

Jordan's *Artificial Intelligence* Strategy and Implementation Plan

2023 - 2027



Ministry of Digital Economy and Entrepreneurship

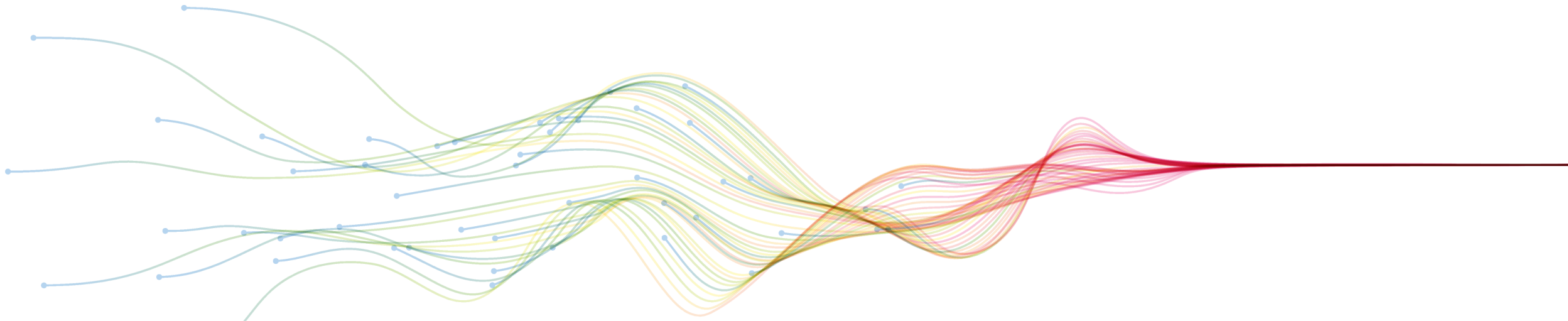


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1.0 Executive Summary

Jordan's Artificial Intelligence Strategy and Implementation Plan of 2023-2027 is an extension to the previous strategies and policies regulating digital transformation and digital technology that have been developed by the government, in line with and keeping pace with the global trends for the adoption of Artificial Intelligence. The strategy aims to accelerate the social and economic development of citizens in key areas such as Health, Education, Social Protection, Employment and Well-Being, through creating a supportive and stimulating environment for establishing artificial intelligence systems at the national level, in addition to building capacities, developing human skills, and raising the efficiency of education at all educational levels.

In order for the strategy to have a clear and competitive vision at the regional level, a focus has been placed on promoting Jordan to become one of the leading countries in this field by creating a technological and breakthrough environment that attracts investment in AI and making the most of the national ecosystem that supports AI, such as skilled and trained Jordanian human resources, digital infrastructure, and related policies and strategies that have been adopted in recent years to support the national economy.

Considering that data is of great importance as it represents the most important and indispensable potential in the search, development and implementation of solutions based on Artificial Intelligence. Whereas a specific chapter on data has been included therein to highlight the importance and role of data in achieving economic development, improving government performance, and supporting decision-making processes based on the resulting analysis and predictions related to Artificial Intelligence systems.



Stakeholders

1.0 Executive Summary

The strategy is accompanied by an executive aspect, as five main objectives of the strategy have been set in line with Jordan's Artificial Intelligence Policy 2020, where the first four objectives focus on developing the supporting ecosystem to enable artificial intelligence, namely: building capacity and developing Jordanian skills and expertise, promoting scientific research and development, improving the environment for investment and entrepreneurship in the fields of artificial intelligence, and ensuring a legislative and regulatory environment that supports the safe use of artificial intelligence. On the other hand, the fifth objective focuses on applying artificial intelligence tools to increase the efficiency of the public sector and priority sectors.

In order to achieve the strategic objectives, a number of initiatives and projects have been identified to promote Artificial Intelligence, which are divided into two main types: The first type focuses on building a supportive ecosystem for Artificial Intelligence in Jordan, and the second type are applied projects that focus on the use of Artificial Intelligence to develop the priority economic sectors that have been carefully selected based on specific factors and in consultation with the stakeholders in these sectors. On the other hand, two types of performance indicators and digital objectives have been identified, the first type being at the level of strategic objectives and the second type being directly linked to projects and initiatives.

2.0 Introduction

Artificial Intelligence is one of the most important emerging technologies, contributing significantly in all sectors. Several studies and reports estimate that the contribution of Artificial Intelligence to the global economy will increase by 5% to 25% of GDP, depending on the technological level of each country. In addition to the great role that Artificial Intelligence plays in fostering entrepreneurship and innovation, openness to the future, and actively contributing to providing the labor market with new job opportunities, it improves the efficiency and quality of public services, lowers their cost, and expands their reach to cover all segments of society.

Legal Reference:

1. Pursuant to the provisions of Article No. (3) Paragraph (D) of the Telecommunications Law and its amendments No. (13) of 1995, which refers to the functions of the Ministry of Digital Economy and Entrepreneurship to improve the competitive position of the Kingdom at the international level in the field of communication and information technology.
2. According to Article No. (61) of the General Policy for the Communications, Information Technology and Postal Sector of 2018, approved by Cabinet Decision No. (3921) on 31/03/2019, it states that "The government recognizes the important role of the information technology sector in Jordan in developing the digital economy....

It is noted that Jordan is already contributing to the development of new technologies such as artificial intelligence (AI), blockchain, and Internet of Things (IoT). Accordingly, this policy highlights the government's support for the development and promotion of this sector to maintain its regional position and advance it as a strong center for information technology services..."

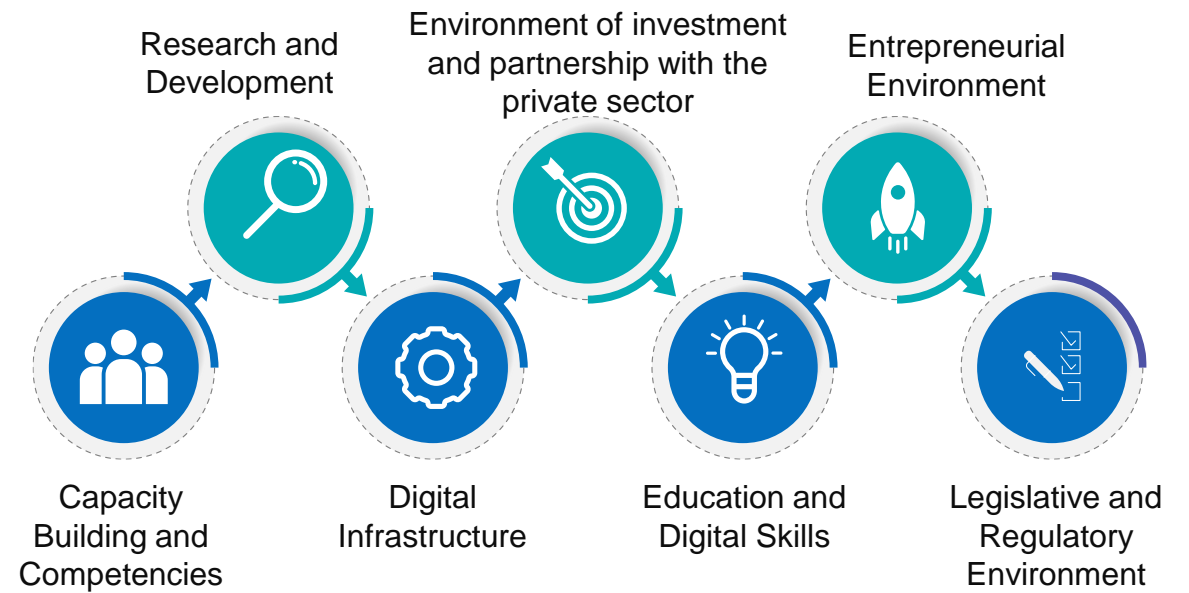
3. Based on the Jordanian Artificial Intelligence Policy of 2020, approved by Cabinet Decision No. (659) dated 20/12/2022, which requires the development of a general strategic framework to promote artificial intelligence in the Kingdom's priority economic sectors.
4. In line with previously developed legislative instruments and national strategies such as the National Digital Transformation Strategy and Implementation Plan (2021-2025), the General Policy for Entrepreneurship and its National Strategic Plan, and data-related policies such as the Personal Data Protection Law (when it becomes effective), the Open APIs Policy, the Open Government Data Policy, the Data Classification and Management Policy, and the Investment Environment Regulation Law (when it becomes effective).
5. In line with the vision of economic modernization 2022-2033, which primarily aims to achieve a better future by achieving accelerated growth and improving the quality of life for all citizens, with the goal of developing Jordan into a center for high-value industry in the region, achieving

2.0 Introduction

excellence and increasing the competitive value in the field of artificial intelligence is one of the most important service sectors and benefiting from emerging technologies and tools of the fourth industrial revolution, in addition to preparing talent to keep pace with the demands of the future by equipping them with the necessary skills. On the other hand, the vision of economic modernization includes a large number of initiatives, including no less than 47 initiatives related to communications, information technology, digital economy and entrepreneurship, covering 17 main and sub-sectors, so that these initiatives are reflected in 5 growth engines, which are: Future Services, Entrepreneurship and Innovation, High Value Industries, Jordan as a Global Destination, and Sustainable Resources.*

6. Based on international and regional best practices and intensive discussions with relevant institutions and stakeholders from the public, private, and academic sectors in this field, the Ministry of Digital Economy and Entrepreneurship (the Ministry) prepared the Jordanian Artificial Intelligence Strategy and Implementation Plan for 2023-2027 (the Strategy).


The strategy confirms that the adoption of AI solutions in the Kingdom requires the existence of a national supportive AI enabling ecosystem that increases the effectiveness and performance of public and private institutions to put Jordan at the forefront of countries benefiting from AI technologies. The following figure shows the components of the national enabling ecosystem for Artificial Intelligence.




This strategy is based on a set of general values and principles that contribute to the development of a number of actionable initiatives and projects in the field of artificial intelligence:




Values and Principles




Artificial intelligence systems should be a complement to the existing workforce, not a replacement for it.




Use the digital infrastructure available in the Kingdom, adapt and improve it to develop artificial intelligence systems.




Activating the partnership to reduce the gap between education outcomes and the labor market.



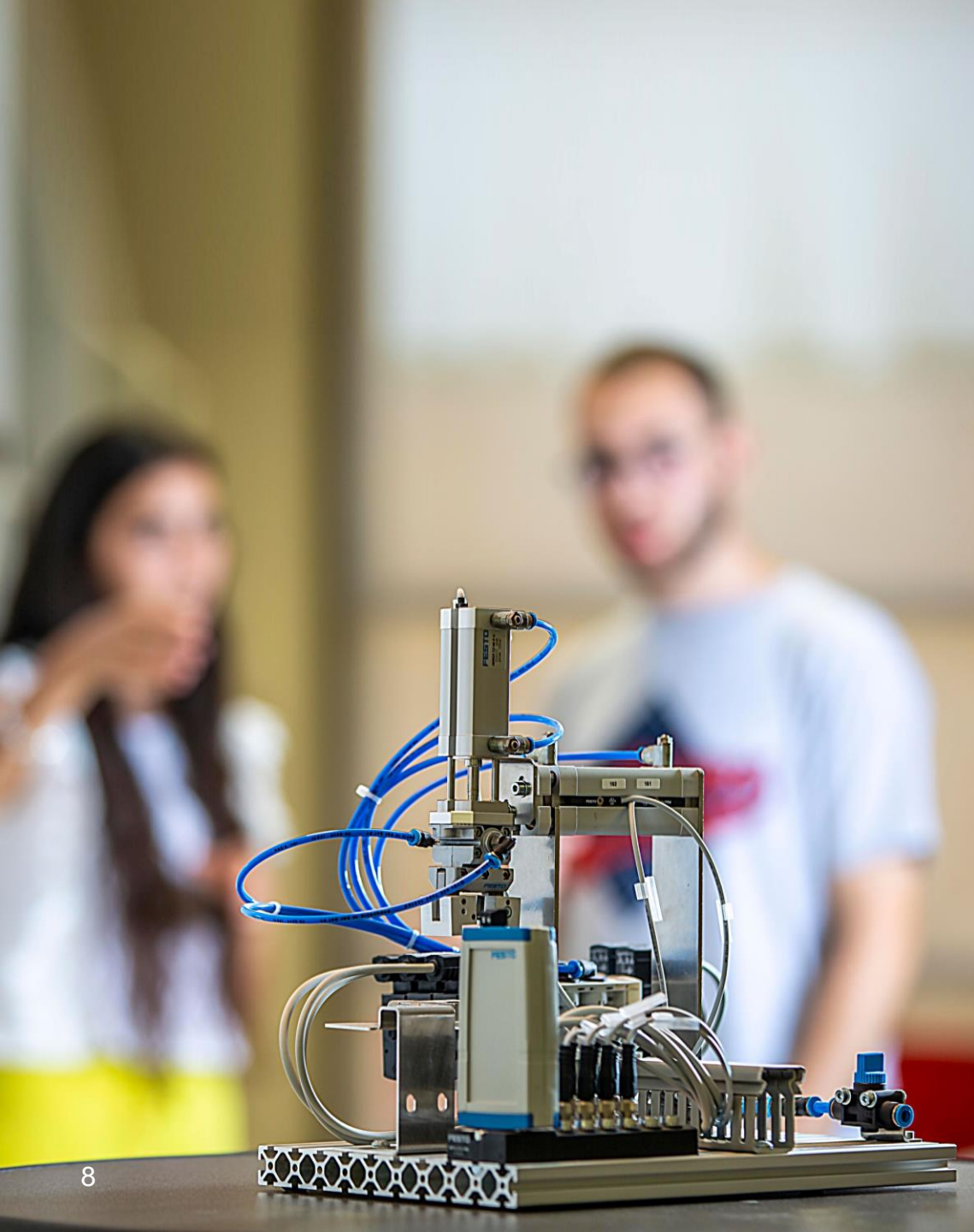
Activate the partnership between the public and private sectors, academia, civil society, vocational training institutions, and citizens to ensure the success of the strategy.



Determine the initiatives and projects to be implemented under the strategy based on actual needs in each sector.



Focus on specific priority sectors that are rich in data that can be collected, processed, and have a tangible impact on citizens.

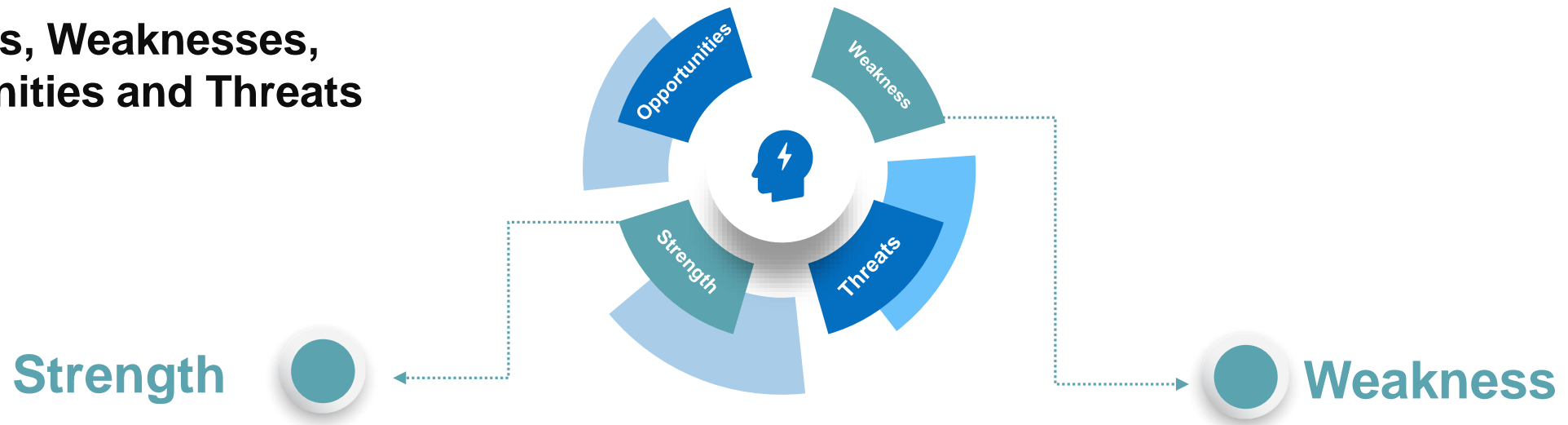


2.0 Introduction

The Status of Artificial Intelligence in Jordan

In order to develop a solid national strategy for Artificial Intelligence, it is important to assess the Kingdom's readiness and the readiness of its various sectors for the actual integration of Artificial Intelligence systems by identifying the strengths and weaknesses as well as the key opportunities and challenges in these sectors, whether they are government or private sectors. The current status of Jordan's readiness to implement Artificial Intelligence systems was explored by conducting a variety of meetings, interviews, and workshops with relevant national institutions to gain insights into current challenges and future initiatives and plans related to Artificial Intelligence.

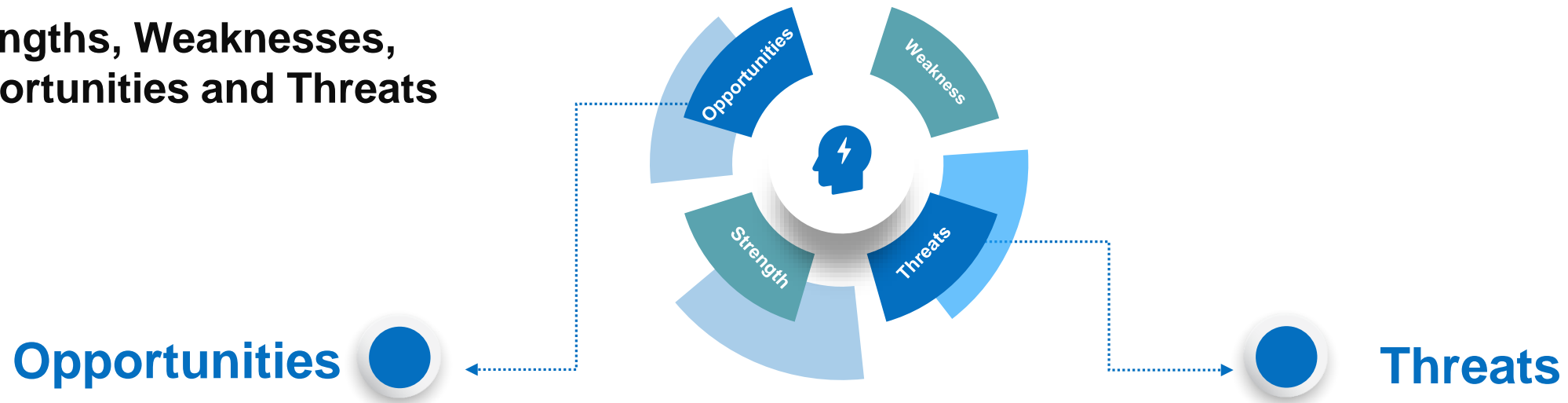
Strengths, Weaknesses, Opportunities and Threats



- A young Jordanian society that relies heavily on human capital to achieve economic growth.
- The will of the Jordanian government to introduce artificial intelligence solutions.
- Availability of laws and regulations in the fields of digital transformation and new technologies.
- Establishment of technical university subjects in the fields of artificial intelligence and data science.
- Availability of adequate number of researchers and graduates in Artificial Intelligence degree programs.
- Demand from start-up companies and entrepreneurs who want to use artificial intelligence.
- Existence of a number of stimulating investment programs and initiatives.
- Scalable digital infrastructure for artificial intelligence deployment.
- Government databases of national data and information.

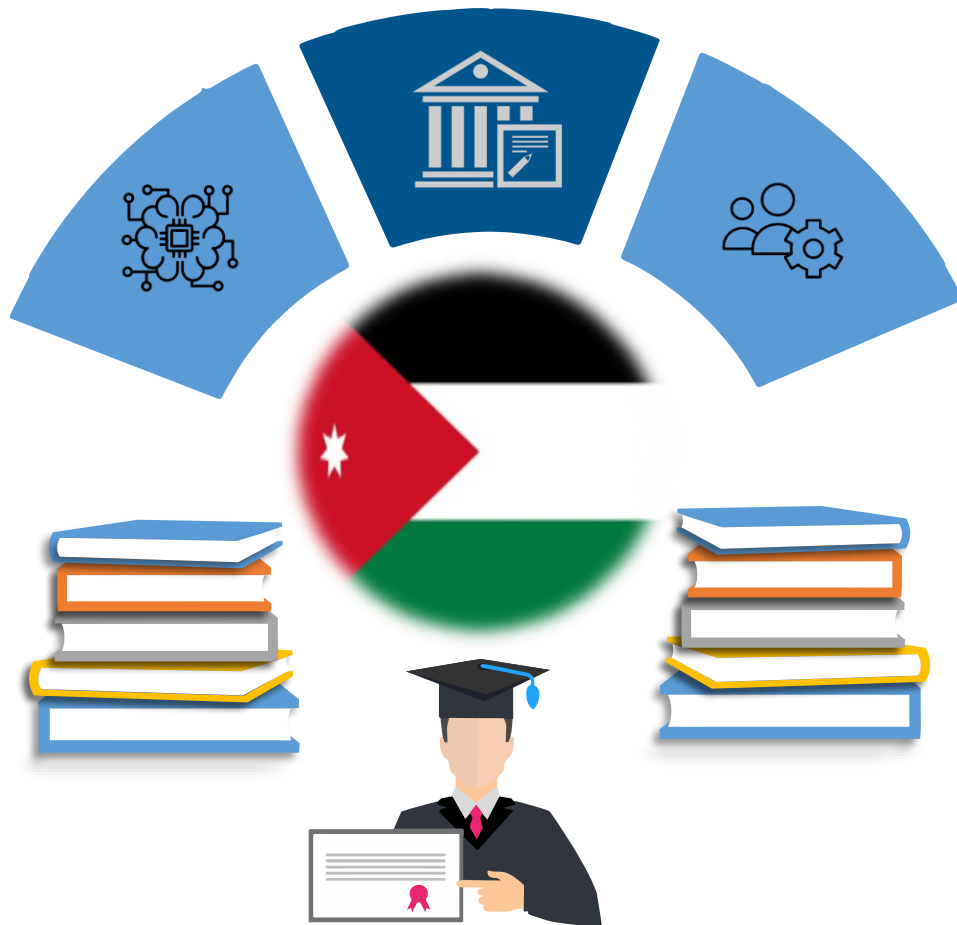
- Weak social awareness of the importance of artificial intelligence.
- The lack of a central government body dedicated to monitoring and regulating artificial intelligence research and development projects and initiatives.
- Weak awareness of the importance of including artificial intelligence projects in the annual plans of state institutions.
- Neglect of practical and applied aspects in the design of university subjects.
- Limited support, financial and training resources for start-up companies.
- Slow procedures for licensing, registration, and issuance of professional practice certificates for start-up companies.
- Unreadiness of data stored in state databases to meet requirements.
- Insufficient material and technical equipment for dealing with Big Data and building artificial intelligence systems.
- Weak partnership between researchers and different sectors to activate important applied research at the national level.
- No existing catalogue for data available at government and private institutions.

Strengths, Weaknesses, Opportunities and Threats



- Partnership between the public, private, and academic sectors to implement and develop artificial intelligence projects.
- Maximize the use of government databases to provide innovative solutions to national challenges and support decision-making.
- Training individuals in the field of artificial intelligence.
- Creating new jobs in the field of artificial intelligence.
- Improving digital government services.
- Deploying high-quality artificial intelligence research to find smart, applied solutions.
- Attracting investment and providing funding for start-up companies operating in the field of artificial intelligence.
- Increasing the competitiveness of existing and start-up companies at the local and regional level.
- Making young Jordanian society more willing to adopt new digital skills.
- Maximizing the use and development of government and private cloud platforms.
- Keeping pace with global developments in communications, information technology, and artificial intelligence.
- Expand higher education in this field and support universities to make Jordan a leading regional education centre for Arab countries.
- Establish a dedicated regulatory authority for artificial intelligence and data governance.

- Constant changes in government priorities.
- The difficulties in passing and updating laws and the long periods of time needed to do so.
- The rapid pace of technological development and the need to keep up with it in government policies and strategies.
- Insufficient commitment to the ethics of artificial intelligence.
- Hesitation and resistance in developing traditional systems to apply artificial intelligence.
- Outflow of Jordanian skills and competition with regional and international markets.
- Limited government funding for the information technology sector.
- Data protection and fear of privacy violation and cybersecurity requirements.
- Lack of optimal use of infrastructure.
- Unavailability of data and difficulties in collecting, processing, storing, and transmitting data, including personal data.
- Taxes, fees, and high operating costs for existing and emerging businesses.
- The ability to build trust and invest in AI systems.



Jordanian society is characterized as a young and digitally skilled society, as it relies on human capital with its innovations and creativity, as well as its various researches and possession of digital skills and creative thinking among Jordanian youth, in addition to the availability of skills specialized in technological fields, which is the result of a strong technical education environment that keeps pace with the development provided by academic institutions. As for the visions, orientation and belief of the government regarding the adoption of artificial intelligence techniques translates, and to shed light on the status of artificial intelligence, we outline some figures and statistics regarding the number of researchers and the number of scientific research that has been produced in the last five years (2017-2022) in the fields of artificial intelligence, where the number of researches reached 897 *, and the number of researchers in the field of artificial intelligence reached 584 researchers.

On the other hand, there are 20 public and private universities offering artificial intelligence degree programs, with approximately 3,000 students studying the relevant subjects.

In the field of artificial intelligence, there are more than 75 companies so far. Their work focuses on education, business intelligence, data analysis, natural language processing and other areas.

The Economic and Social Impact of the Application of Artificial Intelligence

The application of artificial intelligence technology promotes economic growth through the development of new business models that improve the performance of institutions in the public and private sectors and increase their productivity, which positively affects their competitiveness, increases their chances of entering new markets, and improves their ability to absorb economic fluctuations.

The introduction of artificial intelligence represents a key factor leading to the solution of important national problems, such as: the problem of unemployment and narrowing the gap between the rich and poor segments of society, which requires the government to reorder its priorities and focus its efforts to obtain external support for investment in the field of artificial intelligence, which in turn highlights Jordan's role in regional competition and improves its rank in international reports, as Jordan is ranked 80th out of 160 countries in the global index of government readiness in the field of artificial intelligence "Oxford Index" for the year 2021, with a rate of 44.38%.

There is no doubt that artificial intelligence applications play an important role in increasing production and reducing its cost, as a 2018 study by McKinsey Global Research Institute showed that artificial intelligence is expected to add about \$13 trillion to the global economy, as it contributes to overall production by about 1%. A 2016 report by Accenture projects that the use of artificial intelligence technologies will double the economic growth of many developed countries by 2035, with most gains coming in healthcare services, financial markets, retail, and transportation services.



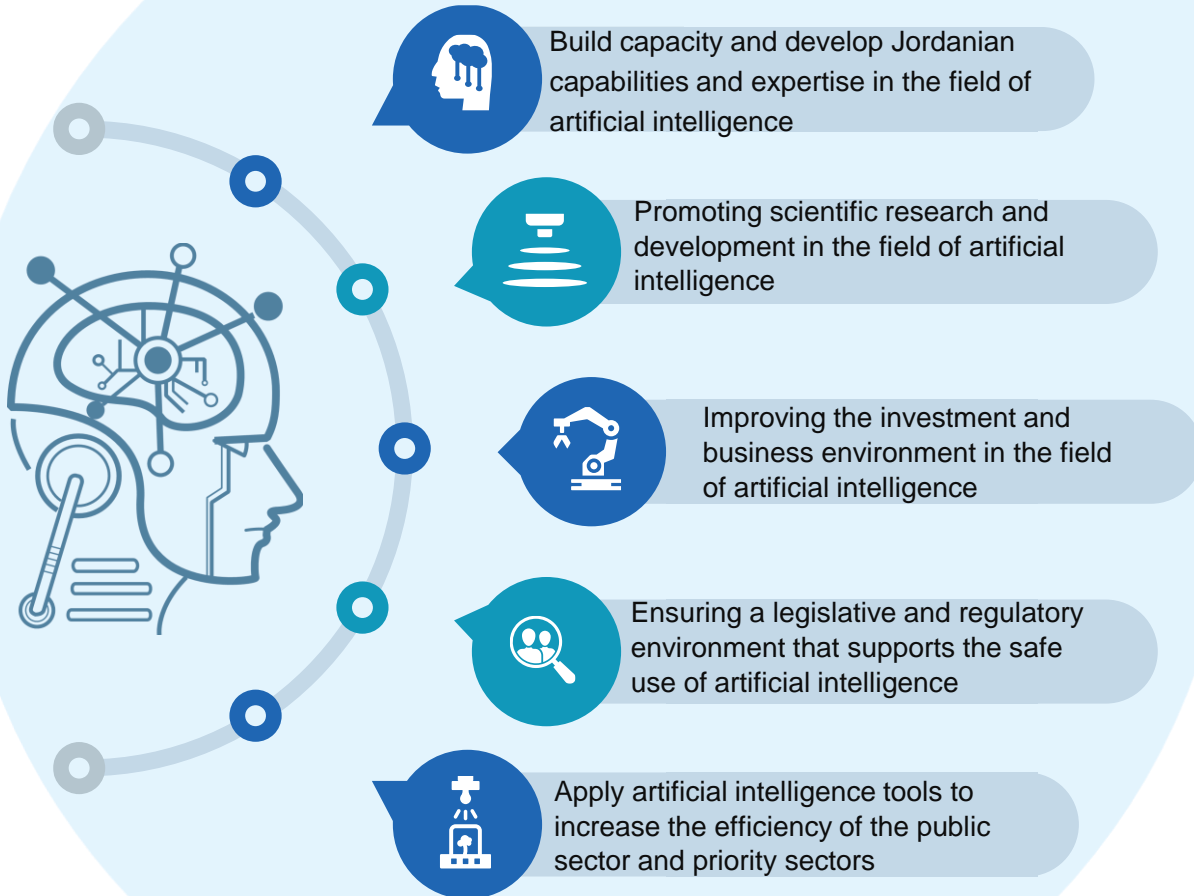
The Economic and Social Impact of the Application of Artificial Intelligence

For the Middle East, PwC predicts that the economic impact of these technologies will amount to \$320 billion by 2030, with manufacturing at the forefront of sectors that will have the opportunity to invest in artificial intelligence in the region, along with several others, including financial and educational institutions, public services, and pharmaceuticals.

On the other hand, the Ministry of Digital Economy and Entrepreneurship has developed a National Code of Ethics for Artificial Intelligence, which addresses the ethical aspects of the introduction of artificial intelligence in all sectors, focusing on the protection of privacy, civil rights, justice, equality and impartiality, in order to protect the social system from the fears caused by the introduction of artificial intelligence technology at the national level. The Ministry will work to implement the Code of Ethics in accordance with procedures that protect citizens while not limiting creativity and innovation in the field of artificial intelligence.



3.0 Vision and strategic goals



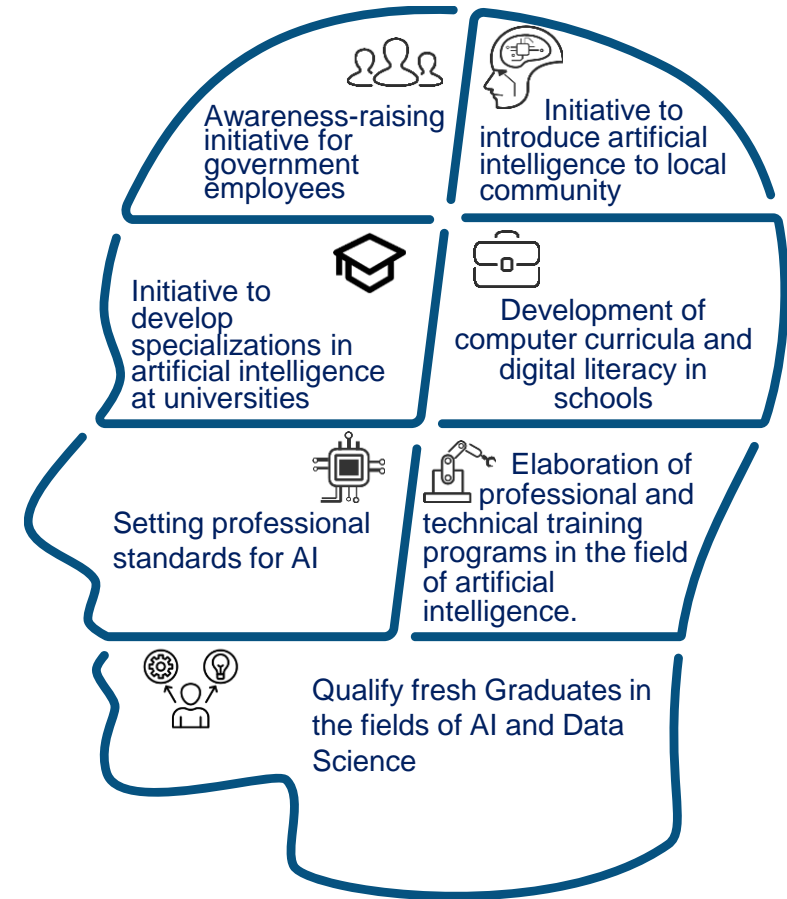
Making Jordan a regional leader in artificial intelligence and creating a unique and attractive technological and entrepreneurial environment where artificial intelligence can be effective, supportive, and an integral part of the national economy

First Objective:

Building capacities and developing Jordanian skills and expertise in the field of artificial intelligence

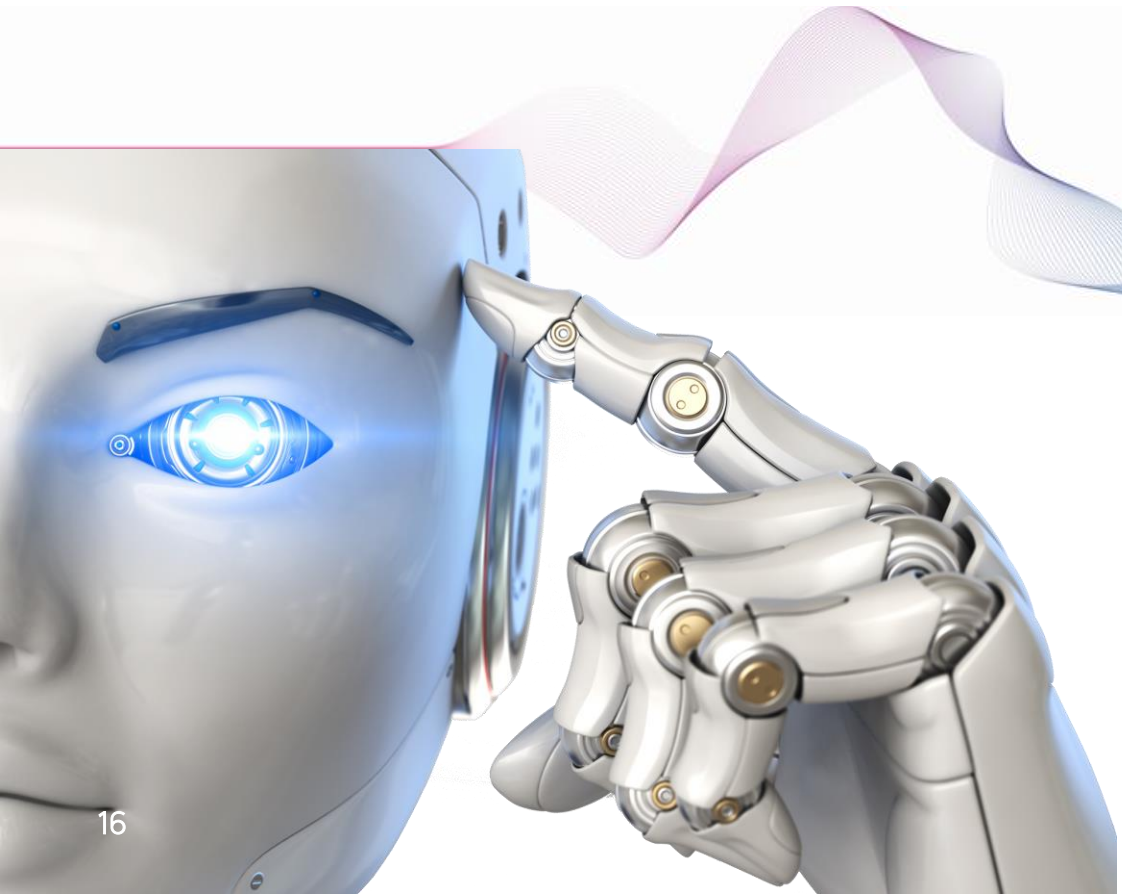
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In order to be able to effectively take advantage of any new technology, it is necessary to develop and invest in national human resources, develop skills, increase efficiency and awareness, develop education at all levels to be compatible with artificial intelligence technology, and utilize available private sector capabilities so that Jordan becomes a producer of high quality and skilled human resources to serve local, regional and global markets. To ensure the optimal achievement of this strategic objective, work will be carried out in three main areas: Raising Awareness of Artificial Intelligence, Education at All Levels, and Building and Enhancing Skills and Competencies.



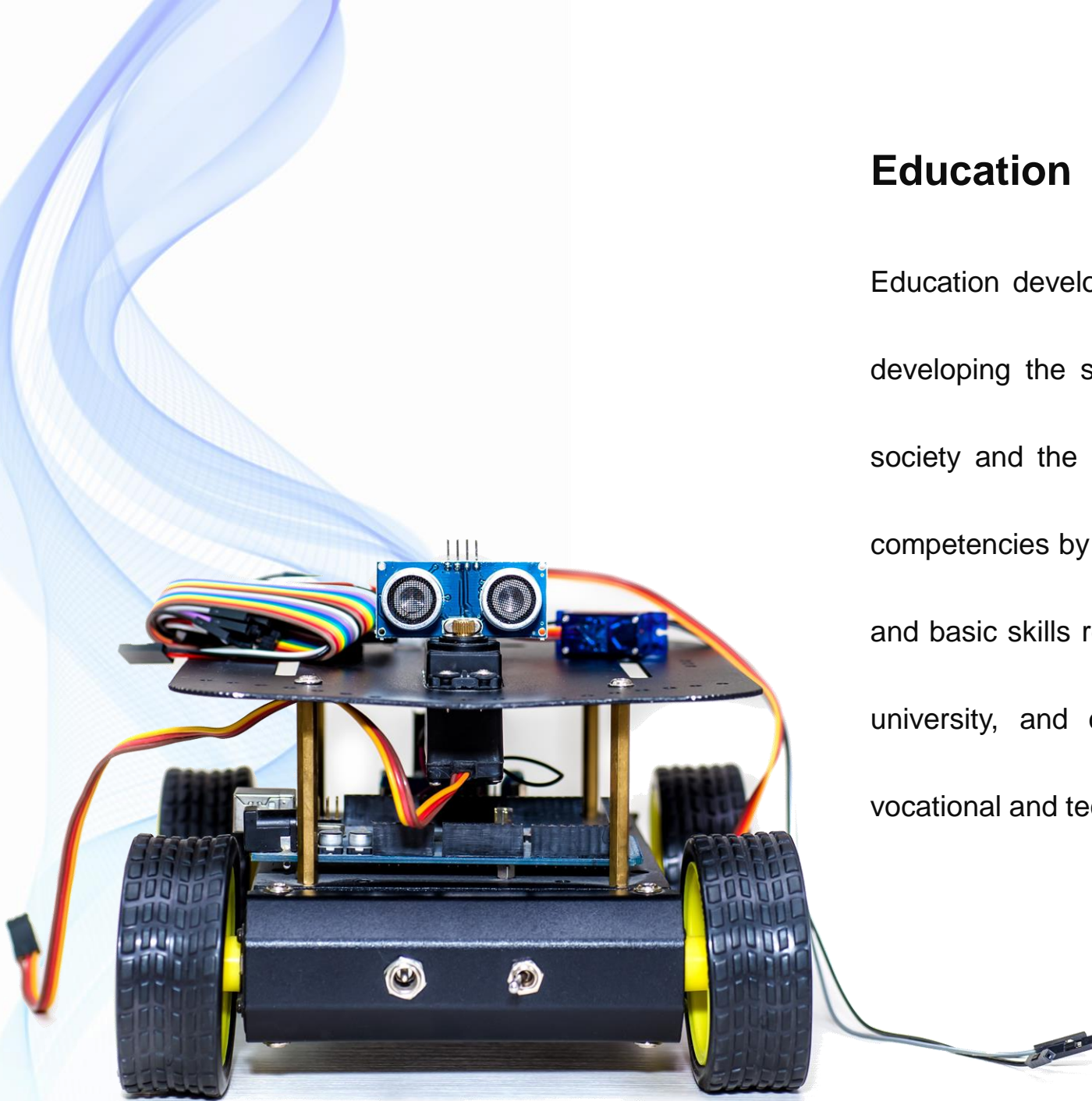
Raising Awareness in Artificial Intelligence

Increasing awareness, societal culture, and competence in the field of AI is an important prerequisite for accepting and keeping pace with the development of emerging technologies, especially AI, and an impetus to learn new skills to benefit from them in improving the quality of life. The same could be achieved through the adoption and implementation of a series of initiatives targeting all categories of Jordanian society in general, such as promotional campaigns in all available means of communication, in addition to projects and initiatives aimed at raising awareness among government sector employees through the implementation of a series of workshops, seminars, and various training programs.



Education

Education development is the cornerstone for building and developing the skills of the next generation and providing society and the labor market with qualitative and qualified competencies by integrating the topics, general applications, and basic skills required by artificial intelligence into school, university, and community college curricula, as well as vocational and technical training programs.





Capacity building and upgrading of skills and competencies

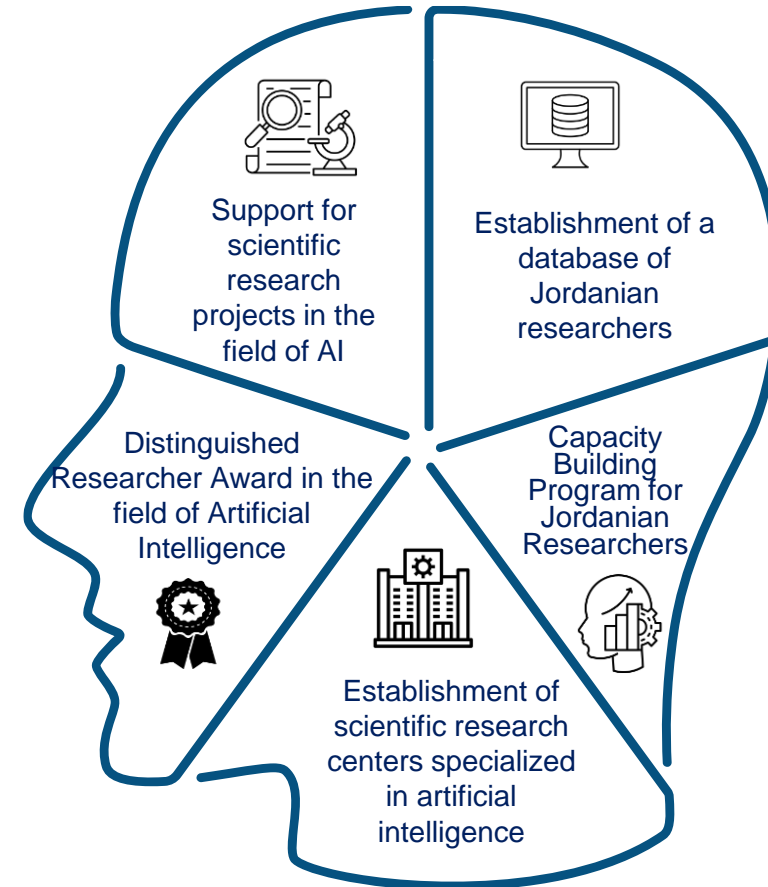
In order to improve Jordan's ability to compete globally with qualified and outstanding national skills and competencies in artificial intelligence and related technologies, it is necessary to work on developing competencies, building capacity, and improving the technical skills that individuals need to acquire, to enter the world of artificial intelligence through specialized training programs targeting individuals, graduates, and workers in communications, information technology, mathematics, physics, computer science, and others to enable them to compete for artificial intelligence jobs in the local and global markets.

Second Objective:

2

Encouraging scientific research and development in the field of artificial intelligence

Promoting research and development in the field of artificial intelligence and directing efforts towards applied research with a national dimension are among the innovative future solutions to the main problems facing the government sectors. Therefore, a program to build the capacity of Jordanian researchers in the fields and applications of artificial intelligence must be implemented. There is also a need to increase support and incentives for researchers and scientific research projects to create effective partnerships between the academic, government, and private sectors to accelerate progress in artificial intelligence to bridge the gap between these sectors and develop applied research to solve national problems.

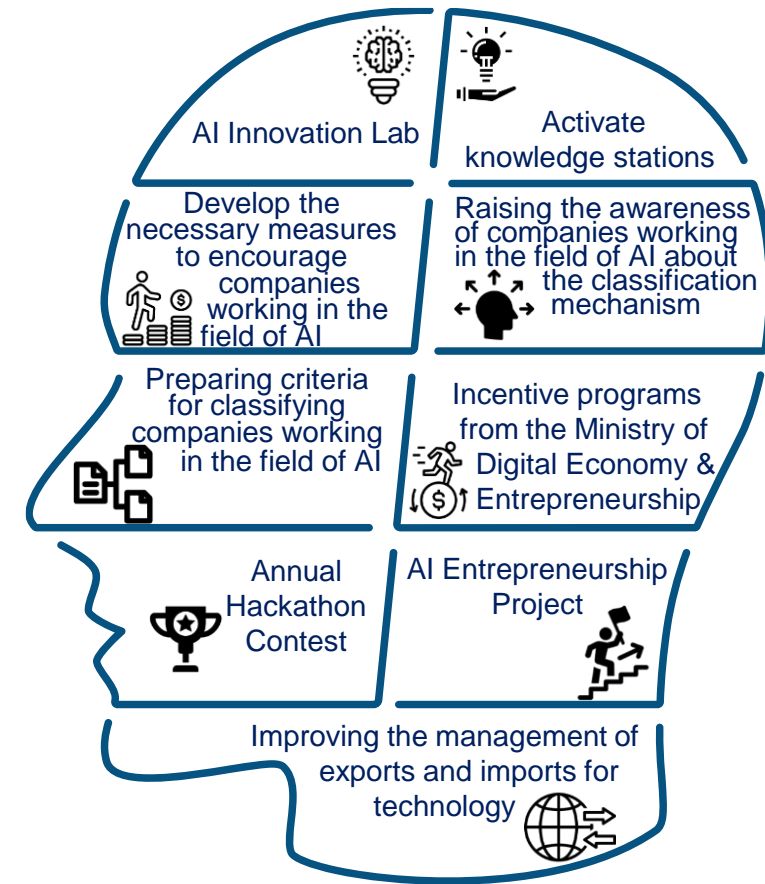


Third Objective:

3

Enhancing the investment and entrepreneurial environment in the field of artificial intelligence

Creating an investment-attractive environment and an incubator for entrepreneurship in the field of artificial intelligence and removing obstacles, ensures maximizing economic potential and enhancing Jordan's ability to compete regionally and internationally, and push the wheel of the national economy towards a knowledge-based digital economy capable of attracting existing and emerging companies and entrepreneurs to work in artificial intelligence. This is done by providing a set of facilities such as tax exemptions, investment incentives, supported employment and training programs, in addition to activating business incubators specialized in artificial intelligence and providing laboratories and technical applications that support entrepreneurs in creating pioneering solutions based on artificial intelligence. In addition, the adoption of a clear plan that includes the standards and foundations necessary to control exports and imports of technology related to artificial intelligence to enable public and private institutions and entrepreneurs to provide the appropriate technology and tools to encourage them to invest in solutions and applications of artificial intelligence *.

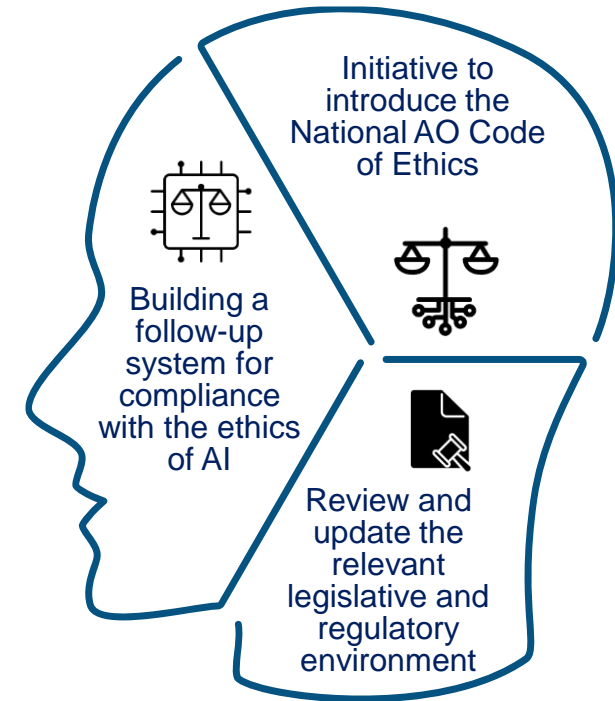


Fourth Objective:

Ensuring the legislative and regulatory environment that supports the safe deployment of artificial intelligence

Therefore, this objective has been an important prerequisite for the implementation of the Strategy and for ensuring the best management of risks that may arise in the deployment of artificial intelligence in different areas, as well as for strengthening the confidence of the community by relying on safe applications that do not violate privacy rights and protect the personal data of citizens and residents, which are protected by laws. This is done by conducting studies, reviews and continuous updating of the legislative and regulatory environment suitable for the application of artificial intelligence, based on the best international practices in the field.

In addition to encouraging institutions and companies that develop and operate artificial intelligence systems to adopt and follow the National AI Code of Ethics, which includes a set of principles and guidelines that promote the rule of law, human rights, democratic values, and diversity, and consider ethical issues for the use of artificial intelligence. Organize publicity campaigns in the media and conduct workshops and seminars to communicate the ethics of artificial intelligence in a simple way and raise awareness of the benefits and risks of artificial intelligence techniques.

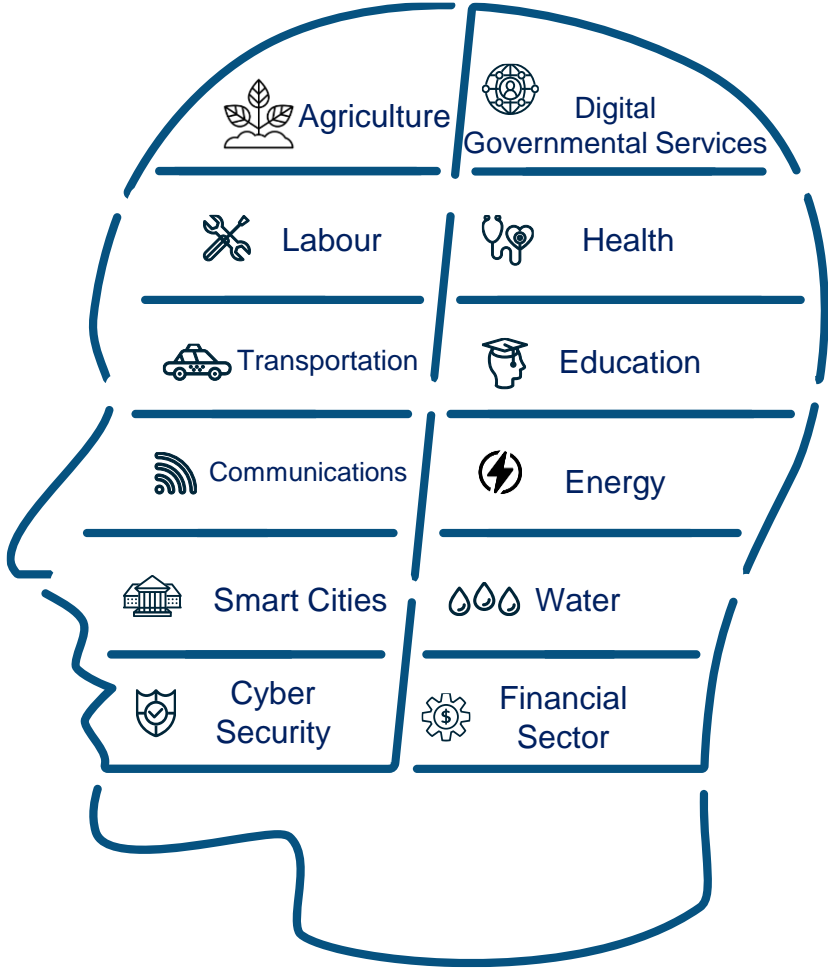


It is possible that the introduction of artificial intelligence will lead to the emergence of some risks that need to be identified and a number of scenarios that need to be properly managed in order to achieve trustworthy AI.

Fifth Objective:

Applying artificial intelligence tools to raise the efficiency of the public sector and priority sectors

Jordan is working through enabling factors and the supporting artificial intelligence ecosystem to identify priority sectors based on a balanced philosophy to select the most relevant sectors that can benefit from the application of artificial intelligence solutions in a way that positively impacts the performance of government institutions in delivering services to citizens, through an approach based on a partnership between the public sector and private, academic and civil society organizations and individuals, so that the different capabilities are leveraged, especially the skills and capacities available through the Artificial Intelligence Innovation Centers of the private sector, and support in the implementation of the initiatives covered by this strategy. On the other hand, these initiatives and applied projects will be implemented in a way that links them to the national strategic challenges within the priority sectors, in addition to building and developing a supportive artificial intelligence ecosystem and promoting the use of new technologies to improve public services.



Fifth Objective:

Applying artificial intelligence tools to raise the efficiency of the public sector and priority sectors

Key priority sectors for the deployment of artificial intelligence solutions and applications include: Health, Education, Energy, Water, Agriculture, Smart Cities, Transportation, Digital Government Services, Labor, Financial Sector, Communications, and Cybersecurity. The following factors were considered when selecting projects within the priority sectors:

- High likelihood of project implementation and completion.
- The direct and indirect positive impact on the daily lives of citizens and the effectiveness of the project in solving the priority problems in the sector.

- Availability and quality of the required data and the ability to collect and extract it during the project period, if needed for the successful implementation of the project.
- The desire of the sector concerned and its staff to carry out the project and to consider it an important necessity for the sector.
- The expected positive cooperation with the public sector stakeholders.
- Whether the project is consistent with the national strategic goals and the United Nations Sustainable Development Goals (SDGs).
- The availability of professionals and sector experts able to accurately identify the sector's problems (Subject Matter Experts).
- The alignment of the project with the Economic Modernization Vision 2022-2033, launched in June 2022.

4.0 Governance

To ensure the implementation of the AI strategy under the supervision of the Ministry of Digital Economy and Entrepreneurship through collaboration with public sector institutions, private sector institutions, academic institutions, civil society, and professional and vocational institutions, a governance framework has been developed that is divided into two parts: the "Follow-up and Implementation" part, which includes the authorities responsible for supervision and follow-up, and the "Measurement and Evaluation" part, which includes initiatives and projects that assess the extent of success in implementing the strategy.

Follow-up and Implementation

The National Council for Entrepreneurship

1. The National Council for Entrepreneurship, formed by Cabinet Resolution No. (5602) on 30/01/2022, will supervise the following tasks:
2. Follow-up on the implementation of the strategy at the national level and submit periodic reports to the Council of Ministers.

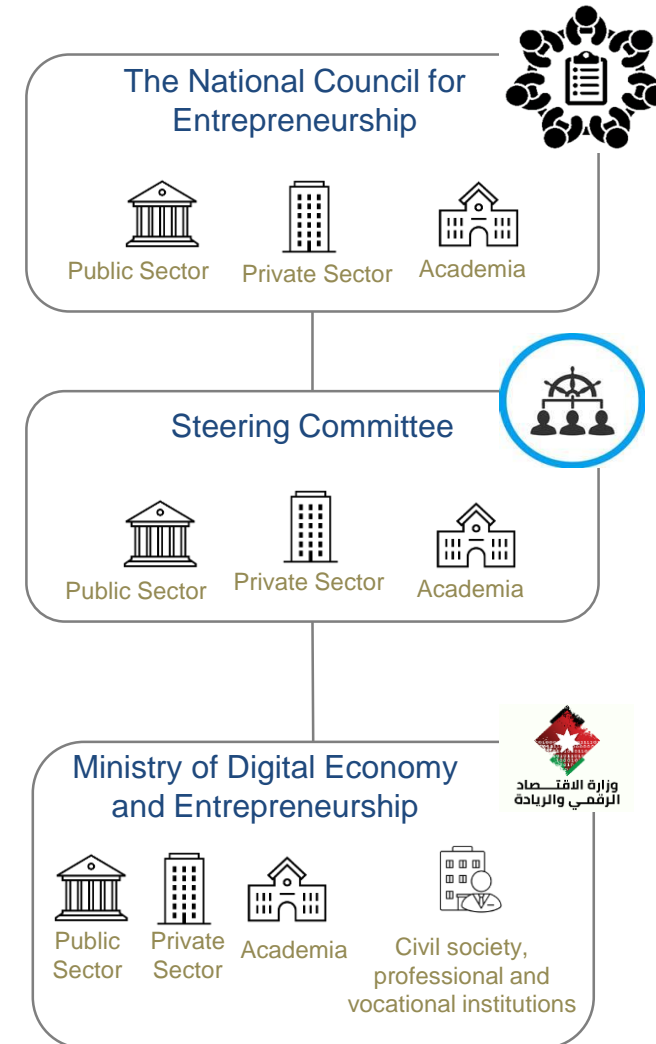
3. Periodically review and update the strategy in cooperation with the relevant authorities.
4. Approach supporters and donors through the Ministry of Digital Economy and Entrepreneurship to obtain the necessary funding for the implementation of initiatives and projects.
5. Forming the Steering Committee as a steering and advisory body composed of representatives from relevant government agencies, the private sector, and academic institutions.

4.0 Governance

Ministry of Digital Economy and Entrepreneurship / Strategy Supervision and Follow-up Unit

The Ministry of Digital Economy and Entrepreneurship will establish a specialized organizational unit to directly supervise and follow-up on all projects and initiatives resulting from the strategy. It will have the following tasks, among others:

1. Supervising and following up on the implementation of projects and initiatives arising from the strategy and preparing periodic reports in this regard.
2. Periodic reporting to the National Council for Entrepreneurship on the progress of projects and initiatives.
3. Follow-up with donors and conduct necessary reviews and evaluations.
4. Periodically prepare knowledge reports on the future of artificial intelligence in Jordan.



4.0 Governance

Measurement and Evaluation⁶

To ensure the optimal implementation of the projects and initiatives resulting from this strategy, it is necessary to measure the extent of penetration and diffusion of artificial intelligence in the Kingdom in general and its impact on the performance of the public and private sectors and its contribution to economic growth, in addition to assessing the readiness of public sector institutions to adopt artificial intelligence and the current state of government institutions, covering the priority sectors of the economy in terms of institutional infrastructure, identify data assessment, qualified personnel, strategies and processes required for the

implementation and deployment of artificial intelligence-based solutions, provide detailed reports on the readiness of public sector institutions, and develop a roadmap for each institution consistent with the national vision of artificial intelligence in the Kingdom, leading to the full implementation of this strategy.

The Ministry will also automate all phases of strategy implementation and monitoring of performance indicators so that detailed and regular electronic automated reports are produced.

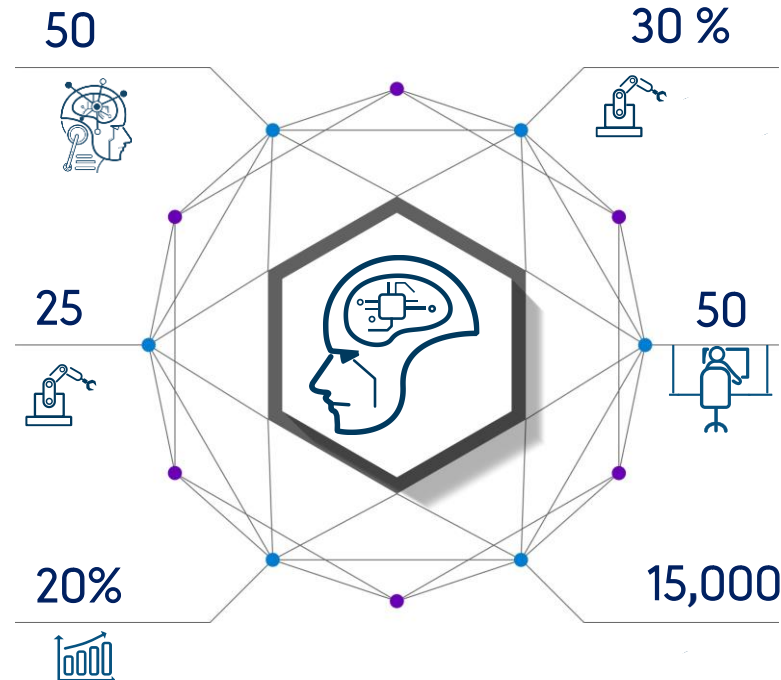
5.0 Targets

Two types of performance indicators and targets were identified, the first type being at the strategic goal level and the second type being directly related to the projects and initiatives, while six targets were identified, linked to the strategic goals as follows:

Increase awareness of artificial intelligence in **50** government agencies.

Use artificial intelligence in **25** government projects to solve national challenges

Improve the global AI readiness index by **20%** from current levels



Increasing the number of artificial intelligence researchers and published research papers by **30%** from the current level, which is measured in determining the baseline for measuring the spread of artificial intelligence in the Kingdom

Increase the volume of investment and increase the number of new AI start-up companies to **50** new operating companies

Train **15,000** trainees through capacity building programs and teaching various skills in the field of artificial intelligence

6.0 Data

The strategy of artificial intelligence is closely related to data, as data is an important and indispensable component in the search, development and implementation of solutions based on artificial intelligence, as governmental and non-governmental data is considered a valuable economic asset that opens new horizons to complement the national economy with new investments, improve government performance and reduce government spending by using data processing and analysis techniques and deriving insights from them in an accelerated manner.

The importance of data analytics has become apparent with the proliferation of Big Data in various forms and the need to analyze and derive insights from it. Data analytics techniques have evolved rapidly in recent times, especially with the maturity of business intelligence techniques and the expansion of the use of artificial intelligence to enable advanced analytics, improve data exploration processes of various kinds, and automate various aspects of data management.

These technologies are now capable of providing descriptive, diagnostic, predictive and directional analytics using solutions with different capabilities that can be applied in different domains.

To maximize the benefits of providing and benefiting from data, a secure technical and legal environment must be established to maximize the utility of available data and open channels for reliable data sharing. There is also a need to increase the government sector's knowledge of how to use data as an economic asset to ensure readiness, access, qualification, and accuracy of data, especially raw data, as it is an inflow and source to provide artificial intelligence systems and applications with what is needed to be self-learning and produce effective results that translate reality and provide accurate predictions and recommendations to help decision makers make appropriate decisions.

6.0 Data

To achieve this, and in line with the vision of economic modernization 2022-2033, the government aims to establish a public data authority responsible for providing data, facilitating access to it, and supporting decision-making. To embody this trend and enable all sectors to benefit from the potential of national data, and to facilitate their regulatory participation under a clear legal framework that fosters innovation and ensures respect for the privacy and confidentiality of information, an integrated data strategy should be developed that includes the following axes:

- The first axis: data and the economy: including the search for applications that represent an economic benefit to provide effective services or enable the saving of costs, time and effort in various government activities and procedures.
- The second axis: Data and Users: This axis provides a legal and practical basis for governing application development and production through a clear definition of data ownership and mechanisms for secure data sharing within the foundations and instructions that increase the transparency and economic value of data.
- The third axis: data and skills: it represents an important common cornerstone and focuses on the aspect of qualification and provision of competencies and skills required for data applications, with the aim of training public sector cadres to improve performance and increase innovation.
- The fourth axis: data and digital technology: the fourth axis is the technical cornerstone to equip the various data service systems with the necessary modern communication technology, cloud sources, storage and processing capabilities of Big Data, which form a common basis for achieving the goals of the strategy for artificial intelligence.

7.0 Risk Management

Like other strategies, the AI strategy may face challenges and obstacles that prevent its full implementation or lead to a deviation from its planned course. The following table shows the risks, the level of impact, and the mechanism for responding to potential risks.

Risks	Impact Level (High - Medium - Low)	Response Mechanism	Remarks
The level of university graduates does not match what should be available to artificial intelligence specialists	High Risk Increasing unemployment and decreasing marketing of specialization	Continuously updating curricula according to developments and changes in advanced techniques and algorithms	The responsibility for this pillar lies with the Ministry of Higher Education, which guides the universities concerned
Lack of real support from government as a true enabler and activator for strategy implementation, whether through funding or legislative change	High Risk Implementation of smart projects and startups is stopped	Forwarding support, grants and external funding for projects in case of weak local funding	The responsibility for this pillar lies with the Ministry of Planning and International Cooperation in cooperation with the Ministry of Industry, Trade and Supply, the Ministry of Labor, and the Ministry of Investment
Failure to ensure the confidentiality and privacy of individuals by neglecting data processing mechanisms and quality, neglecting the cybersecurity aspect and dealing with cases of security breaches of the data storage system at all levels or the occurrence of serious accidents that threaten data centers	High Risk	Raising awareness of institutions and individuals by standardizing data processing mechanisms according to the rules and knowledge of privacy protection and options	Activating the national data strategy, updating the cybercrime law, the cybersecurity law, and the national digital transformation strategy
Lack of understanding of the nature of artificial intelligence among managers or resistance to it by some employees in the organizations	Medium Need to raise awareness of the importance of implementing the strategy and educate about it in regular meetings	Focus on the benefits of the strategy and its role in improving performance and outcomes for individuals	Provide a mechanism for evaluating ministers, officials, and executives in the implementation of national plans
Legislation is not developed and updated in a manner consistent with the continuing evolution of artificial intelligence technologies	High Risk It threatens the output and existence of intelligent systems, and thus the failure to keep up with global developments	Smart systems need an active, changing environment that is responsive to legislation and laws	Responsibility for this pillar lies with the Ministry of Digital Economy and Entrepreneurship and the Ministry of Justice

7.0 Risk Management

Risk	Impact Level (High - Medium - Low)	Response Mechanism	Remarks
Unavailability of the required financial resources	High Risk Many important and economically viable projects are disrupted	The need to calculate a budget for artificial intelligence applications from the general budget for each year in the government plan	The investment volume in the Arab region for artificial intelligence is estimated at \$320 billion by 2030
Lack of the data required to carry out the project	Medium Risk	Ensure that the project budget includes the cost of data extraction and processing	The responsibility for this pillar lies with the Data Authority to be created in cooperation with the Ministry of Digital Economy and Entrepreneurship
That the data used to feed the artificial intelligence software is incorrect or inaccurate and therefore provides incorrect and illogical results	Medium Risk	The project must include the data review phase and compliance with the National Code of Ethics for Artificial Intelligence	
The possibility that the implementation of a project will lead to the loss of traditional jobs	Medium Risk	The strategy must include modernization and rehabilitation projects to pave the way for employees to change their work area	
Refusal to cooperate with the relevant authorities or the owners of the data	Medium Risk	It is necessary to select the projects that have been discussed and agreed upon with the relevant authorities It is also necessary to implement the focus of raising awareness in the public sector and society about the importance and effectiveness of artificial intelligence	Responsibility for this pillar lies with the data authority to be created in collaboration with the Ministry of Digital Economy and Entrepreneurship
Public distrust of artificial intelligence-based software and the inability to interpret the decisions or actions it makes	Low Risk	Ensure that any software includes mechanisms for interpreting and justifying the decisions or procedures it makes, and that the National Ethics Charter for Artificial Intelligence is followed	
Misuse of artificial intelligence systems and negative impact on society	High Risk	Provide early detection and warning of these experiences with appropriate oversight of AI adoption procedures and adherence to the principles of the National Charter for Artificial Intelligence	The responsibility for this pillar lies with the Ministry of Digital Economy and Entrepreneurship through the implementation of the National AI Code of Ethics



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