IFF Global Artificial Intelligence Competitiveness Index Report

Part 1: Analyzing AI Competitiveness From the Enterprise Perspective

DEEP KNOWLEDGE GROUP

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Introduction to the IFF Global Artificial Intelligence Competitiveness Index Report

As the core driving force of a new cycle of the scientific and technological revolution and industrial transformation, artificial intelligence (AI) is profoundly altering the global innovation landscape and pattern of competition.

Against this backdrop, scientifically assessing and grasping the development trends and competitive strength of various countries in the field of AI is of great practical significance for understanding the development trends of global AI and formulating relevant policies. The International Finance Forum (IFF) has determined to inaugurate its Global AI Competitiveness Index Project, which is dedicated to building a comprehensive, objective, and quantifiable global system of assessing AI competitiveness and systematically evaluating and comparing the comprehensive strength and development potential of various countries in the field of AI via multi-dimensional indicators.

This study is based on the principles of multi-dimensional evaluation, objective data quantification, and forward-looking analysis. Building an overall evaluation framework ensures the systematic nature and comprehensiveness of these indicators. Furthermore, collecting all data, and cleaning and normalizing it ensures the objectivity of the quantitative results. Also, the case analysis of some countries not only evaluates the current situation, but also bestows more attention on development potential and judgment of trends.

This study will form an evaluation system from five core dimensions:

1. Technical Development and Applications (as represented by AI companies)

2. Research and Innovation

3. Human Capital

4. Policy and Regulatory Environment

5. Market Acceptance and Infrastructure

Each dimension has several secondary indicators, which are assessed by combining quantitative and qualitative methods. This report, as the first in a series of studies and the first of the five core dimensions of the competitiveness index, will focus on the state of development of global AI companies and engage in an in-depth analysis thereof. Analysis reports on the remaining four dimensions will be successively released to jointly draw up a complete global AI competitiveness index map.

Abstract

This article relates the results of a descriptive statistical analysis of various dimensions of data from over 55,000 artificial intelligence (AI) companies worldwide, and finds that the United States has a major and leading advantage, both in the number of AI companies and in financing amounts. More than 73% of the world's AI companies are concentrated in the top 10 countries. Furthermore, Middle Eastern countries such as the UAE and Saudi Arabia are also actively developing AI. Countries represented by Singapore and Israel have a higher density of AI companies. A regression analysis of financing and valuation prompts the finding that, for companies in the US and Hong Kong, China, financing has a more salient role in promoting the growth of corporate value. Healthcare and marketing are currently the key business application scenarios of global AI companies.

Keywords:

Artificial Intelligence,

Competitiveness Index,

Enterprise

In the context of the rapid development of information technology, AI has become a key force driving global economic growth and social change. With the steady advance of AI technology, competition in the field is heating up among countries worldwide.

From autonomous driving to smart healthcare, from financial technology to smart manufacturing, AI is changing the way we live and work. Governments, companies and investment institutions have raised their investments in AI to take the lead in this emerging field. The International Finance Forum (IFF) officially inaugurated its Artificial Intelligence Committee at the end of July 2024. To better understand and evaluate global AI competitiveness, the IFF and Deep Knowledge Group - the world's top Big Data analysis organization - jointly drafted this Global Artificial Intelligence Competitiveness Index report. This first chapter - Global AI Enterprises - is also one of the key dimensions of the AI Competitiveness Index. Via this report, we hope to provide a comprehensive perspective for policymakers, business leaders, and relevant researchers to enable them to better grasp the global AI competitive terrain and devise corresponding strategies and policies.

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Chapter One: Global AI companies' geographical distribution

Definition and Scope of Artificial Intelligence Enterprises

Before starting this research, it is essential to define the artificial intelligence enterprises involved in this study. We provisionally consider that any company providing products or services involving artificial intelligence-related technologies, such as machine learning, neural networks, natural language processing, and large models, can be recognized as an artificial intelligence enterprise. Additionally, traditional mature enterprises that provide software and hardware, computing power, and cloud service support for the artificial intelligence industry are also identified as artificial intelligence enterprises. It is important to note that when calculating financing amounts in this report, to avoid deviations caused by early-stage financing data or IPO financing data of traditional enterprises, the research scope will focus exclusively on newly established startup artificial intelligence enterprises from the past decade.

Based on the data this study collected, some 100 countries in the world were found to be home to AI companies. This significantly and positively correlates with a country's economic level to an almost entirely equal degree. Therefore, the research scope of this report is set to the top 100 countries in the global gross domestic product ranking. The number of AI companies in countries after 100 falls to one or absolutely zero, and these may thus be disregarded.

When setting about to study the current situation of global AI companies, the first question to confront is: Where are global AI companies situated and what characteristics do they display? Which countries have a larger number of companies in absolute terms, and which countries have a higher density of companies and are exerting greater efforts in the AI field? We shall seek to answer the above questions.

Number of AI companies in each country (top 30 countries/regions selected)

Table 1 - Top 30 countries/regions in number of AI companies worldwide

Rank	Country/region	Number of AI enterprises	Number of enterprises million in population
1	US	20,298	61.2
2	India	4,044	2.9
3	UK	3,795	56.5
4	Japan	2,281	18.1
5	Canada	2,226	58.3
6	Mainland China	2,065	1.5
7	Germany	1,888	22.7
8	France	1,365	20.9
9	Israel	1,257	135.2
10	Brazil	1,144	5.3
11	South Korea	1,067	20.6
12	Australia	958	37.3
13	Singapore	928	162.8
14	Italy	927	15.7
15	Spain	911	19.2
16	Netherlands	726	42.2
17	Switzerland	640	73.6
18	Turkey	510	6.0
19	UAE	490	49.5
20	Sweden	429	41.3
21	Poland	383	10.1
22	Hong Kong, China	353	47.1
23	Mexico	303	2.4
24	Saudi Arabia	292	8.3
25	Belgium	289	24.9
26	Finland	275	50.0
27	Denmark	254	43.8
28	Ireland	254	50.8
29	Taiwan	253	10.6
30	Austria	233	25.9

Table 2 - Top 10 countries/regions with the most AI companies per million in population

Rank	Country/region	Number of enterprises million in population
1	Singapore	162.8
2	Israel	135.2
3	Switzerland	73.6
4	US	61.2
5	Canada	58.3
6	UK	56.5
7	Ireland	50.8
8	Finland	50.0
9	UAE	49.5
10	Hong Kong, China	47.1
11	Denmark	43.8
12	Netherlands	42.2
13	Sweden	41.3
14	Australia	37.3
15	Austria	25.9
16	Belgium	24.9
17	Germany	22.7
18	France	20.9
19	South Korea	20.6
20	Spain	19.2
21	Japan	18.1
22	Italy	15.7
23	Taiwan	10.6
24	Poland	10.1
25	Saudi Arabia	8.3
26	Turkey	6.0
27	Brazil	5.3
28	India	2.9
29	Mexico	2.4
30	Mainland China	1.5

Note: Population data uses the latest population statistics released by various governments, and the number of AI companies is as of October 2024.

Heat map of the number of AI companies in various countries (selecting the top 30 countries/regions):

• As of October 2024, there were about 55,000 AI companies in the world (including startups and mature companies that provide AI products and services).

• At over 20,000, the US has more than 36% of the world's AI companies. This shows the US' strong quantitative edge over other countries and its leading position in global AI competition.

• The top 10 countries are home to some 73% of the world's AI companies, and the concentration of the top companies is readily apparent.

• In the Middle East, the respective tallies of AI companies of the UAE and Saudi Arabia sets them in the world's top 30, demonstrating the enthusiasm and potential of the region for AI development.

• Singapore, Israel, and Switzerland rank in the top three in the world in AI company density, with over 70 AI companies per million population, and Singapore and Israel even top the 100 AI companies per million population mark. The number of AI companies per million population in Hong Kong, China similarly ranks among the world's top 10.

Case Study-AI Enterprise Geographical Distribution TOP 3

The US, India and UK are top 3 coutries in the world in total number of AI companies. We conducted a case analysis of above three countries:

The US:

The fundamental reason why the US leads in the number of AI companies is that the country has preserved its competitive advantage since the advent of the revolution in the information technology sector, particularly in the era of the internet sector revolution. The US has a deep historical accumulation in the area of computer science. It has been developing computer technology since the 1940s, from the Windows system to the Apple iOS and Android systems in the mobile internet era, from the innovative iteration of graphics cards (GPUs) in the PC era to comprehensive social networks. The growth of the Silicon Valley culture has laid a fertile ground for technological innovation, from semiconductors to the internet, and thence to AI, thus forming a complete technological evolutionary path.

Furthermore, the US has the world's top computer science research institutions - e.g., Stanford University, Massachusetts Institute of Technology, and Carnegie Mellon University - which continue to output cutting-edge research results and talents. On the one hand, the open immigration policy has attracted outstanding AI talent from all over the world to develop in the US. On the other hand, the world's top education system has cultivated a large number of professionals in the field of AI. Large technology companies (such as, Microsoft, Google, Apple, Meta) have long invested in basic research in the area of AI. Major technology companies provide AI talents with highly competitive salary levels and scope for career development. The tight integration of industry, academia, and research has spurred innovation and established a solid technical reserve for big technology companies.

With the world's most developed capital market, the US also has a consummated venture capital system in the early stage of venture capital, offering sufficient financial backing for AI startups from their earliest stages. Angel investors and venture capital funds pay close heed to the field of AI and have great efficiency in investment decision-making. The venture capital culture formed in the US over a long period also renders investors more receptive to long-term and high-risk investment. Stock exchanges, Nasdaq among them, supply AI companies with more diversified avenues of financing and exit channels for venture capital institutions.

That the US has the world's best AI industry ecosystem, with a complete industrial chain, from chips to cloud computing infrastructure, also cannot be overlooked. Rich business data resources facilitate training of AI companies' models. A sufficiently large domestic market with rich application scenarios can quickly advance commercialization of AI technology.

These factors interact and promote one other, forming a virtuous cycle, and making the US the most active region for the world's AI firms. In particular, the synergy of the three core elements of technological innovation, capital support, and talent training have enabled US AI companies to swiftly develop and grow. Additionally, the open innovation environment and market-oriented competition mechanism also ensure these companies are able to maintain their steady innovation momentum and competitiveness. This multi-level and multi-dimensional accumulation of advantages has allowed the US to constantly maintain a leading place in the global AI stakes, and has also enabled more entrepreneurs to elect to start up AI companies in the US, further strengthening the country's dominating positioning in the worldwide AI sector.

As regards specific companies, citing OpenAI - the most representative in the field of large models in the US - as an example, the company now has the world's most mature generative AI product, ChatGPT, which is pre-trained via a mass of text data and which can understand and generate natural language, thus offering such functions as dialog, answering questions, and writing text in various application scenarios. OpenAI was set up in 2015 and secured USD 1 billion in financing when it was founded. These funds came from many Silicon Valley stars such as Elon Musk, Sam Altman, Greg Brockman, Reid Hoffman, Peter Thiel, and other such investors. In 2019, OpenAI and Microsoft entered into a strategic partnership, and Microsoft invested USD 1 billion to support OpenAI's research and development (R&D). This funding helped OpenAI hasten its innovation and product development in the AI field. As of October 2024, OpenAI has raised USD 6.6 billion, giving it a post-financing valuation of USD 157 billion, thus notching a new record for the highest financing in the AI sector.

Apart from large-model companies, AI infrastructure is also the US' most powerful advantage. Nvidia, which supplies computing power to large-model companies, may be said to be the most direct beneficiary of the swift development of the AI sector, since training AI models demands a huge number of GPUs for calculations. Nvidia has been exploiting its R&D advantages in GPU products since the start of the era of personal computers. From December 2022 to October 2024, Nvidia's share price rose from USD 16.9 to over USD 140 and its market value topped USD 3.5 trillion, second only to Apple, the company with the world's highest market value. OpenAI and Nvidia are the most salient representatives of US AI companies. These two firms have led the development of the domestic AI sector in the US and driven a large number of upstream and downstream companies in the AI industry chain.

India:

As early as 2018, the Indian government released its '#AI for All' national AI strategy, which is a comprehensive AI development framework devised by the National Transformation Council of India. The main aims of this strategy include:

(1) Planning to invest INR700 billion (about USD 9.5 billion) in AI R&D and applications over five years.

(2) Identifying five key development areas: healthcare, agriculture, education, smart cities, and smart mobility.

(3) Building a National Artificial Intelligence Portal to stimulate knowledge sharing and collaboration.

India has moreover granted a large number of fiscal incentives for the AI sector, including:

Tax incentives for AI startups, and tax exemption for their first three years;

150% tax exemption for AI R&D expenditures and the establishment of an INR10 billion (about USD 135 million) AI special fund.

Local governments in India have also introduced supporting policies, including the setup of a INR10 billion AI innovation fund in Karnataka, the establishment of an AI special economic zone in Telangana, and the launch of an AI startup incubator program in Maharashtra.

As for training talent, the Indian government has launched the 'PM-YUVA Plan,' which aims to train 1 million AI professionals by 2025 and establish 20 centers of excellence in cooperation with top technology companies. It also plans to open seven new Indian Institutes of Technology nationwide to swell enrollment in AI-related majors and invest INR5 billion constructing AI education infrastructure. The Indian government is also pulling out the stops to build a nationwide AI computing infrastructure network, set up AI innovation centers in major cities, and provide access support to high-speed Internet.

India's policy on data management is also quite open. The Indian government has released its 'National Data Sharing and Accessibility Policy,' established an open government data platform; promoted the construction of public data infrastructure; and formulated a data protection bill to provide legal protection for the development of AI. From public data, the annual growth rate of AI-related patent applications in India tops 40%, and the yearly growth rate of AI jobs reaches 25%. The AI sector's market size in India as a whole is anticipated to reach USD 20 billion in 2025.

UK:

United Kingdom companies have performed well in quantity, thanks to factors that include policy support, academic resources, industrial foundation, talent reserves, and international cooperation.

(1) Policy support: The UK government's support for the AI industry is one of the key drivers of its quick development. In 2017, the UK government issued its 'Industrial Strategy: Sector Deal for Artificial Intelligence,' pledging to invest GBP950 million into R&D of AI technology over the next four years. The UK government has also formed an AI commission to draft a national AI strategy to assure the UK's leading position in the global AI area.

According to the 'UK AI Roadmap 2021,' the government plans to extend the application of AI technology to various industries over the next decade and lure more international investment via policy incentives. These policies provide a sound development environment and financial support for AI firms.

(2) Academic resources: The UK has world-leading academic institutions such as the University of Cambridge, the University of Oxford, and Imperial College London, which are at the global forefront in the field of AI research. According to the 2024 Times Higher Education World University Rankings, the University of Oxford, Unversity of Cambridge and Imperial College London ranked in the world's top 10 in the field of computer science. These universities have not only cultivated a large number of high-end talents in the field of AI, but also promoted the commercial application of AI technology through collaboration with enterprises. For example, DeepMind was founded by researchers at the University of Cambridge and was acquired by Google in 2014, becoming one of the world's leading AI companies. The UK enjoys considerable representation in many AI fields, above all in infrastructure.

(3) Industrial foundation: The UK has several high-value companies, such as Graphcore (hardware), Stability AI (image/video models), and Quantinuum (quantum computing). In the healthcare area, UK AI company DeepMind is known for its AI program AlphaFold was able to accurately predict the shape of proteins, a problem considered a "grand challenge" in biology, DeepMind has fine-tuned that protein model to predict which misspellings found in human DNA are safe to ignore and which are likely to cause disease.UK Fintech companies such as Revolut and Monzo utilize AI for risk management and customer service. These firms form a solid AI industry foundation in the UK, and their success stories also show the potential for extensive application of AI technology in different fields.

(4) Talent pool: The UK is among the countries with the highest concentration of AI talent in Europe, per LinkedIn data, with

over 100,000 AI professionals. To further entice international talent, the UK government has instituted the 'Global Talent Visa' program, which lets top technology talents work and live in the country. This policy eases AI companies' attraction of top global talent. The UK is one of the participating countries in the European Union's Horizon 2020 program, which provides much financial support for AI research. The UK government promotes data sharing and openness via its 'National Data Strategy' and encourages companies to use data for innovation.

(5) Infrastructure: In technical infrastructure, the UK is speeding the deployment of fifth-generation wireless networks (5G) and investing in the construction of high-performance computing centers to provide strong computing power support for the R&D and application of AI technology. Over 60% of Britons believe AI technology will positively impact society, per a survey by YouGov.

In sum, the development of UK AI companies has benefited from many factors, including policy support, academic resources, industrial foundation, talent pool, data and technical infrastructure, and social and cultural environment. These factors together constitute an ecosystem that is conducive to the innovation and application of AI technology, setting the UK in a key position in the global AI industry. With the continuous advance of AI technology and the expansion of its fields of application, UK AI firms are forecast to continue to preserve their strong development momentum in the future.

Case Study-AI Enterprise Density Typical Countries/Regions

Singapore, the UAE, and Hong Kong, China are all among the top 10 countries/regions in the world in AI enterprise density. We conducted a case analysis of the above three countries/regions.

Singapore:

(1) Government support: The Singaporean government's support for the AI sector is one of the key drivers of its swift development. Via its 'Smart Nation 2025' plan, the government is committed to building Singapore into a world-leading digital economy. The plan includes investing more than SGD500 million (USD 370 million) in the R&D of AI technology, establishing AI Singapore - a national AI program that targets promotion of the R&D and application of AI technology - launching the 'National AI Strategy' to identify five key areas: transport, urban management, healthcare, education, and security.

(2) Infrastructure: Singapore boasts world-class technical infrastructure that lays a solid foundation for AI companies to develop. Singapore has an internet penetration rate of over 96% and one of the fastest broadband speeds in the world, per an International Telecommunication Union report. Furthermore, the Singaporean government has invested to build high-performance computing and data centers to supply strong computing power support for the R&D and application of AI technology. These infrastructures provide the technical support necessary for the innovation and development of AI companies.

(3) Talent pool: Singapore has a rich pool of AI talent, courtesy of its high-quality education system and open immigration policy. Singapore is among the countries with the highest concentration of AI talent in Southeast Asia at over 10,000 AI professionals, LinkedIn data shows. Singapore's higher education institutions, such as the National University of Singapore and Nanyang Technological University, are at the forefront of AI research and education. These universities have not only trained a large number of high-end talents in the AI field, but also promoted the commercial application of AI technology via collaboration with enterprises.

(4) Open international cooperation environment: Singapore's international collaboration in the field of AI has also advanced the development of its industry. Singapore maintains close cooperation with such countries and regions as the US, China, and the EU in AI research and application. OpenAI has established an office in Singapore, and TikTok has set up its headquarters there.

(5) Social and cultural factors: As a multi-ethnic immigrant country, Singapore has a relatively neutral political stance. The diverse social and cultural environment has also fostered sound conditions for the development of AI companies. The Singaporean public is open to technological innovation and is willing to accept the changes wrought by new technologies. More than 80% of Singaporeans believe that AI technology will positively affect society, a survey by the Pew Research Center found.

Well-known Singaporean AI companies:

Trax: An AI company, it concentrates on the retail sector, providing image recognition and data analysis services to help retailers optimize inventory management and sales strategies. Trax applies AI technology to transform everyday shelf images into real-time, actionable insights. Trax's products include, e.g., a commodity data management platform, intelligent image compliance inspection solutions, and retail inspection robot solutions.

Advance Intelligence Group: A global digital commerce and digital financial services AI firm headquartered in Singapore, which provides such solutions as digital transformation, and anti-fraud and process automation to corporate customers. Among its three major business lines, ADVANCE.AI is a proprietary AI engine that supplies services to enterprises, while Ginee is a merchant platform, and Atome Financial has built a consumer market.

UAE:

(1) Government strategic support and investment: The UAE government has provided great support in the field of AI. In 2017, the UAE became the first country in the world to appoint an AI minister, pioneering the development of AI to the national strategic level. The government issued its 'Artificial Intelligence Strategy 2031,' which is anticipated to achieve an AI industry contribution of AED335 billion (about USD 91 billion) to GDP by 2031, and uses AI to reduce government operating costs by 50%. The annual AI investment growth rate remains above 20%. The UAE has also set up the Dubai Future Accelerator Fund of AED10 billion (USD 2.7 billion) to specifically support AI innovation projects The UAE provides an extremely attractive business environment for AI firms, including zero corporate tax and personal income tax policies, while 100% foreign investment is allowed after a company is established.

(2) Talent attraction and training: The UAE has adopted several measures to attract and train AI talents. It has launched a 'golden visa' program to provide 10-year residency for AI industry experts, founded the world's first AI professional research university MBZUAI, cooperated with top universities around the world to set up research centers and provide high scholarships and research funds. The annual growth rate of AI talent reserves in the UAE tops 30%

(3) Infrastructure advantages: The UAE has world-class digital infrastructure, with 5G network coverage exceeding 90%, an internet penetration rate that reaches 97.1%, and also has the largest data center cluster in the Middle East, while smart city infrastructure is complete, thus offering an ideal testing scenario for AI applications.

Well-known AI company in the UAE

G42: An AI solutions company headquartered in Abu Dhabi. In April 2024, Microsoft invested USD 1.5 billion in it. Also, Microsoft and G42 announced that they will cooperate to establish an AI research institute. The two parties will open two centers in Abu Dhabi to carry out “responsible” AI projects. The company is currently valued at more than USD 10 billion and focuses on AI solutions in the fields of healthcare, finance and smart cities. G42 has currently unveiled its open source Arabic AI language model Jais. This language model has 30 billion parameters, and its training data sources include a large amount of Arabic data and English computer code.

Hong Kong, China:

As an important global financial center and innovation and technology hub, Hong Kong’s performance in the development of AI companies has been outstanding. We engage in an in-depth analysis from multiple dimensions of the reasons for the high density of Hong Kong AI enterprises and their representative companies:

(1) Strategic support from the Hong Kong government: The Hong Kong Special Administrative Region’s government attaches great importance to developing innovation and technology. It has set up an Innovation and Technology Fund of HKD10 billion and initiated the 'Smart City Blueprint 2.0,' listing AI development as a key area. The Hong Kong government has also set up the Innovation and Technology Commission to advance technological development. The 2023 Policy Address proposed the strategy of constructing an “International Innovation and Technology Center.”

(2) Business environment and infrastructure: Hong Kong is one of the world’s freest economies, with the simplest tax system (tax on profits is only 16.5%) and a unique edge in connecting mainland China with international markets. The Hong Kong Science Park has now aggregated over 150 AI-related companies, and Cyberport has cultivated more than 100 AI startups. Hong Kong has an over 95% 5G network coverage rate and one of the largest Asia-Pacific region data center clusters.

(3) Talent attraction: Hong Kong has many world-class universities (e.g., HKU, HKUST, CUHK), which turn out more than 5,000 IT-related graduates each year. The proportion of international talent is high, and more than 15% of IT practitioners come from outside Hong Kong, whose government has instituted the 'Technology Talent Immigration Scheme.'

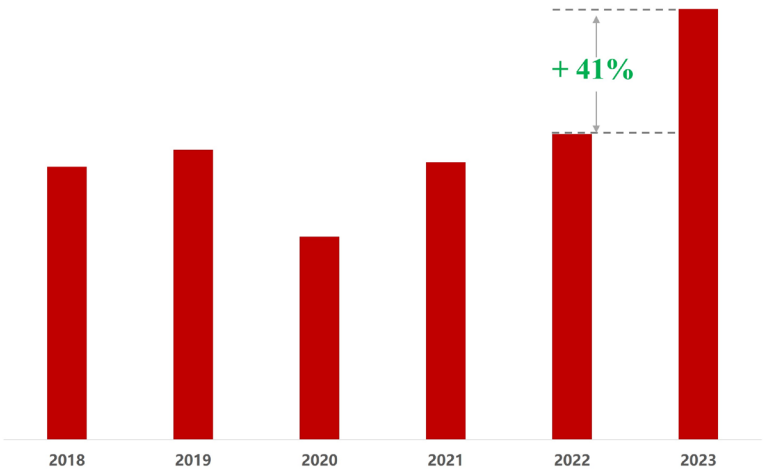
(4) Capital Market: Hong Kong has a world-renowned bourse, the Hong Kong Stock Exchange. As of the end of the third quarter of 2024, it had jumped to become the fourth-largest in the world in funding initial public offerings. Hong Kong has a consummated investment and financing service, which eases AI companies’ funding and listings.

Representative AI company in Hong Kong, China

Insilico Medicine: Founded by Alex Zhavoronkov in the U.S. in 2014, Insilico Medicine established its headquarters in Hong Kong in 2019. As an AI-driven clinical-stage biopharmaceutical company, it uses modern machine learning technologies like deep generative models, reinforcement learning, and transformer models to build a powerful AI-driven drug development platform. The company has created three AI drug development platforms encompassing the three stages of new drug development: target discovery platform PandaOmics, compound design and generation platform Chemistry42, and clinical trial prediction platform InClinico.

2. Histogram of AI company establishment

Figure 2 - Bar chart of time distribution of global AI enterprise establishment



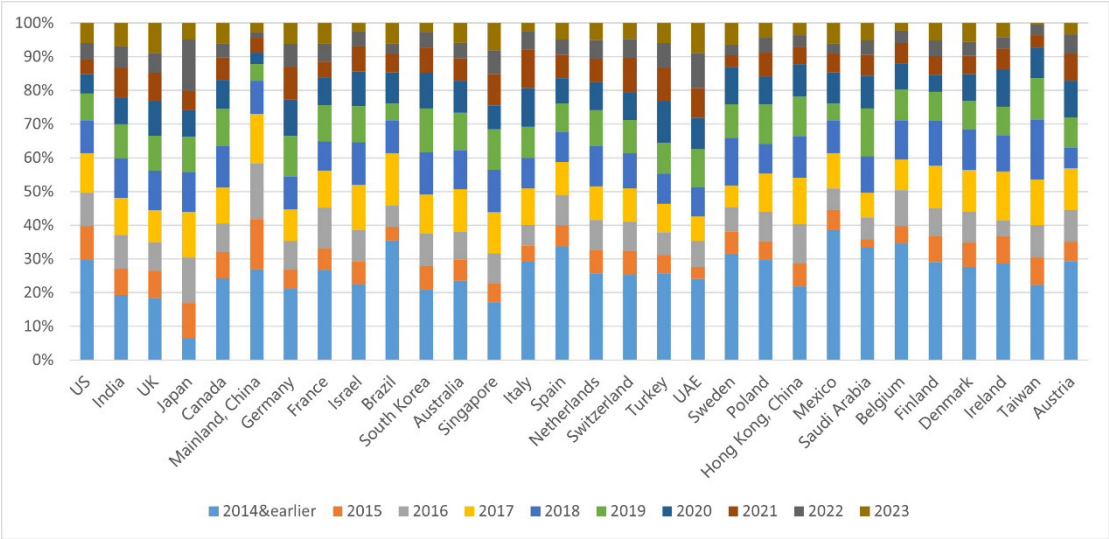
The establishment times of all AI enterprises in the world were statistically distributed by year, prompting the finding that:

In 2018, OpenAI released the GPT-1 model and Google issued its BERT model, which spurred development of the field of natural language processing. Since 2019, the number of newly established AI companies increased year by year, with a notable dip in 2020, we infer, including the obstruction of international exchanges, greater difficulty of capital market funding, a rising threshold for AI technology, and data bottlenecks stemming from a multiplicity of factors.

Since 2022, the number of AI companies globally exhibited a new upward trend, largely thanks to OpenAI's official release of ChatGPT in November of that year, sparking renewed global interest in the AI field. In 2023, the number of newly established AI companies worldwide grew by 41% compared to 2022.

We analyze the annual proportion of AI companies established in the top 30 countries each year:

Figure 3 - Distribution of AI companies founded in the top 30 countries in the world



- More than 30% of AI companies in Mexico, Brazil, Saudi Arabia, Belgium, and Spain were founded in 2014 or earlier, which to some extent reflects the degree of involvement of traditional companies in these countries in AI being ahead of others and their transformation swifter.

- Since the start of the COVID-19 pandemic in early 2020, most economic activities in that year were obstructed, and the influence of that year's trend still needs to be dispelled. We may thus arrive at such a hypothesis: The more AI companies founded between 2021 and 2023, so the more it may be said that their countries have expended efforts in the field of AI in recent years, with a trend toward accelerating catch-up, and that these countries have invested more in AI. After sorting the data, more than 20% of AI companies in the five countries of the UAE, Singapore, the UK, Turkey, and Germany had their inception in 2021 and later, which is the world's leading indicator. It proves that the above five countries continue to make efforts in the field of AI.

Chapter Two: Current status of global AI startup financing

(I) Total financing amounts of AI startups in various countries (in billions of US dollars)

The total financing of AI startups around the world will by the end of 2023 exceed USD 120 billion, according to statistics, of which the top 30 countries will account for more than 98% of the financing amount. The funding sums of AI startups in the US exceeds USD 30 billion, making up over 25% of the global total, followed by mainland China, with its AI startups' funding nearing USD 27 billion.**Noteworthily, Hong Kong, China, which did not stand out in the number and density of AI companies before, has now joined the world' top 10 in total financing of AI companies, ranking eighth. SenseTime, Insilico Medicine are outstanding representatives of Hong Kong's AI companies.**

Figure 4 - Top 30 countries/regions by total funding amount for global AI startups (USD billion)

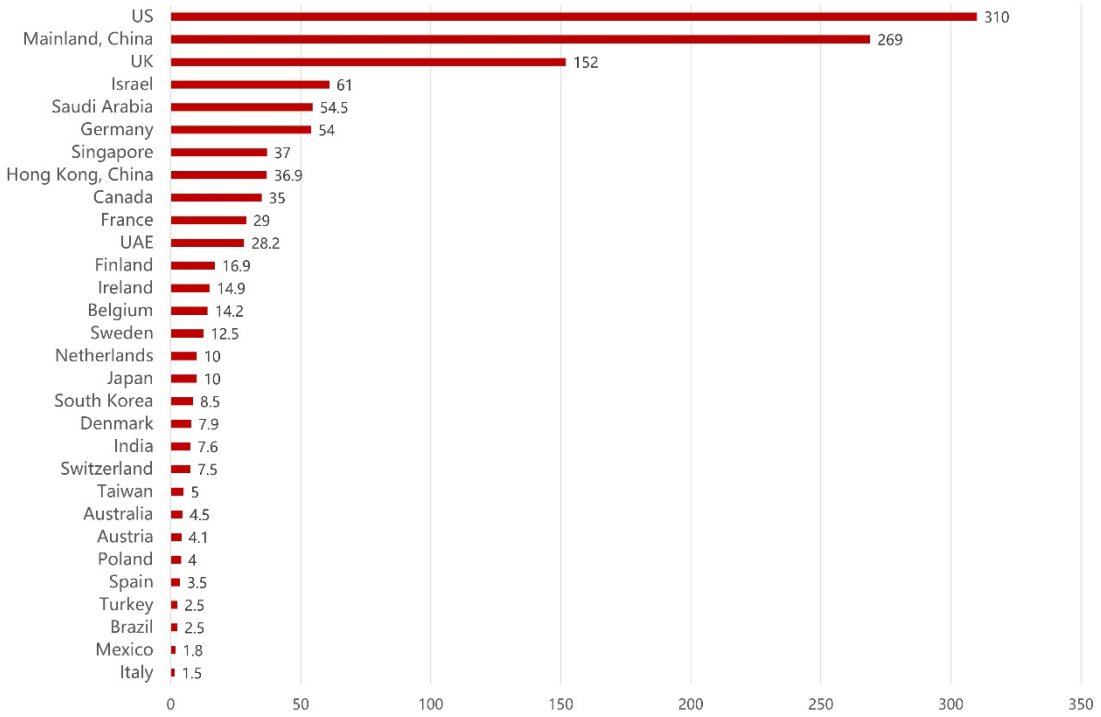


Table 3 - Top 30 countries/regions in total financing amount of global AI startups (USD billion)

Rank	Name of country/region	Total funding amount for AI startups (USD billion)
1	US	310
2	Mainland, China	269
3	UK	152
4	Israel	61
5	Saudi Arabia	54.5
6	Germany	54
7	Singapore	37
8	Hong Kong, China	36.9
9	Canada	35
10	France	29
11	UAE	28.2
12	Finland	16.9
13	Ireland	14.9
14	Belgium	14.2
15	Sweden	12.5
16	Netherlands	10
17	Japan	10
18	South Korea	8.5
19	Denmark	7.9
20	India	7.6
21	Switzerland	7.5
22	Taiwan	5
23	Australia	4.5
24	Austria	4.1
25	Poland	4
26	Spain	3.5
27	Turkey	2.5
28	Brazil	2.5
29	Mexico	1.8
30	Italy	1.5

Case Study-AI Startup Financing Typical Countries/ Regions

For case studies on countries leading in global AI financing, we have selected Saudi Arabia, Hong Kong, China and France.

Saudi Arabia:

1. Government Strategy Support: The Saudi government has taken several strategic measures to promote AI development, creating an excellent environment for AI enterprise financing. Saudi Arabia launched the "Vision 2030," a grand national development plan aimed at diversifying the economy and reducing reliance on oil. AI is considered a key technology in achieving this goal. According to the vision, Saudi Arabia plans to increase AI's contribution to GDP to 12.4% by 2030. This strategic goal provides AI enterprises with clear development directions and policy support.

Saudi Arabia established the Saudi Data and Artificial Intelligence Authority (SDAIA) in 2019, responsible for formulating and implementing the national AI strategy. The establishment of SDAIA signifies a systematic advancement in the AI field. This agency not only promotes the application of AI technology in government and private sectors but also coordinates resources to ensure smooth implementation of AI projects. The Saudi government has pledged to invest more than $50 billion in AI and data technology development over the next decade. These funds support AI research, technology development, talent cultivation, and infrastructure construction, advancing Saudi AI enterprise financing. Saudi Arabia is advancing the construction of NEOM, a new city for the future, with an estimated investment of over $500 billion, providing expansive application scenarios for AI technology. Smart city projects demand ample AI technology support, including intelligent transportation, energy management, and public safety, offering significant market opportunities for AI enterprises.

2. Robust Sovereign Wealth Fund: Saudi Arabia has amassed substantial profits from oil trade. The Saudi Public Investment Fund (PIF), one of the world's largest sovereign wealth funds, manages over $500 billion in assets. PIF actively invests in AI and technology sectors, supporting local enterprise growth and international expansion. Through PIF investments, Saudi AI enterprises receive ample funding to drive technological innovation and market expansion. Additionally, Saudi Arabia aggressively invites foreign investment, attracting over $5 billion in foreign direct investment in 2022, a significant portion directed towards technology and AI sectors.

3. Capital Markets: Saudi Arabia is actively developing its securities market (Tadawul), the largest capital market in the Middle East, providing an excellent financing channel for AI enterprises. Through listings and bond issuance, AI enterprises can secure more financial support. Additionally, Saudi financial institutions actively participate in AI project financing, offering diverse financial products and services.

4. International Cooperation: Led by the Saudi government, partnerships with global tech giants like Microsoft, Google, and IBM have been established. These collaborations not only promote localized application of AI technology but also facilitate technology transfer and knowledge sharing. For example, Microsoft and Saudi Arabia have collaborated on multiple AI projects in smart cities, healthcare, and education. Furthermore, numerous international conferences have taken place in Saudi Arabia, such as the second Global Artificial Intelligence Summit in Riyadh in September 2022. The participating nations signed the "Riyadh AI Action Declaration," fostering a favorable international exchange environment that helps Saudi Arabia attract international investors and tech experts, promoting technology exchange and cooperation. It also provides platforms for Saudi AI enterprises to showcase and connect, helping them attract international investments and partners

Leading AI Enterprise in Saudi Arabia:

Al Moammar Information Systems:A Saudi Arabian ICT solutions technology company focusing on providing information technology solutions and systems integration services. In the AI field, it functions as an infrastructure provider, having invested in OpenAI and Anthropic. Al-Moammar Information Systems also signed a cooperation agreement with Microsoft and the Saudi Data Center Fund to jointly advance AI development in Saudi Arabia.Arabia.

Hong Kong, China:

From the perspective of enterprise financing, we analyze the financing capabilities of Hong Kong AI enterprises.

1. Mature Capital Market: Hong Kong boasts a highly developed and liquid capital market, including stock, bond, and private equity markets. This provides AI enterprises with diversified financing channels allowing them to choose appropriate financing methods based on their development stage and needs.

2. International Investor Network: As an international financial center, Hong Kong gathers investors from around the world, including venture capital firms, private equity funds, and strategic investors. This makes it easier for Hong Kong AI enterprises to access international capital, securing greater financing opportunities.

3. Comprehensive Financial Services: Hong Kong offers the world's richest financial service resources, including investment banks, law firms, and accounting firms, providing professional financing consulting and services for AI enterprises, improving financing efficiency.

4. Proximity to Mainland China Market: CEPA agreements and other policies between Hong Kong and mainland China provide preferential policies for Hong Kong enterprises entering the mainland market. Additionally, Hong Kong actively participates in the Guangdong-Hong Kong-Macao Greater Bay Area development, offering more opportunities for AI enterprise growth.

Leading AI Enterprises in Hong Kong,China:

- SenseTime: Founded in 2014, SenseTime was listed on the Hong Kong Stock Exchange in December 2021 and has become one of the largest AI software companies globally. It has developed a top-notch deep learning platform and supercomputing center, launching leading AI technologies like facial recognition, image recognition, text recognition, medical imaging recognition, video analysis, autonomous driving, and remote sensing. SenseTime has become a leading AI algorithm provider in Asia.

- Insilico Medicine: Founded by Alex Zhavoronkov in the U.S. in 2014, Insilico Medicine established its headquarters in Hong Kong in 2019. As an AI-driven clinical-stage biopharmaceutical company, it uses modern machine learning technologies like deep generative models, reinforcement learning, and transformer models to build a powerful AI-driven drug development platform. The company has created three AI drug development platforms encompassing the three stages of new drug development: target discovery platform PandaOmics, compound design and generation platform Chemistry42, and clinical trial prediction platform InClinico.

France:

1. Government Strategy Support: The French government has implemented various strategic measures to promote AI development, creating an excellent environment for AI enterprise financing. In 2018, France launched the national AI strategy "AI for Humanity," planning to invest €1.5 billion over five years in AI technology development. Bpifrance provides substantial financial support to help AI startups in technology R&D and market expansion. Moreover, the government introduced tax incentives, with R&D tax credits of up to 30% of R&D expenditures, encouraging investment and innovation in the AI sector. France hosts numerous startup incubators and accelerators, such as Station F, one of the world's largest startup campuses, providing workspace, technical support, and financing channels for AI startups.

2. Research Foundation: France boasts world-class research institutions and universities, like INRIA, École Normale Supérieure, and École Polytechnique, leading globally in AI research, driving innovation and application in AI technology.

3. International Cooperation: France participates in the European Union AI strategy's formulation and implementation, particularly in developing the "AI Act," aiming to establish a unified AI regulatory framework within the EU to ensure safe and ethical AI technology development. This benefits French AI companies by gaining competitive advantage in the larger EU market. France also regularly hosts international AI conferences and forums, such as the Paris AI Summit, offering a platform for global AI experts and entrepreneurs to share knowledge and collaborate, enhancing France's reputation and influence in the international AI field.

Leading AI Enterprises in France:

- Mistral AI: Based in Paris, Mistral AI is an AI large model company founded by former employees of Meta Platforms and Google DeepMind in April 2023. By December 2023, it had raised €385 million, focusing on developing large-scale language models similar to OpenAI's GPT series, applicable in natural language processing, text generation, translation, and more.

- Dataiku: Founded in 2013, Dataiku's headquarters is now in New York, but its founding team is from France. Its core product, Dataiku DSS (Data Science Studio), is an end-to-end data science and machine learning platform, offering a complete toolchain from data preparation and analysis to model deployment. Its customers, mainly large and medium enterprises, span finance, retail, manufacturing, healthcare, and more.

- Hugging Face: A leading open-source AI community and platform aimed at democratizing AI and making it more accessible. Founded by a French team, Hugging Face's Model Hub is the world's largest open-source AI model library, encompassing natural language processing, computer vision, speech recognition, and more. Users can freely download, use, and modify these models or upload their trained models to share with the community.

(II) Regression analysis of financing and valuation of unicorn AI enterprises in various countries

The regression analysis of financing amount and valuation of AI enterprises in various countries is limited by an inability to obtain precise valuations of all AI enterprises in various countries. We can further narrow the scope and focus to the leaders of various countries, that is, unicorn AI enterprises. Internationally, companies with a valuation of more than USD 1 billion are generally recognized as being industry unicorn companies. Based on public financing data, the tentative decision was made to declare companies with financing amounts exceeding USD 100 million to be unicorn companies. As a sample for research:

First, the total number of eligible AI unicorn companies in various countries is 243.

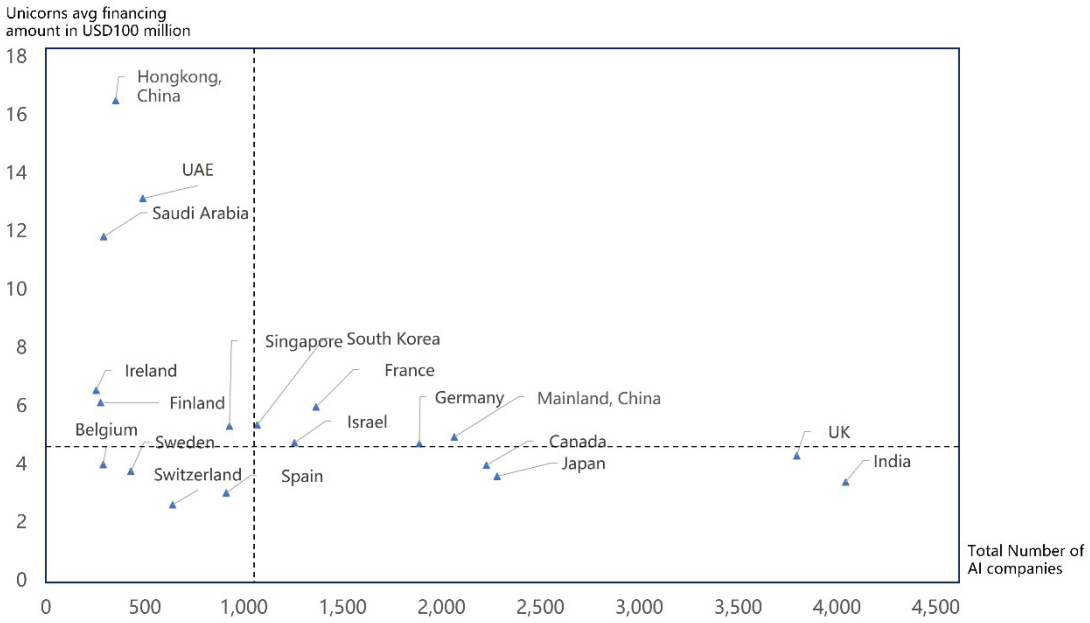
Table 4 - Distribution of countries with AI unicorns in the world

Country	Number of Ai unicorns	Average financing amount (USD 100 million)
US	116	9.81
Mainland China	41	4.94
UK	12	4.29
Canada	10	3.97
Israel	9	4.74
Germany	9	4,71
Singapore	8	5.31
India	7	3.39
France	6	5.97
Saudi Arabia	4	11.82
South Korea	4	5.35
Japan	4	3.59
Belgium	2	3.99
UAE	2	13.13
Finland	2	6.12
Hong Kong, China	2	16.5
Switzerland	2	2.60
Spain	1	3.01
Ireland	1	6.54
Sweden	1	3.76

The US has the largest number of AI unicorns in the world, reaching 116, and mainland China ranks second with 41. Hong Kong, China ranked first in the world with an average financing of USD 1.65 billion per AI unicorn. This relates to the small sample size of enterprises, but also shows the financing ability of AI enterprises in the Chinese enclave. The two companies are SenseTime and Insilicon Valley. In addition, the average financing amount of AI unicorns in Saudi Arabia and the UAE exceeds USD 1 billion to lead all other countries. The average financing amount of 116 AI unicorns in the US is USD 980 million, which is a very astonishing figure.

We use the average financing amount of unicorns and the total number of AI companies as two data dimensions to generate a four-quadrant matrix diagram for the above countries (because the US is so far ahead in two indicators and is in an absolute lead in the first quadrant, it is excluded from the diagram):

Figure 5 - Global AI Unicorn Countries and AI Enterprise Number Distribution Matrix



The dotted line in the figure is the median of all data. The finding is that, in the amount of financing for unicorn enterprises and the number of AI enterprises nationwide, the US, France, Israel, South Korea, Germany, and mainland China are all in the first quadrant. The above countries are superior to others in the number of AI enterprises and the amount of their unicorn financing. However, in the five countries/regions of Hong Kong, China, the UAE, Saudi Arabia, Singapore, Finland, and Ireland, the amount of financing for unicorn enterprises is relatively high, even though the total number of AI enterprises is not dominant, which demonstrates that the capital market is relatively more optimistic about the enterprises in the above countries.

Financing and valuation regression analysis (again, the US is excluded from the figure because it is so far ahead):

Figure 6 - Regression analysis, of financing, and valuation, of global AI unicorn countries

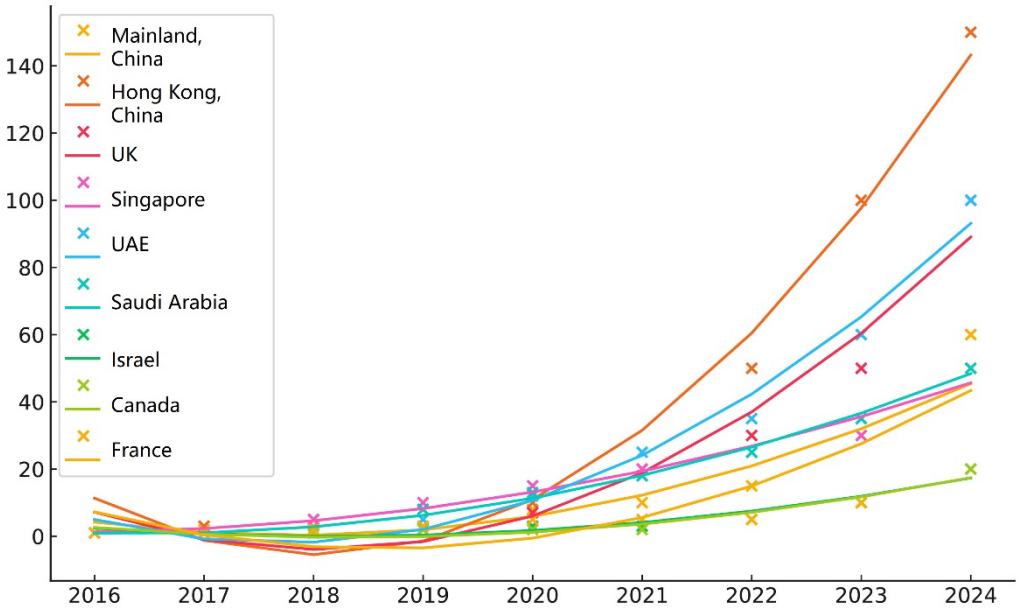


Table 5 - Global AI unicorn country financing and valuation regression analysis fitting slope results

Country	Slope
US	152.5
Hong Kong, China	16.48
UAE	11.42
UK	10.23
Saudi Arabia	5.93
Singapore	5.55
Mainland China	5.15
France	4.52
Israel	1.87
Canada	1.85

A linear regression analyzed the valuation of the top 10 countries with the largest number of AI unicorn companies, and used the least squares method to fit the regression curve. It may be seen that the valuation of AI companies in the US has grown most notably in the past year. The US has an even more evident role in promoting the growth of AI enterprise value. Hong Kong followed, while the UAE ranked third.

Chapter Three: Industry distribution of AI companies

(I) According to the current distribution of the AI industry, the following divisions were made:

Vertical:

AI companies that provide products/services in vertical fields focus on AI applications in a specific industry or market area and have developed to solve specific problems in a specific industry, including internet personalized message recommendations, marketing planning, finance, generation of app and web page customization, automated management, and other fields.

Infrastructure:

Consists of companies that provide AI-related infrastructure - computing power (including quantum computing), chip and hardware manufacturing and. management, data management, data analysis, and AI security. These areas are the lowest infrastructure in the entire AI discipline and provide a common base.

Foundation Model:

AI companies that provide large models, including natural language models, image recognition models, special language models, etc., as represented by ChatGPT. The features of this type of enterprise are that the parameters of product design are huge, and training consumes massive computing power, constantly pushing artificial general intelligence forward.

Medical:

Because of the particularity of the medical field, medical care is listed here as a single field, mainly including, e.g., medical imaging, clinical decision support systems, mental health, and AI drug R&D.

Robotic:

Automated AI companies provide products and services including robotic dogs, humanoid robots, and driverless vehicles, which are mainly used in manufacturing, logistics, and the home and service industries.

National Defense:

In the field of national defense and aerospace, fewer companies are involved in this segment, with AI comprehensively used in Big Data, satellite imagery, and anti-terrorism, and other scenarios to consolidate national defense.

The segmented industries are shown in the figure below:

The segmented industries are shown in the figure below

Figure 7 - Global AI enterprise segmentation by industry

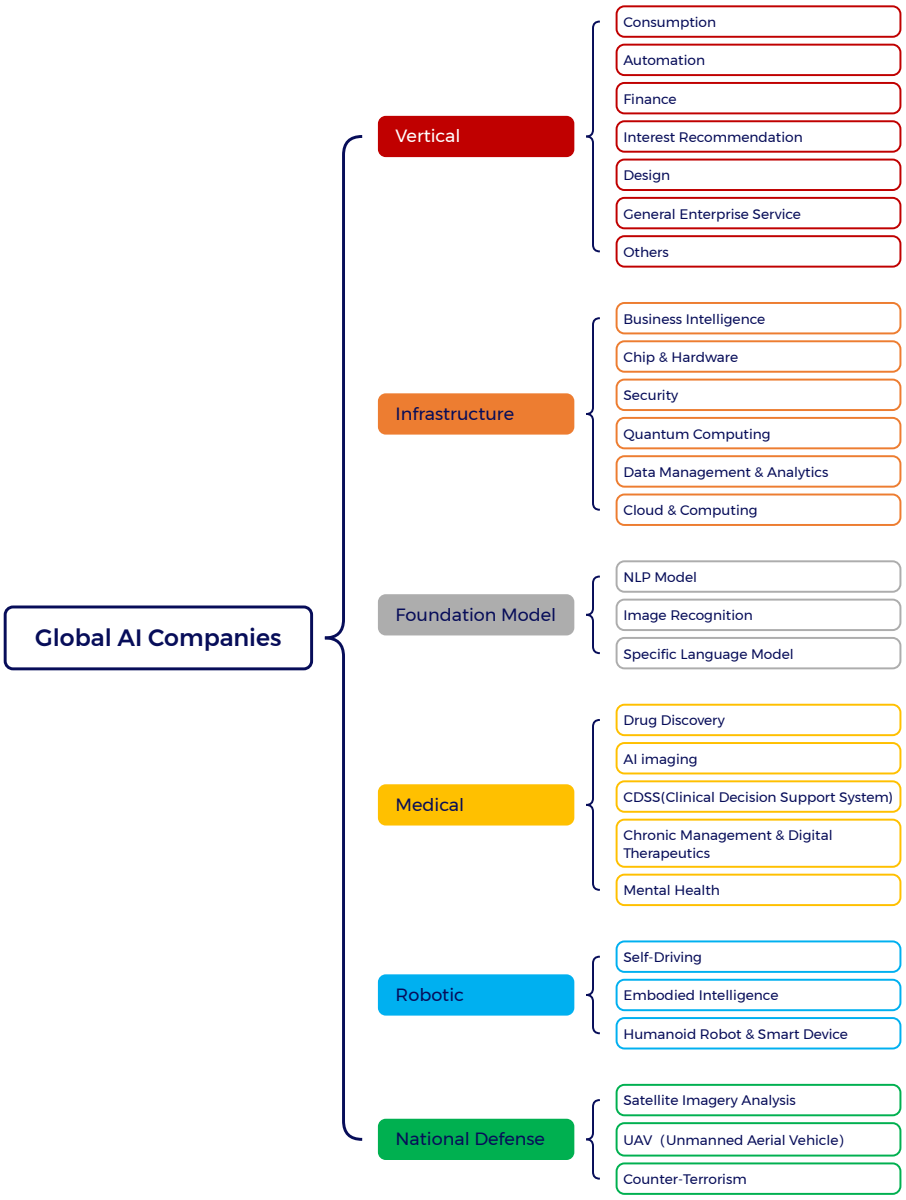
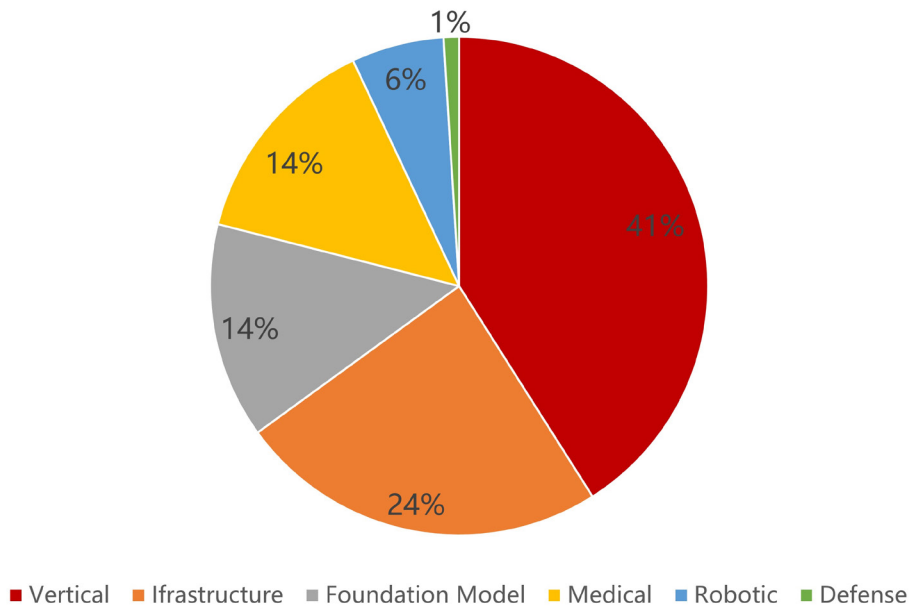


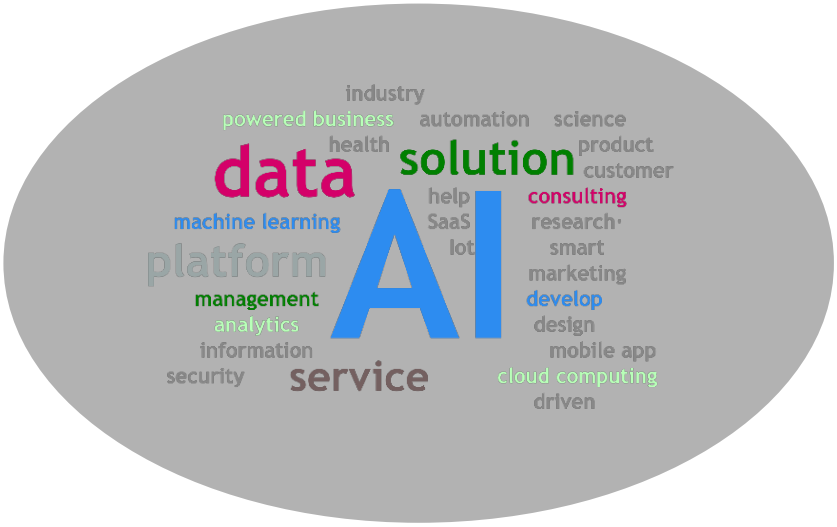
Figure 8 - Pie chart of industry distribution of global AI companies



More than 40% of AI companies in the world apply AI in vertical fields and transform technology into actual application scenarios. About 24% of companies provide AI infrastructure, and about 14% develop foundation models.

(II) Based on the collection of 55,000 global AI companies, this study conducted a Big Data word cloud analysis of the product and service publicity information on the companies' official websites, and obtained the following word cloud chart:

Figure 9 - Global AI enterprises' products and services word cloud



This may be summarized as follows:

- AI has become the biggest promotional tag among all enterprises, distinguishing these enterprises from those of the previous era.

- Data management, cloud computing, machine learning, and mobile apps are the most commonly used technical terms for AI enterprises, which are also the indispensable components and product presentation forms of development of AI technology.

- Software as a service, platform solutions, empowered business, and consulting are the roles that AI enterprises most hope to play in business activities.

- Healthcare, marketing, design, scientific research, automation, security, and the Internet of Things are the application scenarios in which AI enterprises are most involved.

Through the tens of thousands of data collected in this study, we have gained a preliminary understanding of the development status of global AI companies and the competitiveness of various countries, and observed the widespread application and far-reaching impact of AI technology around the world. Behind the data, we can see moving facts. Even in the war-torn Middle East, in Iraq, a country affected by conflict, an AI company is struggling to move forward in the face of difficulties. In the least developed African region, Rwanda, Zambia, Benin, and Senegal have also had AI companies coming into being and operations. The borderless nature of AI technology also profoundly reminds us how important it is in an era of rapid technological development to achieve fair and equal use of AI technology worldwide.

The potential of AI technology can transcend national borders, break down barriers, and bring benefits to human society. However, only with the joint efforts of countries around the world can we ensure that the benefits of this technology are not limited by geographical, economic, or political barriers. Therefore, we call on countries around the world to work together to set more global issues for AI and promote the inclusive development of the technology. Let us work together to ensure that AI technology is not merely the privilege of a few countries, but a common wealth of all humanity that contributes to building a better and fairer future.

Data source/references

The global AI enterprises related data in this article comes from the Crunchbase database,Pitchbook and CB insights.

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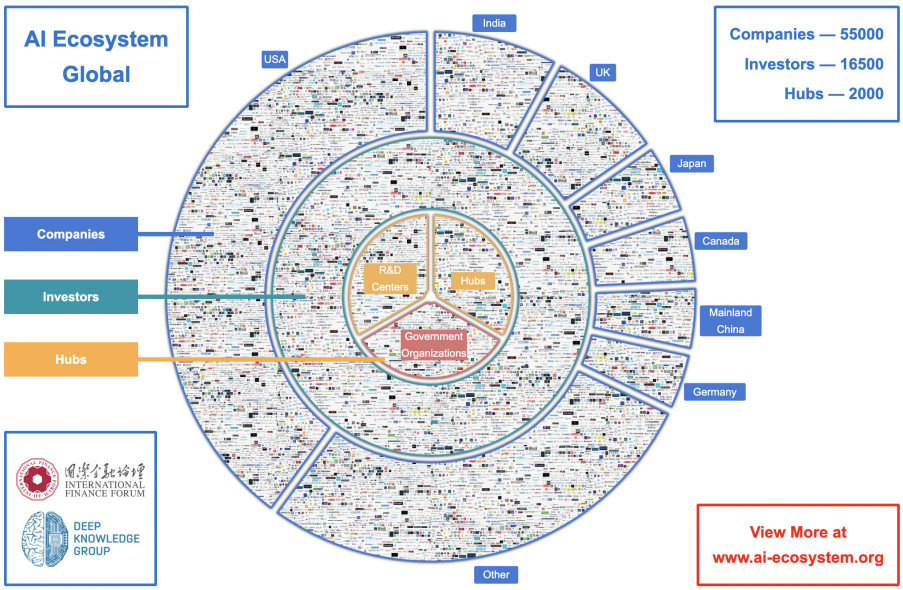
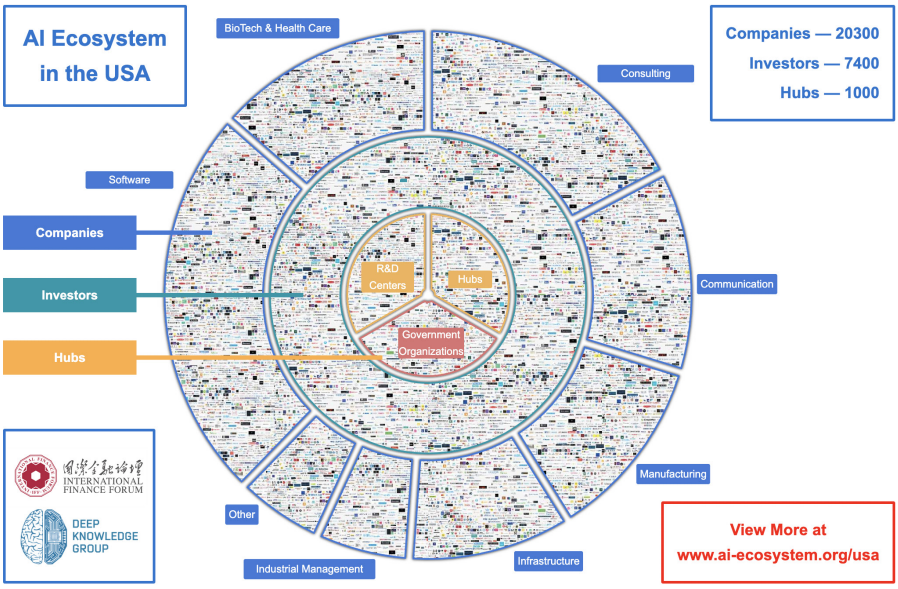
Appendix:

Map of AI companies in major countries around the world (from Deep Knowledge Group):

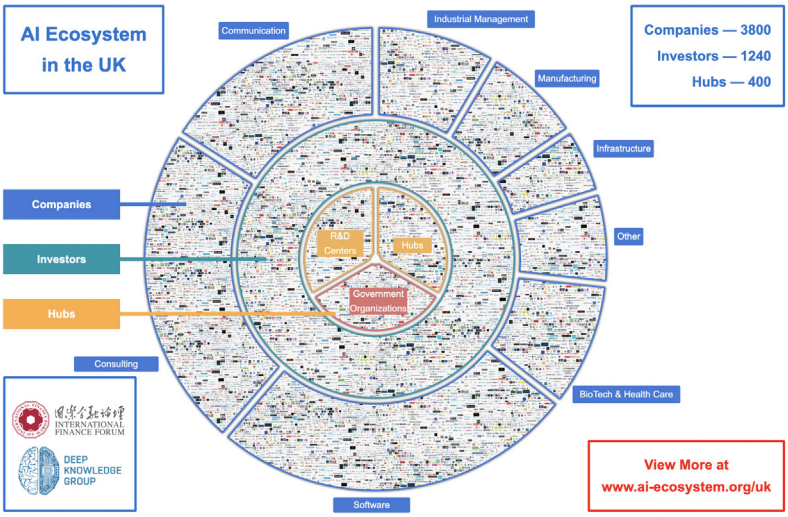
Global:



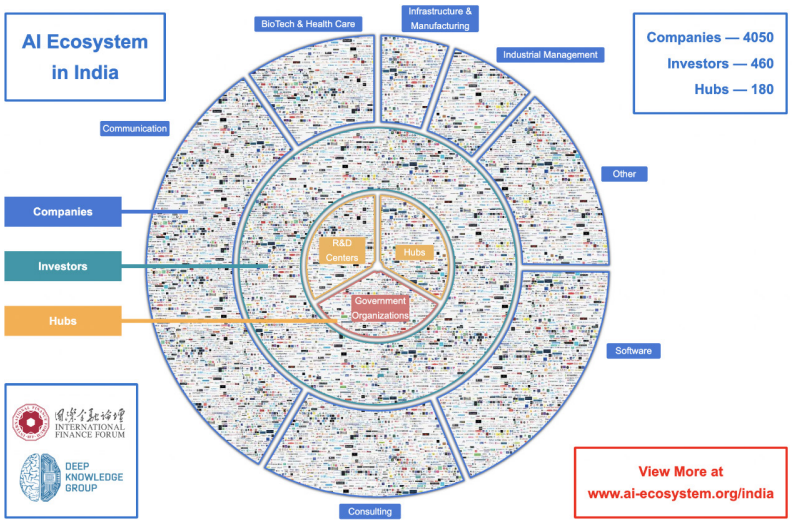
USA:



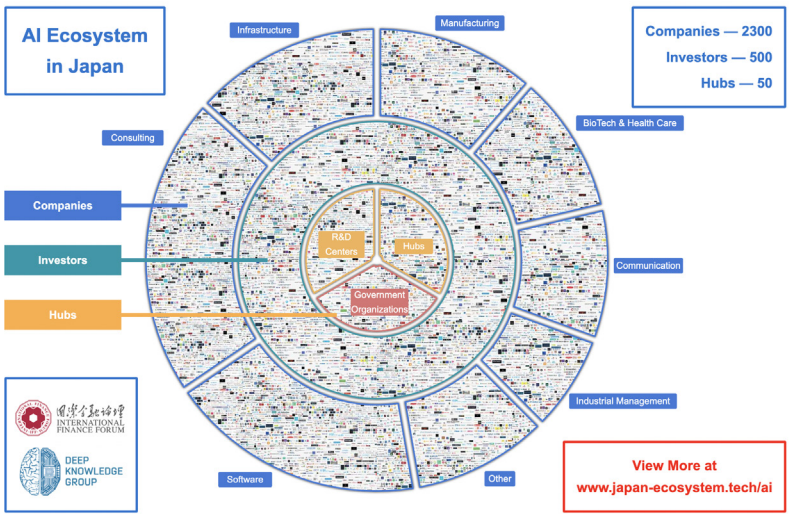
UK:



India:



Japan:



International Finance Forum（IFF）

The IFF is an international, independent, non-profit, non-governmental organization. It was founded in October 2003 by G20 countries and international organizations such as the United Nations, the World Bank, and the International Monetary Fund, and is a high-level permanent institution for dialog and multilateral cooperation in the field of global finance. The IFF is also known as the 'F20 (Finance 20)'.

The IFF's goal is to establish a platform for strategic dialogue, exchange and cooperation, practical innovation, academic research, and talent cultivation in fields such as the global economy, finance, and public policy through an international, market-oriented, and professional operating mechanism, as well as to promote the world of financial services along with comprehensive and sustainable development.

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