Reality of Artificial intelligence
A study based on the Emirati experience's case

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Abstract:

   The United Arab Emirates has strived to develop artificial intelligence and realize its strategy which aims to apply by establishing the concept of artificial intelligence in its development strategy. This study concluded that artificial intelligence is the future language. Many economic sectors such as health, education, services and other vital sectors have become dependent on it, as well as the great economic opportunities that it provides to many of the country's economic sectors, and its ability to make huge profits while applying its uses and relying on the accurate information and advice it provides, and its positive effects in reducing dependence on the human element and labor, this increases the quality of products and reduces spending.

Keywords: *Artificial intelligence, development and growth, the industrial sector, artificial intelligence for the United Arab Emirates.*

JEL Classification: D83, O52.

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واقع الذكاء الاصطناعي

دراسة حالة للتجربة الاماراتية

ملخص :

   عملت الامارات العربية المتحدة على تطوير الذكاء الاصطناعي وتحقيق استراتيجيته والتي سعت لتطبيقها بترسيخ مفهوم الذكاء الاصطناعي في استراتيجيتها التنموية، وقد توصلت هذه الدراسة الى ان الذكاء الاصطناعي هو لغة المستقبل ،حيث اصبحت العديد من القطاعات الاقتصادية مثل الصحة والتعليم والخدمات والقطاعات الحيوية الأخرى تعتمد عليه ، فضلا عن الفرص الاقتصادية الكبيرة التي يوفرها للكثير من القطاعات الاقتصادية بالدولة ، وقدرته على تحقيق أرباح طائلة مع تطبيق استخداماته والاعتماد على ما يقدمه من معلومات واستشارات دقيقة ، وتأثيراته الإيجابية في تقليل الاعتماد على العنصر البشري والعمالة ، مما يرفع جودة المنتجات ويقلل من الإنفاق.

الكلمات المفتاحية : *الذكاء الاصطناعي، التنمية والنمو ، القطاع الاصطناعي، الذكاء الاصطناعي للدولة الامارات العربية المتحدة.*

تصنيف JEL : O52، D83.

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Introduction :

Artificial intelligence today becomes a famous concept between population and has entered all fields of technical science, from even the human sciences, the smart phones in our hands and the TVs that are connected to our houses are the best proof of that. Today, it has become natural to acquire smart devices and deal with smart information programs. Machine intelligence science as such is not a new science in the academic world, not even the commercial one, but today's democracy has allowed it to be circulated as a new concept. This has been increased by the proliferation of connected digital devices and the phenomenon of big data, whereby one, although not a specialist in informatics, is talking about artificial intelligence, and he usually links it to innovative technological devices, although not everything innovative is necessarily linked to the ability to think about oneself.. The characteristics of artificial intelligence such as automatic behavior, self-development, and automatic machine learning suggest the idea of absolute freedom of the machine in making decisions in the near future, including the currently escalating fears on the media and academic arenas.. In this article, we will try to give the foundations of artificial intelligence and its characteristics while giving a living model among the most important global models in which artificial intelligence is developed and thriving. It is represented in the United Arab Emirates, which ranks first in the Arab world and 19th in the world, by shedding light on the reality of its developments and its ambitions, between what it has actually achieved and what it hopes to achieve. From this, the following problem can be posed:

What is the reality of artificial intelligence in the United Arab Emirates, and what are the not important strategies for developing it?

- **Hypotheses of the study:**
- Artificial intelligence contributes to realize economic diversification, both in terms of investment and the services sector, the industrial sector, the agricultural sector;
- Artificial Intelligence has a role in achieving inclusive economic growth;
- The United Arab Emirates has undertaken several initiatives and programs aimed at developing artificial intelligence in it through a set of mechanisms and methods.
- **The importance of studying:**

The United Arab Emirates considers artificial intelligence as one of its main axes that seeks to develop sustainable development, The Arab countries, including the UAE, should not be away from achieving this goal to keep pace with the rapid economic developments in the global economy.

- **Study methodology:**

In the interest to answer the problem, we will talk in the first axis about the most important theoretical foundations of artificial intelligence, meandering the reality and prospects of artificial intelligence in the United Arab Emirates, after we have provided a glimpse of the reality of the UAE economy, by looking at groups of economic indicators.

I.   The first axis: the theoretical framework of artificial intelligence:
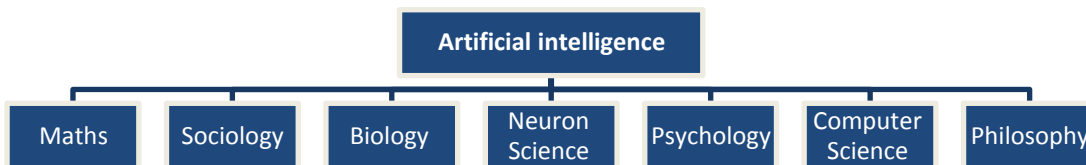### 1.   Definition on artificial intelligence :
The second axis: the reality of the economy of the United Arab Emirates.

‑ Artificial intelligence is a science and technology based on disciplines such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering. A major thrust of AI is in the development of computer functions associated with human intelligence, such as reasoning, learning, and problem solving.Out of the following areas, one or multiple areas can contribute to build an intelligent system. (tutorialspoint);

- **Artificial intelligence** (**AI**), is intelligence demonstrated by machines, unlike the natural intelligence displayed by humans and animals. Leading AI textbooks define the field as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. Colloquially, the term "artificial intelligence" is often used to describe machines (or computers) that mimic "cognitive" functions that humans associate with the human mind, such as "learning" and "problem solving".(Journal of Information Technology ;2020);

‑ **Artificial intelligence (AI)**, the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Since the development of the digital computer in the 1940s, it has been demonstrated that computers can be programmed to carry out very complex tasks—as, for example, discovering proofs for mathematical theorems or playing chess—with great proficiency(B.J. Copeland;2020);

‑ Artificial intelligence is a science and technology based on disciplines such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering. A major thrust of AI is in the development of computer functions associated with human intelligence, such as reasoning, learning, and problem solving.Out of the following areas, one or multiple areas can contribute to build an intelligent system.(digicloud;2020);

Source: digicloud(2020).**Artificial Intelligence – Overview**. available at: https://digicloud.com.ph/artificial-intelligence-overview/; Visited:(27/01/2021).

Figure (01): Contributors to AI

2.   the importance of artificial intelligence :
Artificial intelligence allows computer systems to work with the intellectual processes of humans.However, these machines can carry out tasks more dexterously and efficiently than people. They can also enter hazardous environments, such as areas that require deep sea diving, making certain processes much safer.In short: AI is improving the way we work. It's not about replacing humans, rather, changing our workplaces for the better.For these reasons, it's currently being utilised by a variety of industries, including:

a- Healthcare:

AI can mimic cognitive functions. This makes it a perfect fit within healthcare, where many issues need addressing to make treatments faster, more effective and more affordable;

b- Transport:

Artificial intelligence is greatly improving the efficiency of the transport sector. It can help optimise routes, finding the fastest and safest journeys for different vehicles;

c- Manufacturing:

Adopting AI in different factories is helping to:

- Make certain processes safer by automating them;
- Improve engineering efficiency;
- Reduce costs;
- Increase revenue;
- Plan supply and demand.

d- Space:

Artificial intelligence has enormous promise within satellite and space technology;

e- Global Navigation:

Data collected by Global Navigation Satellite Systems (GNSS) can support AI applications. Tracing, tracking, positioning and logistics are all areas that can be greatly improved due to precise and consistent data collection;

f- Earth Observation:

Satellite imagery in conjunction AI can be used to monitor a number of different places, from urban to hazardous areas.This can help improve urban planning, finding the best places for development. It can also help discover new routes, allowing us to get around more quickly and efficiently. Satellites can also observe areas of interest, such as deforestation. Data collected by this technology can help researchers in monitor and look after them. As well as this, satellites can be deployed to monitor hazardous environments, such as nuclear sites, without the need for people having to enter. Data collected by space technology and processed by AI machines is fed back to the industries that require it, allowing them to proceed accordingly;

g- Communications:

Satellites can transfer important information to AI machines, providing reliable and important communication. This can be used for traffic needs, for example. Satellites can collect data, on congestion or accidents, and feed back to the machines. Artificial intelligence can then be used to find alternative courses, rerouting or diverting traffic where necessary.(Chethan Kumar;2018).

3. Using Artificial Intelligence to detect COVID-19:

The artificial intelligence tool could help states develop more specific COVID-19 ; rtificial Intelligence is an upcoming and useful tool to identify early infections due to coronavirus and also helps in monitoring the condition of the infected patients. It can significantly improve treatment consistency and decision making by developing useful algorithms. AI is not only helpful in the treatment of COVID-19 infected patients but also for their proper health monitoring. It can track the crisis of COVID-19 at different scales such as medical, molecular and epidemiological applications. It is also helpful to facilitate the research on this virus using analyzing the available data. AI can help in developing proper treatment regimens, prevention strategies, drug and vaccine development. .(Mohamed Cherif Haidara, 2020)
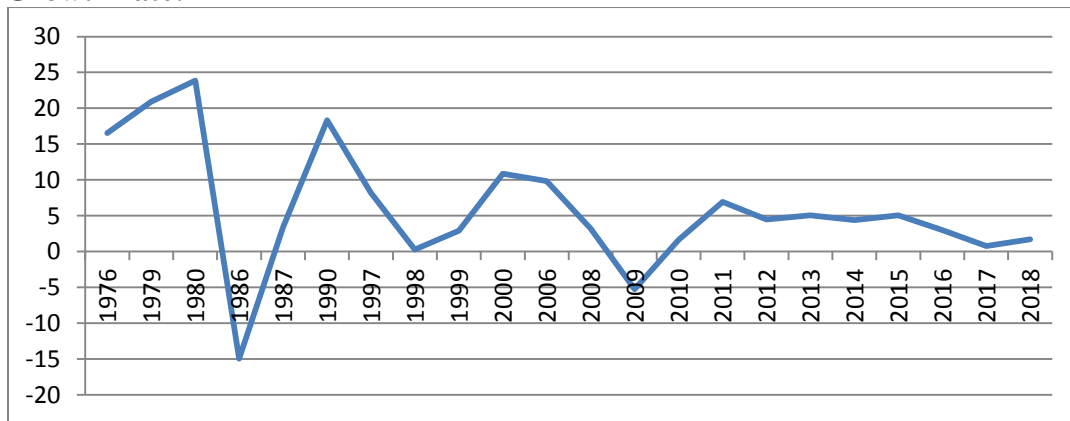
4. The Impact of Artificial Intelligence on the World Economy :

Artificial intelligence has the potential to incrementally add 16 percent or around $13 trillion by 2030 to current global economic output-- an annual average contribution to productivity growth of about 1.2 percent between now and 2030, according to a September, 2018 report by the McKinsey Global Institute on the impact of AI on the world economy. However, in addition to its economic benefits, AI will also lead to significant disruptions for workers, companies and economies. There will likely be considerable costs associated with managing labor-market transitions, especially for workers being left behind by AI technologies, which could reduce the gross impact of AI by around 10 percentage points, leading to the aforementioned net GDP increase of 16 percent or $13 trillion by 2030. (Irving Wladawsky-Berger ;2018).

II.   The second axis: the reality of the economy of the United Arab Emirates:

With regard to the reality of development and economic growth in the United Arab Emirates, we looked closer to the main basic indicators related to the development of economic intelligence in the country.
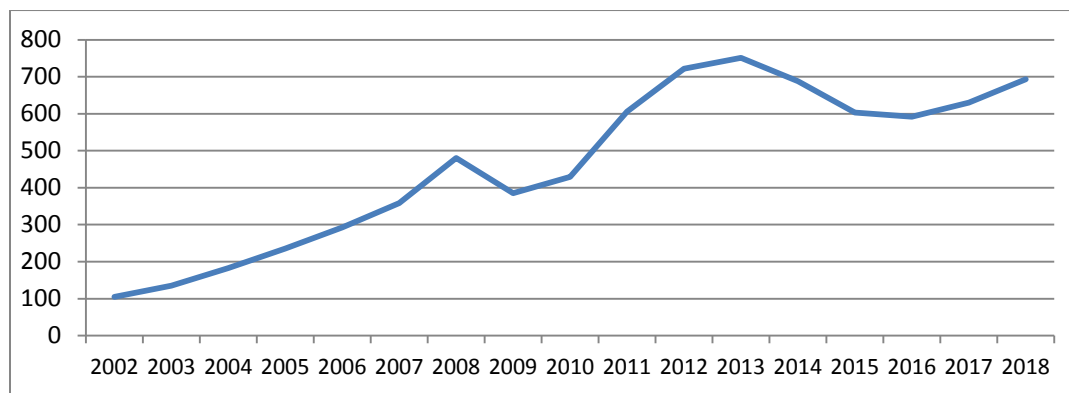
1. Growth rate:

Source: Prepared by the The two researchers based on World Bank statistics.

Figure (02): The evolution of the percentage of GDP growth in the The United Arab Emirates during the period (2000-2018)

The GDP growth rate in the United Arab Emirates fluctuated between high and low, from 16% in 1976 to 23% in 1980, to decrease significantly as a result of the oil crisis in 1986, recording -14%, then, it increased again in 1990, recording 18%. In the 1990s, the rate fluctuated significantly, where it recorded 8.1% in 1997 and then decreased to 0.29% due to the decline in oil prices due to the Asian crisis, to re-rise, registering 10% in 2000, after the rise in oil prices. to mention also recorded 5% in 2015 because of the drop in oil prices in the second half of 2014, the UAE has succeeded in diversifying the economy and increasing the contribution of non-oil sectors to the GDP in recent years; where the UAE focused on attention to other industries, most of all metal industries, furniture, wood industry, aluminum industry, building materials, machinery and equipment.(World Bank ;2020).
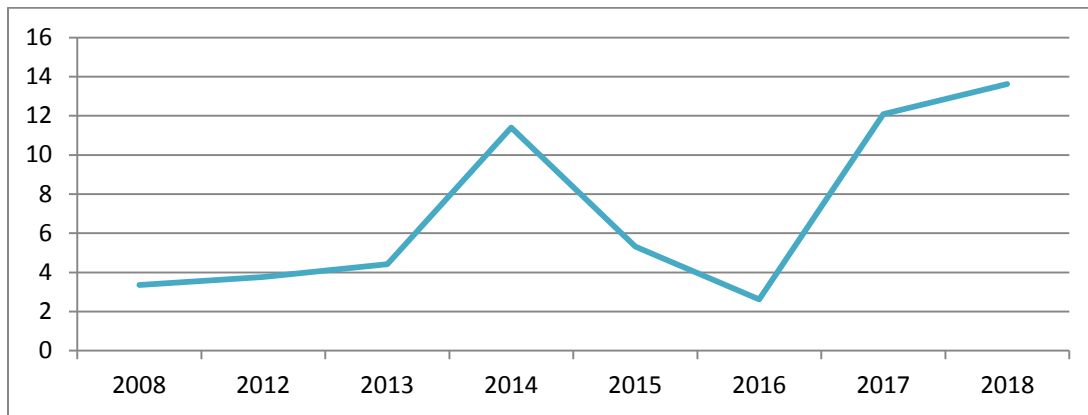
2. Exports:

Source: Prepared by the The two researchers based on World Bank statistics.

Figure (03): The evolution of the UAE's exports during the period (2000-2018) billion dollars.

The UAE exports developed during the period 2002-2018, recording a value of 134.71 billion dollars in 2002, to rise to 429.41 billion dollars in 2010, then to 693.28 billion dollars in 2018.
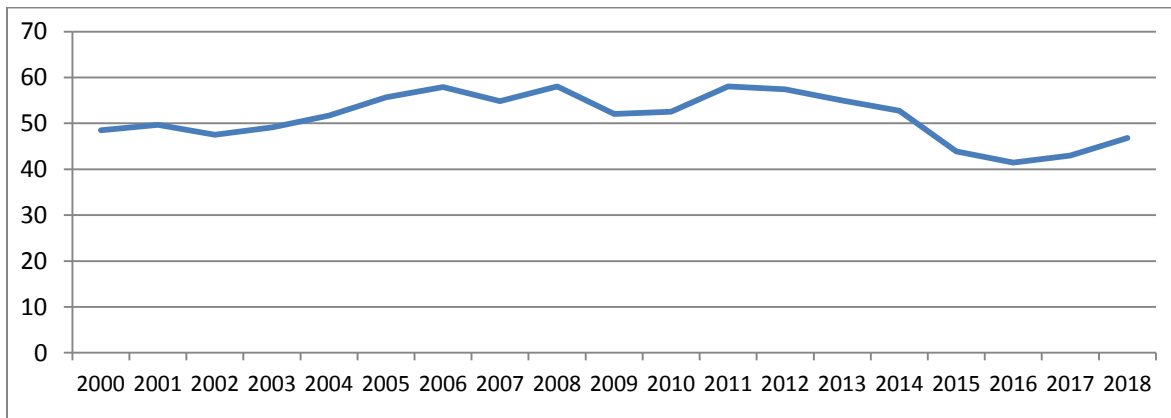
3. **Technology exports:**

Figure (04): Evolution of high technology exports (% of manufactured goods exports)in United Arab Emirates during the period 2002-2018

In the last years, it has been witnessed a development in high-tech exports from exports of goods made in the United Arab Emirates during the period 2002-2018 from 3.3% in 2008 to 13.62% as a result of technological development and the development of the services sector in the country.

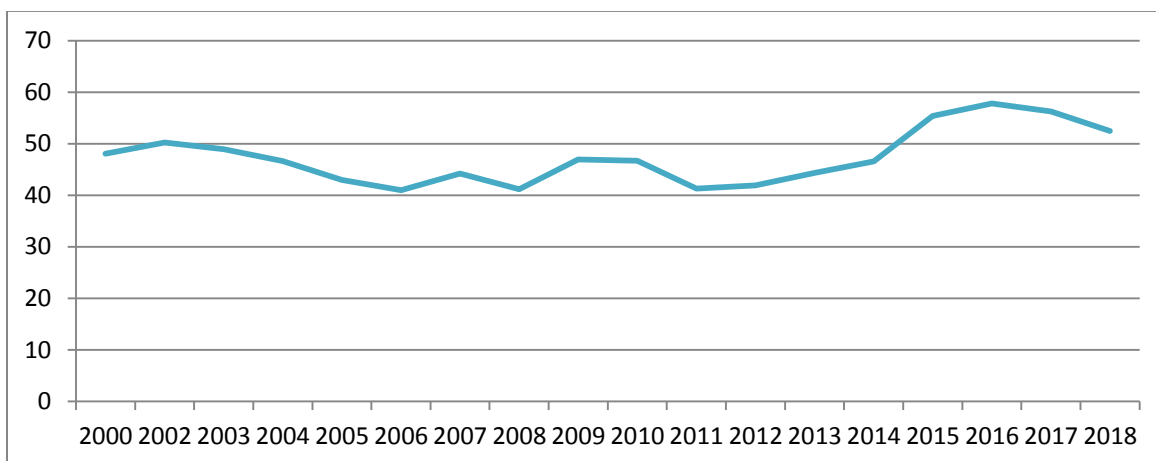**4.** **The industry's contribution to the GDP:**

Figure (05): The evolution of the industry's contribution to the GDP in the United Arab Emirates during the period 2000-2018 in percentage.

The development of the industry's contribution to the GDP in the United Arab Emirates during the years 2000-2018 witnessed a fluctuation, recording 49.12% in 2003 to 43.89% in 2015, to 46.78% in 2018 due to the development of the contribution of other sectors, the most important of which is the services sector.

5. Service sector:

Source: Prepared by the The two researchers based on World Bank statistics**.**

Figure (06): **Growth of the service sector's contribution to the UAE's GDP during the period (2000-2018), in percentage terms**

The development of the service sector's contribution to the GDP in the United Arab Emirates during the period (2000-2018) from about 41% in 2006 to 46% in 2014, to about 52% in 2018.

III.   The third axis: the reality and prospects of artificial intelligence in the United Arab Emirates:

The United Arab Emirates ranks first in the world as a fruit of the implementation of the UAE strategy for artificial intelligence, and the country's efforts to transform into smart cities that achieve sustainable development for future generations.

1. Artificial intelligence facts and figures:

The UAE has been ranked top in the Middle East in respect of its readiness to navigate advances in artificial intelligence,Researchers found the Emirates came 19th worldwide, with Singapore claiming the number one spot, followed by the UK, Germany, the US and Finland.The UAE in particular has various AI-related strategies, around areas such as smart cities and autonomous transport, that may accelerate AI adoption.(the national news ;2019).

2. Historical background of artificial intelligence in the United Arab Emirates:

- In the year 2000, the UAE started the first step for electronic transformation;

- In 2013, the UAE launched a smart government initiative to provide services to the public;

- In 2014 the UAE established the first integrated smart city project "Silicon Park";

- In 2015, the UAE completed the smart transformation of government services by 100%;

- In 2017, the UAE launched the Artificial Intelligence Strategy as the first mega-project within the 2071 centenary.(Ahmed Majed, Nada Hashemi ;2018). (Ahmed Majed, Nada Al-Hashemi;2019).

3. The motives of the United Arab Emirates' direction to activate artificial intelligence:

Among the most important motives for the United Arab Emirates to move to activate artificial intelligence in its economic production and service sectors are the following:

- The industry sector is considered one of the main important economic sectors at the level of the UAE, considering it is moving strongly to activate the policy of diversifying sources of income, and therefore this sector affects the country's economic position and this requires supplying this important vital sector with the outputs of the fourth artificial revolution, most notably artificial intelligence techniques;

- Artificial intelligence is a necessity due to the dependence of the health, education and services sectors on it, and it will also serve other vital sectors such as transport through drones, autonomous cars, flying taxis, metro, and all means of land and sea transport;

- Artificial intelligence has become rapidly developing in all areas of life, such as health, for its ability to assist the medical staff in diagnosing and treating diseases, prescribing medicines, conducting surgeries, and better accessing patient files with voice commands. Patients can also book appointments;

- There is the possibility of self-education and development through artificial intelligence programs such as learning machines, logic, self-correction and self-programming;

- Artificial intelligence contributes to providing legal advice and achieving interactive education, as it is used in the security and military fields;

- Artificial intelligence reduces hardship and dangerous work to humans, such as exploration and rescue operations during natural disasters that require muscle strength; It is possible to use artificial intelligence in expert systems that are based on knowledge bases and facial recognition technology;

- The education system will change as a concept and as a result of applying the principles of the Fourth Artificial Revolution, as it will focus on sensory education to meet the industrial sector and artificial intelligence;

- Artificial intelligence has the ability to provide new job opportunities and provide services at a cheap cost, and contribute to maintaining security, and it also provides mechanisms and solutions to face challenges, including cybercrime.(Ahmed Majed , Nada Al-Hashemi;2018;P09-10).

4. The sectors targeted in the UAE Strategy for Artificial Intelligence:

The strategy will cover the following sectors:

- transport – to reduce accidents and cut operational costs;
- health – to minimise chronic and dangerous diseases;
- space – to help conduct accurate experiments, reduce rate of costly mistakes
- renewable energy – to manage facilities;
- water – to conduct analysis and studies to provide water sources;
- technology – to increase productivity and help with general spending;
- education – to cut costs and enhance desire for education;
- environment – to increase forestation rate;
- traffic – to reduce accidents and traffic jams and draw more effective traffic policies. (The official portal of the UAE government;2019).

5. Mechanisms of the United Arab Emirates to activate artificial intelligence:
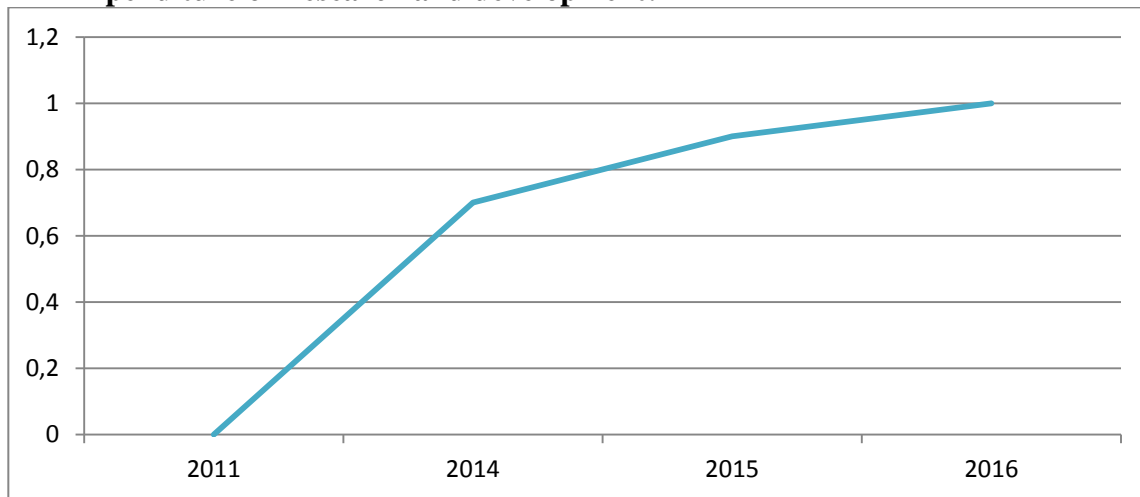   The Artificial Intelligence Strategy includes five axes; The strategy is first of its kind in the region and the world and it aims to:

- achieve the objectives of UAE Centennial 2071
- boost government performance at all levels
- use an integrated smart digital system that can overcome challenges and provide quick efficient solutions
- make the UAE the first in the field of AI investments in various sectors
- create new vital market with high economic value.(The official portal of the UAE government;2019).

6. Some statistics related to artificial intelligence in the UAE:
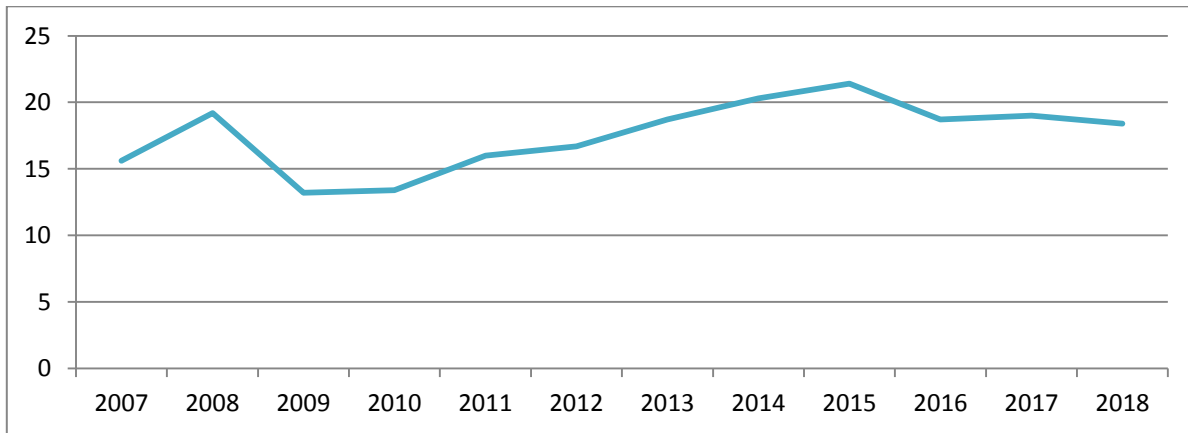We define it in the following indicators:

A- Expenditure on research and development:

Source: Prepared by the The two researchers based on World Bank statistics**.**
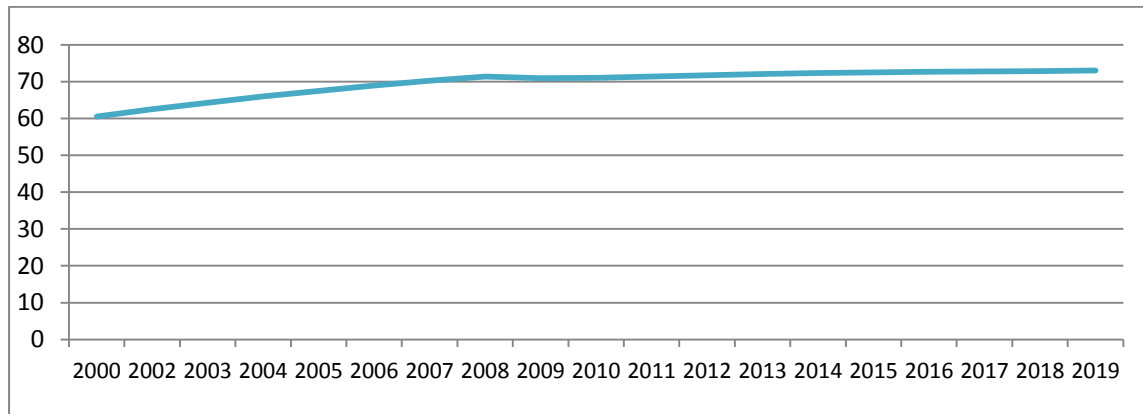
Figure (07): Expenditure on research and development as a percentage of GDP during the period(2011-2016)

     After it represented researchers working in the field of research and development (% per million people) 97, 2003 in 2015 the number increased to 2406,573 (% per million people) in 2016, as for spending on research and development, as a percentage of GDP, the percentage increased from 0.5% in 2011 to 1% in 2016 as a result of the UAE's interest in research and development**.**(word bank,2020).

Source: Prepared by the The two researchers based on World Bank statistics**.**

Figure (08): Total trademark applications in the United Arab Emirates during the period (2007-2018)

Source: Prepared by the The two researchers based on World Bank statistics**.**

Figure (09): Workers in services (% of total employed) during the period 2011-2016in the United Arab Emirates during the period (2000-2019)

Table N°(01): Evolution of patent applications for residents during the period (2011-2018)

	2011	2012	2013	2014	2015	2016	2017	2018
Patent applications, residents	26	20	18	29	15	-	52	56

Source: Prepared by the The two researchers based on World Bank statistics**.**

7. A forward-looking vision for the future of artificial intelligence in the UAE:

The United Arab Emirates seeks a forward-looking vision that adopts global trends and developments, supports young minds and promising talents, encourages modern innovations and creative ideas, and adopts advanced technologies. The goal is for the UAE to be the first choice for technology companies and talents specializing in the fields of artificial intelligence around the world .., the UAE is also one of the best countries in the

world in developing this future sector and investing in its capabilities, as the Artificial Intelligence Talent Attraction Program has been launched an advanced environment to develop innovative solutions and pioneering projects that serve humanity. .(The official portal of the UAE government;2019).

Conclusion :

The UAE is ranked among the leading countries in the field of artificial intelligence technology, as artificial intelligence is a fundamental pillar of the state's strategies and development plans for the next 50 years, and a vital tool for developing work in all areas related to people's lives, as the state has worked to ensure that artificial intelligence is not limited to government services, It will raise the standard of living of the individual in the UAE. In view of the close relationship between artificial intelligence and sustainable development, the United Arab Emirates, like other developed and developing countries, is seeking to develop artificial intelligence to achieve a number of development goals, the most important of which are enhancing economic growth opportunities, reducing unemployment rates, in addition to achieving sustainable development goals.

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