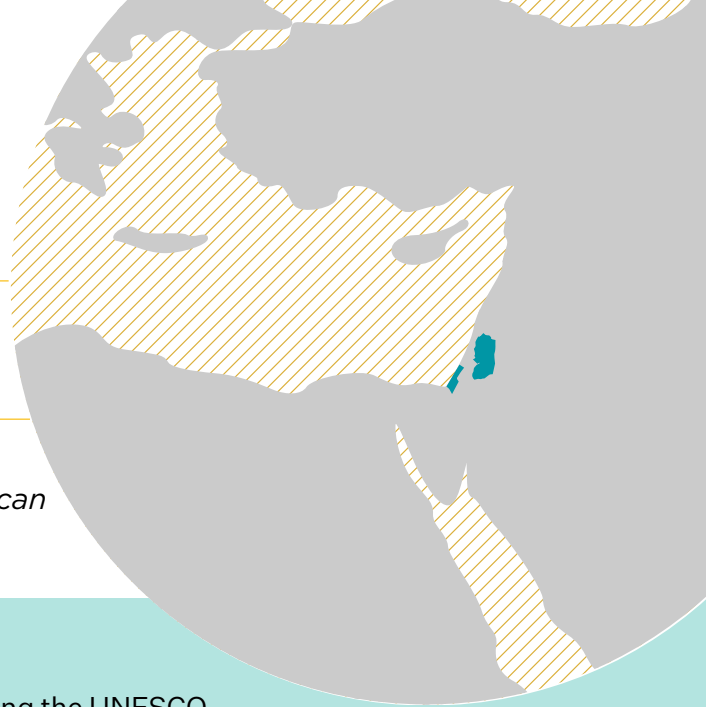


Palestine

Adapting the science landscape for artificial intelligence

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Key takeaways

- The introduction of an AI National Strategy and using the UNESCO Readiness Assessment Methodology tool mark significant achievements for Palestine.
- Capacity-building programmes and infrastructure development are underway, aiming to develop local expertise and create a supportive environment for AI research and applications.
- There is a pressing need to develop policies and frameworks to support and expand AI research and development in Palestine.

As an emerging nation, Palestine faces unique opportunities and challenges in integrating AI into its national research ecosystem. Palestine's AI National Strategy (Ministry of Telecommunications and Digital Economy, 2024a; Demaidi, 2023; Palestinian AI National Strategy, 2023) encourages a comprehensive and collaborative approach, and the country has used the UNESCO Readiness Assessment Methodology (RAM) tool (UNESCO, 2023a, 2023b) to understand its preparedness to implement AI ethically and responsibly. Using insights from both the AI National Strategy and the RAM findings, this case study explores the integration of AI in Palestine and outlines opportunities, challenges and strategic actions aimed at enhancing national preparedness and adaptation for AI in the scientific ecosystem.

Institutional arrangements

The Palestinian Council of Ministers established an Artificial Intelligence National Team, headed by the Ministry of Telecommunications and Digital Economy (MTDE), in September 2021. The team includes representatives from government ministries, authorities and councils, and from the academic and private sectors. This ensures that AI initiatives align with national development goals, such as enhancing economic growth, fostering innovation and addressing societal needs.

Universities and research centres play a crucial role in AI research and talent development. However, Palestine's expenditure on research and development (R&D) is approximately 0.01% of its GDP, significantly below the global average of 2.62% (World Bank Open Data 2021) and the overall research output from Palestinian universities is far lower than that of leading global institutions. By 2023, Palestine had produced 1,867 AI-related publications, a modest number when compared with other countries. The proportion of female authors of AI

publications in Palestine (16.03% in 2023) also lags behind countries such as India (52.03%), the USA (48.43%) and France (41.70%) (OECD.AI Policy Observatory 2024).

There remains a pressing need for increased research output and the Palestinian AI National Strategy calls for more investment to bridge this gap and foster innovation.

Role of the private sector

The private sector is a critical component of the AI National Strategy, with key institutions playing pivotal roles. The Bank of Palestine, by supporting technology-based start-ups, including AI-driven ventures, is helping build a resilient ecosystem for innovation. Its RISE-Palestine and SAFE-Palestine initiatives offer technology-based start-ups essential financial resources, mentorship and networking opportunities (RISE-PALESTINE, 2024).

By integrating private sector participation and fostering a strong start-up ecosystem, Palestine can accelerate the development and adoption of AI technologies, driving economic growth and innovation across various industries.

Building a robust foundation for AI development

Developing the necessary infrastructure is crucial for scaling AI development and implementing AI-based solutions across Palestine. Establishing dedicated AI research centres and enhancing existing facilities will promote advanced AI research. Palestine currently has five data centres, which help support AI and data-intensive applications (Data Center Platform, 2024). However, the country lacks a policy for AI-driven cloud computing, something that is vital for scalable AI solutions. Developing such policies and ensuring a legal framework for consistent data management and publication are essential to advance AI infrastructure.

The Palestine Emerging initiative emphasizes the critical need for a robust digital infrastructure to support AI development and overall economic growth. A key element of this infrastructure is the implementation of 5G technology throughout Palestine (Palestine Emerging, 2024). The adoption of 5G will be transformative, enabling enhanced Internet connectivity, supporting advanced AI applications and providing the foundation for innovations in sectors such as healthcare, education and smart cities.

However, during the recent war on Gaza, Internet connectivity has declined significantly, with many areas experiencing up to an 80% reduction in access, and some regions facing complete shutdowns. Power outages are frequent and prolonged (Access Now, 2023). These issues have been devastating for Gaza's universities and technology start-ups. Most universities have been severely damaged or destroyed, affecting the studies and career opportunities of thousands of students (Le Monde, 2024; Reuters, 2024) and removing an important source of research and innovation, which are vital for developing Gaza's tech sector. For technology start-ups, the challenges are just as serious. With regular power and Internet interruptions, many companies cannot continue their work, connect with global clients or meet deadlines. These problems make it much harder for Gaza to close the digital gap and restrict the technology sector's ability to support future growth and recovery.

Data sharing and accessibility

Data sharing and accessibility are essential for using machine learning and AI in scientific research, with high-quality, accessible datasets enabling researchers to train and validate AI models effectively. The Open Data Inventory (ODIN) examines the coverage (how much data is available) and openness (how accessible the data is) of official statistics, with an ODIN score representing how well a country provides important statistics and whether the data is easy to access and use (Open Data Inventory, 2024). Palestine's ODIN score of 71/100 indicates a good start in making important data available for AI research, but more work is needed to improve its open data policy.

Making high-quality datasets more accessible with better metadata, more download options and clear open licensing will strengthen Palestine's infrastructure for AI research, helping to drive innovation. Its open government data policy aims to create additional datasets representing different sectors in the country. Notably, the data policy mentions making datasets available and accessible for research. Currently, 40 datasets are available on a portal which focuses on education, finance and agriculture (Open Data Palestine, 2024). The MTDE is working on an open data 'hackathon' to enhance the existing datasets and encourage their use for research and innovation (MTDE, 2024b).

Developing a national data-sharing framework will help ensure structured data management and accessibility and facilitate the integration of data from various sectors, thus enhancing the ability to apply AI effectively. The formation of a national committee tasked with expanding the availability of datasets and supporting AI research and applications reflects Palestine's commitment to institutionalizing open data practices.

Capacity building for AI in Palestine

Capacity building is a cornerstone of Palestine's AI National Strategy. Developing the ability to identify the information to collect, the technical knowledge to gather, store and present data, and the expertise to interpret it are essential for cultivating a robust science ecosystem that can leverage the full potential of AI. The AI National Strategy emphasizes several key areas to ensure a knowledgeable and skilled workforce, fostering a culture of innovation and ethical responsibility.

Awareness of AI-related laws and regulations is critical for the ethical and responsible implementation of AI technologies. The AI National Strategy highlights the need for education on legal frameworks to ensure stakeholders are well-informed and compliant. Building this awareness lays the groundwork for responsible AI deployment, fostering trust and adherence to ethical standards.

The AI National Strategy also sets clear goals for educational integration, aiming for 300 AI graduates and the incorporation of AI into four educational programmes within three to five years. Key initiatives include launching an AI R&D centre, integrating AI into school curricula, developing hands-on AI courses at universities and initiating AI programmes across all higher education institutions.

As part of the Palestine Emerging initiative, the Gaza Technical University of Reconstruction

(GTUR) will integrate programmes for researchers focused on post-conflict reconstruction and economic development with a strong emphasis on AI and related technologies. GTUR will also offer a vocational programme, training local workforces to address post-conflict challenges, ensuring that students are equipped with the necessary AI skills to contribute to Palestine's reconstruction and economic growth.

Within GTUR, the Data4Palestine initiative will serve as a central data hub for collecting, analysing and disseminating real-time information on the impact of conflict and reconstruction efforts across Palestine. This initiative will aggregate and leverage crowdsourced data, satellite imagery, social media analysis and other data sources to provide comprehensive insights to guide reconstruction and development efforts. It will also develop interactive dashboards for decision-makers.

GTUR students and faculty will be actively involved in research, fieldwork and data analysis projects, ensuring that the data reflects the lived experiences of those most affected by conflict. The curriculum will incorporate courses on data collection and analysis, geospatial analysis and AI. By fostering collaboration with international partners and creating opportunities for practical application, GTUR and Data4Palestine will strengthen Palestine's AI and data infrastructure, driving innovation and informed decision-making in the reconstruction process.

Additionally, the Palestinian Information Technology Association of Companies has started a programme to upskill 40 mid-level engineers in technology companies, ensuring that professionals in the industry are equipped with advanced AI skills. This fosters innovation and enhances research capabilities within their companies, contributing to the overall scientific and technological development in Palestine.

The Arab American University is playing a leading role in advancing AI research and offers robust AI educational programmes, contributing to the cultivation of local talent. Fostering partnerships with international AI research institutions also brings global best practices to regions like Palestine, where AI has the potential to address significant local and regional challenges. Such international collaborations can amplify research outputs, foster innovation and develop AI solutions that are directly relevant to the unique challenges of these areas.

Next steps

Despite its achievements, limited resources and funding for AI projects hinder further progress in Palestine. There is a need for a robust legal framework to support AI development, and expanding AI research is crucial, with an emphasis on increasing the number of AI research projects and publications. Strengthening partnerships between government, academia and the private sector can foster collaborations and drive innovation, while developing and refining laws and regulations for AI will address emerging ethical and societal issues. Finally, integrating AI education into all levels of the educational system will prepare the next generation for an AI-driven world.

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