2022 FEBRUARY

AI START-UPS BAROMETER

Skopai
Deep Tech Insights

CONTENT INDEX

Skopai
Deep Tech Insights

INTRODUCTION

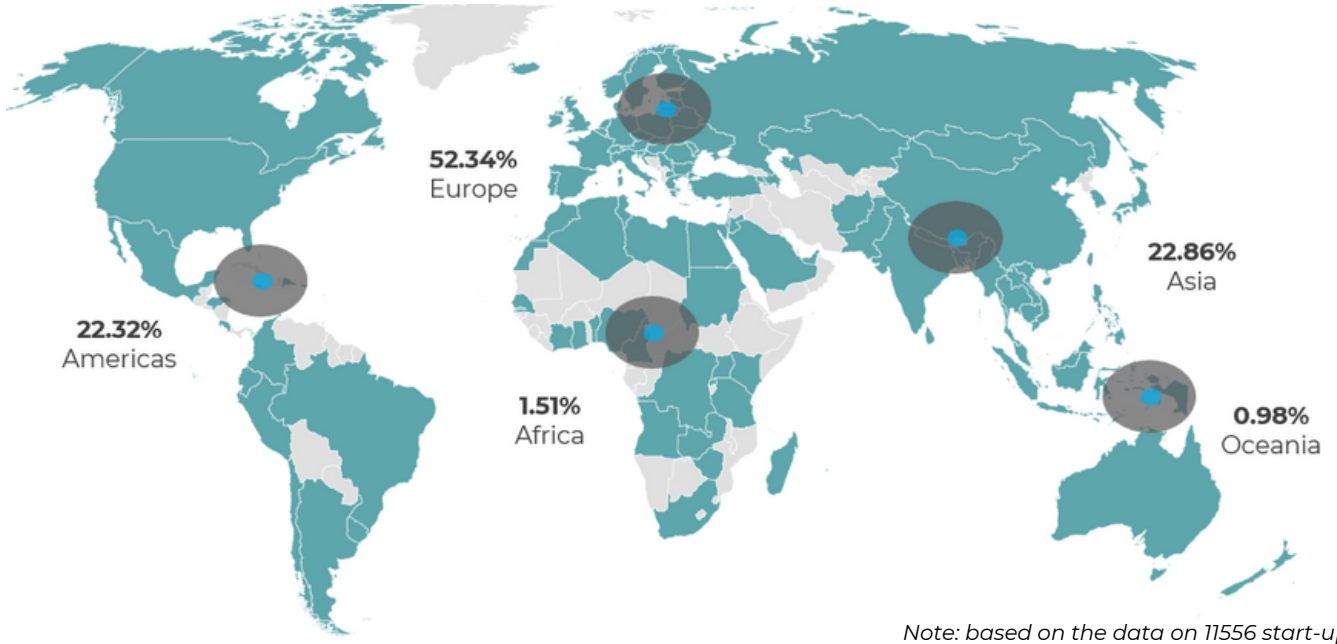
The term "artificial intelligence (AI)" is widely used in common language. It broadly refers to "the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages" (The Oxford Dictionary).

Smart assistants, self-driving cars, robo-advisors, and social media monitoring are only a few examples of AI applications. Companies, governments, and society are increasingly adopting AI due to its capabilities to solve problems and enhance the world. Start-ups play an important role in the development and dissemination of AI technologies across industries. This report presents an overview of the current landscape of AI start-ups over the world with a focus on European and French start-ups.

PANORAMIC VIEW
OF AI START-UPS

AI start-ups from five continents and 117 countries are presented in this study. More than half of the analyzed start-ups operate in Europe (52.34%). Asia (22.86%) and the Americas (22.32%) account for a less than a quarter of start-ups each. About 2.5% of start-ups have their headquarters located in Africa and Oceania.

The most presented countries include the United States (19.76% of start-ups), France (10.06%), the Great Britain (8.42%), Italy (6.91%), India (5.64%), and Germany (5.39%). Start-ups from Spain, Singapore, China, the Netherlands, Belgium, and Sweden represent more than 2% of the sample each.

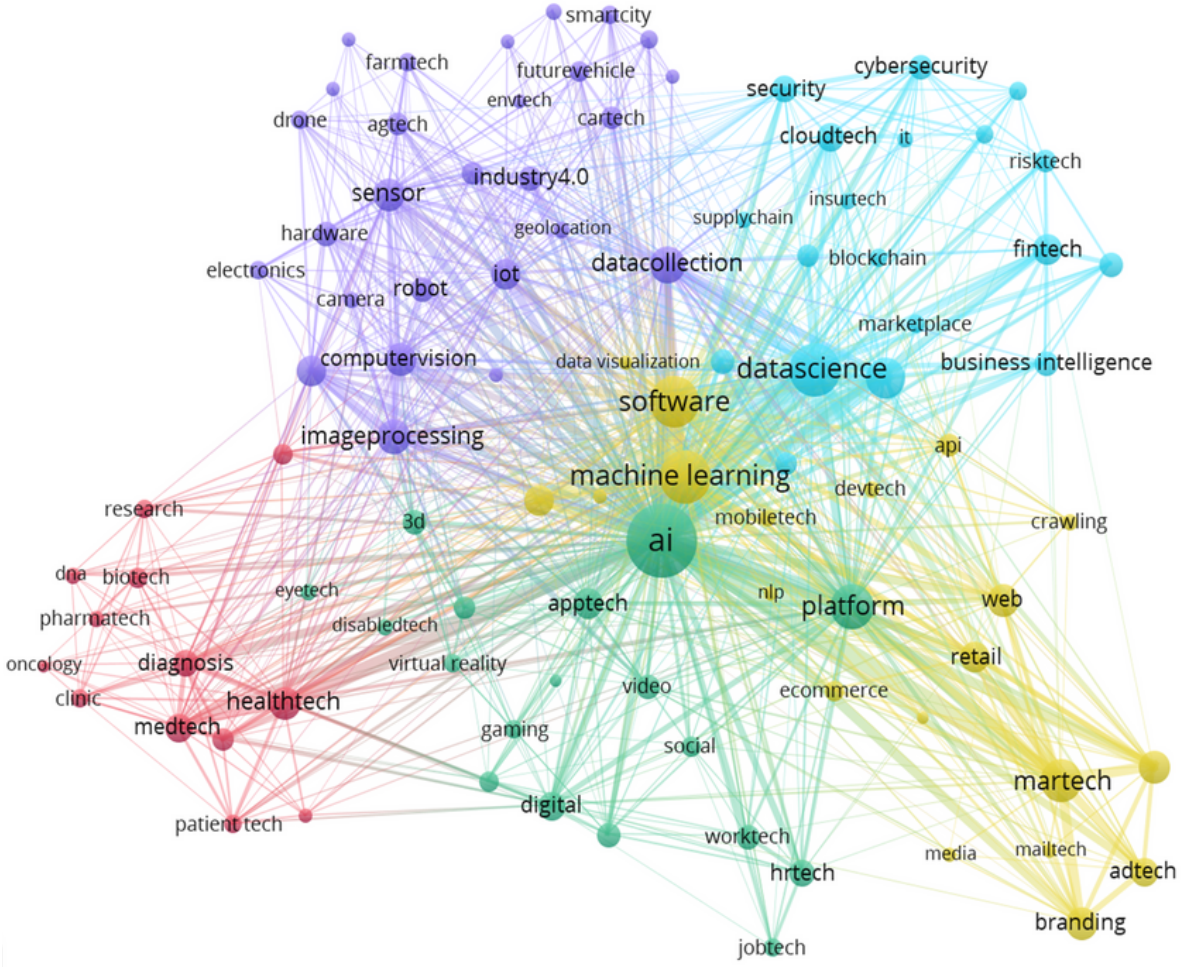


Note: based on the data on 11556 start-ups

THEMATIC CLUSTERS

AI start-ups focus on various technologies, products, and markets. The network depicts the most occurred tags that describe AI start-ups. It consists of nodes and links. The node size represents the occurrence of the tag: the larger the node, the more start-ups in the landscape are characterized with a given tag. Given the nature of the landscape analyzed, the dominant tags include AI, machine learning, data science, software, platform, data collection, big data, computer vision, and image processing.

Different colors represent five clusters of tags. These include the cluster of industrial solutions such as agtech, cartech, electronics, industry 4.0, smart city (violet cluster), the fintech and security cluster (blue), the marketing and branding cluster (yellow), the healthcare cluster (red), and the cluster related to hrtech, video, and gaming (green). The identified clusters are the main industry domains related to AI.



Note: co-occurrence analysis of start-ups' tags performed using VOSviewer software

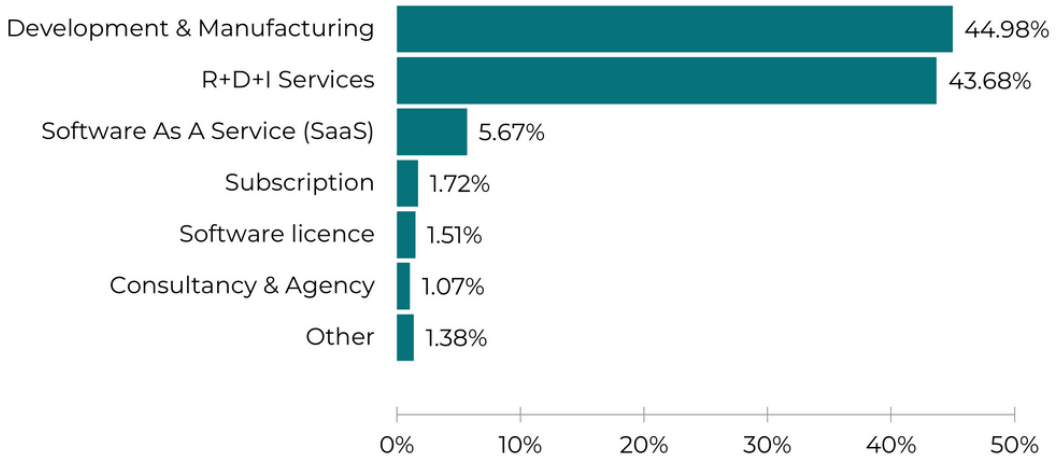
MARKET

COMMERCIAL TRANSACTION

The dominant form of commercial transaction of AI start-ups is Business-to-Business (B2B, 95%). Only 4% of the analyzed start-ups have Business-to-Consumer model (B2C) and offer solutions to individuals, and 1% – have Business-to-Government model (B2G) and provide services to governmental institutions.

BUSINESS MODEL

In terms of business models, the majority of AI start-ups have development and manufacturing (44.98%) and R+D+I Services (Research, Development and Innovation, or sometimes Research, Development and Industrialization) business models. Software as a service (SaaS), subscription, software license, and consultancy and agency business models are also present in the landscape.

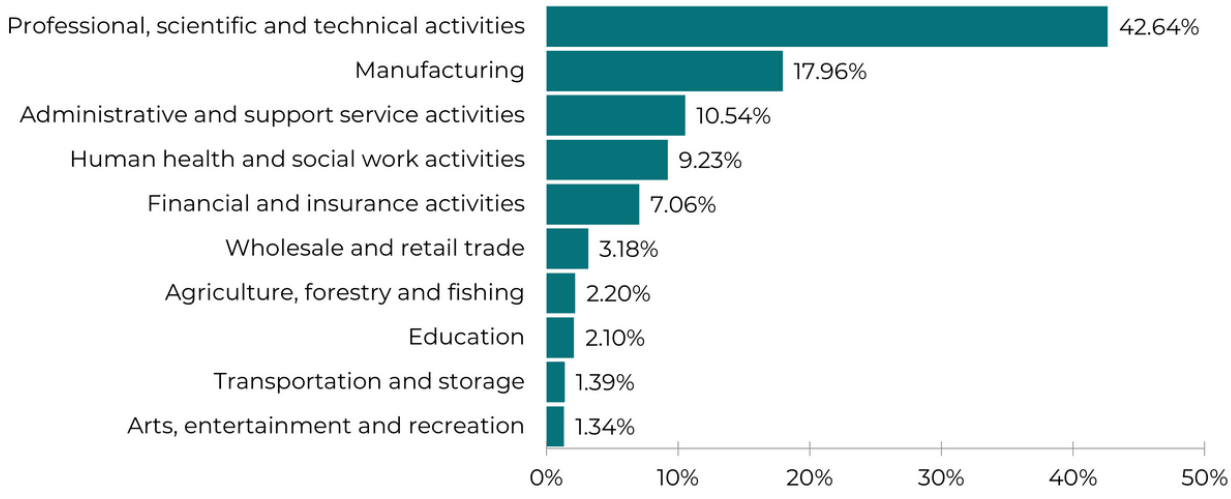


Note: based on the data on 11667 and 3844 start-ups for commercial transaction and business model, respectively. Categories are not mutually exclusive and start-ups with several types of commercial transaction and business models are possible.

INDUSTRIAL APPLICATION

OF AI TECHNOLOGIES

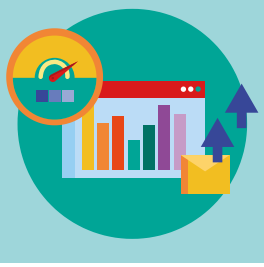
AI technologies are applied in a variety of sectors. Professional, scientific and technical activities (42.64%), manufacturing (17.96%), administrative and support service activities (10.54%) are among the main sectors, as well as human health and social work (9.23%), financial and insurance (7.06%) sectors. For example, AI is present in biotechnology and integrated in drug discovery and development. It is also useful for nanomaterials to analyze data and create a more precise representation of the system. AI is transforming industries by proposing new ways of operations forecasting, maintenance, and workforce training. Financial analysts and investors use AI in their decision-making to identify outperforming companies based on million data sources.



Note: based on the data on 11975 start-ups

MARTECH

20%



HEALTHTECH

10%

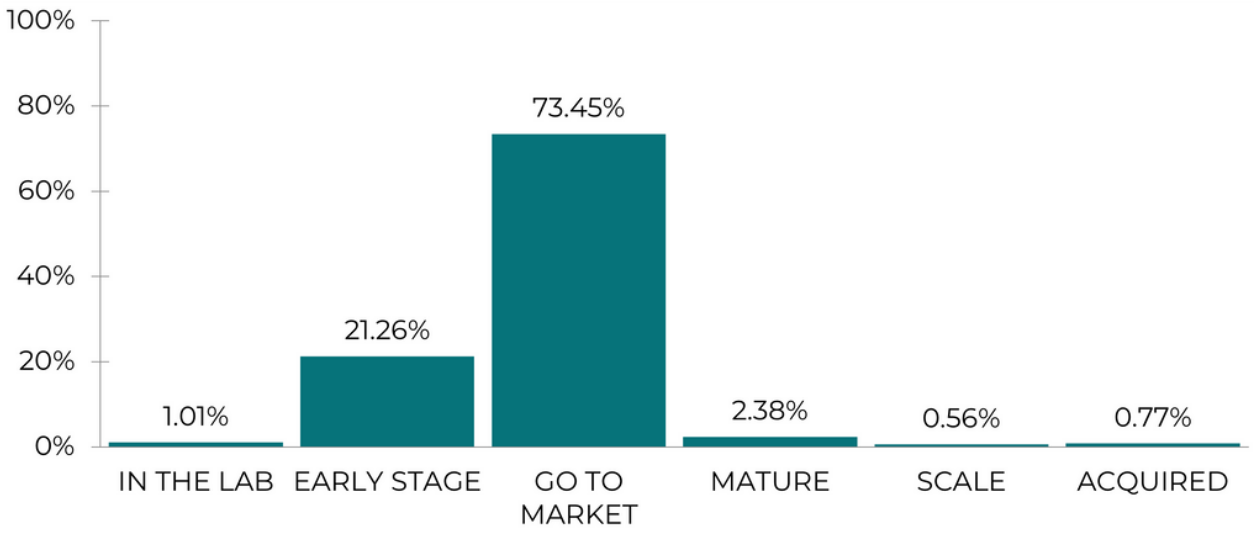
FINTECH

9%

MATURITY STAGE

Most start-ups in the landscape are on the go-to-market stage (73.45%), have defined their markets and search for the first customers. More than 20% of start-ups are on their early stage, focus on product development and search for the initial funding.

More than 1200 new AI start-ups have been created over the last three years. There are 43 AI unicorns in the landscape. These companies are valued at $1 billion or more.



Note: based on the data on 12413 start-ups

1200+

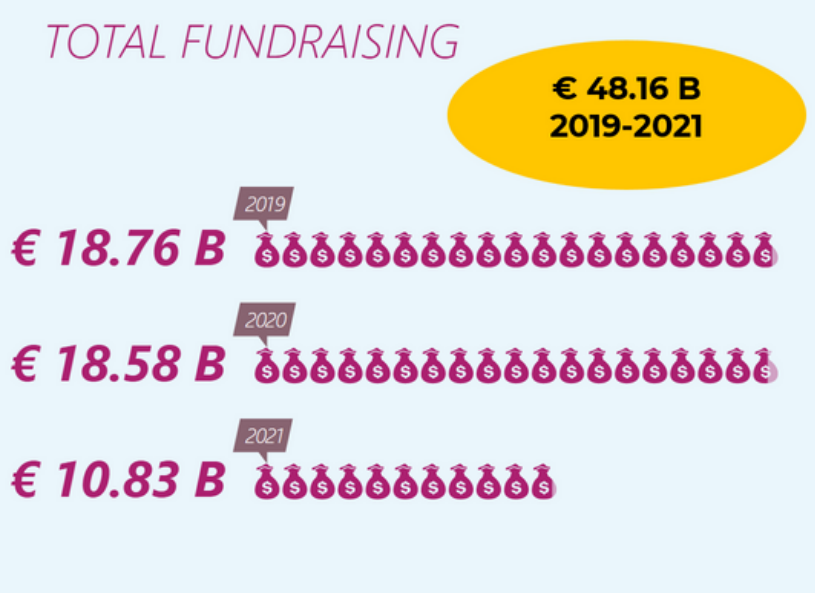
NEW START-UPS CREATED DURING 2019-2021

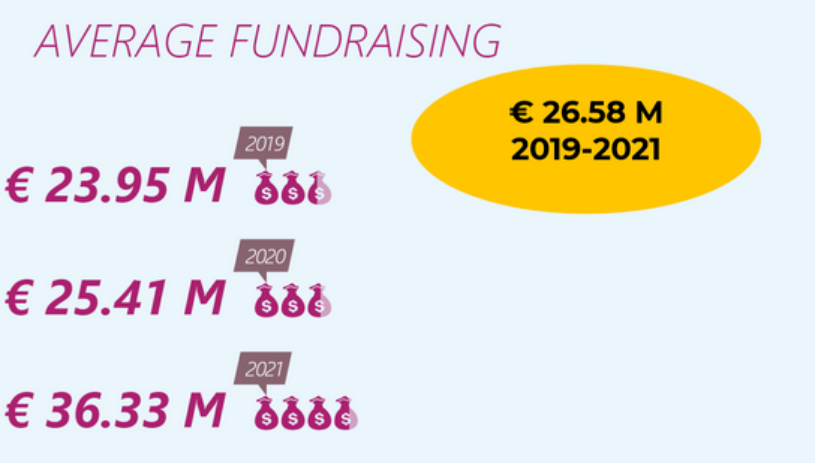
43

UNICORNS

AI START-UPS FUNDRAISING

Over the last three years (2019-2021), AI start-ups raised more than 48 billion euros in funding. In 2021, start-ups raised on average 36 million euros in funding which is more compared to the previous year.

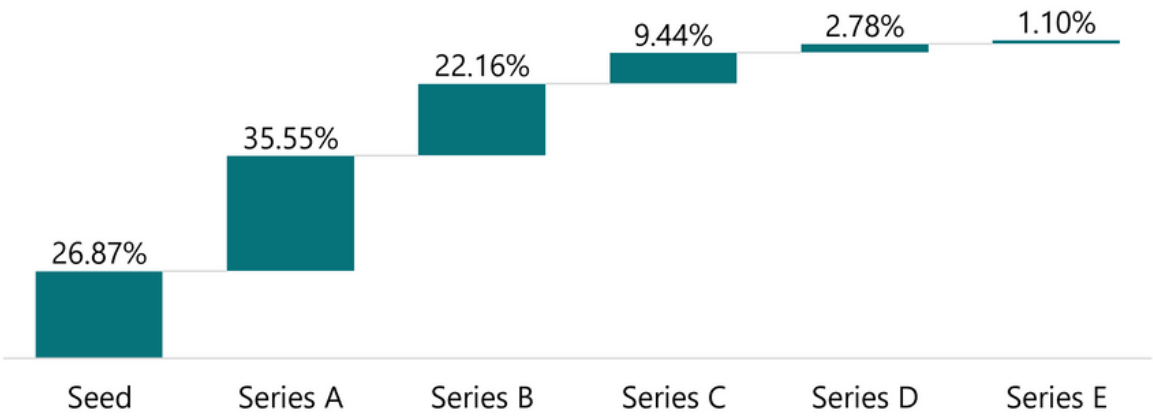




Note: based on the data on 1812 start-ups.
Total fundraising in 2021 might be underestimated since it is possible that recent fundraising events have not been yet communicated at the time of extraction.

FUNDING ROUNDS

The last funding round raised by AI start-ups is mainly Series A (35.55%), Seed (26.87%) and Series B rounds (22.16%). This reflects the dominated go-to-market maturity stage of the start-ups in the landscape. Further, less than 10% of start-ups raised Series C, and only about 4% – Series D or Series E.



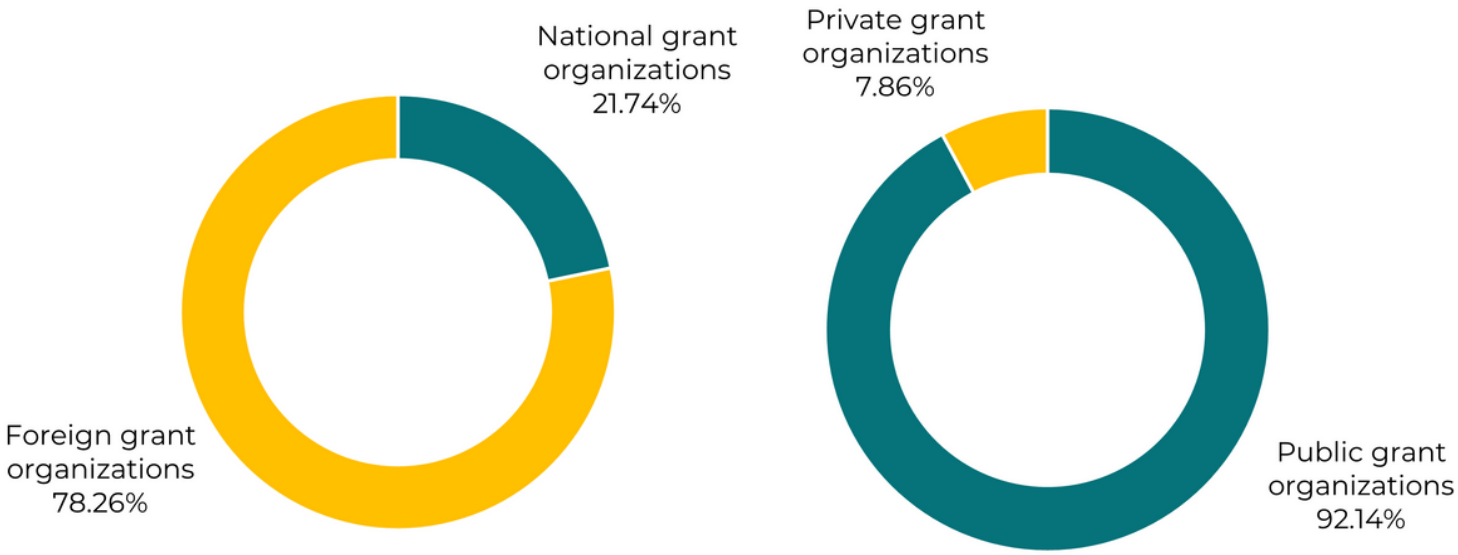
Note: based on the data on 1187 start-ups

More than half of AI start-ups raised funding from national investors (61.87%), which operate in the same country as the main country of a start-up. 38.13% of start-ups were funded by foreign investors, which operate in a different country than the start-up's main country.

Note: based on the data on 2182 start-ups.
Categories are not mutually exclusive and start-ups funded by both national and foreign investors are possible.

GRANTS OF START-UPS

Grants and development programs from governmental agencies and private corporations provide support opportunities and are the form of alternative financing for start-ups and innovators at early stages. AI start-ups obtained grants to a greater extent from foreign (78.26%) compared to national (21.74%) organizations. In terms of organizational form, grants obtained from public organizations (92.14%) substantively exceed those received from private companies (7.86%).



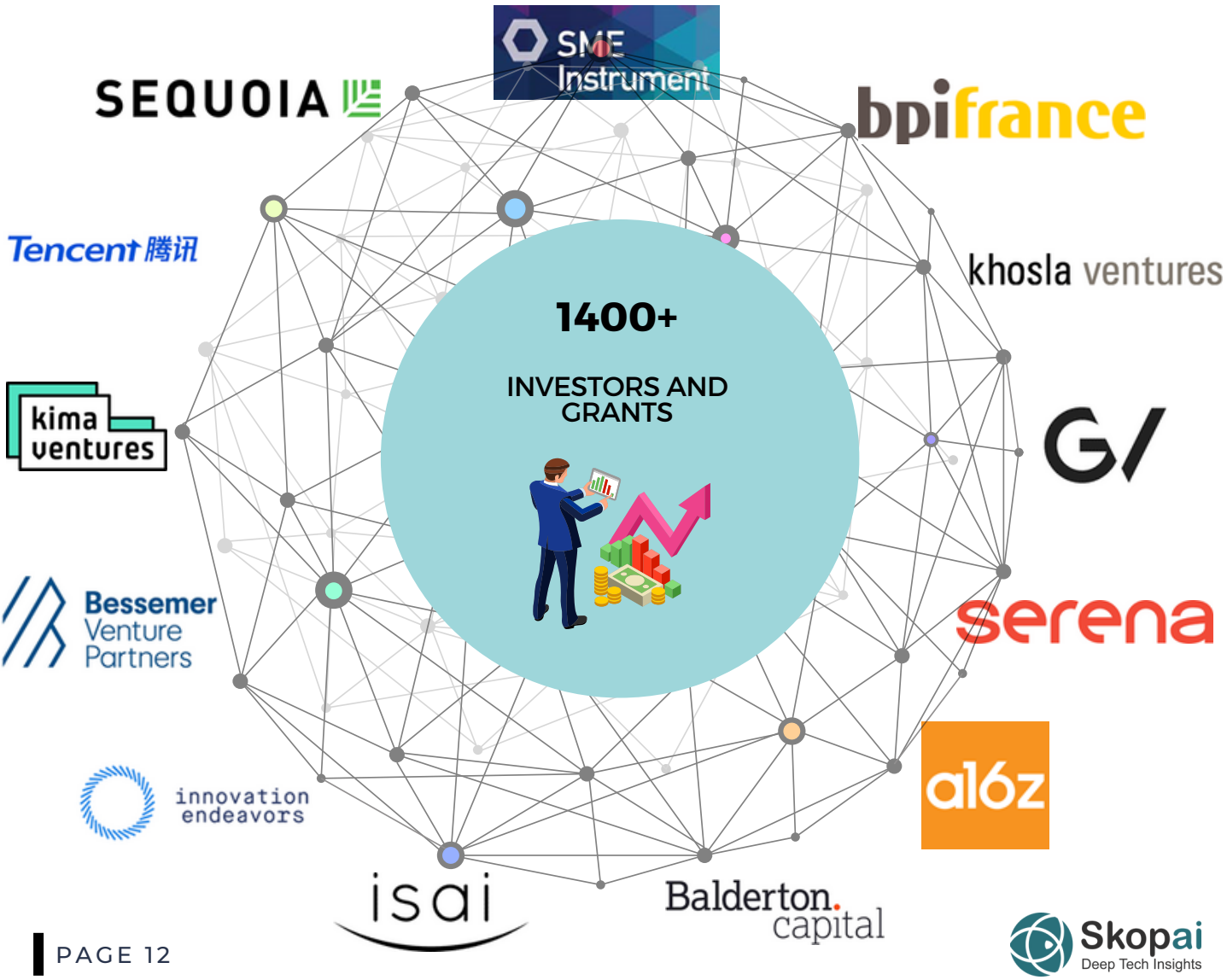
Note: based on the data on 552 and 560 start-ups for national / foreign and public/private distributions, respectively.
EU grants are considered as foreign. Categories are not mutually exclusive and start-ups funded by both national and foreign, public and private organizations are possible.

AI START-UP ECOSYSTEM

INVESTORS, GRANTS

Start-ups in the AI landscape are deeply embedded in the entrepreneurial ecosystem which includes different actors such as investors, business incubators, accelerators, partners, and industrial clusters.

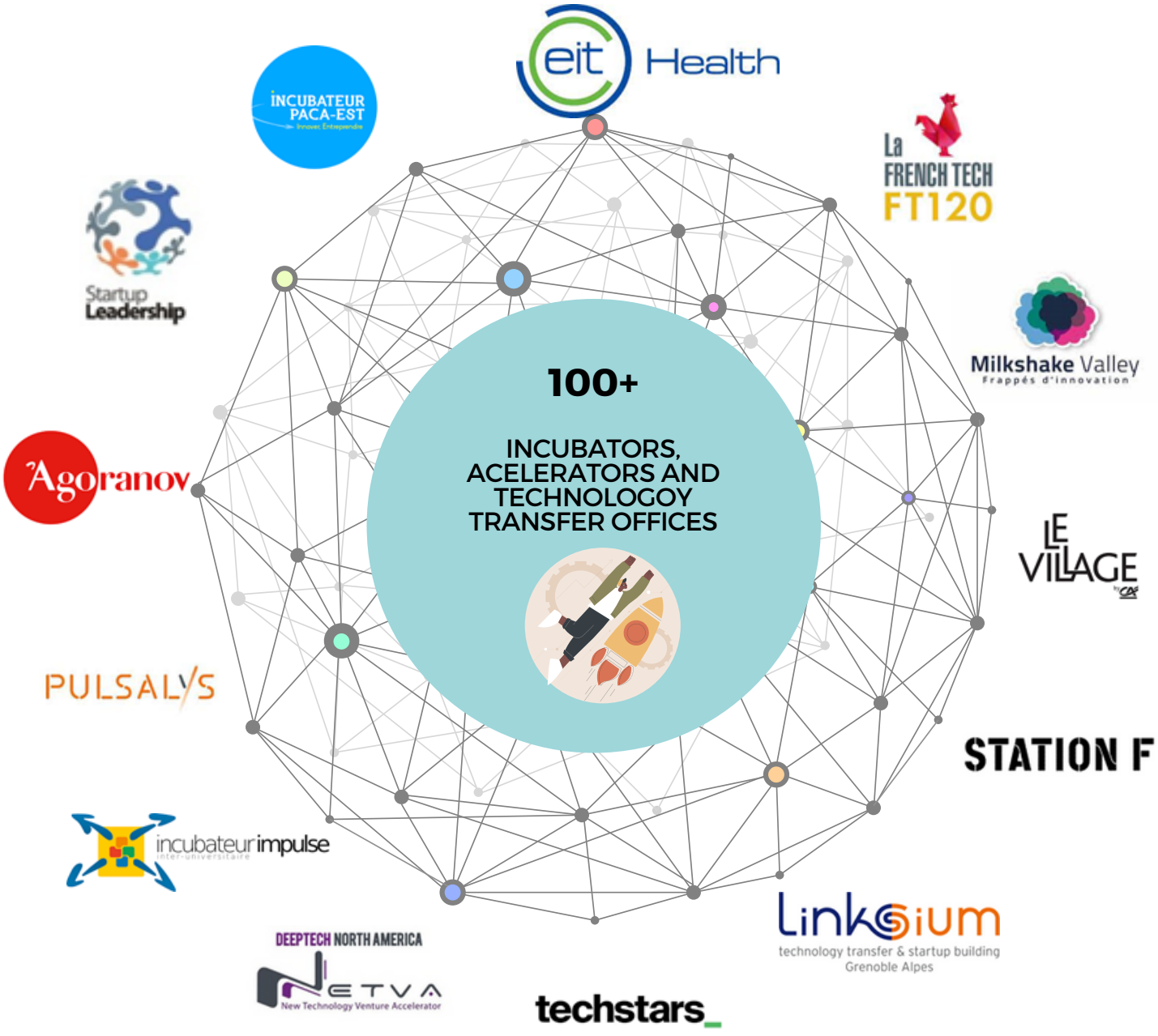
The data shows that start-ups have been funded by more than 1400 different investors, including venture capital, corporate venture funds, and grant programs. The dominant are the SME Instrument launched by the European Commission under Horizon 2020 to support the whole innovation cycle of SMEs with strong ambition to develop, growth, and internationalize, Bpifrance and i-Lab innovation competition that aims to detect and support innovative technology projects, Khosla Ventures, GV, Sequoia Capital, Serena Capital, Andreessen Horowitz, and Balderton Capital among many others.



AI START-UP ECOSYSTEM

INCUBATORS, ACCELERATORS, TTO

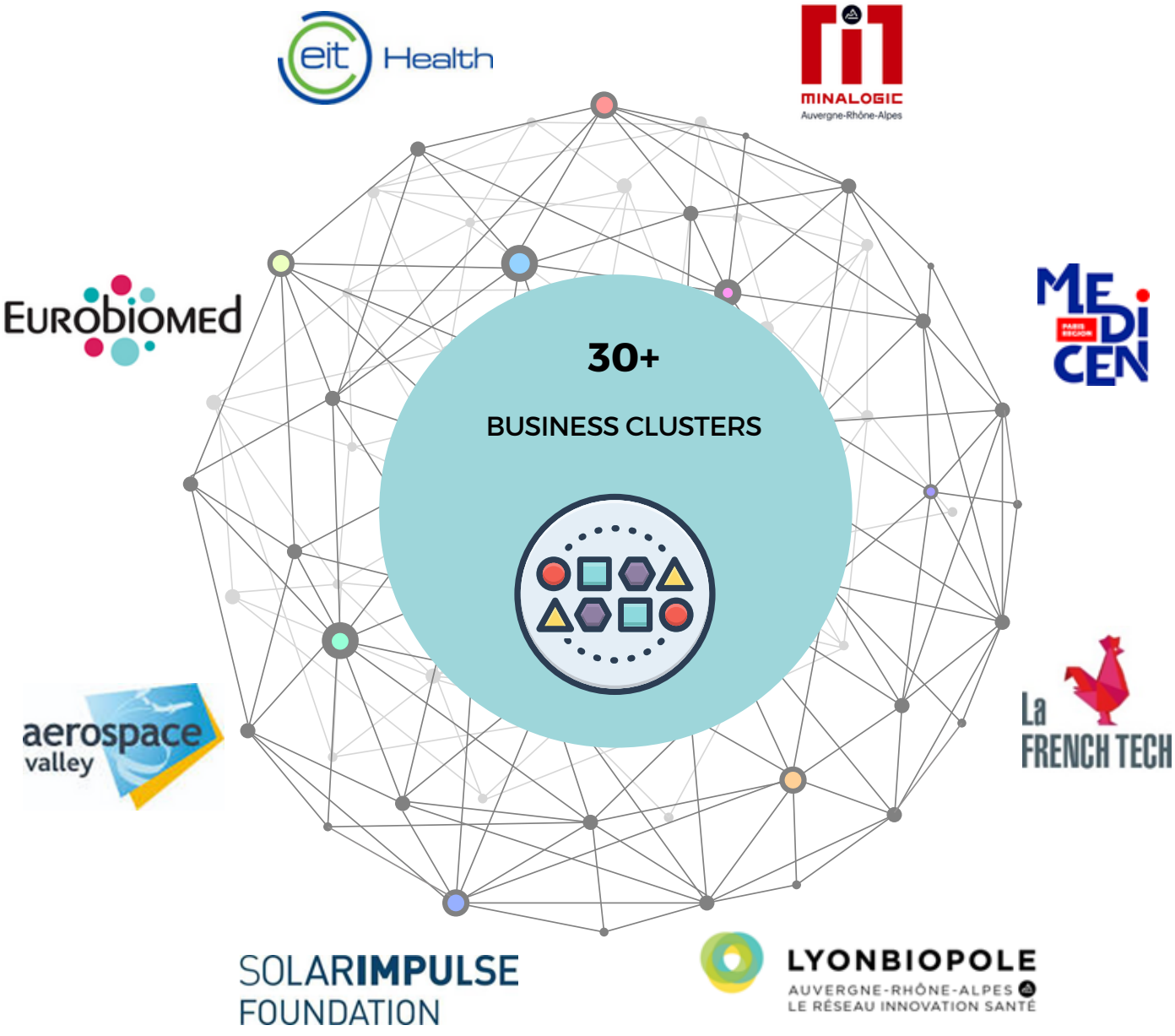
AI start-ups are incubated in more than 100 different incubators, accelerators, and technology transfer offices (TTOs). These include the French Tech 120 that is France's growth-stage program aimed at providing support for the 120 fastest growing companies in France, EIT Health acceleration programs, Milkshake Valley start-up acceleration program of Hewlett Packard Enterprise, Le Village start-up accelerator by Crédit Agricole Group, Station F, and Techstars, among others.



AI START-UP ECOSYSTEM

BUSINESS CLUSTERS

The analyzed start-ups are the part of more than 30 different business clusters in various fields. Some of the clusters are the EIT Health network of health innovators backed by the EU, Minalogic, the global innovation cluster for digital technologies in Auvergne-Rhône-Alpes in France, Medicen focused on innovative technologies for health and new therapies, the health innovation network Lyonbiopôle, La French Tech that brings together startups, investors, policymakers, and community builders, as well as Aerospace Valley focused on aeronautics, space, and drones.



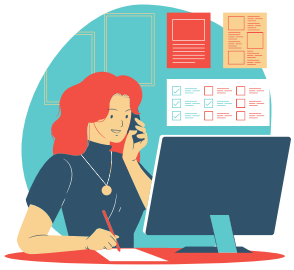
AI START-UP ECOSYSTEM

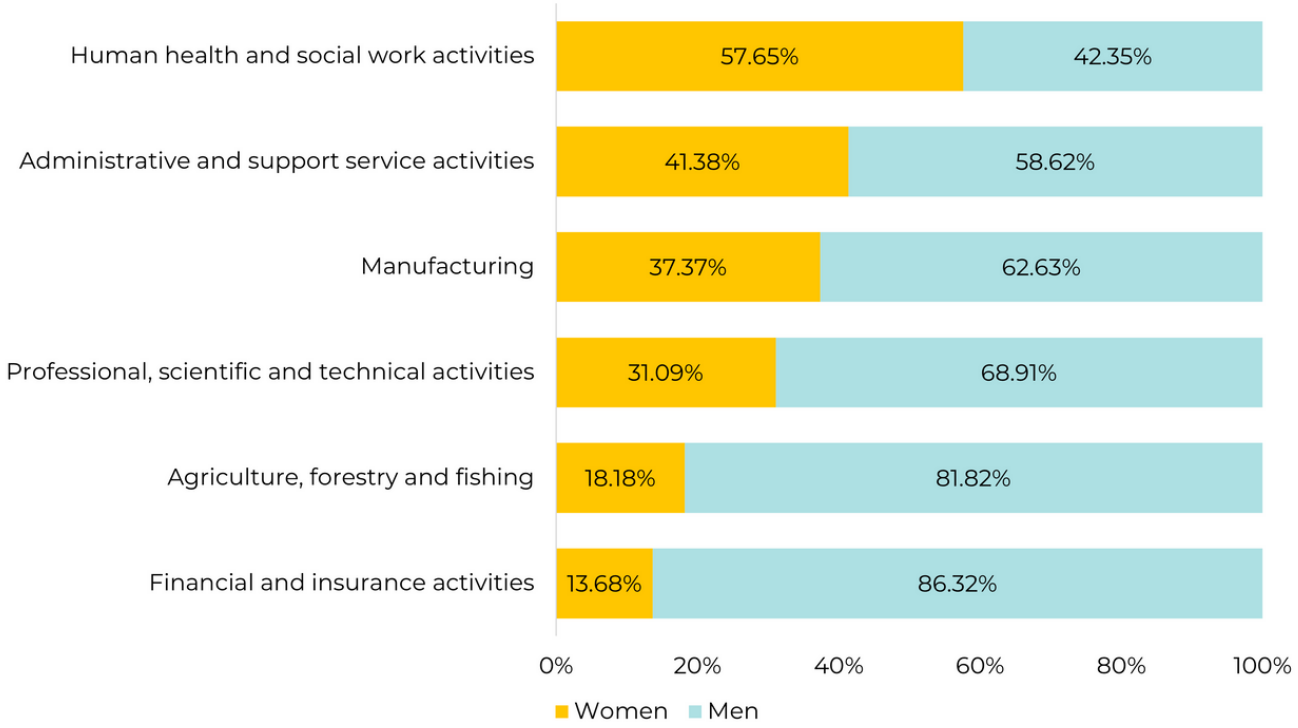
PARTNERS

AI start-ups established relationships with more than 400 different industrial, academic, and governmental partners such as Amazon Web Services, Microsoft, Google, IBM, Airbus, Nvidia, and CNRS. The different collaborations are established to pursue the shared research and development, exchange technological knowledge and skills, and commercialize innovative products and services.

FEMALE ENTREPRENEURSHIP

Between 13% and 57% of AI start-ups in different industries are founded and/or managed by women. Women are among the founders and/or executives of more than half of start-ups in human health and social work activities (57.65%), 41.38% of start-ups in administrative and support service activities, and 37.37% of start-ups in manufacturing. Female entrepreneurship is less presented in finance and insurance (13.68%) and agriculture (18.18%) industries.





Note: based on the data on 728 start-ups

TECHNOLOGY

More than 1800 AI start-ups have patent filings, which represent about 16% of the analyzed start-ups in the landscape. Most of these start-ups operate in manufacturing and healthcare, as well as electricity, transportation, and agriculture sectors. In total, more than 12000 patent filings have been registered by the start-ups, with an average of 6 patents per start-up.

1800+ OR 16%

START-UPS WITH PATENT FILINGS

12000+

PATENT FILINGS

6

AVERAGE NUMBER OF PATENTS OF START-UPS

DATA COLLECTION

14%

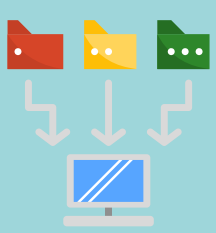
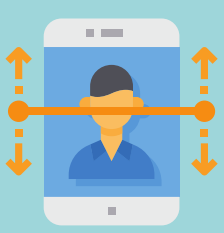


IMAGE PROCESSING

12%



COMPUTER VISION

10%

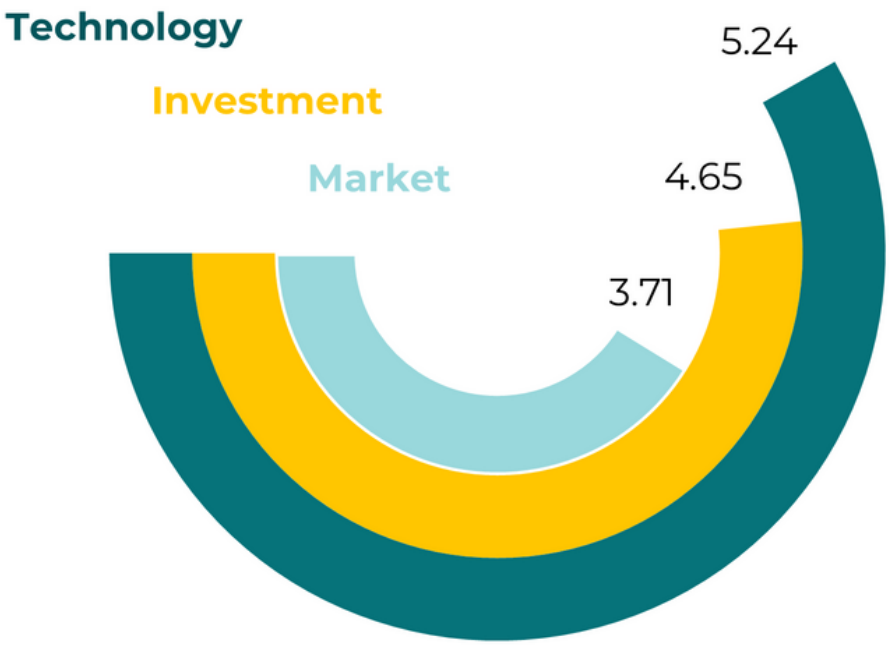
READINESS LEVELS

OF AI START-UPS

POSITION IN THE 3 DIMENSIONS TECHNOLOGY, INVESTMENT AND MARKET

The readiness levels assess the maturity of technology, investment, and market of start-ups. The estimation is based on the methodology developed at NASA that enables consistent and uniform discussions of maturity across different types of technology. Each start-up is evaluated against the parameters for each dimension of technology, investment, and market on a 9-point scale (1-lowest, 9-highest).

On average, AI start-ups are estimated to have higher level of technology readiness (5.24), followed by investment (4.65) and market (3.71) readiness levels.



Note: based on data on 11571, 9590, and 9325 for technology, investment, and market readiness levels, respectively.

READINESS LEVELS

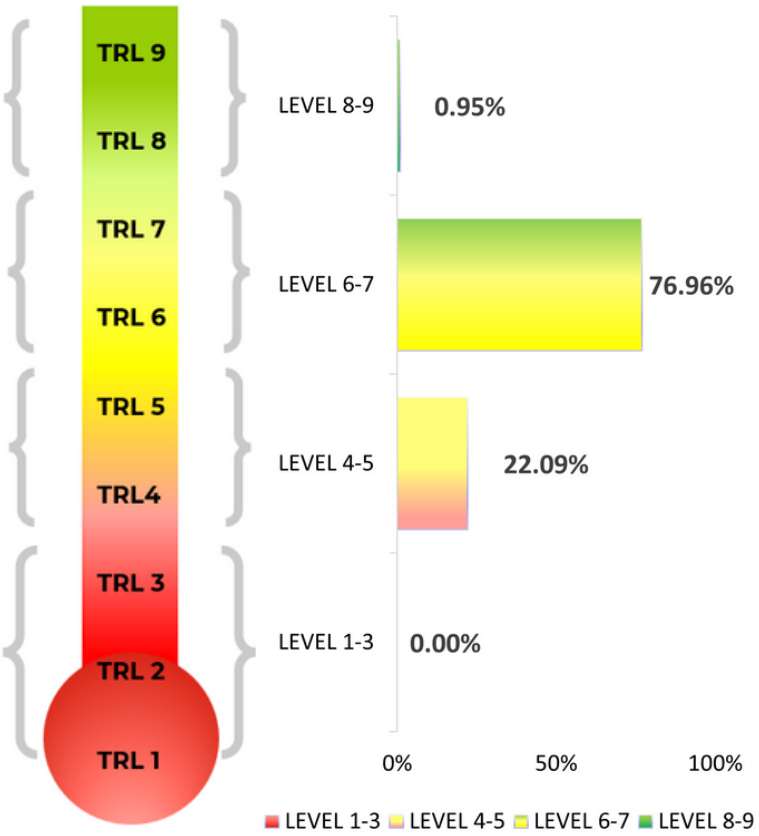
OF AI START-UPS

DISTRIBUTION OF AI START-UPS BY TRL, IRL AND MRL

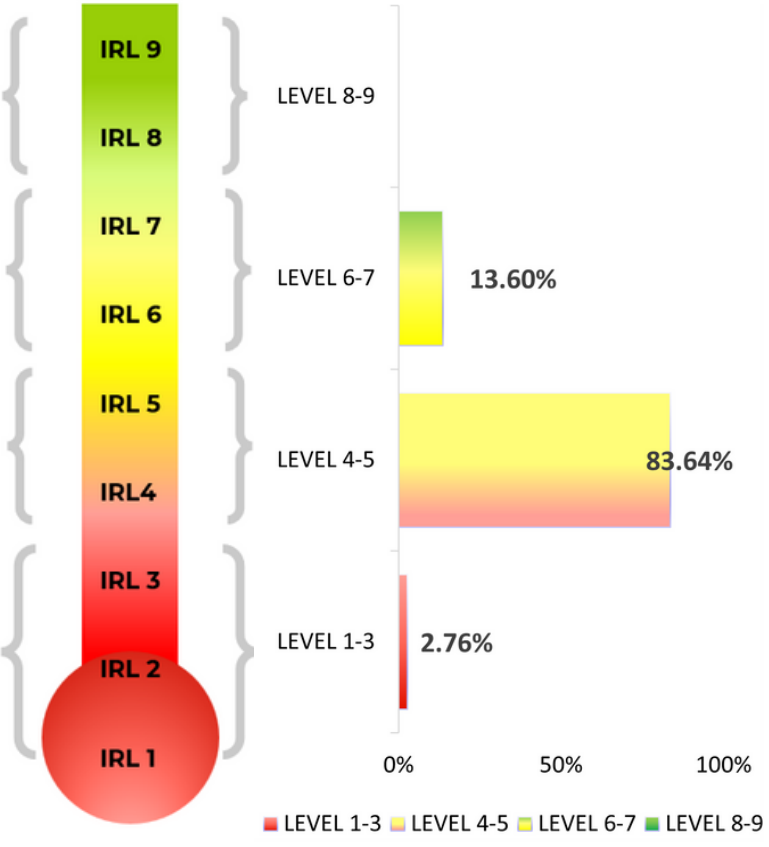
The technology readiness of more than three quarters of AI start-ups is estimated at the levels 6-7 (76.95%). Less than a quarter of start-ups have TRL estimated at the levels 4-5 (22.09%), and almost 1% of AI start-ups have reached higher end of the scale (levels 8-9).

Regarding the investment readiness, most AI start-ups are ranked at levels 4-5 (83.64%) on the scale. IRL of 13.60% of start-ups is estimated at the levels 6-7.

TECHNOLOGY READINESS LEVEL



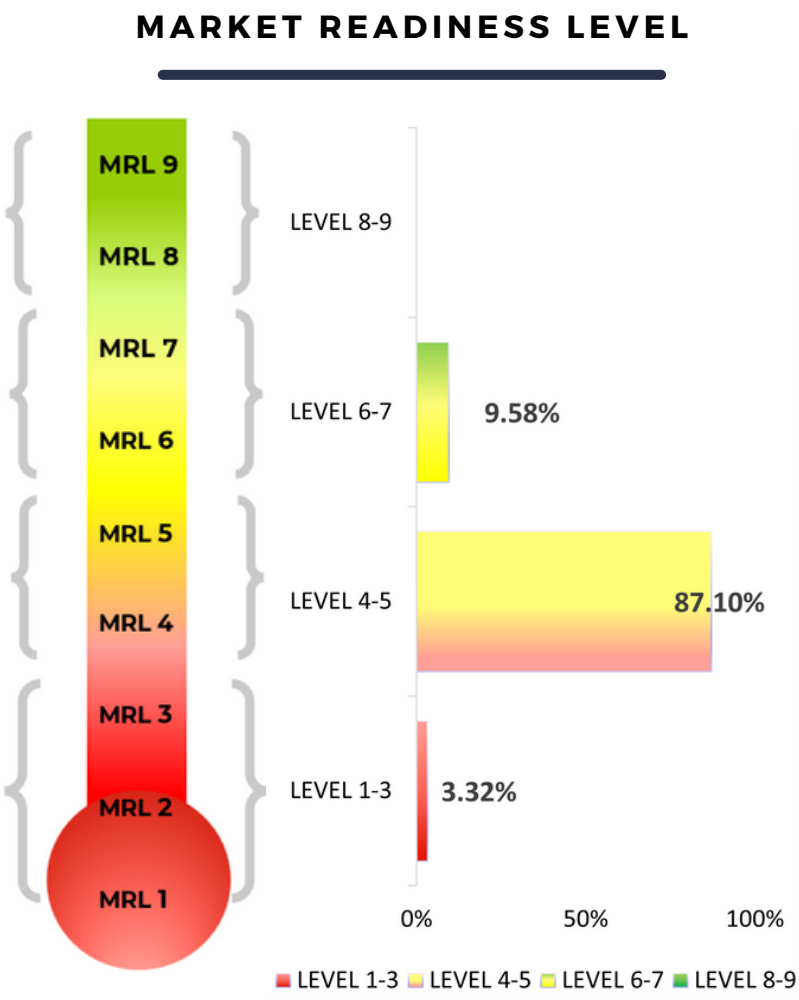
INVESTMENT READINESS LEVEL



READINESS LEVELS

OF AI START-UPS

Similarly, the market readiness of AI start-ups is estimated predominantly at the levels 4-5 (87.10%), and 9.58% of start-ups have MRL estimated at the levels 6-7.



DESIGN OF THE STUDY

BIG DATA AND AI TO CAPTURE THE NUMBER AND DYNAMICS OF START-UPS

The study uses Skopai innovation intelligence platform that offers a full set of comprehensive and qualified real-time information on start-ups worldwide, including early-stage projects, with a particular focus on Deep Tech. Using the validated methodology and machine learning algorithms, it helps discover, monitor, and evaluate technology companies and innovation ecosystems across sectors by providing relevant, accurate, and reliable information in real-time.

Start-up sources: Numerous aggregators are used to source start-ups, among which are the portfolios of incubators, accelerators, and investors, as well as the information from media and newsletters. The list of aggregators is constantly updating.

Data sources: The data on start-ups are collected from open and official internet sources, including company registers, start-ups' websites, patents database, media, social networks, using data science and AI algorithms. The quality and completeness of the data are verified by experts.

Dynamic information: The methodology allows to constantly track and update various events of start-ups such as fundraising, patents, and awards.

- The data for this study were extracted between January and February, 2022.
- Start-ups were included in the analysis if they have at least one of the following tags: AI, data science, machine learning, deep learning, computer vision, NLP (natural language processing), image processing, sentiment, sentiment analysis, or (data management platform and deeptech). The scope is start-ups created after January 1, 2010. The geographic coverage is worldwide with a focus on European and French start-ups.
- This study is based on the total sample of 12473 start-ups. The analyses of specific topics (team, fundraising, market, technology) are performed on the subsamples of start-ups with the data available on the respective topics, which is reported for each graph.



APPENDIX

MATURITY STAGE

In the Lab :	Still a project in maturation, likely in a R&D lab.
Early Stage :	The start-up has been founded and is searching for funds (seed).
Go to Market :	A market is identified; the start-up is searching for the first customers.
Mature :	The market is well targeted, the team is achieving an execution agenda.
Scale:	A scale-up plan is defined (extension of the products, international landing, new types of customers, ...).
Acquired :	Another company acquired this start-up.

TECHNOLOGY READINESS LEVEL

- TRL 1 : Basic principles observed and reported.
- TRL 2 : Potential application or solution validated.
- TRL 3 : Proof-of-concept demonstrated, analytically and/or experimentally or mock-up.
- TRL 4 : Component and/or breadboard and/or prototype laboratory validated or first tests.
- TRL 5 : Component and/or breadboard and/or prototype validated in simulated or real space environment or first market (pilot).
- TRL 6 : System or solution or service adequacy validated in simulated environment or in limited area.
- TRL 7 : System or solution service adequacy validated.
- TRL 8 : Focus on quality and cost.
- TRL 9 : Post market surveillance.

INVESTMENT READINESS LEVEL

- IRL 1 : Team in place.
- IRL 2 : Potential application or solution validated.
- IRL 3 : Attractive solution, solid IP.
- IRL 4 : Regulatory, certainty regarding difficulty.
- IRL 5 : Business model validated, first market pilot.
- IRL 6 : Recurrent revenue.
- IRL 7 : Profitable growth.
- IRL 8 : Focus on capacity, quality and cost.
- IRL 9 : Post market surveillance.

MARKET READINESS LEVEL

- MRL 1 : Need validated.
- MRL 2 : Potential application or solution validated.
- MRL 3 : Key competencies, regulatory or trials or tests for market access.
- MRL 4 : Pilot, first revenue.
- MRL 5 : Distribution or commercial partnerships, first recurrent revenue.
- MRL 6 : Recurrent revenue.
- MRL 7 : Profitable growth.
- MRL 8 : Focus on production ramp up.
- MRL 9 : Post market surveillance.