

# AI-Driven Investment Analytics

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## *Overview*

March 2021



## About Advanced AI-Driven Investment Analytics

**AI-based investment analytics systems of Deep Knowledge Group (DKG)** are integrated into all analytical subsidiaries of the DKG consortium and produce **automatized AI-driven investment insights** covering longevity, AI in pharma, neurotech, fintech, govtech, and spacetech.

The project is dedicated to producing **advanced data-driven quantifiable investment recommendations** in order to conduct **tangible, fast, comprehensive, and inexpensive SWOT analysis and due diligence** for deep tech startups, as well as **real-time financial analytics and consulting** for publicly traded corporations in deep tech sectors, which includes 3 stages: data parsing, AI-driven data analysis, and user-friendly data visualization.

Investment analytics focuses on a number of key technological areas, including:

- **AI for Drug Discovery and Development;**
- **Longevity Biomedicine;**
- **AgeTech;**
- **GeroScience;**
- **Longevity FinTech;**
- **Longevity Governance;**
- **NeuroTech;**
- **SpaceTech;**
- **GovTech;**
- **Financial Industry.**

**The analytics can deliver value to investors looking for investment targets and companies analyzing their competitors**

### Investors

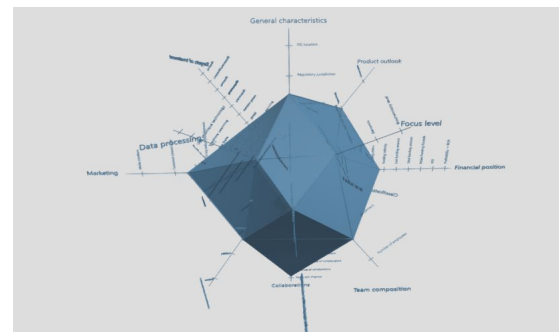
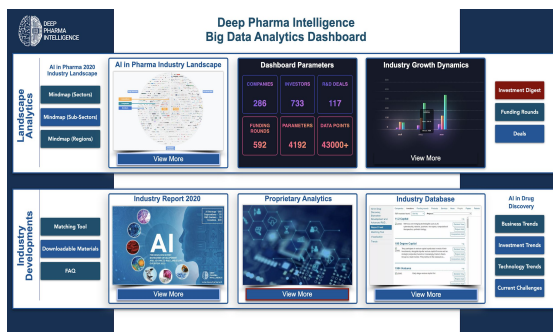
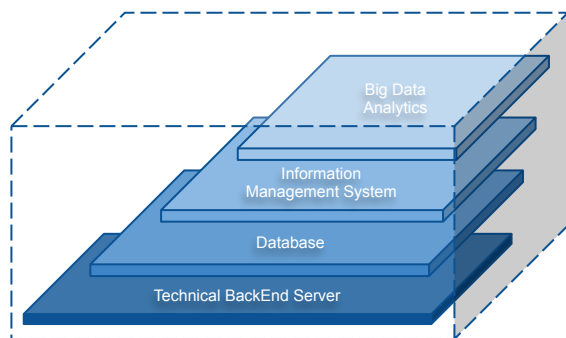
- SWOT analysis of investment targets;
- Due diligence of portfolio companies;
- Stock market analysis;
- Analysis of the strategies of leading industry investors.

### Companies

- SWOT analysis of competitors;
- Automatic business development recommendations generation;
- AI-based matching with investors.

## The process of insights generation can be divided into three main stages:

Data aggregation	Data analysis	Data visualization
<p>Automatized data parsing, aggregation, optimization, and management via using open-access and proprietary online databases, and expert opinion aggregation. Real-time database updates and structure building.</p> <p>Cooperation with companies, hubs, and investors regarding data aggregation and data quality check.</p>	<p>Machine learning and deterministic scoring algorithms aimed at ranking, valuation, SWOT analysis, correlation analysis, and recommendation generation.</p> <p>Data analysis combines financial and technological analysis, AI insights and expert opinions, machine learning and deterministic formulas.</p>	<p>SWOT analysis, competitor matching, and due diligence results are delivered in readily available, user-friendly form through advanced visualization mechanisms (3-dimensional and 4-dimensional radar charts). Diagrams visualize not only the results of the analytics, but the algorithms themselves, in order to prevent “black box” problem.</p>



## Dashboard Overview

Deep Knowledge Group is building a sophisticated cloud-based engine for advanced market and business intelligence in various deep tech industries. It includes data mining engine, infrastructure for expert data curation, and advanced visualization dashboards, including mindmaps, knowledge graphs, and 3-dimensional visualizations.

Matching tool	Machine learning for database extrapolation	Dynamic SWOT analysis representing evolution of a company
Companies database	Machine learning and deep neural networks for companies clusterization	Interactive industry mindmaps
Investors database	Machine learning for financial indicators predictions	Real-time financial data analytics platform for AI in pharma corporations
SWOT analysis	Interactive AI-based scenario analysis and financial planning	AI in pharma financial instruments analytics

## Commercial Value

- **Data-driven insights about the emerging areas in the medical, longevity, fintech, and spacetech research and technology, including pharmaceutical, biotech, medical devices, and healthcare tech industries;**
- **Investment advisory and actionable insights about primary and secondary markets;**
- **SWOT analysis of most promising entities and technologies, providing a clear view of opportunities and risks;**
- **Identification of growth opportunities, including partnerships, technology deals, and investment prospects;**
- **Competitive intelligence;**
- **Business and technical due-diligence and more.**

## Who Can Benefit

- Investment institutions, funds, investment banks, family offices;
- Private and public companies in pharma/biotech space;
- Research institutions, universities;
- Technology vendors and contract research organizations;
- Startup hubs, accelerators;
- Consulting companies and agencies.

# Multiparametric Assessment Analysis (Using Big Data Analytics Platform)

The project offers state-of-the-art interactive online AI-based **SWOT analysis system** covering more than 40000 companies in various deep tech industries.

The product allows to conduct initial data-driven due diligence of the companies **instantly, automatically, and holistically** by comparing 200-300 data points for each company combined in the 10-20 vectors of business development.

The results of the analysis are represented in easily perceived form of 2-dimensional and 3-dimensional radar charts.

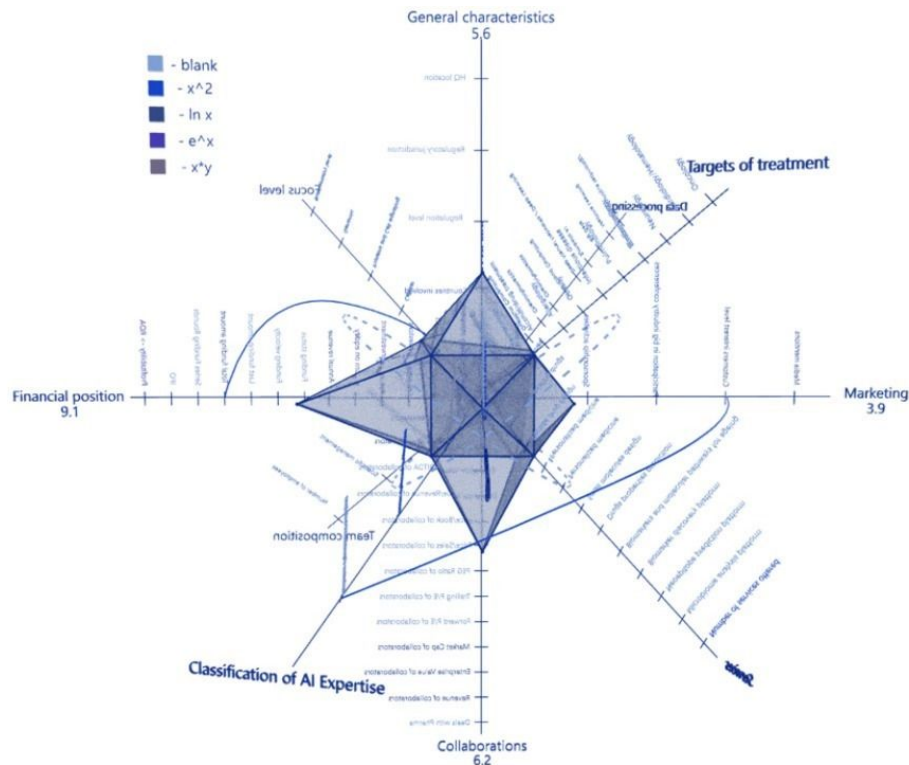
## Applications

Real-time SWOT analysis of AI for drug discovery companies and investors

Analysis of closest competitors and comparison of related companies

Automatized algorithmic due diligence

Detection of the most prospective investment targets



## Data Points

6 000 000+ data points

2000+ parameters

100+ vectors

20+ dashboards

## Sectors

10+ industries

120+ sectors

400+ subsectors

150+ countries

## Data Types

15+ types of entities

100+ subtypes of entities

10+ data types

3 data layers

## Data Aggregation

150+ data sources

10+ data sources  
categories

5 data aggregation  
methods

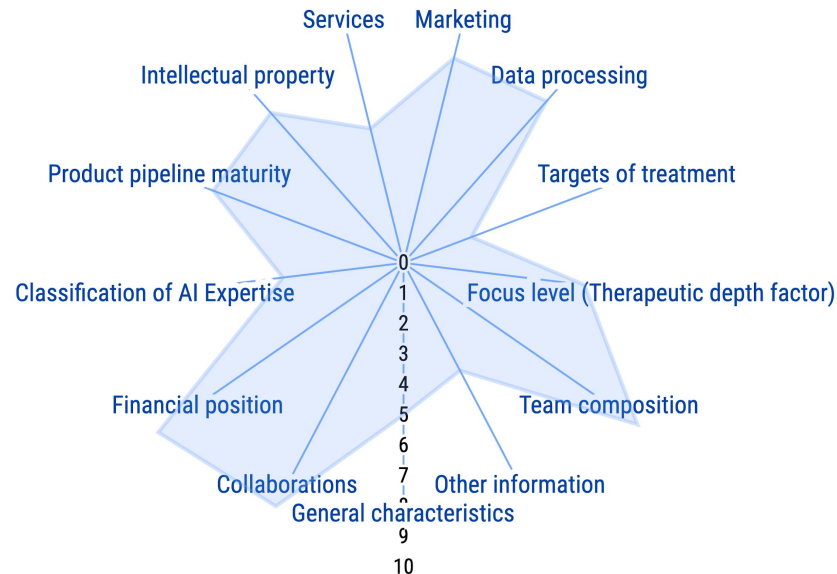
4 methods of data quality  
testing

# Multiparametric Assessment Analysis (Using Big Data Analytics Platform)

Automatized SWOT analysis system allows to replace long, resource-requiring, manual, and unsystematic process of due diligence, investment analytics, and investment targeting by a real-time available product extracting quantifiable insights from the **largest in the world AI in pharma industry database** with the help of **deep learning algorithms and multidimensional polynomial formulas** calibrated by combining **expert opinions with big data analysis**.

This enables to conduct an investment analysis which is **faster, more precise, and cheaper** at the same time, since it is being done automatically, permanently, without essential human interaction, and using more data points.

Database, AI and ML algorithms overview	
Parameters	180 parameters with appropriate weights combined into 12 vectors
Data points	5 200 000 data points which are being updated permanently
Algorithms	Deep neural networks, polynomial formulas with mathematical transformations, regression models
Data aggregation	Automatized parsing, extrapolation using machine learning, feedback from companies



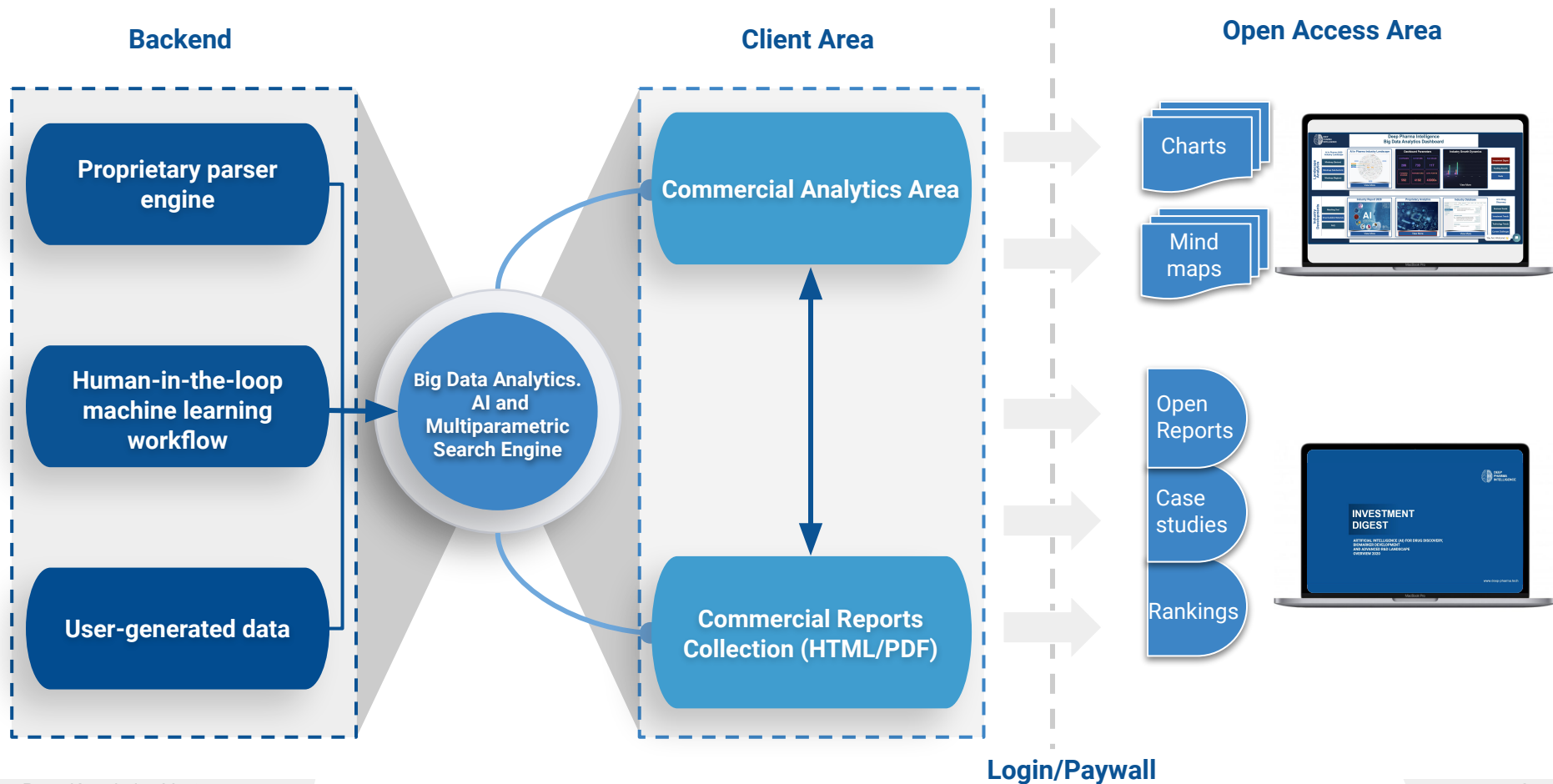
# Our Technologies

The technologies (AI, ML, algorithms, data aggregation) that are applied for each of our products are listed below.

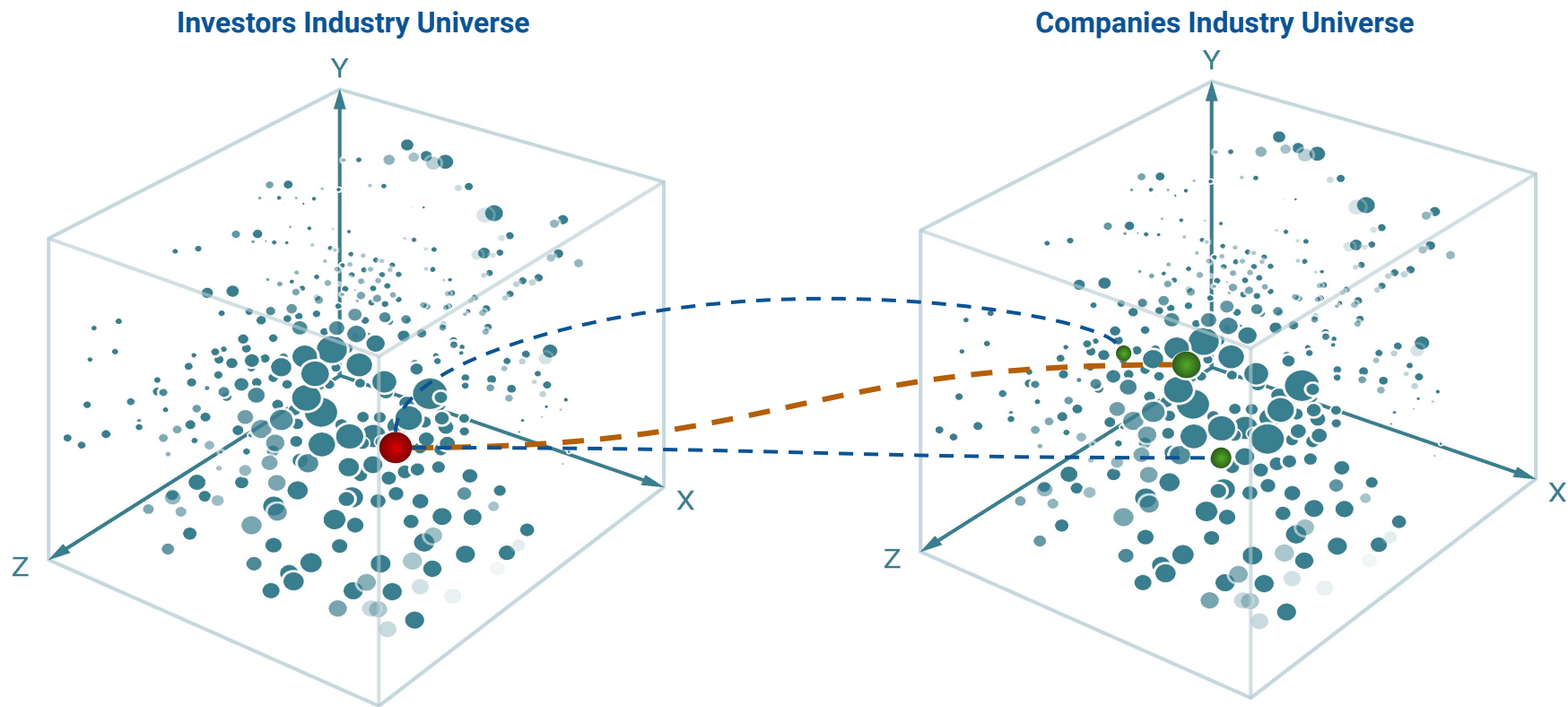
SWOT Analysis	Data aggregation	Forecasting	Clusterization and competitor analysis
Polynomial formulas, multidimensional vector spaces	Data extrapolation through regressions	Neural networks with LSTM layers for time series data analysis	Unsupervised machine learning for companies clusterization
Mathematical transformations: logarithmic, exponential, parabolic, multiplicative	Data extrapolation through deep neural networks	Recurrent neural networks to extract complex hidden connections from the data	K-Means algorithm for companies clusterization
Business development harmonization analysis: definite integrals, standard deviation	Natural language processing for tag cloud creation	Brownian motion modelling for stock market forecasts	Calculation of the distance between companies in multidimensional space
Variance-covariance analysis of the parameters of the companies	Data parsing	GARCH model	Convolutional neural networks for the identification of the companies with similar patterns
Linear algebra	Deep neural networks for data structuring	Real option analysis, scenario planning	Using tag clouds to categorize companies



# Big Data Analytics Platform at a Glance

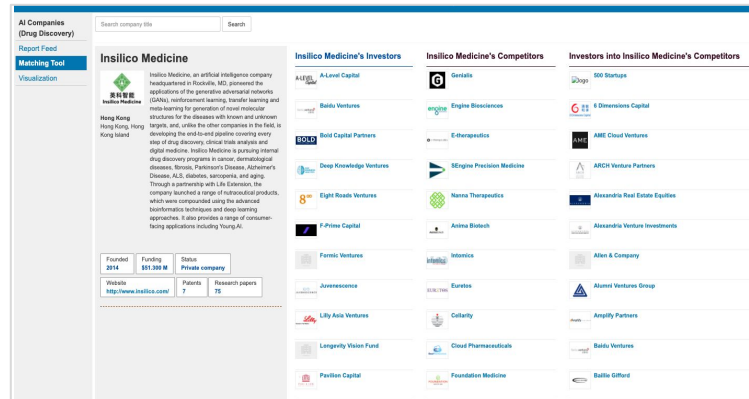
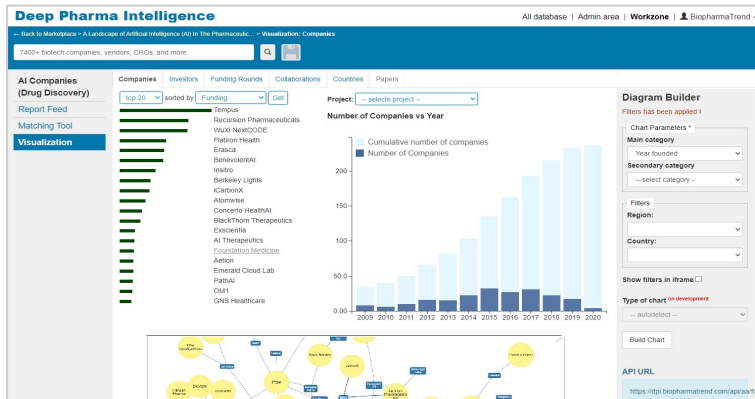


# Multidimensional Big Data Analytics Vector Space

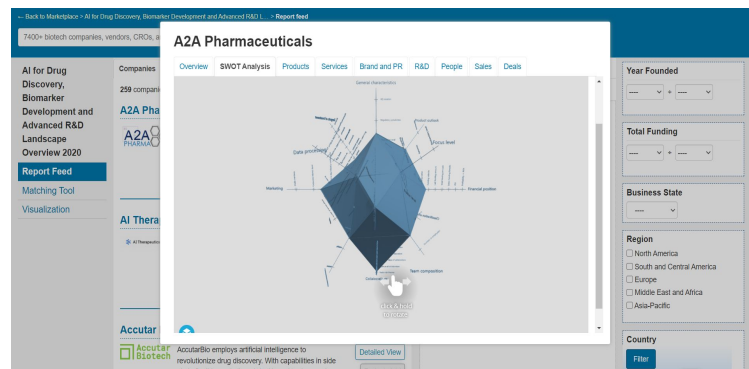
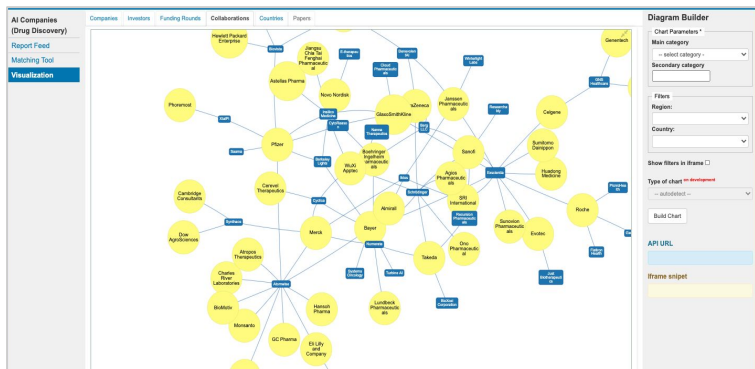


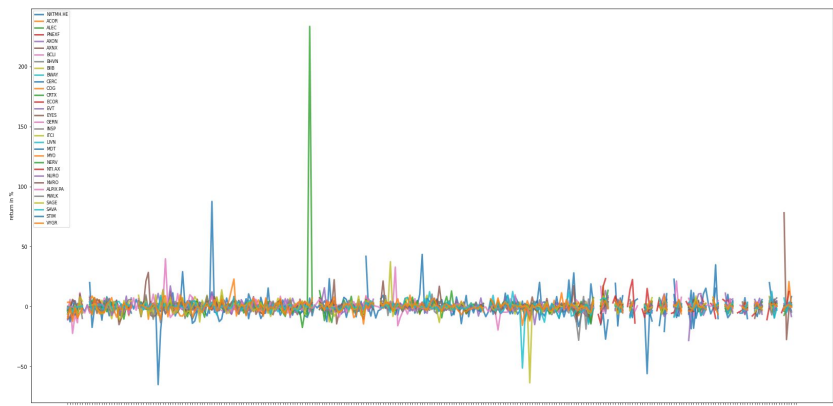
The system enables targeted and intelligent smart-matching between investors and portfolio candidates based on specified sectors and qualifying criteria (e.g. highly-targeted ratios of rankings in specific areas).

# Big Data Analytics Platforms Features



The analytics platform offers a suite of resources and capabilities, including a comprehensive database of data and user-friendly search, visualization, and matching capabilities, as well as dynamic SWOT analysis - allowing for revealing actionable quantifiable insights about deep tech markets and players.



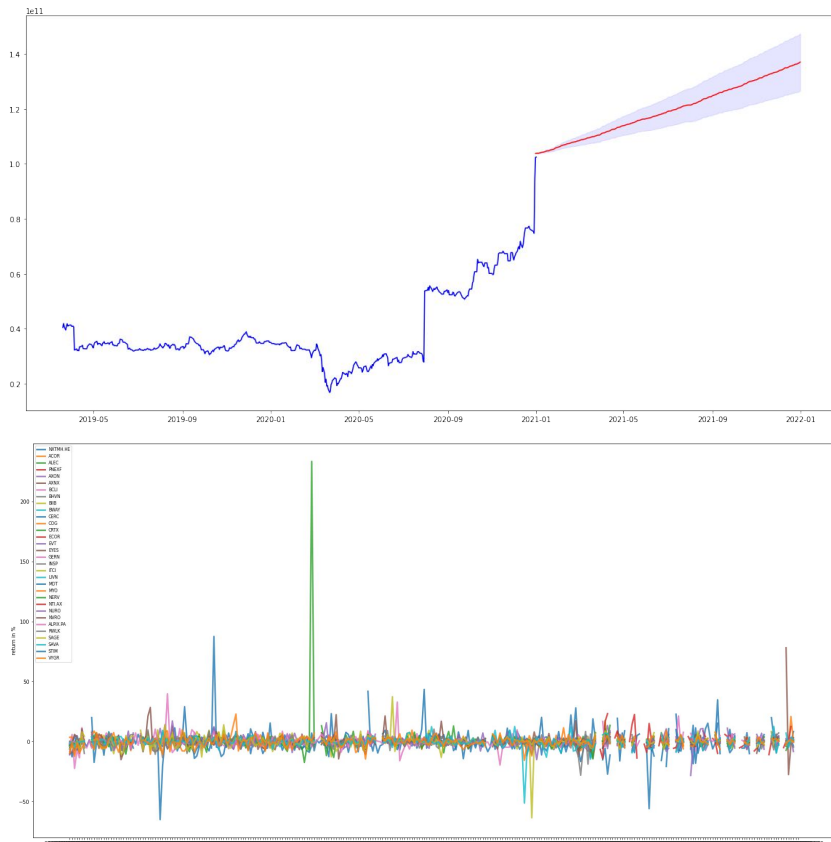


We provide **real-time data-driven AI-based stock market analytics and forecasting** related to various deep tech industries, such as longevity, spacetech, and neurotech.

The analytics includes:

- Portfolio optimization tools;
- Econometric analysis of stock prices dynamics;
- Stochastic simulations of stock prices and their derivatives;
- Technological evaluation of R&D process in deep tech corporations;
- De-risking of stock market investments;
- Financial databases;
- Financial projections;
- Risk management metrics;
- Advanced trading strategies analysis including options and exotic derivatives;
- Fundamental analysis of deep tech stock prices.

We construct **specialized thematic stock indices** representing the dynamics of deep tech industries which serve as the foundation for the development of **longevity and AI in pharma exchange traded funds**. These indices include not only relevant publicly traded corporations, but financial derivatives, funds, and bonds as well.



Stock Market Division provides **real-time data-driven AI-based stock market analytics and forecasting** for the Longevity **Exchange Traded Fund (ETF)**, comprised of 300+ companies in such sectors as aging, advanced preventive precision biomedicine, AgeTech.

The analytics includes:

- Portfolio optimization tools;
- Econometric analysis of stock prices dynamics;
- Stochastic simulations of stock prices and their derivatives;
- Technological evaluation of R&D process in deep tech corporations;
- De-risking of stock market investments;
- Financial databases;
- Financial projections;
- Risk management metrics;
- Advanced trading strategies analysis including options and exotic derivatives;
- Fundamental analysis of deep tech stock prices.

Beneficiaries: Individual investors, Corporations, Startups, Independent Financial Advisors, Asset Managers, Retail Banks, Private Banks & Wealth Managers.

# Stock Market Analysis

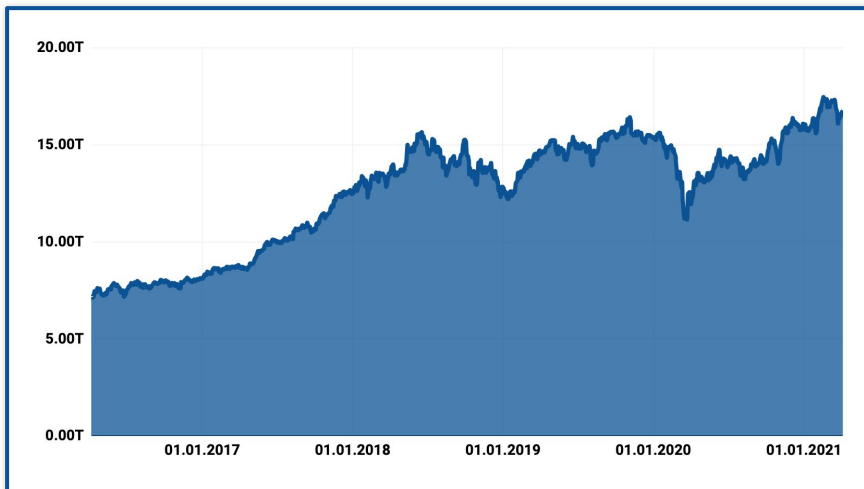
As an innovative company, our main goal is not only to provide a useful and profound analysis of the stock market, but also to implement recent theoretical discoveries in quantitative finance, mathematics and other disciplines in order to create original and unique data

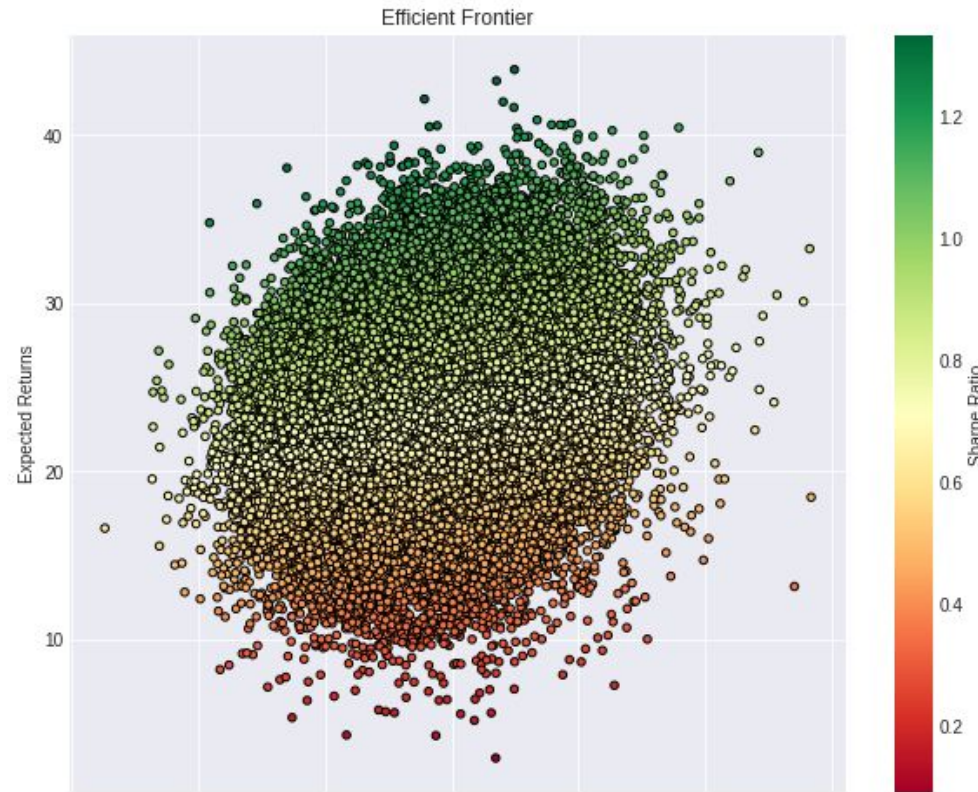
## Tools and approaches

- ➔ Keeping this in mind our goals, we apply **Agent-based asymmetric trading** technique that allows us to analyse both leverage and anti-leverage effects that are of importance for price dynamics.
- ➔ We implement newest theoretical accomplishments in **Auction Theory** based on different types of probabilistic distributions which helps us to create profound stock market analysis.
- ➔ Optimization is one of the most important parts in stock, that's why we use **Artificial Neural Networks (ANN)** for such classical tasks as option pricing.

## Solution

Providing real-time data and advanced analytics for **Longevity Exchange Traded Fund (ETF)**, with up to 300 publicly traded companies, and other stock market solutions.





Both conventional econometric models and advanced **artificial intelligence and deep learning tools** are applied to extract value from stock market data.

Financial analytics is combined with technological evaluation of the companies.

Stock market dataset which is being updated in real time provides a **concrete, quantifiable data-driven framework for deep tech development hypothesis testing**.

**Stock market simulations** enable to test various trading strategies and investment principles.

Neural networks with LSTM layers for time series data analysis

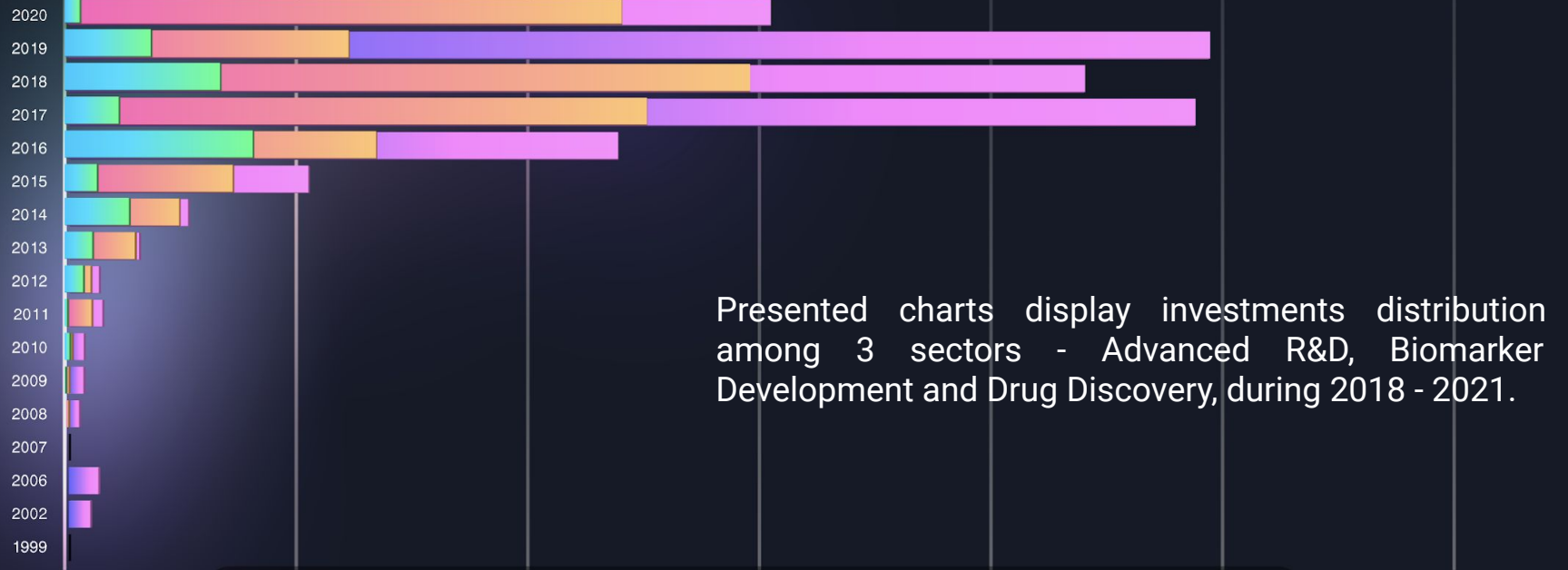
Recurrent neural networks to extract complex hidden connections from the data

Brownian motion modelling for stock market forecasts

GARCH model

Real option analysis, scenario planning





0 167

333 500  
Drug Discovery

25%

Drug Discovery

666

833 1000  
Advanced R&D

55%

Advanced R&D

1166

1333 1499 1666  
Biomarker Development

20%

Biomarker Development

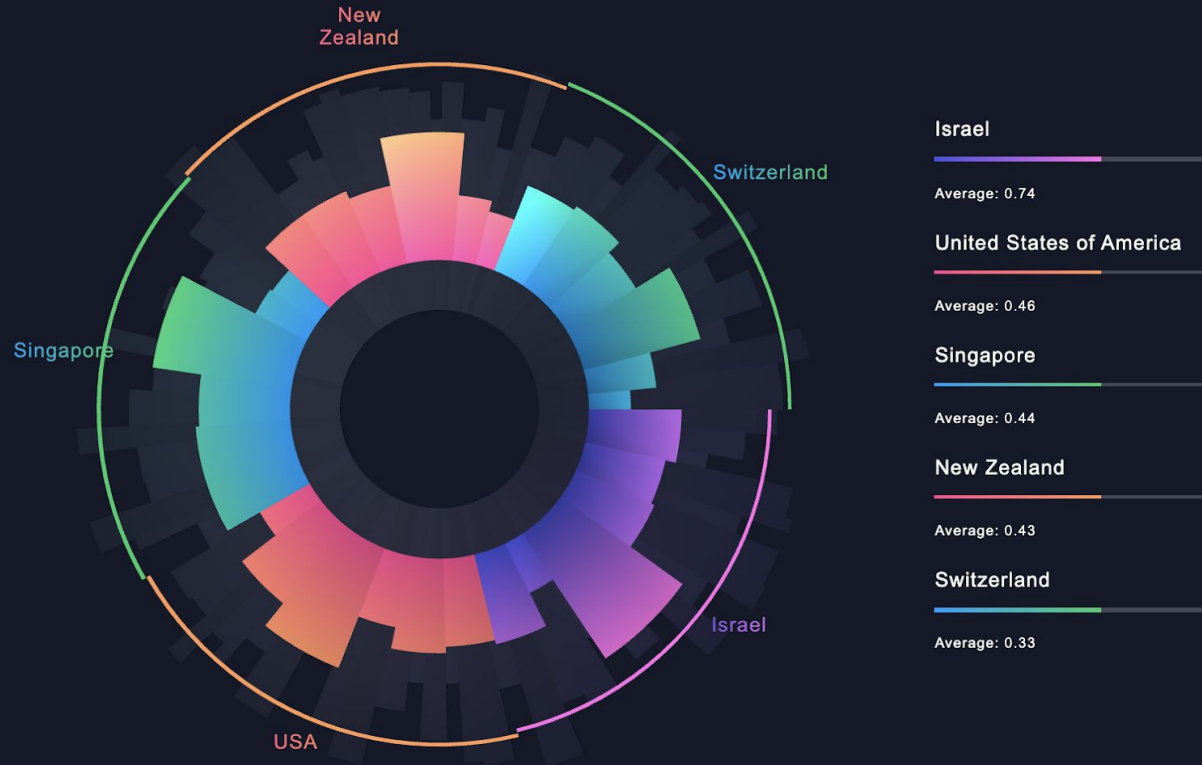
1833

1999



DEEP  
PHARMA  
INTELLIGENCE





An example of dynamic industry chart: a pie chart representing regional distribution of longevity companies with intelligence search by countries.

### Our services will help your company to:

- Obtain a better understanding of your market positioning and to enhance your value proposition to the market;
- Engage with a number of top executives of tech corporations and to establish commercial relationships (deals, collaborations, contracts, etc) with them;
- Raise a new investment round in the future;
- Conduct competitive, comparative and SWOT analysis.

### Specific scope of services we can provide:



Deep Comparative/Competitive analysis	Identification of your competitors
Financial projections of the company	Analytical preparation for the IPO
Deep SWOT analysis	Benchmarking
Smart matching with potential investors	Identification of key market trends influencing your position
Identification of the most relevant potential clients/partners	Identification of your strengths and unique advantages and improvement of your competitive positioning
Competitor matching	Advanced human resources management
Product maturity evaluation	Company ranking and scoring

### Our services will help the investors to:

- Select the most prospective investment targets - deep tech startups with the opportunities of producing tangible disruptive results;
- Track the behavior and investment strategies of your competitors;
- Attract funding to your institution;
- Reallocate resources to more promising sectors and entities.

### Specific scope of services we can provide:



## Investmen Analytics: Key Analytical and Consulting Services

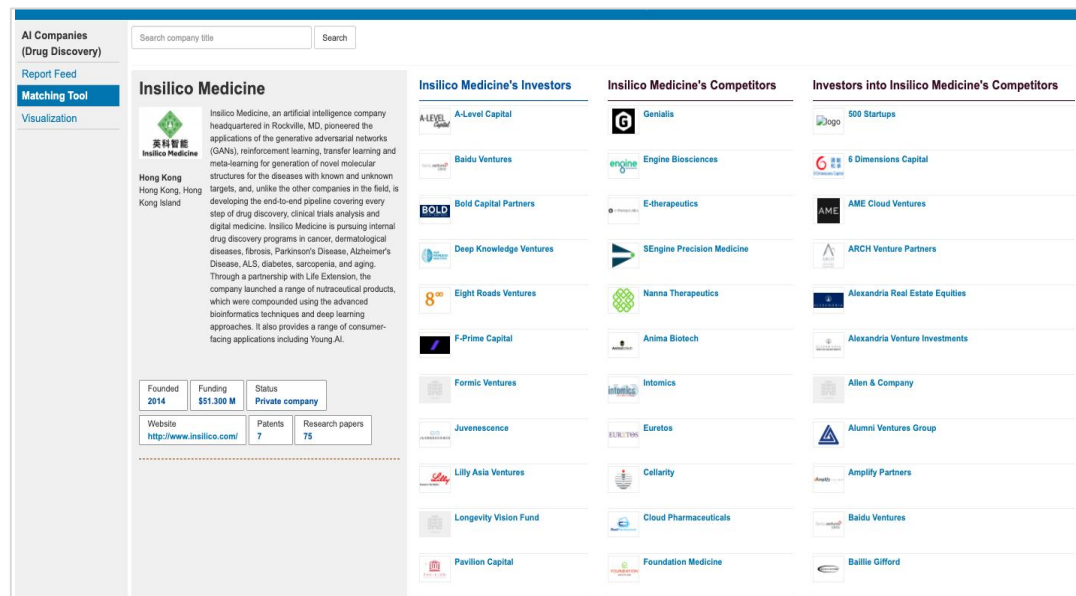


**Our key analytical and consulting services will provide your organization with an access to a highly specialized data-driven AI-based expertise and wide array of advanced analytical products**

# Competitor Matching

Deep tech companies and investors may benefit from identifying their closest competitors and similar companies in terms of technologies, products, R&D processes, and team compositions. We provide them with **AI-driven big data analytics tools** that enable **smart competitor matching, calculation of the distance between companies** in terms of their business development, location of the companies and investors in multidimensional vector space.

We also apply smart automatized multiparametric companies clusterization via the application of unsupervised machine learning.



## AI and Data Analysis Tools for Competitor Matching

Unsupervised machine learning for companies clusterization

K-Means algorithm for companies clusterization

Calculation of the distance between companies in multidimensional space

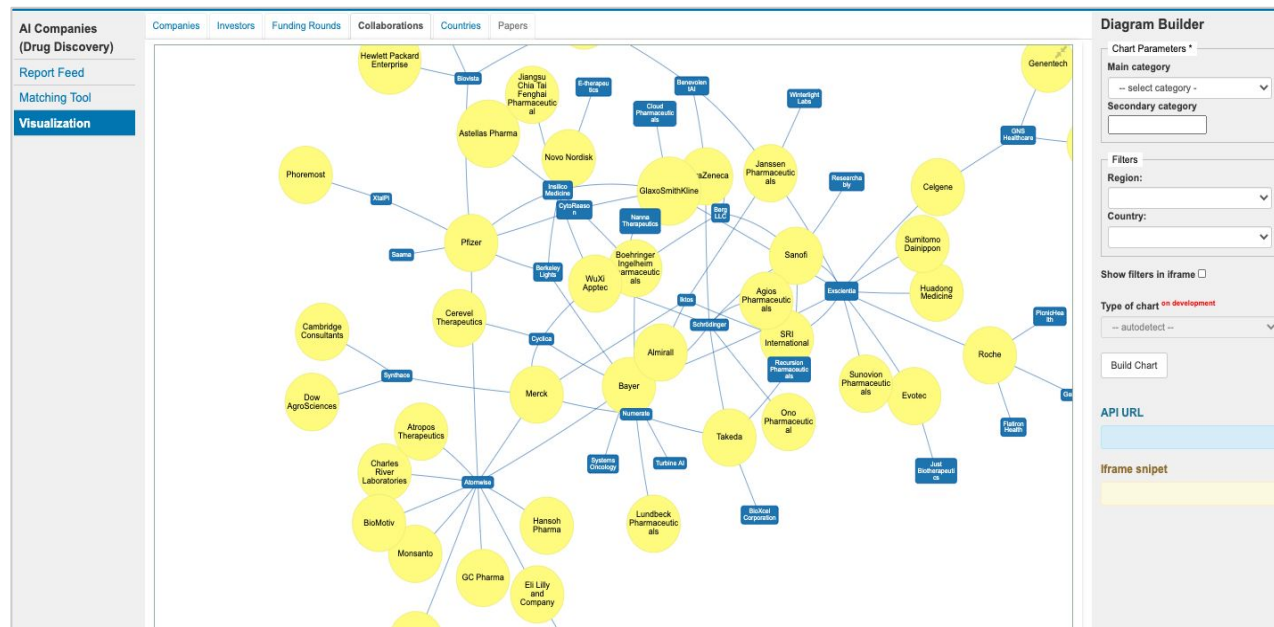
Convolutional neural networks for the identification of the companies with similar patterns

Using tag clouds to categorize companies

## Interactive Network Diagrams

It is crucial to define a company or an investor in the context of the existing industry infrastructure. Identification of key company's collaborators and partners is both a valuable addition to the **automatized quantitative SWOT analysis and competitor matching tools**.

Our platform enables investors or competitors to evaluate the prospects of the company by looking at its place in the industry networks, including **collaborations, partnerships, funding rounds, scientific cooperation, connections of R&D teams and higher management, and the level of the similarity of the markets.**



## Tools for Industry Connections Building

## Funding rounds analysis

## Collaboration analysis

## Team networks analysis

## Comparative analysis of business development

## Market closeness analysis

## Due Diligence on Strength of the Emerging Technologies and Forecasting on Opportunities Likely to be Incorporated into Deep Tech R&D in 3-5 years.

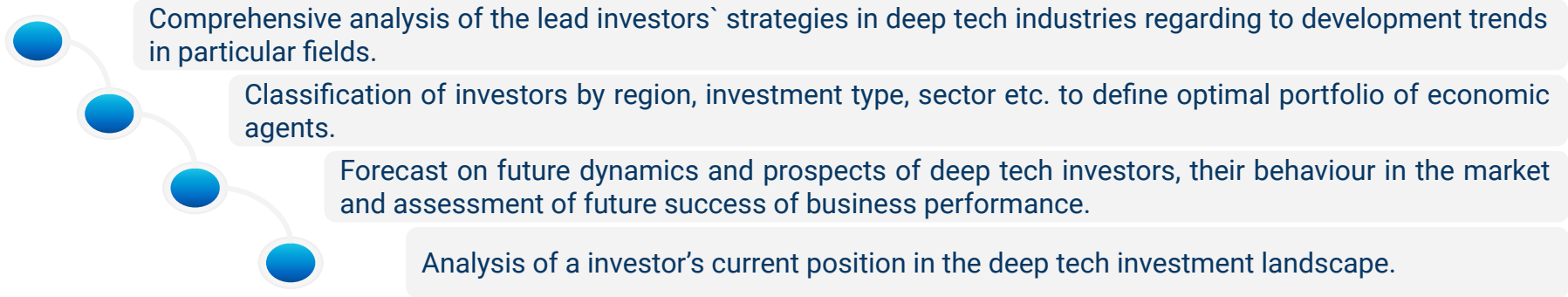
In order to compete in the future, it is crucial to be an early adopter of game changing technologies, like various “flavors” of AI landscape. To address this need, Deep Knowledge Group investment analytics services offer strategic insights, including the following:



## Support of Deep Tech Companies for Matching with Prospective Investors

Multiple deep tech industry sectors have a large potential to impact the whole economy essentially. Knowledge of the key investors in this industry is crucial for the survival and development of every company operating in the market.

### We deliver:



Data on seed rounds, private equity, corporate rounds, venture funding, grants, as well as other types of funding rounds and non-equity assistance will be collected and analysed according to various parameters set forth in our proprietary evaluation criteria methodology. All leading investors in deep tech sectors have are selected based primarily upon the following criteria groups:

**Investment strategies**

**Portfolio companies features**

**Technologies, tools, and team**





Using sophisticated quantitative analytical frameworks, we identify and provide recommendations on most promising startups, most undervalued or overvalued companies thus enhancing the process of investment target identification for large investment funds.

Enhanced due diligence for actual investment targets, conducting deep analysis of ratios of scientific and technological strength, management team strength, business development, marketing, IP and other pertinent metrics to strengthen and somewhat automate the due diligence process of investment firms interested in this sector.

- **Analysis will include identification of the companies which:**
- Have unique technology and advantage in some in some particular domain of deep tech industries
- Are undervalued or currently early-stage and could be considered as an interesting potential investment target
- Have strong scientific background and validation in R&D
- Exhibit IP-compliance according to our infringement analysis, and can be considered as a reliable counterparty for corporate clients and partners

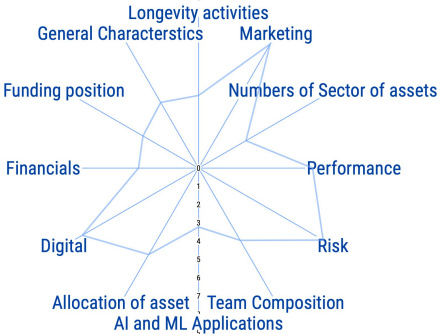
# Longevity Financial Industry Analytical Framework: Open Access

	Structure of Assets and Liabilities				
	Liquidity				
	Operating Efficiency				
	Beta Variation				
	Balance Sheet				
Number of Brands and Subsidiaries	Income Statement		Number of Investors		Total Patents in AI or ML
Number of Portfolio Companies	Profitability		Number of Institutional Investors	Cooperation with Longevity Companies	Number of Related Patents in AI or ML
Number of Core Capabilities	Stock Price History		Advisory Board H-index	Acquisition of Longevity Companies (Numbers)	Number of Subsidiaries in AI or ML
Countries Involved	Share Statistics	Sponsorship Activities	Top Management Qualifications	Longevity Insurance	Revenue Generated from AI / ML Investments
Regulation Level	Dividends and Splits	Participation in Industry Conference	Annual Revenue Growth during the Current CEO	Mentions of Longevity in Reports/Quotes	Investment via AI / ML
Regulatory Jurisdiction	Management Effectiveness	Customer's Interest Level	Management with Celebrity Status	Types of Longevity Derivatives	AI or ML Asset / Total Assets
HQ Location	Valuation Measures	Media Mention	Number of Employees	Availability of Longevity Derivatives (Y/N)	Investment in AI or ML Infrastructure
General Characteristics	Financials	Marketing	Team Composition	Longevity Activities	AI and ML Applications

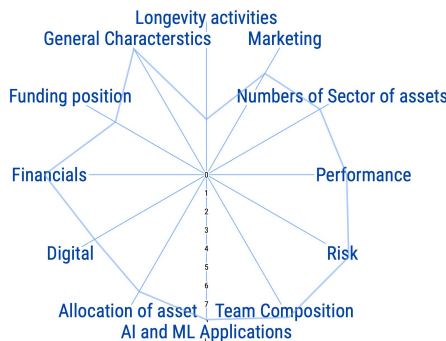


Longevity Financial Industry Analytical Framework

SWOT Analysis of Financial Institutions

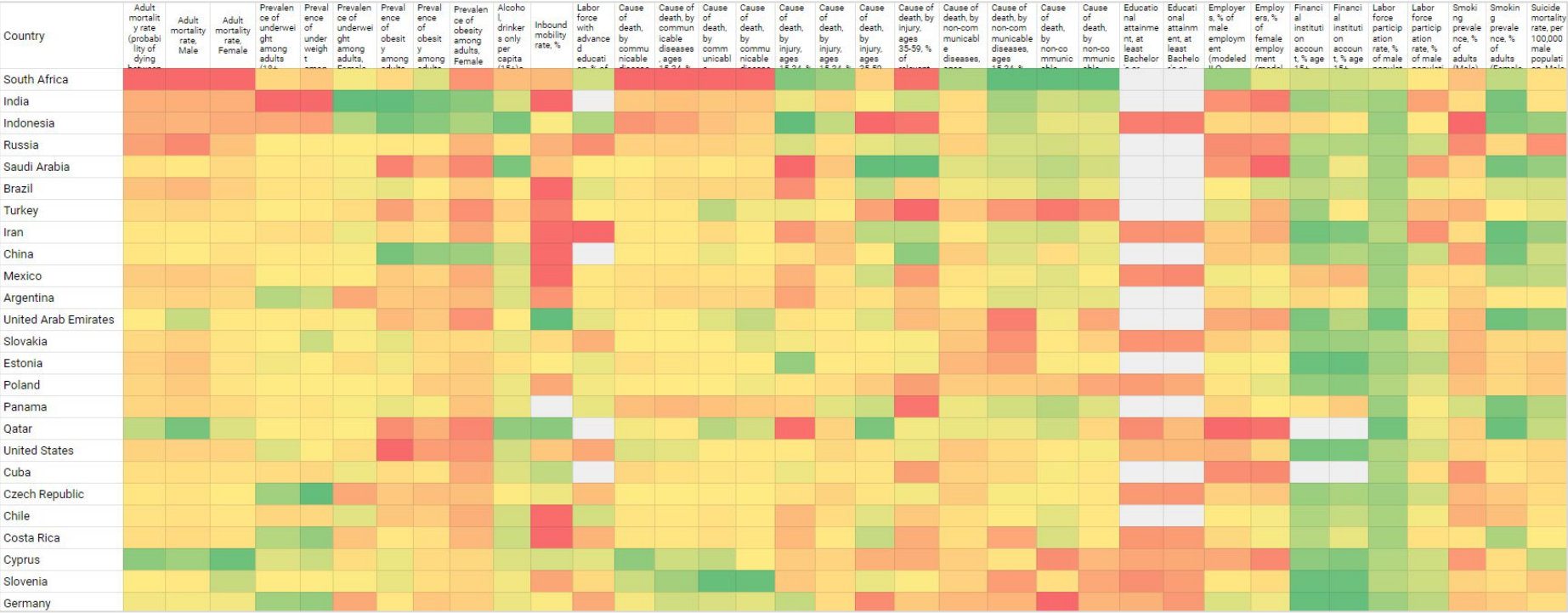


SWOT Analysis of Financial Institutions



# Longevity Governance Big Data Analytics

To derive the interconnection between metrics and classify countries into groups, patterns recognition is **based on a comparison of 240 parameters across regions according to their distribution and variation.**





## Longevity Investment Big Data Analytics Dashboard

### Market Intelligence

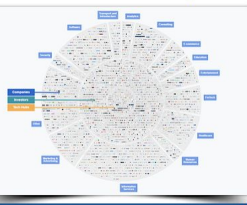
Longevity Investment  
Market Intelligence

Major Trends

Network Diagrams

Interactive MindMaps

### Interactive Mindmaps



View More

### Dashboard Parameters

DATA POINTS

4810866

PERSONALITIES

16107

COMPANIES

19603

INVESTORS

9007

SECTORS

14

SUBSECTORS

140

### Dynamic Industry Charts



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Longevity Investment  
Market Intelligence

SWOT Analysis

FAQ & Tutorials

Register Free Account

Send Us Feedback

### Search Engine

Longevity Investment  
Ecosystem Investors

Investor Portfolio Search

Investor Competitors Search

Investor Search

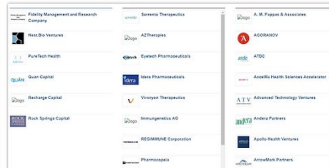
### Investor & Company Advanced Search



Find Investors

Find Companies

### Competitor Search



Company Competitors

Investor Competitors

### Interactive Network Diagrams



View More

Longevity Investment  
Ecosystem Companies

Company Investor Search

Company Competitors Search

Entrepreneur Search



## Longevity Finance Big Data Analytics Dashboard

### Market Intelligence

Longevity Finance  
Market Intelligence

SWOT Analysis

Interactive Mindmaps

Market Intelligence

#### Interactive Mindmaps



View More

#### Dashboard Parameters

DATA POINTS

100020

PERSONALITIES

2000

CORPORATIONS

1000

ASSETS UNDER  
MANAGEMENT

15

INDUSTRIES

6

SECTORS

50

#### SWOT Analysis



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Longevity Finance  
Market Intelligence

Pre-Subscribe for Beta

Sponsorship Opportunities

Request Custom Analytics

### Search Engine

Longevity Finance  
Search Engine

Interactive Database

Dynamic Network Diagrams

Competitor Search

#### Interactive Database



FinTech

WealthTech

InsurTech

#### Interactive Network Diagrams

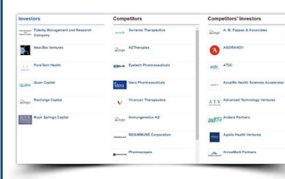


FinTech

WealthTech

InsurTech

#### Competitor & Investor Search



FinTech

WealthTech

InsurTech

Longevity Finance  
Search Engine

Personalities

Corporations

Startups

Investors



## Longevity Governance Big Data Analytics Dashboard

### Market Intelligence

#### Longevity Governance Market Intelligence

Full Analysis

Interactive Mindmaps

SWOT Analysis

Dynamic Charts

#### Full Big Data Analysis



View More

#### Dashboard Parameters

DATA POINTS

12000

PARAMETERS

240

REGIONS

50

LAYERS OF FRAMEWORK

6

DYNAMIC CHARTS

100

SWOT ANALYSIS PROFILES

50

#### SWOT Analysis



View More

#### Longevity Governance Market Intelligence

Pre-Subscribe for Beta

COVID-19 Dashboard

3D Visualization

### Search Engine

#### Longevity Governance Search Engine

Benchmarking Charts

Major Trends

Practical Recommendations

Big Data Framework

#### National Healthy Longevity Interactive MindMaps



View More

#### Longevity Progressiveness 3D Visualization



#### Longevity Progressiveness Benchmarking Charts



View More

#### Longevity Governance Search Engine

Health-Adjusted Life Expectancy (HALE) Gap and Life Expectancy

Health-Adjusted Life Expectancy (HALE) Benchmarking





## Deep Pharma Intelligence Big Data Analytics Dashboard

### Landscape Analytics

AI in Pharma 2020  
Industry Landscape

Mindmap (Sectors)

Mindmap (Sub-Sectors)

Mindmap (Regions)

### AI in Pharma Industry Landscape



View More

### Dashboard Parameters

COMPANIES

286

INVESTORS

733

R&D DEALS

117

FUNDING  
ROUNDS

592

PARAMETERS

4192

DATA POINTS

43000+

### Industry Growth Dynamics



View More

Investment Digest

Funding Rounds

Deals

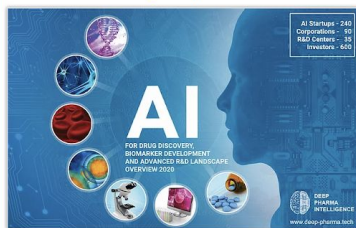
### Industry Developments

Matching Tool

Downloadable Materials

FAQ

### Industry Report 2020



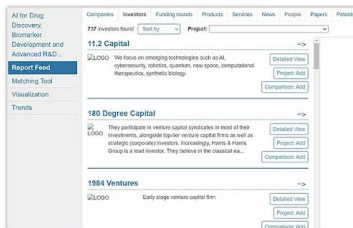
View More

### Proprietary Analytics



View More

### Industry Database



View More

### AI in Drug Discovery

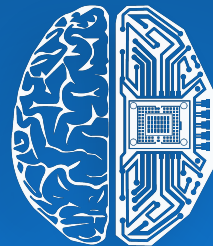
Business Trends

Investment Trends

Technology Trends

Current Challenges

You Are Welcome!



# Deep Knowledge Ventures

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www.dkv.global