Analytical Frameworks
Teaser

Evolution of Analytical Methods and Systems Developed by Deep Knowledge Group

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

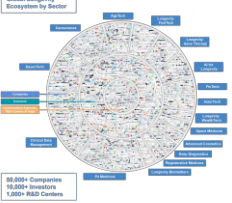**Frameworks of Complex Longevity and DeepTech Industries**

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

Fundamental Analytical Reports

Industrial and regional representation of the market development

Advanced Visualization of DeepTech Industries

Different analytical products arranged into thematic dashboards
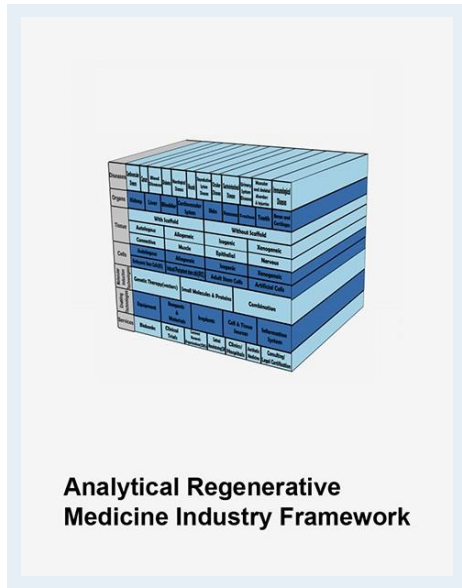
Big Data Analytics Dashboards

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

AI-driven Big Data Analytics System and Dashboards

| 2013 | 2014 - 2018 | 2019 | 2020 - 2021 | 2021 - 2023 |

Evolution of Reports Released by Aging Analytics Agency: 2013 - 2015

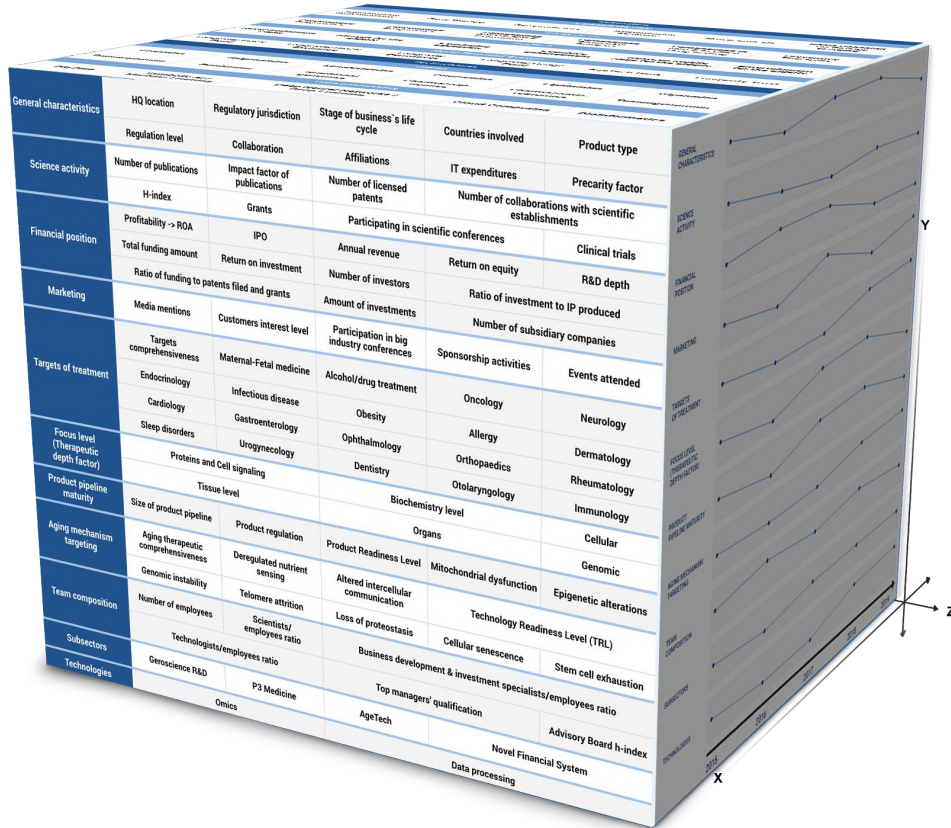## Specialized Longevity Industry Reports

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

METRICS LEVELS

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.

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.**
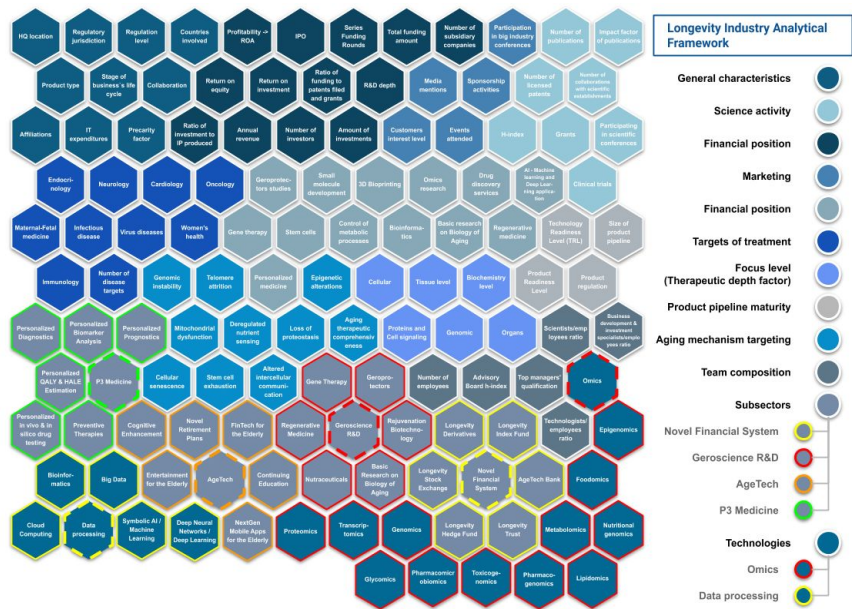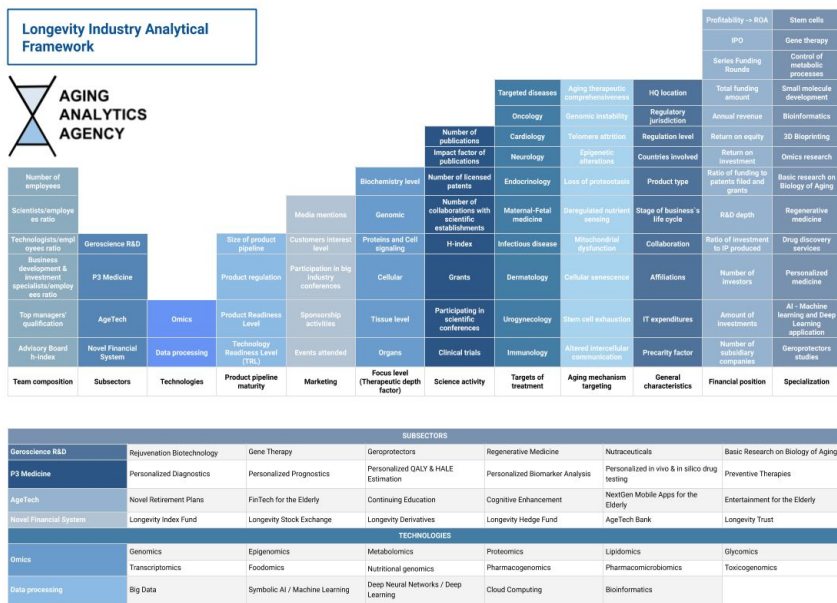
Deep Knowledge Group Analytical Frameworks

Longevity Industry
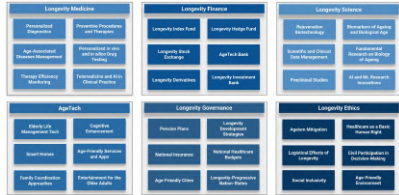
Longevity Financial Industry
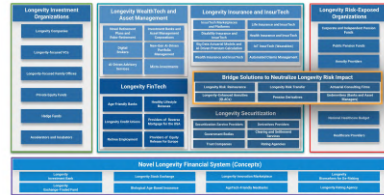
Longevity Governance Industry
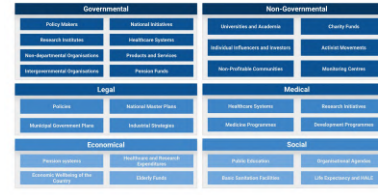
Longevity Corporate Strategy

DeepTech Industry
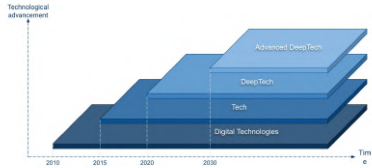
Philanthropy Industry

5th Industrial Revolution Framework

Disruptive Technologies in Pharma

Deep Knowledge Group Analytical Frameworks

AI in Drug Discovery Industry

Insurance Industry

InsurTech Industry

SpaceTech Industry

GovTech Industry

NeuroTech Industry

FemTech Industry

Geoeconomics Industry

Longevity Industry Framework

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

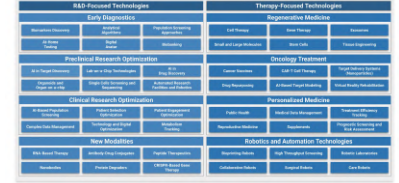|	
Rejuvenation Biotechnology	Biomarkers of Ageing and Biological Age
Scientific and Clinical Data Management	Fundamental Research on Biology of Ageing
Preclinical Studies	AI and ML Research Innovations

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

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

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

Longevity Corporate Strategy Framework

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

DeepTech Industry Framework
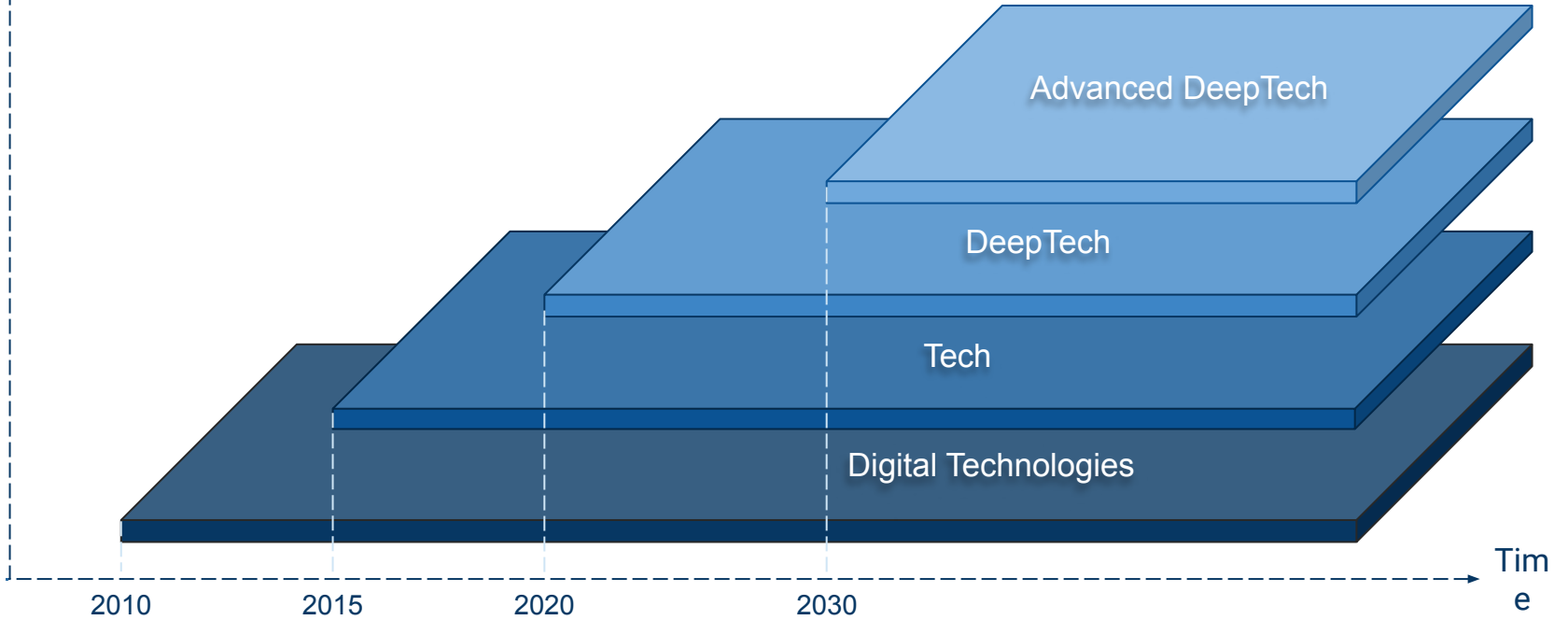
Philanthropy Industry Analytical Framework

Social Impact Organisations

Philanthropy

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

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 Framework

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

Disruptive Technologies in Pharma Framework

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 Discovery Industry Framework

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

Insurance Industry 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 Industry 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

SpaceTech Industry Framework

SpaceTech Core Companies

Space Services
- Education and Training
- Service and Consulting
- Science and Engineering
- Security & Defense

Space Technologies
- Robotics and UAV
- Software and Hardware
- Space Medicine

Data from Space
- 5G Communication
- AI Solutions
- Data Solutions

SpaceTech Verge Companies

Space Observation
- Space Imagery
- Remote Sensing
- Navigation and Mapping

Space Development
- Space Travel & Exploration
- Spacecraft Development
- Natural Resources

Space Manufacturing
- Manufacturing
- Material and Product Supply

Space-Applied Businesses
- Drones
- Nanotechnologies
- Smart Materials
- Cyber Security
- Robotics
- Expert systems (AI)
- Additive Manufacturing (3D)

GovTech Industry Framework

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 Industry Framework

By Technology Type

Hardware Systems and Devices
- Neurorobotics
- Neuroprosthetics
- Brain-targeted Drug Nanocarriers
- Brain-Computer Interface
- Neuromorphic and Neurohybrid Systems

Artificial Neural Networks
- Brain-reading
- Synthetic Telepathy
- Deep Brain Stimulation
- Whole Brain Emulation
- Brain-Like Intelligence

Research and Clinical Technologies
- Viral Neuronal Tracing
- Neuromonitoring
- Neuromodulation
- Neurotransmitter Detection
- Optogenetics
- Cerebral Organoid
- Mesoscale connectomics
- Neuroenhancement
- Cluster Imaging of Multi-brain Networks
- Neuronal Positioning System

By End-Users

Individual
- Mental Health
- Rehabilitation
- Smart Environments
- Wellness
- Lifestyle Computing

Community
- Healthcare
- Electronics
- Bioengineering
- Robotics
- SpaceTech

Business
- Workplace
- Management
- Marketing
- Consumer Applications
- Gaming Industry

Government
- Security Systems
- Government Regulation
- Military or National Security
- Jurisdiction
- Education

FemTech Industry Framework

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

Geoeconomics Industry Framework

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

Deep Knowledge Group