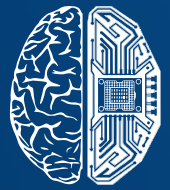
DEEP
KNOWLEDGE
GROUP

Analytical Frameworks

www.dkv.global



DEEP
KNOWLEDGE
GROUP

Evolution of Analytical Methods

www.dkv.global

Analytical Methods and Systems Developed by Deep Knowledge Group

Created frameworks as a basis for further analytical research of complex industries

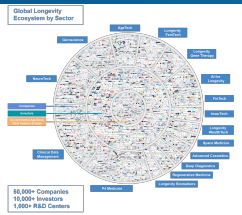
Frameworks of Complex Longevity and DeepTech Industries

2013

Produced first-of-their-kind reports on Longevity and DeepTech

Fundamental Analytical Reports

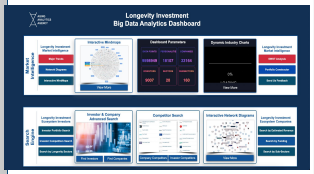
2014 - 2018



Industrial and regional representation of the market development

Advanced Visualization of DeepTech Industries

2019



Different analytical products arranged into thematic dashboards

Big Data Analytics Dashboards

2020 - 2021

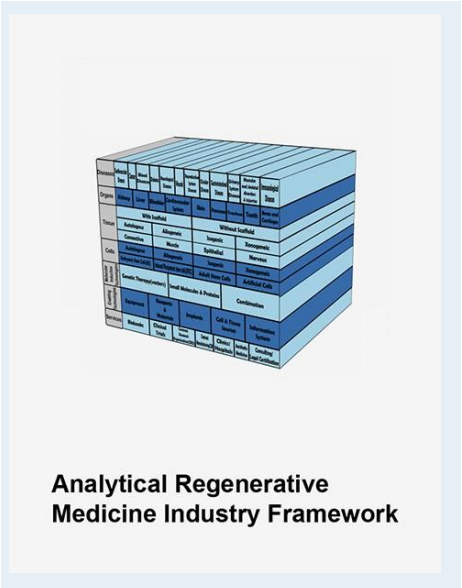
Extended the number of dashboards' tools and added the embedded AI Engine

AI-driven Big Data Analytics System and Dashboards

2021 - 2023

Reports by Aging Analytics Agency 2013 - 2015

Specialized Longevity Industry Reports



2013

2014

2015

Sophisticated Multi-Dimensional Analytical Framework

Aging Analytics Agency's 3-D Longevity Industry Analytical Framework, the production of which was necessitated by the complexities of the sector, and required in order to obtain a tangible and pragmatic understanding of the industry in order to structure investment strategy in a relevant way.

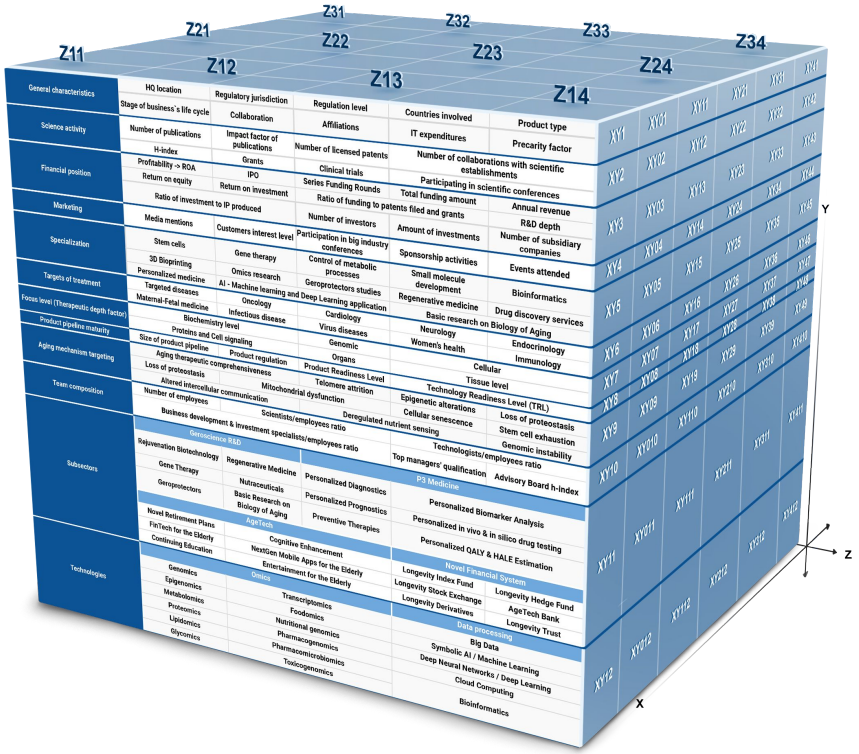
Aging Analytics Agency has been working over the course of the past five years on designing and validating increasingly quantitative and multidimensional approaches to industry analytics so as to serve as the leading tools and solutions for strategic decision making, with the aim of developing corresponding frameworks to the levels necessitated by the rapidly complexifying nature of the global healthcare system.

Sophisticated Multi-Dimensional Analytical Framework

The metrics developed for and used in Aging Analytics Agency's National Longevity Development Plans: Global Overview 2019 report, presented in UK Parliament at the official launch event of the All-Party Parliamentary Group for Longevity, are broken down into 6 distinct layers, with specific ratios being derived from 1st layer metrics, specific metric ratios and growth rates of ratios being derived from 3rd-layer metrics, effectiveness measures being derived from 4th layer metrics, and effectiveness measure growth rates being derived from 5th layer metrics.

Comprehensive Open-Access and Proprietary Analytical Frameworks for Benchmarking and Forecasting

Open Access Metrics



Aging Analytics Agency recognizes that an industry as complex and multidimensional as the Longevity industry requires the application of an equally multidimensional comparative analysis and classification framework.

This analytical framework includes metrics for identifying the breadth of the industry, identifying the diverse technological threads that make up the future growth of the industry, and its depth, identifying

the focus level of each technology, and the state of maturation of each. To identify the top 400 Longevity companies across 10 specific Longevity Industry subsectors, open access metrics were applied.

Comprehensive Open-Access and Proprietary Analytical Frameworks for Benchmarking and Forecasting

Proprietary Metrics

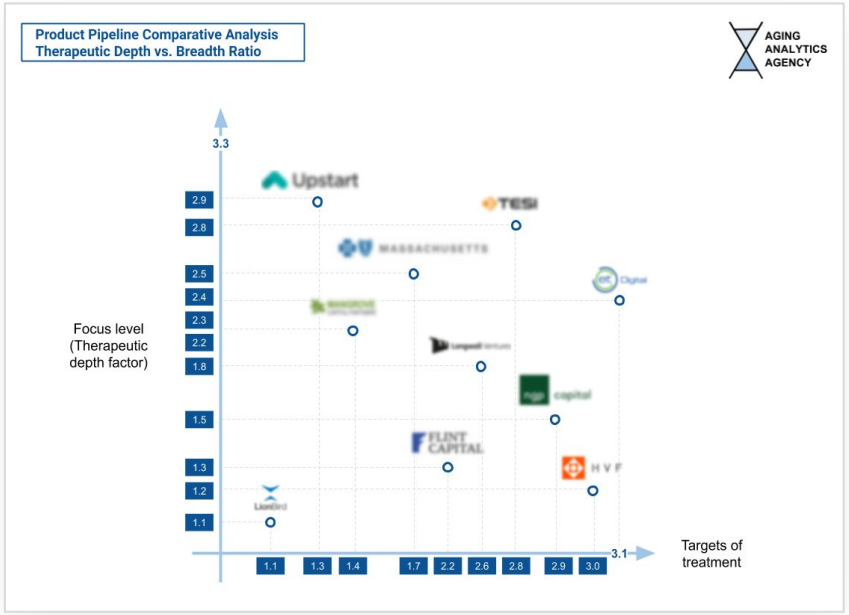
Developed years ago, the methodology and metrics of the framework were public and used in a number of other open-access Aging Analytics Agency reports, whereas a large portion of the analytical frameworks used for benchmarking are proprietary, available to potential clients interested in more tailored analytics, SWOT and practical recommendations via NDA.

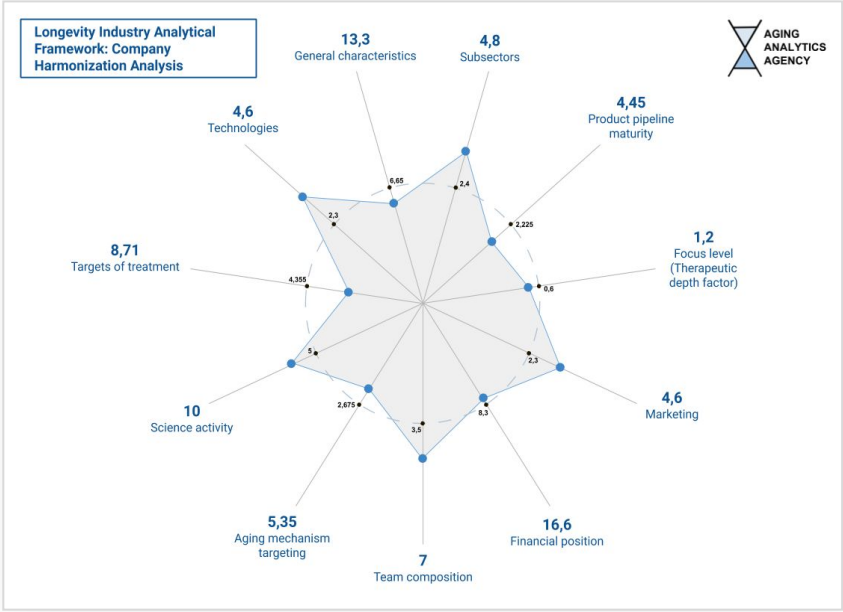
These include both absolute values (quantitative or qualitative) and dynamic parameters to analyze metrics as they change over time.

Benchmarking of top-100 and top-40 Longevity Companies was conducted primarily via the use of proprietary metrics, which includes parameters specific to 10 distinct Longevity Industry subsectors, and which also analyzes dynamic changes in company strengths and weaknesses over time.

Advanced Longevity Industry Analytical Frameworks

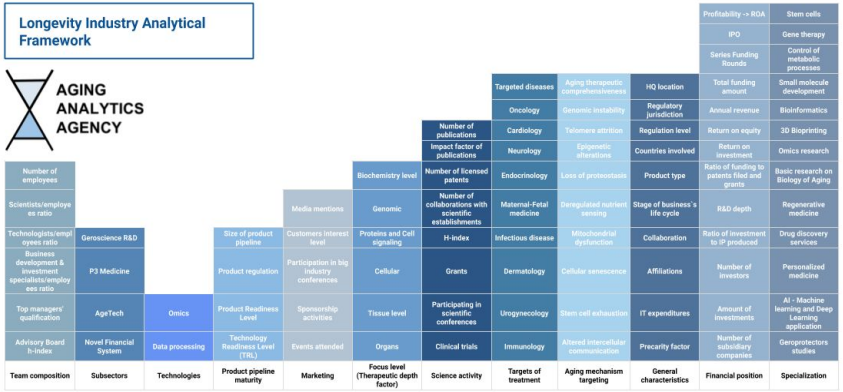
Since first developing quantitative analytical frameworks for Longevity Industry analysis in 2013, Aging Analytics Agency has continued to refine these comparative analysis systems, both in terms of the specific metrics used to conduct its market studies, as well as the mathematical formulas used to combine them, and the advanced visualization techniques used to make their forecasts, ranking and determinations maximally concrete and understandable.



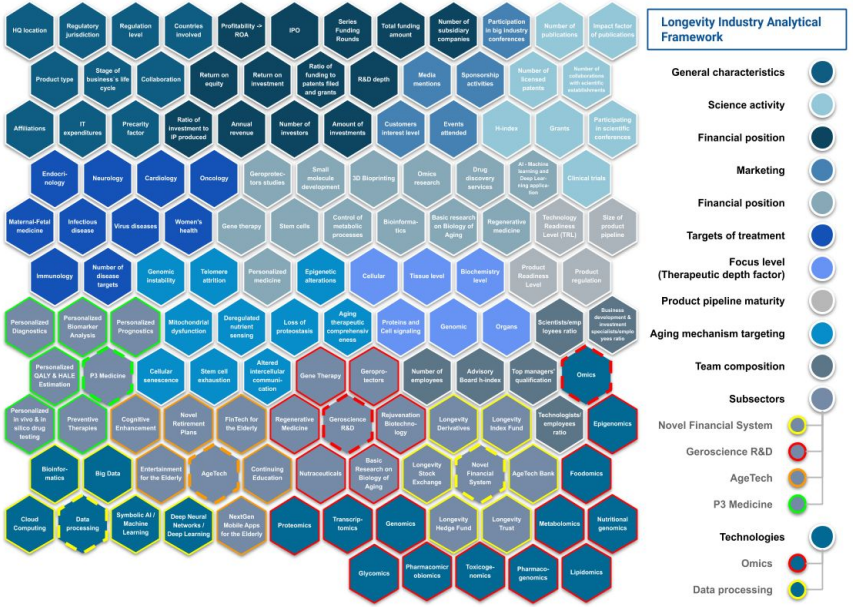


Advanced Longevity Industry Analytical Frameworks

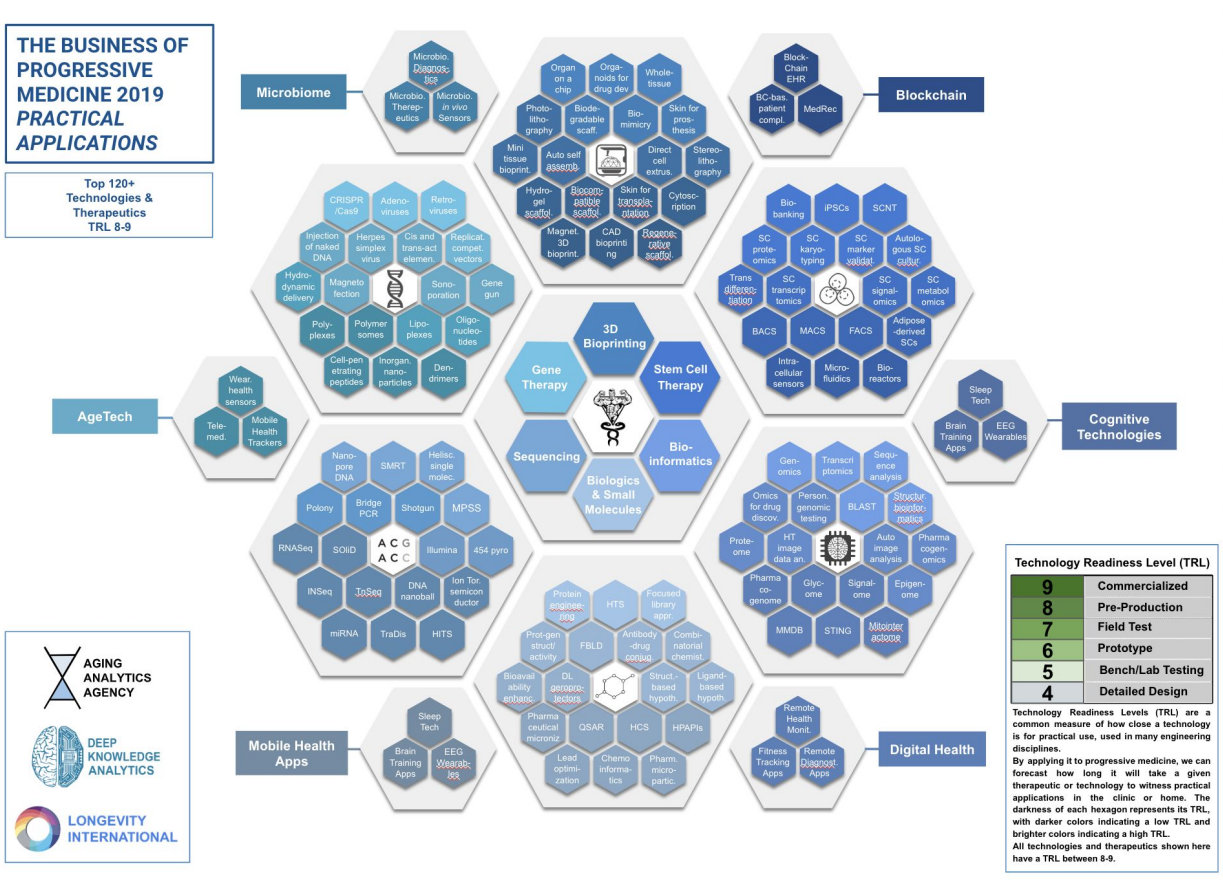
These analytical methodologies have evolved to incorporate 3-D frameworks where metrics and submetrics can be visualized simultaneously, as well as the development of advanced “timeline machines” to study the changing state of a company’s strength in specific areas ranging from scientific validation to business development, R&D, etc. over time, and projected into the future based on the statistical properties of its past behaviour. **The quantitative frameworks developed by Aging Analytics Agency form the basis for investment target identification, portfolio structuring and optimization, and due diligence processes.**



SUBSECTORS						
Geroscience R&D	Rejuvenation Biotechnology	Gene Therapy	Geroprotectors	Regenerative Medicine	Nutraceuticals	Basic Research on Biology of Aging
P3 Medicine	Personalized Diagnostics	Personalized Prognostics	Personalized QALY & HALE Estimation	Personalized Biomarker Analysis	Personalized in vivo & in silico drug testing	Preventive Therapies
AgeTech	Novel Retirement Plans	FinTech for the Elderly	Continuing Education	Cognitive Enhancement	NextGen Mobile Apps for the Elderly	Entertainment for the Elderly
Novel Financial System	Longevity Index Fund	Longevity Stock Exchange	Longevity Derivatives	Longevity Hedge Fund	AgeTech Bank	Longevity Trust
TECHNOLOGIES						
Omics	Genomics	Epigenomics	Metabolomics	Proteomics	Lipidomics	Glycomics
	Transcriptomics	Foodomics	Nutritional genomics	Pharmacogenomics	Pharmacomicrobiomics	Toxicogenomics
Data processing	Big Data	Symbolic AI / Machine Learning	Deep Neural Networks / Deep Learning	Cloud Computing	Bioinformatics	



De-Risking Longevity Investments via Technology Readiness Levels (TRLs)



Technology Readiness Level (TRL)	
9	Commercialized
8	Pre-Production
7	Field Test
6	Prototype
5	Bench/Lab Testing
4	Detailed Design

Technology Readiness Levels (TRL) are a common measure of how close a technology is for practical use, used in many engineering disciplines.
By applying it to progressive medicine, we can forecast how long it will take a given therapeutic or technology to witness practical applications in the clinic or home. The darkness of each hexagon represents its TRL, with darker colors indicating a low TRL and brighter colors indicating a high TRL.
All technologies and therapeutics shown here have a TRL between 8-9.

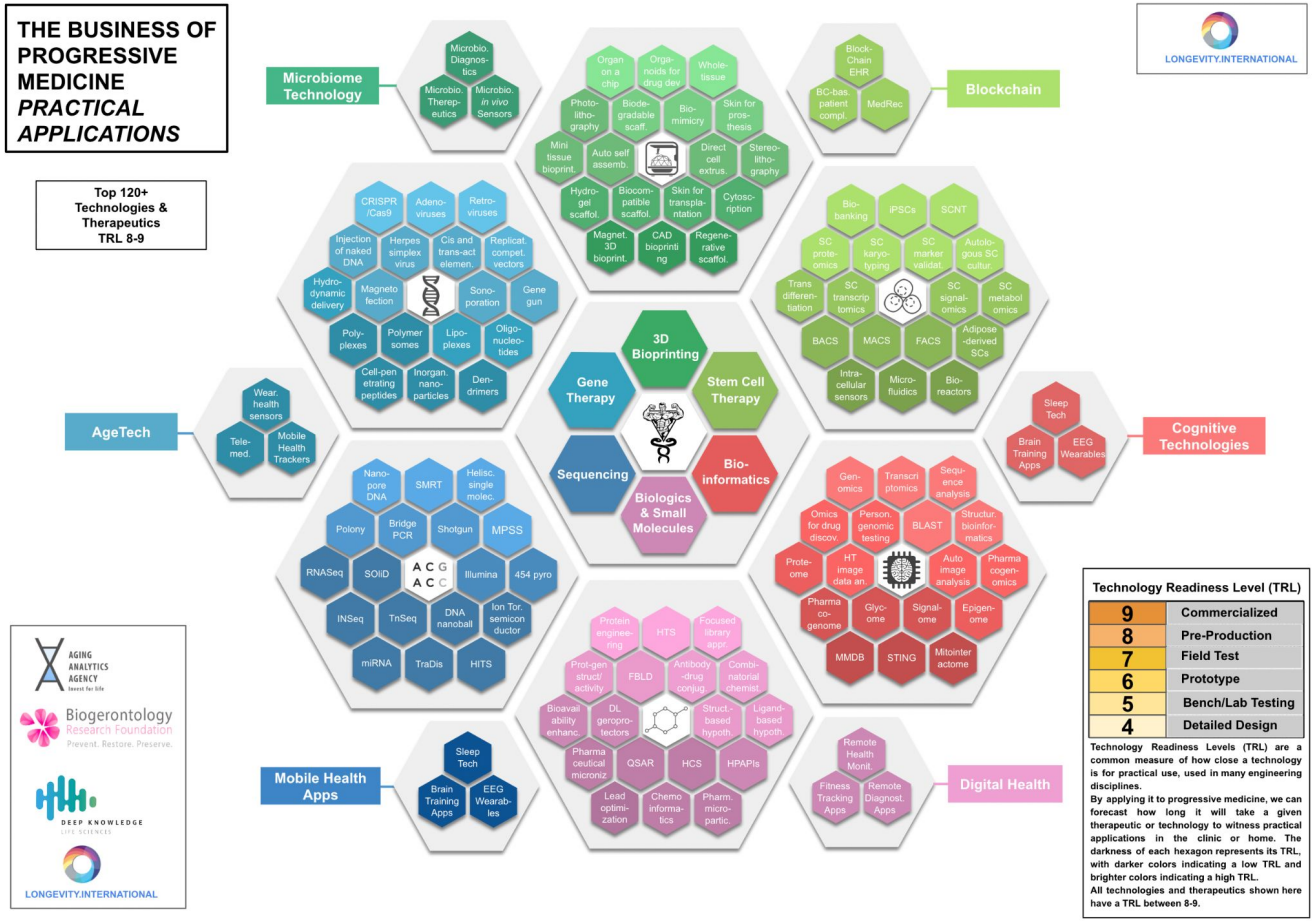
Aging Analytics Agency was the first entity to take validated approaches for market-readiness forecasting developed in other advanced industries like aerospace and apply it the the life sciences and the Longevity industry.

Technology Readiness Levels (TRLs) use a ranking of 1-9, with 9 being the most mature technology. Specific levels are assigned to specific technologies by a group of relevant scientific experts.

The use of TRLs provides a uniform metric, enabling consistent discussions of maturity across different types of technologies. In the coming years, TRLs can underpin efforts to shed light on the most important technologies and reveal those currently furthest away from practical applications.

Therefore, TRLs enable the right timing and focus to ensure each emerging technology accomplishes its specific endpoints, and highlights the interactions that are possible between technologies.

Business of Progressive Medicine Practical Applications Analytical Framework



NeuroTech Market and Technology Analysis Framework

General characteristics of the market

Technologies

Trends

Markets by disorders

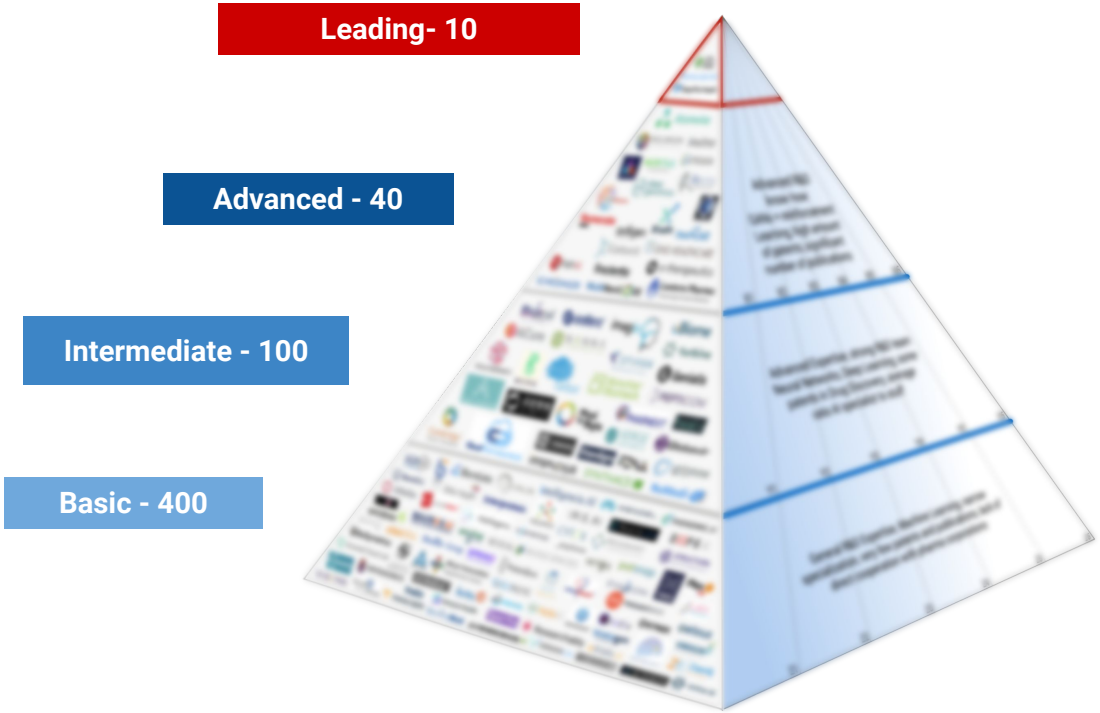
Risks and opportunities

Financials

Market in the context

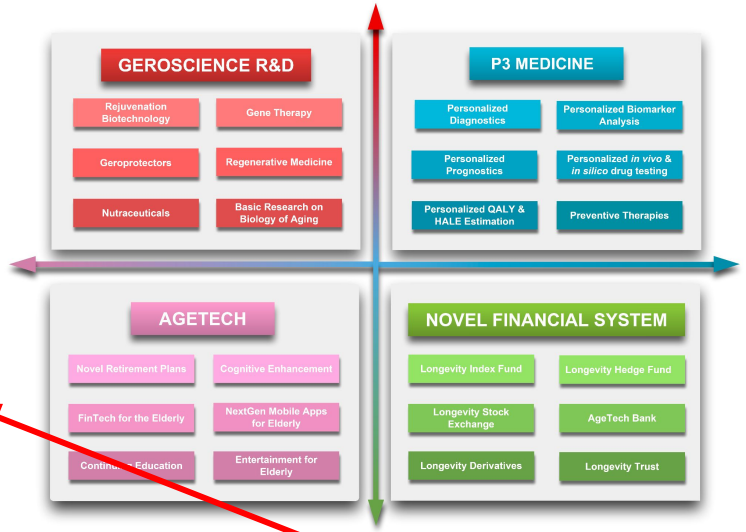
Deep Multidimensional Benchmarking of Global Longevity Industry

At the request of Longevity.Capital, Aging Analytics Agency has developed a sophisticated multidimensional analytical framework to benchmark the full scope of companies within the global Longevity Industry via advanced comparative and competitive analyses in order to identify the top-40 most promising Longevity companies distributed across 10 distinct market sectors, revealing the untapped bottom of the Longevity Industry iceberg.



This benchmarking is first applied to the full scope of Longevity companies globally, comparing hundreds of active players in the space side by side, which are then segregated into progressive levels of advancement and potential. The only way to identify the most promising players in an industry distinguished by extreme levels of complexity and multidimensionality is to use advanced comparative analytical frameworks of equal complexity. This analytical methodology is the data-driven foundation which forms the basis for the structuring of the fund's general investment strategy, company valuation procedures, and due diligence processes.

Deep Knowledge Group Coined and Popularized the Term ‘Longevity Industry’



Deep Knowledge Group’s work toward creating a truly comprehensive, actionable and relevant Longevity Industry Framework began in earnest through the release of its first formal **Longevity industry framework in 2017/2018** through the publication Aging Analytics Agency’s 1000+page *Longevity Industry Landscape Overview 2018* (*Volume I: The Science of Longevity* and *Volume II: The Business of Longevity*).

Aging Analytics Agency was the First to Define the Longevity Industry

Deep Knowledge Group's flagship Longevity-focused analytical subsidiary Aging Analytics Agency also contributed the **official definition** and only entry of the '*Longevity Industry*' in the ***Encyclopaedia of Gerontology and Population Aging***, the world's largest and most definitive encyclopaedia on aging and Longevity compiled and edited by Danan Gu (**Population Division of the United Nations, Department of Economic Social Affairs Population Division, New York USA**) and Matthew E. Dupre.

From 2018 - 2022, Deep Knowledge Group continued to build upon the foundation of Aging Analytics Agency's first-ever comprehensive, full-scope definition and analytical framework for the Longevity Industry through the release of dozens of open-access analytical reports and IT-Platforms via a number of its life science-focused analytical subsidiaries, continuing its mission to comprehensively structure the industry's breadth and complexity by identifying, classifying, and profiling all participants in the Global Longevity Industry ecosystem, applying AI, modern data science, machine learning, reinforcement learning and Big Data analysis for industry analytics to make this information available through a variety of open-access reports and analytics.

Longevity Industry Framework Developed in 2018

GEROSCIENCE R&D

- Rejuvenation Biotechnology
- Gene Therapy
- Geroprotectors
- Regenerative Medicine
- Nutraceuticals
- Basic Research on Biology of Aging

P4 MEDICINE

- Personalized Diagnostics
- Personalized Biomarker Analysis
- Personalized Prognostics
- Personalized in vivo & in silico drug testing
- Personalized QALY & HALE Estimation
- Preventive Therapies

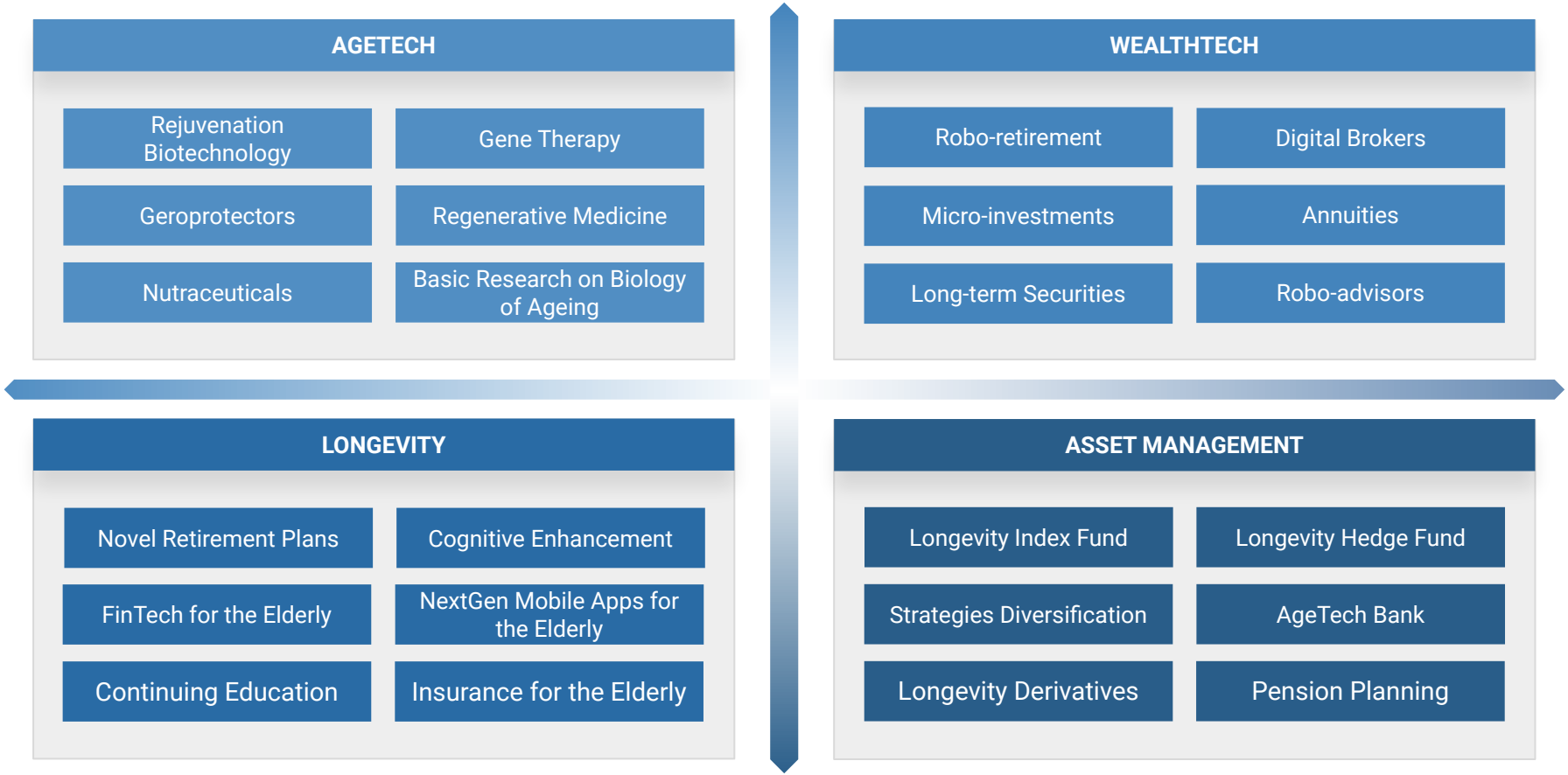
AGETECH

- Novel Retirement Plans
- Cognitive Enhancement
- FinTech for the Elderly
- NextGen Mobile Apps for the Elderly
- Continuing Education
- Entertainment for the Elderly

NOVEL FINANCIAL SYSTEM

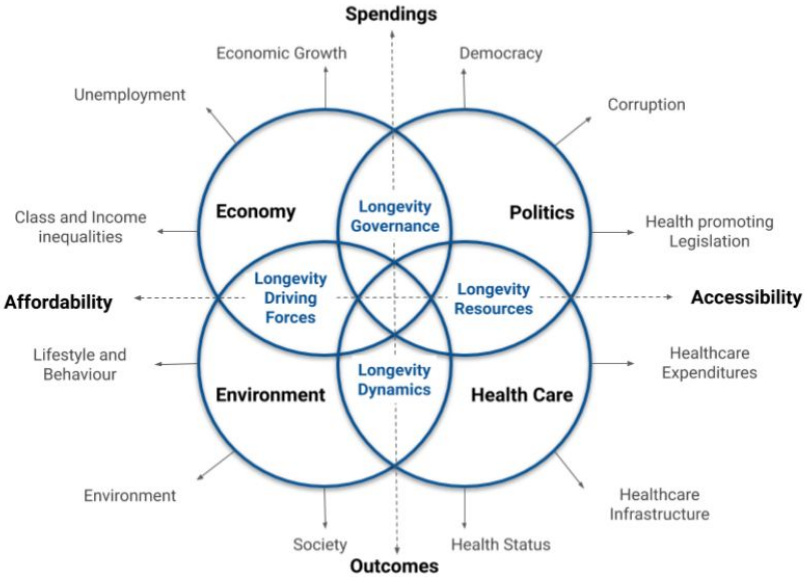
- Longevity Index Fund
- Longevity Hedge Fund
- Longevity Stock Exchange
- AgeTech Bank
- Longevity Derivatives
- Longevity Trust

Longevity Financial Industry Framework Developed in 2018



Longevity Governance Analytical Framework Developed in 2019

One of the analytical precedents used in the creation of the present special case study (**and its corresponding analytical framework**) is "*Global Longevity Governance Landscape: 50 regions Big Data Comparative Analysis of Longevity Progressiveness*", a special analytical case study developed by its Longevity-focused analytical subsidiary that applied Big Data Analysis (utilizing **200 parameters** applied to **50 regions**, encompassing **10,000 data points in total**) to rank the effectiveness of nation's Longevity Progressive Medicine Policy/Governance efforts.



Most Comprehensive Longevity Industry Framework

We uniquely specialize in the design of multidimensional frameworks to define and precisely categorise industries and technologies. These analytical frameworks heavily prioritize the scientific and technological features of projects and companies, and create the only reliable systematic basis for conducting effective analysis, benchmarking and forecasting.

Longevity Science	
Rejuvenation Biotechnology	Basic Research on Biology of Ageing
Geroprotectors	Regenerative Medicine
Nutraceuticals	Gene Therapy

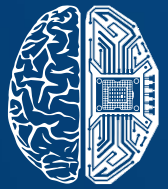
Longevity Medicine	
Personalised Diagnostics	Personalised HALE and QALE Estimation
Personalised Prognostics	Personalised in Vivo and in Silico Drug Testing
Preventive Therapies	Participatory Medicine

AgeTech	
NeuroTech	Cognitive Enhancement
Smart Homes	NextGen Mobile Apps for the Elderly
Continuing Education	Entertainment for the Elderly

Longevity Finance	
Longevity Index Fund	Longevity Hedge Fund
Longevity Stock Exchange	AgeTech Bank
Longevity Derivatives	Longevity Investment Bank

Longevity Governance	
Pension Plans	National Healthcare Budgets
Longevity Development Strategies	Elderly Care Programs
National Insurance	Elderly Education

Longevity Ethics	
Ageism Mitigation	Civil Participation
Logistical Effects of Longevity	Age-friendly Environment
Social Inclusivity	Healthcare as a Basic Human Right



DEEP
KNOWLEDGE
GROUP

Analytical Frameworks

www.dkv.global

Major Differentiating Points and Advantages of Deep Knowledge Group Analytics Methods

Deep Knowledge Group is a consortium of commercial and non-profit organisations active on multiple fronts in the realm of DeepTech and Frontier Technologies (AI, Longevity, FinTech, GovTech, InvestTech), ranging from scientific research to investment, entrepreneurship, analytics, media, philanthropy and more. The Group is known for its sophisticated multidimensional DeepTech analytics, predictive forecasting and benchmarking, and considers its 10+ analytical subsidiaries its most valuable asset.

The DeepTech sector and its numerous component industries (Longevity, SpaceTech, NanoTech, AI, etc.) are developing at an extremely rapid pace of progress and innovation, with hundreds of thousands of companies that five years ago would be considered as just tech companies, but which have evolved enough in terms of technological and scientific sophistication and complexity to be considered as DeepTech. As a result, DeepTech is gradually replacing Tech as the new normal. We consider the Longevity Industry in particular to be at the very forefront of DeepTech.

The complexity and technological intersectionality of these industries is already so advanced that it makes standard methods of analysis, due diligence and forecasting ineffective, and this unprecedented overcomplexity is only growing, exhibiting increasing degrees of fusion and interconnectivity between different domains of science and technology. There is a pressing need for methods of analytics, benchmarking and forecasting capable of matching and withstanding this growing overcomplexity in order to support, formulate and execute effective decision making. Deep Knowledge Group has an extensive track record of designing effective analytical frameworks for managing this complexity.

- Our Group's focus is on the most advanced DeepTech Industries (and especially those that are the most sophisticated from a scientific and technological point of view), with a particular prioritisation of the Artificial Intelligence and Longevity Industries
- We uniquely specialise in the design of multidimensional logic frameworks to define and precisely categorise DeepTech industries and technologies
- These analytical frameworks heavily prioritise the scientific and technological features of projects and companies, and create the only reliable systematic basis for conducting effective DeepTech analysis, benchmarking and forecasting
- We have designed and validated specialised software capable of aggregating information and data on a massive scale and in a structured manner, subjecting this data to proprietary Big Data Analytical methods in order to effectively and actionably analyse entire DeepTech industries on global and regional scales
- These analytical approaches are then integrated with proprietary Big Data Design software that employs advanced visualisation techniques to represent entire industries within one display, reflecting the dynamics, trends, scope and/or categorical dimensions of entire industry landscapes at a single glance, similar to the concept of 'star maps' (*visualisations of the entire set of stars visible in the night sky*)
- We then use machine learning techniques to extract hidden correlations and latent patterns within this extreme abundance of data, transforming them into actionable insights
- These techniques are further enhanced by applying specific methodologies of technological forecasting across short-term and long-term timeframes. The end result of this process is similar to Gartner curves, but in our case these are also combined with advanced Big Data analysis of DeepTech industries, sectors and segments, and enhanced with regional assessments of each industry in particular

- While we do have analytics on publicly traded companies (which in general tend to have very significant volumes of information openly accessible), our major focus is on private equity companies (which tend to have lesser volumes of data in the open domain), and we are also conducting sophisticated analysis of matured pre-IPO companies

- For this purpose we strongly prioritise conducting AI-driven *cross analyses* between pre-IPO companies and publicly traded companies that were only recently listed (and which in many respects can be reasonably compared with very matured pre-IPO companies), which yields very unique and actionable insights. In a similar manner we conduct cross-analyses between matured private equity companies and early stage startups, which allows extraction of highly unique insights and valuable correlations not obtainable by any other system we are aware of.

Alternative data in DKG as a cutting-edge solution

Alternative data, by definition, is the data that comes from sources outside of the company. Alternative data analysis can be viewed as an investigation of the traces that the business leaves instead of self-reporting fillings and press releases.

There are many benefits to expanding analytical scope with this type of data, namely:

- better timing - we see the relevant event for the business immediately or with a short lag and don't have to rely on companies' official statements
- objectivity - alternative data is more robust to potential misreporting or fraud because of its externality to company nature and opportunity to cross-validate a few sources
- scope - financial reports are written by the rules and often disclose only details requested by the corresponding standard. The scope of alternative data is limited only by a willingness to look for the data because the number of traces each company leaves during its business is sufficient to obtain a decent understanding of its intangible assets.

The classical approach to valuation relies a lot on financial reports and uses them as a background to build future predictions. However, for private companies, these reports are usually unavailable unless the company is willing to disclose them, which is quite rare, and even in that case, the level of reliability and details can be lower than the one for a public company which has to meet the IFRS, US GAAP or another set of standards.

Our approach is based on two observations:

- when the company of interest is a research-based company which sells (or is going to sell) technology, formulas, and molecules, its future cash flows and therefore value weakly depend on financial numbers of the last quarter or year, but depends on their intangible assets such as intellectual property, experience of employees, projects in progress, etc. As well as its competitive environment.
- if the most relevant data is the data described above, there is really not so much difference between the public and private research-based companies, and the valuation of private companies can be approximated without particular knowledge of all of existing financial details

Luckily, alternative data is available in various open sources. We carefully collect relevant metrics for each DeepTech industry and thoroughly analyse them using public equity and its market price as a reference. Our model is based on more than 150 metrics covering patents, publications, team competence, etc.

Looking at the market pricing of public equity, we are able to determine the key metrics affecting value and use them to find market inefficiencies and thus price private companies with a similar business structure.

Clustering machine learning algorithms help us to define the proper peer group for each company, get a view of the market structure and competition.

All listed above allow us to value a large number of private and public companies and get a broader and deeper view of their business. We are constantly monitoring new data becoming available and incorporating it into the valuation models.

Longevity Financial Industry Framework

Longevity Investment Organizations

- Longevity Companies
- Longevity-focused VCs
- Longevity-focused Family Offices
- Private Equity Funds
- Hedge Funds
- Accelerators and Incubators

Longevity WealthTech and Asset Management

- Novel Retirement Plans and Robo-Retirement
- Investment Banks and Asset Management Corporations
- Digital Brokers
- New-Gen AI-Driven Portfolio Management
- AI-Driven Advisory Services
- Micro-Investments

Longevity FinTech

- Age-Friendly Banks
- Healthy Lifestyle Bonuses
- Longevity Credit Unions
- Providers of Reverse Mortgage for the USA
- Retiree Employment
- Providers of Equity Release for Europe

Longevity Insurance and InsurTech

- InsurTech Marketplaces and Platforms
- Life Insurance and InsurTech
- Disability Insurance and InsurTech
- Health Insurance and InsurTech
- Big Data Actuarial Models and AI-Driven Premium Calculation
- IoT InsurTech (Wearables)
- Wealth Insurance and InsurTech
- Automated Claims Management

Bridge Solutions to Neutralize Longevity Risk Impact

- Longevity Risk Reinsurance
- Longevity Risk Transfer
- Actuarial Consulting Firms
- Longevity-Enhanced Annuities (QLACs)
- Pension Derivatives
- Underwriters (Banks and Asset Managers)

Longevity Securitization

- Securitization Service Providers
- Derivatives Providers
- Government Bodies
- Clearing and Settlement Services
- Trust Companies
- Rating Agencies

Longevity Risk-Exposed Organizations

- Corporate and Independent Pension Funds
- Public Pension Funds
- Annuity Providers
- National Healthcare Budget
- Healthcare Providers

Novel Longevity Financial System (*Concepts*)

- Longevity Investment Bank
- Longevity Exchange-Traded Fund
- Longevity Stock Exchange
- Biological Age-Based Insurance
- Longevity Innovation Marketplace
- AgeTech-Friendly NeoBanks
- Longevity Biomarkers for De-Risking
- Longevity Rating Agency

Disruptive Technologies in Pharma

R&D-Focused Technologies

Early Diagnostics

- Biomarkers Discovery
- Analytical Algorithms
- Population Screening Approaches
- At-Home Testing
- Digital Avatar
- Biobanking

Preclinical Research Optimization

- AI in Target Discovery
- Lab-on-a-Chip Technologies
- AI in Drug Discovery
- Organoids and Organ-on-a-chip
- Single Cells Screening and Sequencing
- Automated Research Facilities and Robotics

Clinical Research Optimization

- AI-Based Population Screening
- Patient Selection Optimization
- Patient Engagement Optimization
- Complex Data Management
- Technology and Digital Optimization
- Metabolism Tracking

New Modalities

- RNA-Based Therapy
- Antibody-Drug Conjugates
- Peptide Therapeutics
- Nanobodies
- Protein Degraders
- CRISPR-Based Gene Therapy

Therapy-Focused Technologies

Regenerative Medicine

- Cell Therapy
- Gene Therapy
- Exosomes
- Small and Large Molecules
- Stem Cells
- Tissue Engineering

Oncology Treatment

- Cancer Vaccines
- CAR-T Cell Therapy
- Target Delivery Systems (Nanoparticles)
- Drug Repurposing
- AI-Based Target Modeling
- Virtual Reality Rehabilitation

Personalized Medicine

- Public Health
- Medical Data Management
- Treatment Efficiency Tracking
- Reproductive Medicine
- Supplements
- Prognostic Screening and Risk Assessment

Robotics and Automation Technologies

- Bioprinting Robots
- High Throughput Screening
- Robotic Laboratories
- Collaborative Robots
- Surgical Robots
- Care Robots

AI in Drug Development

Focus on Applications of AI for Drug Discovery

- Advanced R&D
- Biomarkers Development
- Drug Discovery

Focus on Applications of AI for Oncology Diagnostics and Treatment

- AI-Assisted Diagnostics
- At-Home Cancer Detection With AI-Based Devices
- Clinical Decision Support
- Medical Images Analysis
- Patients Outcome Prediction
- Personalized Treatment Options Identification

Established Drug Discovery-Oriented Entities

Early Drug Development

- Compounds Classification
- Drug Repurposing
- Identifying New Drug Candidates
- Identifying New Drug Pathways
- Identifying New Drug Structures
- Hit Identification
- Lead Optimization
- Predictive Drug Modeling
- Target Identification
- Virtual Screening

Clinical Drug Development

- Identifying Drug to Drug Interactions
- Identifying New Drug Indications
- Identifying New Metabolic Pathways
- Identifying Suitable Patients
- Imaging Analysis
- Patient Stratification
- Predictive Modeling
- Real-Time Monitoring

End-to-End Drug Development

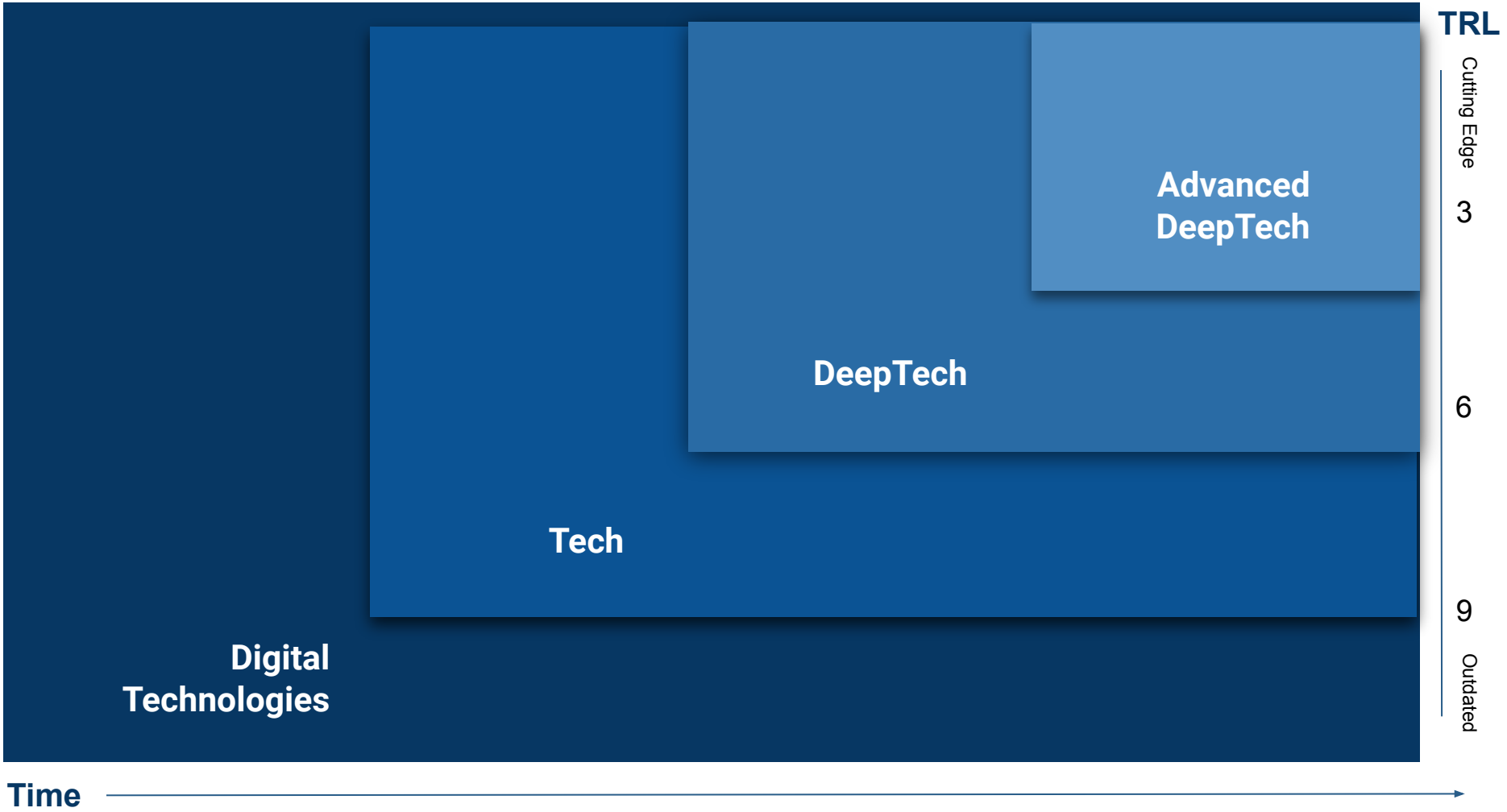
- Automated End-to-End Drug Analysis
- Automated End-to-End Drug Production
- Predictive Patient Reaction Modeling
- Virtual Experiment Processing

Preclinical Development and Automation

- ADME/PK Modeling
- Experiment Data Analyzing
- Preclinical Protocol Optimization
- Robotic Hands
- High Throughput Screening
- Drug Safety Improving
- Preclinical Trials Prediction
- Preclinical Imaging Analysis
- Robotic Laboratories
- Collaborative Robots

Data Processing

- Chemical Data Analyzing
- Clinical Trials Data Analyzing
- Imaging Data Analysis
- Lab Experiments Data Analyzing


TRL
Cutting Edge
3
6
9
Outdated
Advanced DeepTech
DeepTech
Tech
Digital Technologies
Time

Digital Technologies

Tech

- Drones Development
- Seed Technologies
- Waste Management
- Geopositioning Technologies
- Business Development Technologies
- Avionics and Flight Vehicles
- Electrical Vehicles
- Telecommunication Technologies
- Chemicals and Chemical Synthesis
- Optical Manufacturing
- Automation Technologies

Tech

DeepTech

EdTech

RegTech

LegalTech

AgTech

3D Printing

Machine Learning and Big Data

HealthTech

Renewable Energy Systems

GIS Systems

Blockchain

GovTech

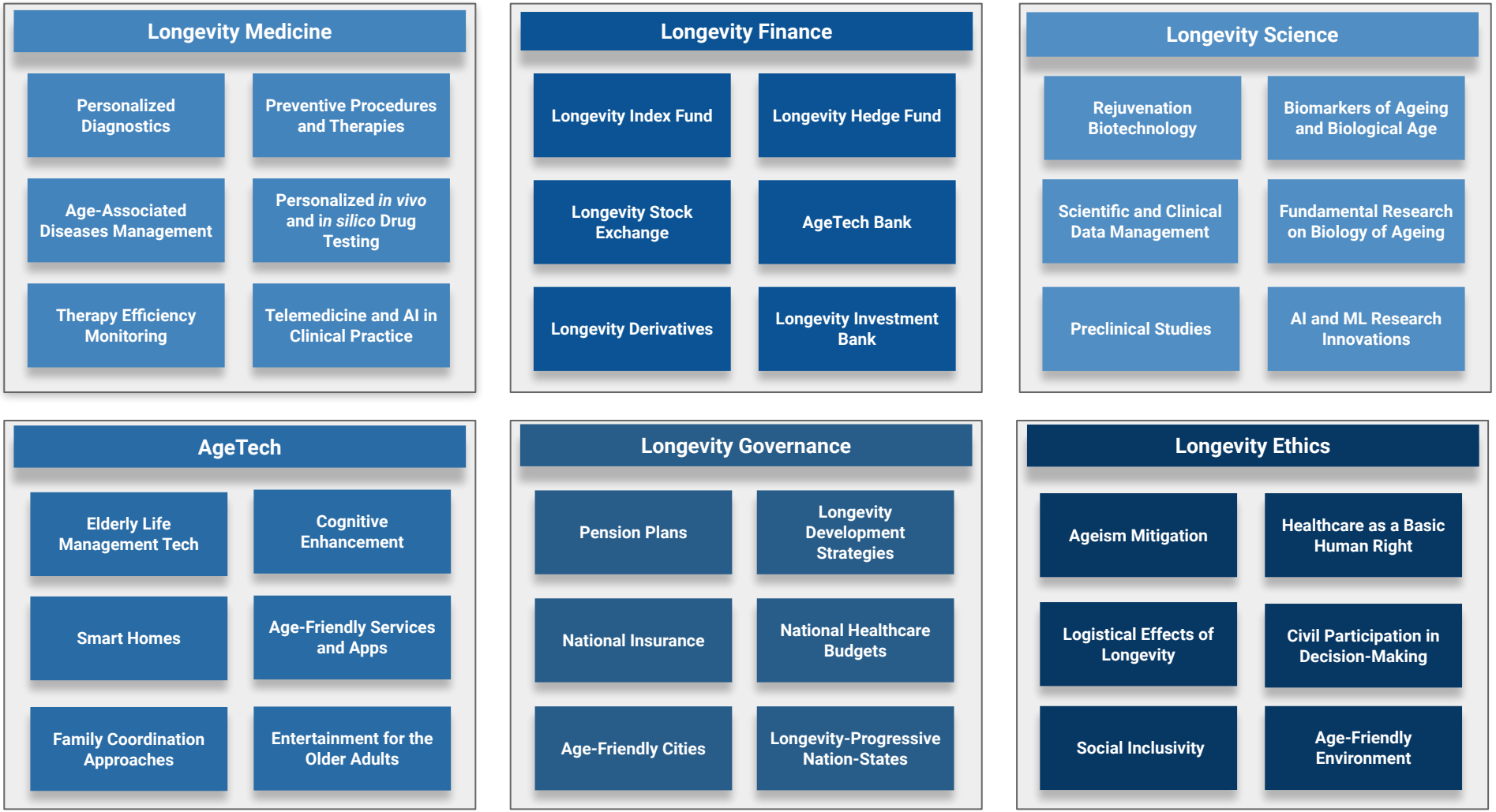
DeepTech

Advanced DeepTech

- Longevity and HealthTech
- Deep Learning AI Systems
- Internet of Things
- Pharma and BioTech
- Advanced 3D Printing
- Robotics
- Smart Cities
- SpaceTech
- Advanced Renewable Energy Systems

Advanced DeepTech

- Advanced Artificial Intelligence Systems
- Deep Diagnostics Technologies
- MetaVerse
- Atomically Precision Manufacturing
- Advanced Longevity HealthTech
- Advanced Smart Cities
- PharmTech and Advanced BioTech
- Energy 2.0
- Advanced SpaceTech
- NanoTech


Longevity Medicine
Personalized Diagnostics
Preventive Procedures and Therapies
Age-Associated Diseases Management
Personalized *in vivo* and *in silico* Drug Testing
Therapy Efficiency Monitoring
Telemedicine and AI in Clinical Practice
Longevity Finance
Longevity Index Fund
Longevity Hedge Fund
Longevity Stock Exchange
AgeTech Bank
Longevity Derivatives
Longevity Investment Bank
Longevity Science
Rejuvenation Biotechnology
Biomarkers of Ageing and Biological Age
Scientific and Clinical Data Management
Fundamental Research on Biology of Ageing
Preclinical Studies
AI and ML Research Innovations
AgeTech
Elderly Life Management Tech
Cognitive Enhancement
Smart Homes
Age-Friendly Services and Apps
Family Coordination Approaches
Entertainment for the Older Adults
Longevity Governance
Pension Plans
Longevity Development Strategies
National Insurance
National Healthcare Budgets
Age-Friendly Cities
Longevity-Progressive Nation-States
Longevity Ethics
Ageism Mitigation
Healthcare as a Basic Human Right
Logistical Effects of Longevity
Civil Participation in Decision-Making
Social Inclusivity
Age-Friendly Environment

Insurance Framework

Life Insurance

- Term life insurance
- Whole life insurance
- Universal life insurance
- Endowment insurance
- Variable life insurance

Health Insurance

- Individual health insurance
- Group health insurance
- Short-term disability insurance
- Dental insurance
- Critical illness insurance
- Long-term disability insurance

Business Insurance

- General liability insurance
- Property insurance
- Workers' compensation insurance
- Professional liability insurance
- Cyber liability insurance
- Business interruption insurance

Property and Casualty Insurance

- Home insurance
- Automobile insurance
- Liability insurance
- Flood insurance
- Earthquake insurance
- Umbrella insurance

Logistics Insurance

- Cargo insurance
- Transportation insurance
- Warehouse insurance
- Marine insurance
- Supply chain insurance
- Import-Export insurance

Travel Insurance

- Travel medical insurance
- Trip cancellation insurance
- Travel interruption insurance
- Baggage insurance
- Adventure sports insurance
- Travel accident insurance

Agriculture Insurance

- Crop insurance
- Livestock insurance
- Dairy insurance
- Poultry insurance
- Fishery insurance
- Agricultural machinery insurance

Wealth Management Insurance

- Annuities
- Long-term care insurance
- Whole life insurance with a savings component
- Universal life insurance
- Variable annuities
- Income protection insurance

Environmental Insurance

- Pollution liability insurance
- Renewable energy insurance
- Water risk insurance
- Climate change insurance
- Carbon offset insurance
- Climate adaptation insurance

InsurTech Framework

Online Insurance

- Direct-to-consumer insurance platforms
- Insurance comparison websites
- Digital-first insurance providers
- E-commerce insurance integrations

Blockchain Insurance

- Decentralized insurance platforms
- Smart contract-based insurance
- Tokenized insurance products
- Blockchain-based claims management

Cyber Insurance

- Small business cyber insurance
- Data breach insurance for large enterprises
- Standalone cyber insurance products
- Cyber insurance for cloud service providers

Telematics Insurance

- Usage-based auto insurance
- Pay-per-mile insurance
- Telematics-based life insurance
- Smart home insurance products

Health InsurTech

- Health Insurance
- Disability Insurance
- mHealth
- Tourism Insurance

Wealth Insurance

- Private Client Life and Health Insurance
- Property & Casualty InsurTech
- Asset-Backed Securities Insurance
- Art and Collectibles Insurance
- Digital Assets and Collectibles Insurance
- Securities and Investment Insurance

Microinsurance

- Mobile-based microinsurance products
- Agricultural microinsurance
- Health microinsurance
- Remittances-linked microinsurance

Life InsurTech

- Longevity & Pension Risk Transfer
- Life Insurance & InsurTech
- Qualified Longevity Annuity Contracts
- Longevity Immediate and Deferred Income Annuities

InsurTech Innovative Solutions and Services

- InsurTech Marketplaces / Platforms
- IoT InsurTech (Wearables)
- Big Data Actuarial Models and AI-Driven Premium Calculation
- Automated Claims Management
- Data Analytics and Management
- Risk Assessment

Extraterrestrial Activity

Object

Active

- Alternative Life Forms
- Primitive Life Forms
- Intelligent Life Forms
- Biosignatures
- Technosignatures

Remains

- Fossils
- Ruins and Tools
- Technological Structures
- Terraforming
- Messages
- Megastructures
- Space-Time Disruption
- Electromagnetic Radiation

Research Method

Biological Methods

- In Vivo Modeling
  - Hot Spring/Vent Microbiology
  - Gravitational Biology
  - Prebiotic Chemistry
  - Photobiology
- Sample Study
  - Electron microscopy (S/TEM)
  - Scanning probe microscopies
  - Mass spectrometry
  - Electron spectroscopic techniques

Astrophysical Measurement

- Spectroscopy
  - Absorption spectroscopy
  - Energy dispersive X-ray Spectroscopy
  - Transmission Spectroscopy
  - Raman Spectroscopy
  - Integral Field Spectroscopy
- Imaging
  - Adaptive Optics
  - Radio Imaging
  - UV Imaging
  - Quantum Imaging
- Interferometry
  - Radio Interferometry
  - Laser Interferometry
  - Speckle Interferometry
  - Gravitational Waves Screening

Modelling

- Simple Modelling
  - Alternative Life Forms
  - Techno-signatures
  - Planetary Conditions
- AI-Powered Modelling
  - Digital Twin
  - Physics-Informed Neural Nets
  - Artificial life modelling
  - Planetary Spectrum Components deducing

Location

Planet Earth

- Oceans
- Fossils
- Lower Atmosphere
- Upper Atmosphere

Earth Orbit

- Moon
- Asteroids
- Other Bodies

Our Solar System

- Other Planets
- Planetary Satellites
- Asteroid Belt
- Kuiper Belt
- Trojan Asteroids

The Milky Way

- Potentially Reachable Systems
- Debatably Reachable Systems
- Unreachable Systems

Observable Universe

Longevity Governance Industry Players

Governmental

- Policy Makers
- National Initiatives
- Research Institutes
- Healthcare Systems
- Non-departmental Organisations
- Products and Services
- Intergovernmental Organisations
- Pension Funds

Non-Governmental

- Universities and Academia
- Charity Funds
- Individual Influencers and Investors
- Activist Movements
- Non-Profitable Communities
- Monitoring Centres

Legal

- Policies
- National Master Plans
- Municipal Government Plans
- Industrial Strategies

Medical

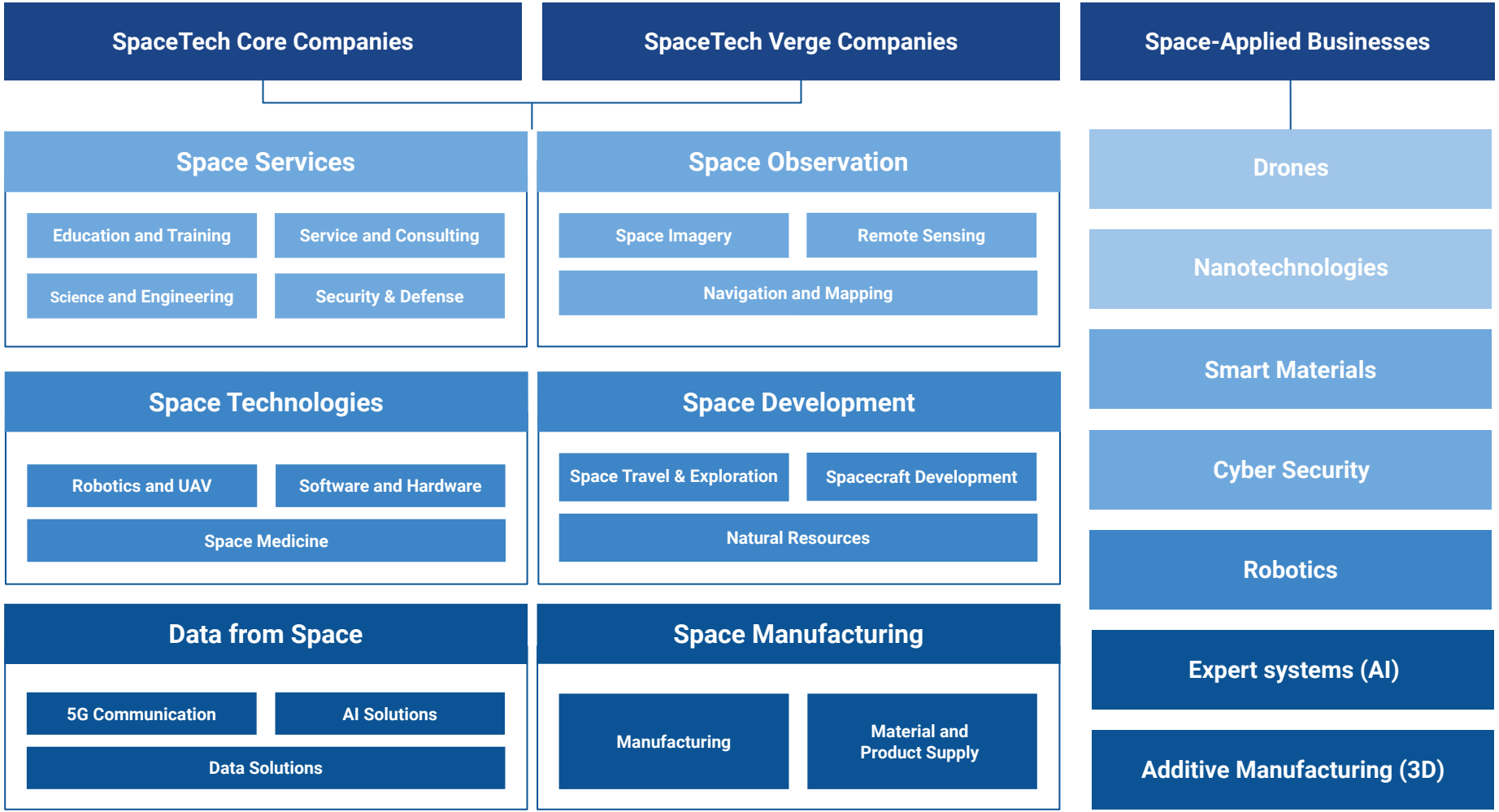
- Healthcare Systems
- Research Initiatives
- Medicine Programmes
- Development Programmes

Economical

- Pension systems
- Healthcare and Research Expenditures
- Economic Wellbeing of the Country
- Elderly Funds

Social

- Public Education
- Organisational Agendas
- Basic Sanitation Facilities
- Life Expectancy and HALE


SpaceTech Core Companies
SpaceTech Verge Companies
Space-Applied Businesses
Space Services
Education and Training
Service and Consulting
Science and Engineering
Security & Defense
Space Observation
Space Imagery
Remote Sensing
Navigation and Mapping
Space Technologies
Robotics and UAV
Software and Hardware
Space Medicine
Space Development
Space Travel & Exploration
Spacecraft Development
Natural Resources
Data from Space
5G Communication
AI Solutions
Data Solutions
Space Manufacturing
Manufacturing
Material and Product Supply
Drones
Nanotechnologies
Smart Materials
Cyber Security
Robotics
Expert systems (AI)
Additive Manufacturing (3D)

Social Impact Organisations

1

Philanthropy

2

- Charities
- Non-Profits and NGOs
- Grant-invested
- Grant-invested and Trading Revenue

3

Sustainable Development
- Animals Protection
- Food Management
- Community Development
- Environment and Ecology

Health
- Hospitals
- Community Health Care
- Family Welfare
- Disability Care

Human Services
- Arts and Culture
- Humanitarian Aid
- Educational and Consulting
- Inclusive Development

Venture Philanthropy

- Social Investment Companies (SI)
- Social Enterprises Generating Revenue
- Socially-Driven Businesses

Investment Platforms
- Value Banking
- Social Stock Exchanges

Advisory
- Social Investment Advisers
- Funding Consultancies

Investment Funds
- Venture Philanthropy Funds
- Social Investment Funds

Social Profit Philanthropy

- Socially Responsible Businesses
- Companies Allocating % to Charity

- Sustainable Development
- Nature & Climate Protection
- Education, Culture, and Sport
- Humanitarian Aid
- Legal Services
- Healthcare & Support
- Financial Inclusion

5th Industrial Revolution

MetaTechnologies

- Neurotech
- Digitization
- ML-driven technologies
- AI-backed Technologies DL
- IoT Connectivity Technologies

DeepTech

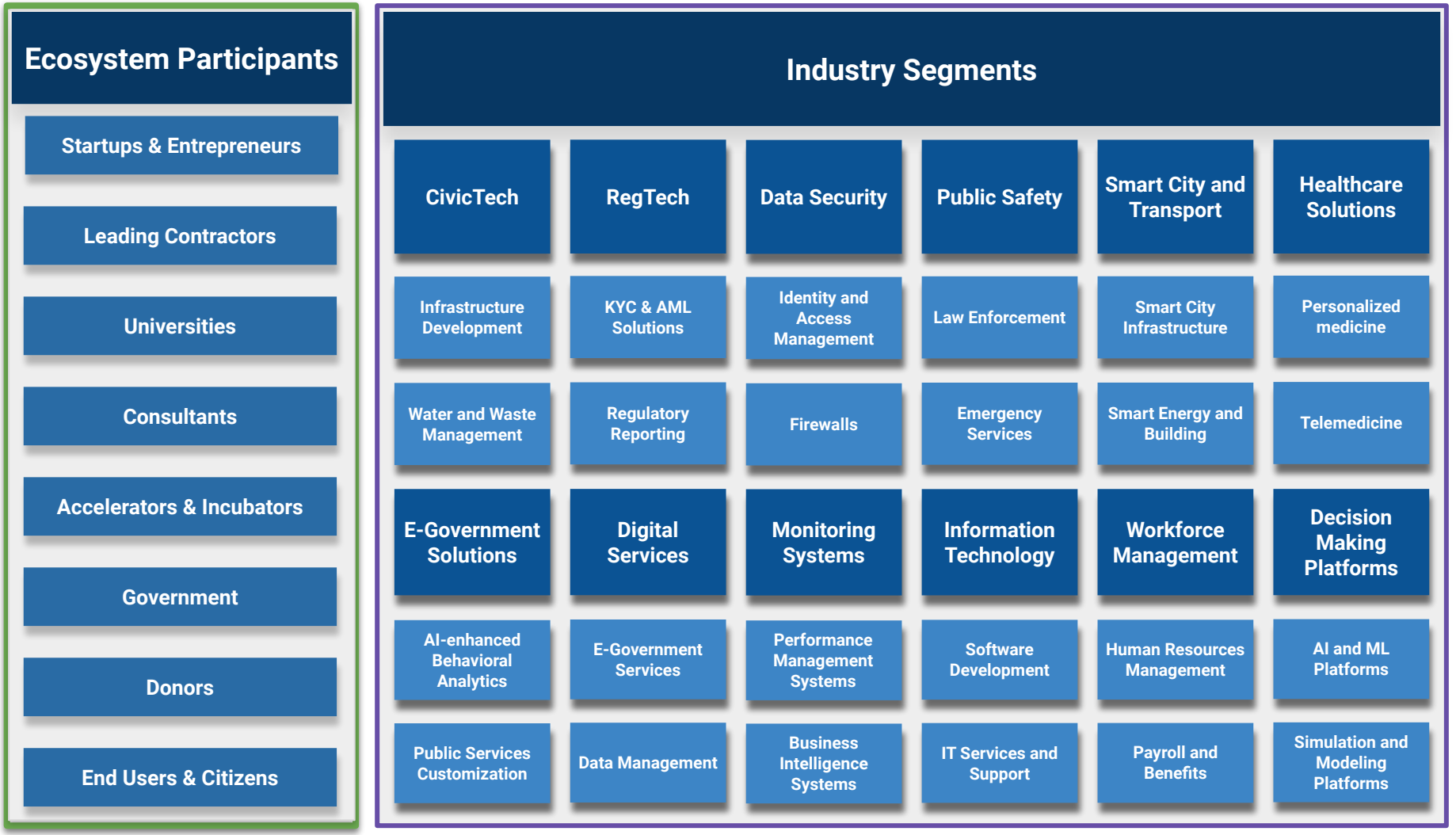
- Security
- Reg Tech
- HealthTech
- Bioinformatics
- GeoEngineering
- IoT
- SpaceTech
- FinTech 2.0
- New Materials
- Space Medicine

PoliTech & SocieTech

- GovTech
- EduTech
- GeoPolitics
- Technocracy
- Societal Psychology

Financial Systems & Economies

- InvestTech
- Innovation Economics
- Novel Financial System
- Innovation Marketplaces
- DeepTech-Tied Financial Derivatives


Ecosystem Participants
Startups & Entrepreneurs
Leading Contractors
Universities
Consultants
Accelerators & Incubators
Government
Donors
End Users & Citizens
Industry Segments
CivicTech
RegTech
Data Security
Public Safety
Smart City and Transport
Healthcare Solutions
Infrastructure Development
KYC & AML Solutions
Identity and Access Management
Law Enforcement
Smart City Infrastructure
Personalized medicine
Water and Waste Management
Regulatory Reporting
Firewalls
Emergency Services
Smart Energy and Building
Telemedicine
E-Government Solutions
Digital Services
Monitoring Systems
Information Technology
Workforce Management
Decision Making Platforms
AI-enhanced Behavioral Analytics
E-Government Services
Performance Management Systems
Software Development
Human Resources Management
AI and ML Platforms
Public Services Customization
Data Management
Business Intelligence Systems
IT Services and Support
Payroll and Benefits
Simulation and Modeling Platforms

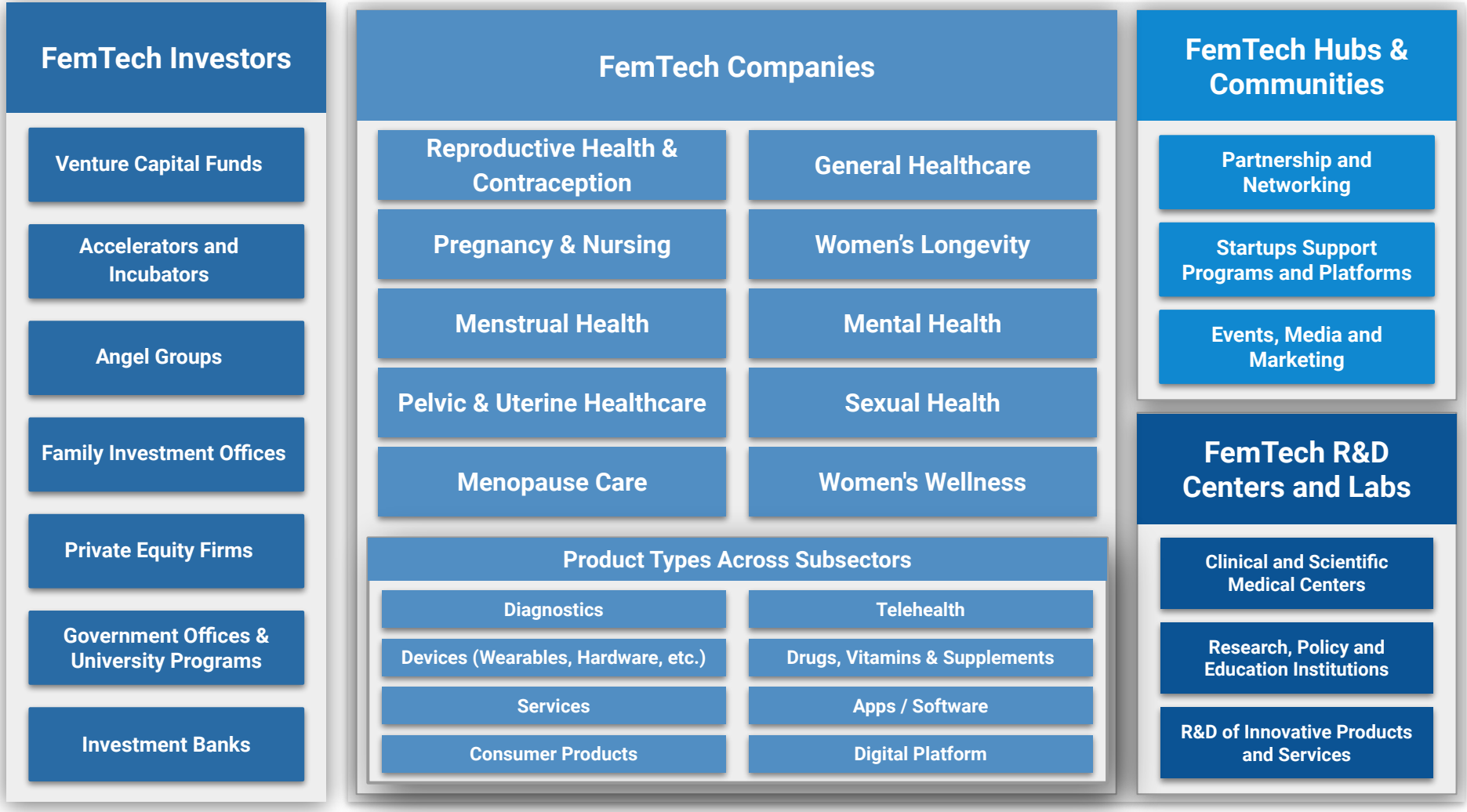
NeuroTech Framework

By Technology Type

Hardware Systems and Devices	Artificial Neural Networks	Research and Clinical Technologies	
Neurorobotics	Brain-reading	Viral Neuronal Tracing	Cerebral Organoid
Neuroprosthetics	Synthetic Telepathy	Neuromonitoring	Mesoscale connectomics
Brain-targeted Drug Nanocarriers	Deep Brain Stimulation	Neuromodulation	Neuroenhancement
Brain-Computer Interface	Whole Brain Emulation	Neurotransmitter Detection	Cluster Imaging of Multi-brain Networks
Neuromorphic and Neurohybrid Systems	Brain-Like Intelligence	Optogenetics	Neuronal Positioning System

By End-Users

Individual	Community	Business	Government
Mental Health	Healthcare	Workplace	Security Systems
Rehabilitation	Electronics	Management	Government Regulation
Smart Environments	Bioengineering	Marketing	Military or National Security
Wellness	Robotics	Consumer Applications	Jurisdiction
Lifestyle Computing	SpaceTech	Gaming Industry	Education


FemTech Investors
Venture Capital Funds
Accelerators and Incubators
Angel Groups
Family Investment Offices
Private Equity Firms
Government Offices & University Programs
Investment Banks
FemTech Companies
Reproductive Health & Contraception
General Healthcare
Pregnancy & Nursing
Women's Longevity
Menstrual Health
Mental Health
Pelvic & Uterine Healthcare
Sexual Health
Menopause Care
Women's Wellness
Product Types Across Subsectors
Diagnostics
Telehealth
Devices (Wearables, Hardware, etc.)
Drugs, Vitamins & Supplements
Services
Apps / Software
Consumer Products
Digital Platform
FemTech Hubs & Communities
Partnership and Networking
Startups Support Programs and Platforms
Events, Media and Marketing
FemTech R&D Centers and Labs
Clinical and Scientific Medical Centers
Research, Policy and Education Institutions
R&D of Innovative Products and Services

Components of the Longevity Corporate Strategy

Business Strategy	Market Superiority	Governance	Ownership	Leadership	Innovation
SWOT Analysis	Demographic Analysis	Data and Analytics	Regulatory and Policy	Branding and Marketing	Vision and Mission
Distribution and Sales	Market Segmentation	Risk Management	Business Model Innovation	Partnership and Collaboration	Research and Development
Competitive Analysis	Market Analysis	Employee Development	Monitoring and Evaluation	Corporate Social Responsibility	Product and Service Innovation

Geoeconomics Framework - Geoeconomics Industry

Geopolitics

Geostrategy
- Military strategy
- International security
- Diplomatic policy
- International economic strategy

Energy and Environmental Policy
- Climate change policy
- Environmental regulation
- Pollution management
- Resource allocation

Economic Policy
- Monetary policy
- Trade policy
- Investment policy
- Financial policy

Geopolitical Research
- Private firms
- Government agencies
- University departments
- Think tanks

International Economics

Resource Economics
- Military strategy
- International security
- Diplomatic policy
- International economic strategy

Urban Economics
- Urbanization
- Transportation economics
- Housing economics
- International development finance

International Finance
- International monetary economics
- International banking
- International capital markets
- International investment

International Trade
- Trade policy
- Trade and development
- Trade and environment
- Trade and finance

GovTech

E-Government
- Digital participation
- Decision-making platforms
- Electronic identity
- Electronic voting
- G2G systems
- G2B services

Smart Cities
- Monitoring systems and disaster management
- Energy-saving solutions
- Electronic identity
- Waste management
- Smart transport
- Traffic management solutions

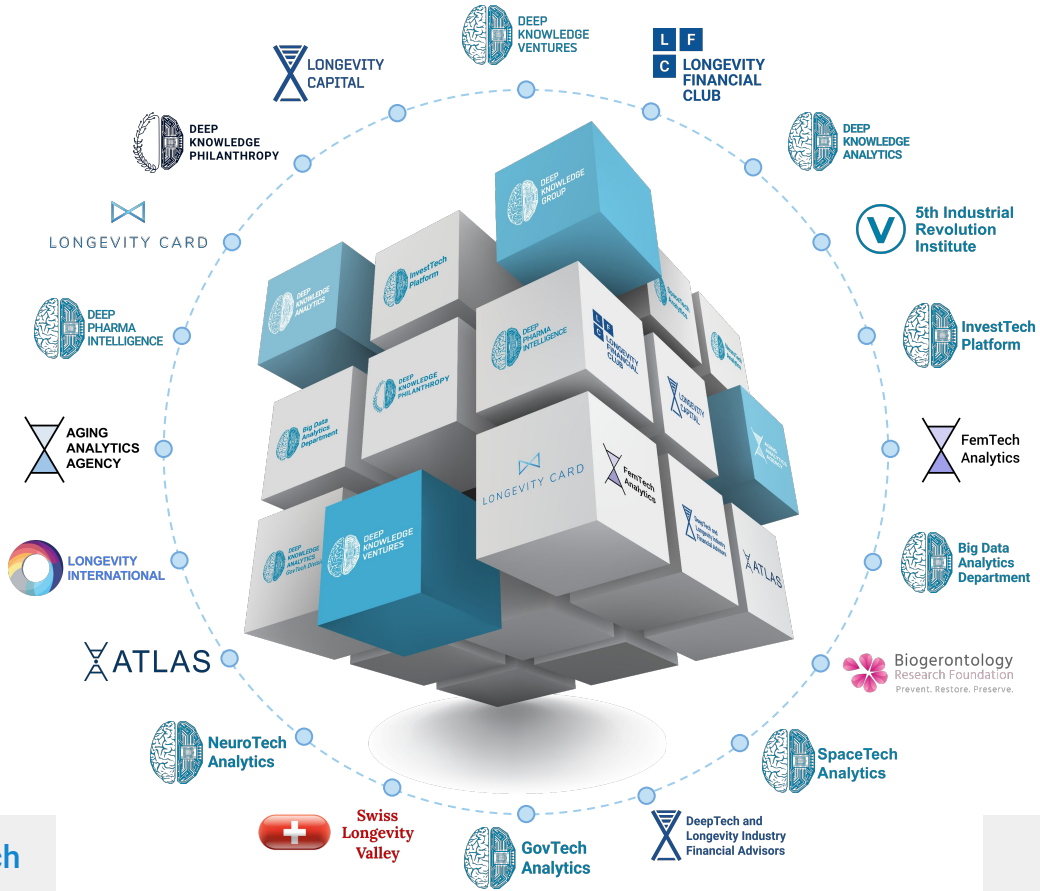
CrimeTech
- Smart recognition and identification
- Cyber security
- e-Courts
- Civil defence
- Cryme analysis platforms
- Anti-money laundering

International Economic and Financial Actors
- AgTech (Agriculture)
- Longevity Technologies
- e-HealthCare solutions
- Various sensors and IoT technologies

www.dkv.global

Deep Knowledge Group

www.deep-knowledge.org



www.deep-innovation.tech

www.longevity.network