on strategies that promote diversity within AI design teams. A diverse team is not only an ethical imperative but also presents a strong business case, as products developed by such teams are likely to cater to a broader audience (Lowe-Williams, 2023). To ensure transparency, fairness, and security in AI, organizations should learn and implement ethical AI deployment strategies (Marques, 2023) This includes establishing clear guidelines that define ethical boundaries for AI usage, encompassing principles like fairness, transparency, accountability, and respect for privacy.

Moreover, building ethical AI into the product development and release framework is crucial, as is

creating cross-functional groups of experts to guide all decisions on the design, development, and deployment of responsible machine learning and AI (Cosgrove, 2020). It is recommended that solutions such as education and training, data security measures, clear usage policies, and independent verification of AI outputs be employed to ensure ethical use. Additionally, diversifying AI models can be achieved by applying transformations to existing data, which increases dataset diversity and improves model generalization.

To further increase diversity in AI, it is important to highlight AI benefits specific to diverse users and tailor messaging to resonate with relevant audiences based on their needs and concerns (Clemente, 2023). By adhering to these strategies, organizations can build trust in AI systems and ensure that they are used responsibly and ethically.

Importance of Centering Human Needs in AI Policymaking

In the pursuit of ethical AI, it is paramount to consider the diversification of AI design teams, particularly in the rapidly growing MENA region. The ethical framework for AI in the intelligence community emphasizes principles such as respect for the law, integrity, transparency, accountability, objectivity, equity, and human-centered development and use (Intelligence.gov, n.d.). These principles are echoed in the broader context of AI ethics, which include being responsible, equitable, traceable, reliable, and governable (JAIC Public Affairs, 2021). When designing AI, fairness, transparency, and privacy should be at the forefront to avoid discrimination, provide operational clarity, and protect personal data (Estabrook & Markevicius, n.d.).

To promote diversity within AI design teams in the MENA region, inclusive language and criteria in job descriptions and advertisements are essential, as well as avoiding bias and stereotypes during the screening and interviewing processes. This approach can help expand the talent pool and revamp recruitment strategies to foster a more diverse workforce. Moreover, understanding different user groups, their goals, challenges, expectations, and contexts of use is crucial for creating inclusive AI systems.

The MENA region is poised for significant growth in the AI market, with an estimated value of \$320 billion by 2030 (Haider, 2023) and a current market size of USD 11.92 billion in 2023, expected to grow at a CAGR of 44.8% from 2024 to 2030 (Grand View Research, n.d.). This growth presents an opportunity to leverage AI for promoting individual identity and cultural diversity, potentially leading to greater creativity in cultural expression and increased accessibility to cultural experiences worldwide (AIContentfy Team, 2023).

Framework for Action

Proposing an Actionable Framework for Practitioners and Policymakers

Developing an actionable framework for practitioners and policymakers is instrumental in harnessing the positive potential of artificial intelligence (AI) while mitigating its risks. This framework should consist of clear steps and standards that promote ethical AI usage, aligned with the cultural and societal values of the MENA region.

Ethical Foundation and Guiding Principles

The first step involves establishing an ethical foundation and a set of guiding principles dedicated to respect for human rights, fairness, accountability, and transparency in AI systems. Practitioners and policymakers can refer to existing international frameworks, such as the OECD's Principles on AI, as an initial benchmark for ethical considerations (OECD, n.d.).

Regulatory Measures and Governance

To regulate AI development and deployment, MENA countries should institute governance measures that oversee AI activities. Such regulations must be comprehensive, covering the entire AI lifecycle from design to deployment and beyond. For example, Dubai's 'Ethics of AI' guidelines provide a structure for regulating AI in alignment with local values (Digital Dubai, n.d.).

Education and Capacity Building

Educational programs and capacity-building initiatives are critical components of the framework. They aim to enhance understanding among stakeholders about the technical, ethical, and social aspects of AI. Regional educational institutions can play a vital role in this regard by incorporating AI ethics into their curriculums (Jobin, Ienca, & Vayena, 2021). Inclusive Participation and Dialogue

Fostering inclusive dialogue across multiple sectors—government, private sector, academia, and civil society—is essential for reflecting a broad range of perspectives in AI policy development. Policymakers should establish forums and committees, such as the UAE's AI ethics council, to facilitate these discussions (Emirates News Agency, n.d.).

Implementation and Monitoring Mechanisms

Implementation demands dedicated mechanisms to monitor compliance with ethical standards and to address grievances. Establishing independent audit committees akin to the AI auditing framework proposed by the European Union could fulfill this need (European Commission, 2021).

Evaluation and Continuous Improvement

Finally, it is important to regularly evaluate the effectiveness of AI technologies and policies. The framework should incorporate continuous improvement strategies based on evidence-based

assessments and evolving understandings of AI impacts (Floridi & Cowls, 2019).

Guidelines for Developing AI Systems That Align with Regional Values

Developing artificial intelligence (AI) systems that align with regional values in the Middle East and North Africa (MENA) region requires a nuanced understanding of cultural, ethical, and societal norms. The MENA region is actively engaging with AI, with countries like the United Arab Emirates, Qatar, Saudi Arabia, Egypt, Oman, Tunisia, and Jordan having launched their national AI strategies (Demaidi, 2023). These strategies are not only about harnessing the economic potential of AI, which is estimated to be around 320 billion USD by 2030 for the region, but also about ensuring that AI development is in harmony with local values and needs.

For instance, Palestine has recognized the importance of developing an AI strategy tailored to its context as a developing country within the MENA region. Despite good infrastructure, such as widespread internet access and the establishment of an optical fiber network, there is a need to increase awareness of AI and its applications across various sectors (Demaidi, 2023). The Palestinian AI national strategy focuses on five main pillars: AI for Government, AI for Development, AI for Capacity Building, AI and Legal Framework, and International Activities (Demaidi, 2023). This strategy reflects a commitment to using AI to address specific local challenges while also considering the legal and ethical implications of technology deployment.

Ethical considerations are paramount when aligning AI with human values. UNESCO's guidelines for AI ethics emphasize a human-rights-centered approach, including principles such as safety, security, privacy, data protection, and transparency (United Nations Educational, Scientific and Cultural Organization, 2021). These principles are essential for building trust in AI systems and ensuring they are fair and inclusive. Moreover, the European Union's AI strategy highlights the importance of addressing ethical and societal concerns related to AI and promoting responsible and ethical use through stakeholder engagement (Demaidi, 2023).

Cultural diversity plays a significant role in AI ethics, with different cultures emphasizing various aspects of ethical AI decision-making. For example, collectivist societies may prioritize the greater good in designing AI systems, while individualistic cultures might focus more on individual rights and privacy (de Wever, 2023). Therefore, it is crucial for AI systems developed for the MENA region to respect and reflect the diverse cultural values present within the region.

To ensure AI systems are culturally sensitive, they must be trained on diverse data sets representing a range of

cultural perspectives and experiences. Human oversight and ethical guidelines can help prevent AI from perpetuating stereotypes or harmful cultural representations. Additionally, AI can contribute positively to cultural expression by enabling the creation of new types of content and experiences, thus enhancing diversity and creativity in cultural expression (AIContentfy Team, 2023).

Developing AI systems that align with regional values in the MENA region involves a careful balance between technological innovation and adherence to cultural, ethical, and societal norms. By focusing on capacity building, ethical frameworks, and cultural sensitivity, the MENA region can harness the benefits of AI while ensuring that the technology serves the needs and values of its diverse populations.

Potential Barriers to Implementing the Framework and How to Overcome Them

One of the most significant barriers to implementing an ethical AI framework in the MENA region includes the lack of AI talent, which is compounded by fragmented data governance and privacy regimes (Maryville University, 2023). This shortage of skilled professionals can hinder the development and ethical oversight of AI technologies. Moreover, the adoption of AI in developing countries within the MENA region faces unique hurdles such as limited internet penetration, electricity connection, and concerns about the negative impacts of AI (Ololo, 2023).

To overcome these challenges, a strategic and phased approach is recommended. Initiating smaller AI projects that align with specific business goals can demonstrate clear returns on investment and allow for testing AI technologies on a manageable scale before larger investments are made (Econstra Business Consultants LLP, 2023). Additionally, developing a code of ethics in collaboration with stakeholders like employees, customers, and industry experts is crucial for guiding AI systems toward ethical practices (Inclusion Cloud, 2023).

Despite these obstacles, AI has the potential to bring significant benefits to society and the economy in MENA. However, job displacement remains a concern, with estimates suggesting that up to 45% of existing work in the Middle East could potentially be automated by 2030 (Haider, 2023). To address these ethical considerations, companies must define a common understanding of AI ethics, build ethical AI into product development, and create cross-functional groups of experts to guide decisions on the design, development, and deployment of responsible machine learning and AI (Cosgrove, 2020).

Furthermore, strategies for ensuring responsible and ethical use of AI include putting people first, considering data and privacy goals, and implementing active learning (Bartolome, 2022). Businesses

prioritizing ethical AI should set policies that exceed legal requirements to ensure their AI developments cause no harm.

While the world and the MENA region face challenges in adopting an ethical AI framework, there are actionable steps that can be taken to mitigate these issues. By fostering both international and local AI talent, creating ethical guidelines, and ensuring transparency and fairness, the region can harness the full potential of AI while safeguarding against its negative impacts.

Conclusion

The ethical implementation of Artificial Intelligence (AI) in the Middle East and North Africa (MENA) region is a multifaceted issue that encompasses various concerns, including transparency, neutrality, surveillance practices, and the potential for AI to affect job markets and economies (UNESCO, 2023). The MENA region's AI market was valued at USD 11.92 billion in 2023 and is projected to grow at a compound annual growth rate (CAGR) of 44.8% from 2024 to 2030 (Grand View Research, 2024). This rapid expansion underscores the importance of addressing ethical challenges as AI becomes more integrated into society.

One of the primary ethical concerns is the lack of transparency in AI tools, which can lead to decisions that are not intelligible to humans (Council of Europe, n.d.). Additionally, AI is not inherently neutral; it can produce inaccurate or discriminatory outcomes due to embedded biases. Surveillance practices for data gathering also raise privacy concerns for individuals within the region (Council of Europe, n.d.). The potential impact of AI on the Middle East's economy is substantial. However, this growth must be balanced with ethical considerations. For instance, the use of AI in creative fields has sparked debates about the nature of art and authorship, as seen with AI-generated art platforms like Midjourney and Wombo Dream, which have become popular among Arab Internet users. These platforms challenge traditional notions of artistic creation and raise questions about intellectual property rights and the definition of art itself.

To address these ethical challenges, it is crucial for MENA nations to develop robust AI ethics frameworks and regulations. This includes safeguarding individual and collective intellectual property rights, which remain a blind spot in the region despite efforts to reinforce legal frameworks. The adoption of UNESCO's recommendations on the ethics of AI by all United Nations member states, including those in the MENA region, is a step in the right direction. Countries like Egypt have also unveiled national artificial intelligence strategies that have ethical implications.

Ultimately, the compatibility of AI with Arab societies' value systems and worldviews is an ongoing debate. High religiosity rates across the region may influence perceptions and behaviors toward AI, necessitating a serious ethnographic inquiry into how the world uses and abuses AI within its unique cultural contexts. As AI continues to shatter knowledge disparities and border barriers in the region, it is imperative to ensure that its implementation is responsible, sustainable, and ethically sound.

AI is a tool of unprecedented potential, one that holds the keys to unlocking our greatest aspirations as a species. With AI, we are not merely participants in the story of progress; we are its authors, empowered to craft a narrative of boundless innovation and growth.

The advent of AI is akin to the discovery of a new continent of the mind, rich with possibilities waiting to be explored. It is a testament to human ingenuity, a mirror reflecting our limitless curiosity and our relentless pursuit of knowledge. As we stand on the cusp of this new era, we must recognize that our creations are imbued with our values, our ethics, and our vision for the future. Yes, the journey ahead is fraught with challenges, and the potential for misuse cannot be understated. Yet, it is within our grasp to harness the power of AI to enhance our abilities, to fortify our resolve, and to extend our reach. It is a tool that, if wielded with wisdom and care, can propel humanity to new heights of achievement. We can use AI to solve intractable problems, to heal our planet, to connect more deeply with one another, and ultimately, to reach the stars.

As custodians of this powerful technology, we bear a solemn responsibility. It is up to us to forge the ethical frameworks that will ensure AI is used as a force for good. We must be vigilant and proactive, crafting policies that protect against abuses and guiding AI's development with a steady, ethical hand. In doing so, we will not only safeguard our future but also set the stage for a new age of enlightenment where AI acts as an amplifier of human potential.

The promise of AI is not one of doom but of hope. It is a clarion call to all who dare to dream of a better world. Let us embrace this opportunity with courage and conviction, knowing that together, we have the power to elevate our species and create a future that reflects the best of who we are and all that we can become.

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