Hashemite Kingdom of Jordan

وزارة الاقتـــصاد
الرقمـي والريادة

Jordan Artificial Intelligence Policy

2020

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1 Introduction

(1) Government recognizes the leading role of Artificial Intelligence (AI) in the development of a sustainable digital-led economy. This is confirmed by the General Policy for the Information & Communication Technology and Postal Sectors 2018 in Article 8 which states: "This policy is intended to seize the opportunities of the Fourth Industrial Revolution with the primary goal being the development of a digital economy leading to renewed economic development and increased income and wealth of individual Jordanians. Government is keen for Jordan to harness existing and emerging digital technologies including but not limited to Artificial Intelligence, Blockchain and the Internet of Things (IoT) provided by the Telecommunications, Information Technology and Postal sectors for economic and social development."

Article 61 of the same Policy provides that: " Government recognizes the important role of the IT sector in Jordan in the development of the digital economy, and the intellectual property and high value jobs that are its basis noting that Jordan is already contributing to the development of emerging technologies including AI, distributed ledgers (blockchains) and the
Internet of Things. Accordingly, Government is, through the Policy, renewing its support for the development and growth of the sector with the aim of maintaining and developing Jordan's position as a strong regional IT services hub, an enabler of the digital economy and a leading exporter, with the strength to develop intellectual property of its own that will be the basis for its future revenue."

(2) Due to the rapidly growing Tech industry and the need to align the digital environment with the opportunities offered by the new digital and emerging technologies, global studies anticipate a significant increase in the contribution of artificial intelligence to Gross Domestic Products (GDPs) in the global economy, depending on the country's technological progress. In this regard, Jordan is expected over the next five years to witness an increase in the number of graduates from disciplines that directly serve the field of artificial intelligence. Further, an increase in the number of technical universities is also anticipated by introducing programs that serve the needs of the labor market in the field.

(3) There are different definitions for artificial intelligence, but for the purposes of this Policy, it refers to the use of digital technology to create systems capable of performing tasks that stimulate human mental abilities, mimic their actions, analyze the surrounding environment, learn from errors and exhibit traits associated with the human mind such as the ability to reason and make predictions, give recommendations or take actions that affect real or virtual environments with a degree of autonomy.

(4) Artificial intelligence is of vital importance with its various applications that create new opportunities in the labor market and improve the efficiency, quality and availability of government services, reducing their costs and improving their take-up across all segments of society. This helps accelerate economic development and creates an environment that encourages innovation and entrepreneurship through the development of applications that leverage AI, and the development of mechanisms and solutions to meet the challenges of the era, including cyber attacks and handling big data. In this context, the Government endeavors to place Jordan as a strong regional tech hub and an entrepreneurial enabler, leveraging the availability of distinguished local talents. This is in addition to stressing the importance of embracing AI as a national strategic priority on the one hand, and on the other as an achievement of the sustainable development goals set by the international community to be achieved by 2030. Embracing AI also helps create new methodologies to develop and improve the utilization of traditional and non-traditional data sources and create new frameworks for data management and utilization.

(5) Accordingly, the Government, through the Ministry of Digital Economy and Entrepreneurship (the Ministry), has issued the Jordanian Artificial Intelligence Policy 2020 (the Policy) in order to enhance future comprehensive cross-sectoral social and economic development, keep abreast of the steady changes in AI, harness its great economic benefits and improve the performance of government sectors, namely in education, health, agriculture, industry and environment. In addition, AI plays a role in setting directions and priorities and determining the necessary means of adoption of legislative, participatory and ethical dimensions of technology.

(6) Government considers the application of AI in the public sector a priority in order to increase the efficiency of government services, support the local AI -ecosystem, build confidence in government services, spread a culture of openness to AI and encourage investment in it. Therefore, the Government needs to work in partnership with the private sector to embrace AI in all economic sectors, with a focus on health, education, energy and clean technology, financial services, transportation, telecommunications, and cybersecurity. Further, the Government needs to encourage the adoption and development of AI in the private sector with the aim of maintaining and developing Jordan's position as a strong regional IT research and entrepreneurship hub and increasing the contribution of the information and communication technology sector to the Jordanian economy.

(7) The implementation of AI faces several challenges, most importantly its potential impact on workforce. In this context, international studies indicate that some traditional jobs are likely to be lost, but, in return, the application of advanced technology will create new jobs related to data analysis and other professions necessary for the maintenance, operation and development of AI. In addition, there will be an increase in demand for scientific disciplines such as mathematics, statistics, software and medical fields. Therefore, the Government, through this Policy, aims to maintain and develop national competencies in these areas against current regional and global competition.

(8) In addition, one of the key challenges that this Policy aims to address is the absence of legislation and regulations governing the use of new technological systems that are based on AI, machine Learning, deep learning, data sharing, privacy preservation and algorithmic bias. Therefore, the Policy sets out the necessary tools to address such challenges.

(9) Government recognizes the opportunities that lie in the development of national and international competencies in the fields of AI, data science and analysis, programming, and engineering and technology specialties such as mathematics, science, computer and data science. Moreover, it is important to make use of academic and administrative institutions that are able to provide scientific consultations and practical expertise in the field of AI and data science. Likewise, it is crucial to create a modern technical education system that pays special attention to departments and colleges providing specialized academic degrees in AI in more than one university in Jordan. Also, further cooperation is needed between higher education institutions to adapt their curricula to ensure that they are aligned with labor market requirements.

(10) Therefore, the Government's vision, as reflected in this Policy, is to harness AI as an essential element to increase the effectiveness and performance of public and private institutions with the aim of developing Jordan's position in the region as a leading country pursuing AI advantages and preventing its potentially negative consequences.

2 Policy Scope of Application

(11) The Policy is applicable to the public and private sectors, international and local organizations, civil society organizations, and individuals, who are either developers or providers of AI-based services and technologies in the Kingdom, or any outside entity working or providing services for the benefit of the Kingdom.

3 Policy goals

(12) Through this Policy, the government aims to achieve the following goals:
1. Promote the use of AI in all vital economic sectors.
2. Build an enabling environment for AI that encompasses the legislative, regulatory and technological environment.
3. Develop a digital infrastructure to keep pace with AI needs and developments.
4. Build AI-specialized Jordanian capacities, expertise and skills, and employ knowledge in developing all sectors.
5. Strengthen the role of the public sector in the use of AI and its applications and build the necessary partnerships with the private sector with the aim of enhancing productive pathways toward sustainable development.
6. Strengthen AI business environment and increase investment and support for AI-related initiatives and Jordanian startups in the IT sector, providing service-based solutions.
7. Build a well-established system for scientific research, development, application and experimentation related to AI, and create the right environment for it.
8. Raise public awareness and increase confidence in AI in the public sector and all segments of society.

4 Policy Pillars

(13) In order to achieve the Policy goals, it is of significant importance to address the following main pillars: governance, legislative and regulatory environment, digital infrastructure, business and investment environment, and capacity building.

1-4 Pillar One: Governance

(14) To implement this Policy and manage its outputs, a National Ministerial Committee for Artificial Intelligence (the Committee) formed under a decision by the Council of Ministers. The Committee is headed by the Minister of Digital Economy and Entrepreneurship, with members from a number of ministries and government institutions working in data-rich sectors such as health, education, finance, energy, clean technology, cyberspace, transportation, justice and community protection. This is in addition to representatives from the private sector, civil society organizations, academia and research bodies.

(15) The Committee is tasked with the development of a general strategic framework to activate AI in all priority sectors and submits its recommendations to the Council of Ministers. In addition, the Committee plays a central role in supporting the rapid adoption of AI-powered technological solutions

and is responsible for building an effective and dynamic environment that promotes the growth of AI in Jordan. This is done by defining the national priorities needed to adopt those solutions through putting incentives in place, maximizing data availability and engaging entrepreneurs in developing AI-based technological industries in Jordan.

(16) The Committee shall set out sectoral plans and strategies for AI that state the required market analyses, define the procedures and give the necessary recommendations for the growth of AI in the Kingdom per sector as required. The Committee may form specialized sectoral committees as required to implement AI solutions in specific sectors.

(17) The Committee is responsible for laying the foundations that ensure promoting the use of AI in the Kingdom and addressing any challenges that stand in the way of achieving growth in the field.

(18) Artificial intelligence is primarily based on technology and data. Therefore, the Government requires the Ministry to monitor the implementation of the Policy and its outputs. The Ministry shall submit an annual report to the Committee, which includes evaluation of Policy implementation through the use of smart self-assessment tools. Further, the Ministry is responsible for reviewing and updating the Policy in partnership with the relevant authorities, provided that the review period does not exceed four years.

2-4 Pillar Two: Legislative and Regulatory Environment

Legislative and Regulatory Frameworks

(19) Government is aware of the importance of a legislative environment in speeding up the adoption of smart technology solutions. Therefore, the Ministry must study the legislative environment with the aim of making the best use of AI in the public sector, motivating the private sector to adopt smart solutions while ensuring data security and privacy, and ensuring the availability of high-quality government data.

(20) Government is the largest driver and consumer of technological solutions. That is because the government's procurement mechanisms are the main drivers to adopt smart solutions in the public sector. Therefore, the Ministry, in coordination with the Procurement Department and the Committee, must aim to review the legislative requirements related to government procurement in order to facilitate the adoption of AI in the public sector. In this context, the review process is intended to focus on prioritizing open-source programs and solutions based on open standards and assigning the highest priority to empowering Jordanian entrepreneurs and start-ups to provide AI-based solutions.

National Charter on AI Ethics

(21) Government realizes that there are some concerns that may slow down the adoption of AI-based solutions, such as poor accountability, lack of clarity in the decision-making mechanism, lack of justice and bias in data analysis. Therefore, the Government requires the Committee to prepare a National Charter on AI Ethics by launching a national initiative that draws on international best practices in order to draft the aforementioned National Charter, in cooperation with government and private entities, civil society organizations, universities and research institutes involved in AI. The Charter shall provide a framework of principles and guidelines related to the accountability of AI operating systems and ensuring their transparency in decision-making and impartiality in data processing and data privacy.

(22) Government also recognizes the negative effects that technology may have, especially with electronic systems that analyze data and make decisions in accordance with existing findings and surrounding environment. Therefore, government entities must aim to assess potential risks related to the privacy of individuals, racial discrimination, data penetration and the loss of some jobs. The entities are required to inform the Ministry of those risks so that it shall investigate and discuss them with the Committee to take measures to minimize them.

Regulatory Sandbox

(23) Government recognizes that there are regulatory frameworks that may hinder the application of AI technologies in the public sector due to the sensitivity of the data and the decisions that may arise as a result of that application. Therefore, the Government requires for the Ministry to establish an experimental regulatory environment (sandbox) for AI applications and solutions. The sandbox aims to evaluate outputs during experimental phases to assist government entities in overcoming obstacles facing long-term plans and development.

3-4 Pillar Three: Digital Infrastructure

ICT

(24) Government is aware of the need to increase investment in the Information and Communications Technology (ICT) sector with the aim of providing an infrastructure that is capable of transmitting data at the speeds needed by AI applications, such as 5G, IoT, and promoting the creation of local network access points. Keeping pace with the latest telecommunications infrastructure developments is of vital importance.

(25) Government understands the need to develop technological solutions to support AI ecosystems. Therefore, the Telecommunications Regulatory Commission (TRC) shall work with the relevant government entities to develop a plan to raise the standards for tech exports and imports related to AI.

Data Governance

(26) The full and speedy implementation of the Data Classification and Management Policy (2020) will promote and help accelerate the adoption of AI in government projects. Therefore, the implementation of the aforementioned policy is central to the government, as its different entities should refer to the policy in matters related to AI management in the public sector and to governmental data classification and protection controls.

(27) Government is aware of the importance of sharing and facilitating access to the data of the public and private sectors with the aim of developing digital startups and small and medium enterprises and encouraging competition and digital innovation in the field of AI. Accordingly, the Government requires its entities, in cooperation with the Ministry, to support and facilitate a safe and reliable exchange of data sources.

(28) The Ministry shall establish, manage and continuously update participatory data warehouses and reliable data sources. In addition, it shall establish rules and prepare all necessary instructions and standards to define the rights and responsibilities of participants with the aim of facilitating safe, open and non-discriminatory access to voluntarily shared data sources in accordance with the requirements of personal data protection and anonymity, security and accountability. In addition, processing of personal data must comply with the Personal Data Protection law once enacted.

(29) Government requires its entities to ensure the full and speedy implementation of the Open Government Data Policy and all the Ministry's relevant instructions and requirements in order to improve the quantity and quality of government data available to the public. The Ministry shall also consider the need to standardize data formats or application programing interfaces (APIs) to facilitate access to and use of such data.

(30) Government recognizes the importance of supporting Open APIs to facilitate access to government data. The Ministry shall meet the technical and organizational requirements needed to achieve this.

Cloud Platforms

(31) Government recognizes that cloud platforms enables growth and development at lower costs and better quality. Therefore, Government intends to motivate the public and private sectors and entrepreneurs to benefit from cloud platforms in developing services and applications in accordance with the relevant government legislations. This aims for rapid growth in small and medium enterprises, leading to growth in digital economy.

4-4 Pillar four: Business and Investment Environment

Research and Development

(32) Government is aware that a national research and development system specialized in AI will help disseminate and embrace the technology, encourage new investments and support the creation of new AI-based businesses. Therefore, Government intends to encourage investment in research and development through the development of the National Center for Innovation (NCI) established under NCI Act No. (90) of 2018, under the provisions of Article 7 of the Higher Council for Science and Technology Law No. 30 of 1987. As a center of excellence and a major network for scientific research and development, NCI encompasses scientists and researchers with the aim to discuss developments in AI, conduct applied research, enhance participation and cooperation among the research community, and organize events to promote research and increase students interest in AI topics. Moreover, NCI has a responsibility to provide the necessary support to governmental and private research institutions, increase financing aimed for the expansion of scientific research and government research programs and encourage full partnership between universities and companies in AI. This can also be achieved in cooperation with the Scientific Research Support Fund of the Ministry of Higher Education and Scientific Research with the aim of establishing effective partnerships between academic, governmental and the private bodies to accelerate progress in AI.

(33) Government requires that NCI acts as the main coordinator of the academic community in this area, acting as a research hub through the establishment of a scientific research network and development to support research and increase students interest in AI topics. The network will bring together researchers in the field of AI to promote participation, relationships and cooperation among members of the research community. To accomplish this, NCI aims to organize an annual meeting in Jordan for local, regional and international researchers, among other concerned stakeholders, to discuss the latest research developments.

(34) In order to achieve the desired benefit from research and development in AI, the Ministry, in cooperation with the relevant entities such as NCI and the Scientific Research Support Fund, shall seek to coordinate and develop a scientific research environment and launch periodic research programmes related to artificial intelligence in existing research centres. Furthermore, the Ministry shall establish new specialized AI research centres or laboratories across the Kingdom that are fit for each region's

needs and potentials, and capable of developing sectors to adopt AI-based solutions. Examples on this include the establishment of centres specialized in agriculture and education in the northern region, health, education and transport in the central region, and energy and water resources in the southern region. The Ministry, in coordination with the Committee, shall develop an incentive system that includes tax exemptions or preferential financing programmes with the aim of encouraging AI research and development in the private sector in Jordan.

Classification of AI Entities

(35)   Government recognizes the extent of difference in the objectives of technology companies providing AI-based services. However, competition between these companies must be maintained. Therefore, the Ministry, in cooperation with the Ministry of Industry, Trade and Supply, the Companies Control Department and other relevant bodies, shall set out classification criteria for AI entities with the aim to raise the level of competition among entities working in this field, based on firm foundations such as compliance with the National Charter on AI Ethics, cooperation with research institutions, and the ability to provide solutions that support national priorities.

(36)   The Ministry shall raise the awareness of all entities and bodies in the field of AI about the classification implementation mechanisms and how to move from one classification to another to benefit from incentives in accordance with the level of classification and in cooperation with the relevant authorities.

Support Investment in AI

(37)   Government requires that the Ministry, the Ministry of Planning and International Cooperation and the Ministry of Finance, in cooperation with the Investment Commission and the Telecommunications Regulatory Commission and in consultation with AI stakeholders, develop the necessary measures that encourage investment in AI in Jordan in accordance with the classification of AI entities, which include, among others, tax exemptions, investment incentives and public-private partnerships. The aforementioned ministries shall then submit their recommendations to the Ministry of Finance to study the desired economic feasibility and its impact on the national economy and develop specialized AI accelerators.

(38)   Government recognizes the risk of migration of AI-based business away from complex tax environments and procedural requirements. Therefore, the Investment Commission, in cooperation with the concerned entities, shall develop special facilitations for investors in AI aimed to increase chances of their investment in the private sector and strengthen the government support to investment in startups that aim to build and develop AI-based solutions in Jordan. Such facilitations include tax exemptions, research grants, facilitation of bidding procedures, giving priority to AI funding, and localization of digital products that rely on AI and promoting them locally, regionally and globally.

Public-Private Partnership

(39)   Government sets out requirements for the Public-Private Partnership Council formed under the Public-Private Partnership Law No. (31) of 2014 and its amendments, to give priority to projects that embrace AI, such as joint research projects, and encourage entrepreneurial companies active in the field, giving them priority in government tenders and joint development of some applications such as experimental applications.

(40) Government believes that the public sector plays an important role in promoting and adopting AI. Therefore, the public-private partnership shall aim to focus on benefiting from government resources including experimental projects and government procurement with the aim of supporting the growth of AI locally, which will significantly improve the efficiency of government services. Since government services public, the Ministry must set in place rules and controls that govern the adopting of AI through partnership with the private sector for the purposes of monitoring, accountability and minimizing potential damage.

5-4 Pillar Five: Capacity Building

Awareness

(41) Government is aware of the importance of building a community culture that is aware of AI-based solutions. Therefore, the Ministry, in cooperation with the relevant entities, civil society organizations and higher education institutions, shall develop and implement periodic awareness programs at different levels for government employees and organize community events that aim to spread AI culture among all segments of society and develop smart solutions that serve the public sector and enable its employees to establish and develop their own companies.

Education

(42) Government stresses the importance of reorienting school education in Jordan to provide students in elementary and secondary schools with the skills and knowledge necessary to develop technology in innovative ways. To that end, Government requires the Ministry of Education to develop an action plan with the aim of making the necessary adjustments to elementary and secondary education curricula. The review process should take account of the modification of the main enablers of AI, such as mathematics curricula development that aims to refine students' mathematical skills including mathematical analysis and algorithms used in artificial intelligence. In addition, more efforts should be placed on developing computing curricula with the aim of developing students' digital skills, such as programming, and development of new innovative teaching methods including cartoon story writing, among other skills related to AI.

(43) Government believes that the reorientation of school education requires certain competencies that enable educating and training students on modern technologies. Therefore, Government requires the Ministry of Education to attract the necessary talents and train teachers and guide them on how to provide AI education to students.

(44) Government requires the Ministry of Higher Education and Scientific Research, in consultation with Jordanian higher education institutions and other stakeholders domestically and internationally, to develop an adjustment plan for curricula and higher education programmes aimed at enhancing the skills of graduates in a way that supports the growth of AI and ensures that are fit for the demands of labour market in the AI era.

Skills and Competencies

(45) Government aims to develop the skills of national competencies at the global level. Therefore, Government requires the Technical and Vocational Skills Development Council (TVSD Council), established under the Technical and Vocational Skills Development (TVSD) Law No. (9) of 2019, to study the necessary AI skills at the local and global levels, in cooperation with the Committee and the

Ministry, to identify the educational needs and skills expected to arise in the AI era, and to conduct consultations with different parties to gather information on digital skills and AI tools necessary for Jordanian citizens. These include core skills that the Jordanian workforce needs in order to adapt to future AI-affected labour markets and acquire the necessary skills to support AI research, development and design.

(46) The TVSD Council shall submit an annual report to the Technical and Vocational Skills Development Commission, formed under the Technical and Vocational Skills Development (TVSD) Law No. (9) of 2019. The report should identify the key anticipated skills in demand and provide the necessary recommendations and actions to keep pace with the rapid developments in this field. Moreover, the Ministry shall monitor with the Technical and Vocational Skills Development Commission the implementation of the report's recommendations.

(47) Government recognizes that the AI tools used in management will reprocess and redefine management systems in the public sector in order to increase efficiency. Therefore, Government intends to spread a culture of continuous education in Jordan. Therefore, the public and private sector stakeholders shall take the necessary measures and implement programs that aim to rehabilitate the workforce in AI and develop their skills through organizing specialized training courses for technical employees that encourage innovation.

(48) Government encourages public-private partnerships including international and national administrative, educational and technological institutions in order to support the diffusion of AI knowledge and skills among public sector employees and build their capacity in this field through singing memorandums of understanding, which could include a fellowship programme for Jordanian civil servants to work for a specified period in the private sector, and workshops, webinars and courses for government officials, in cooperation with private sector experts.