

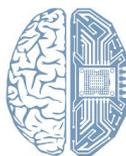
LONGEVITY INDUSTRY 1.0

Event characteristics	14 Jurisdiction	Regulatory jurisdiction	Regulation level	Countries involved	Product type
Science industry	Stage of business life cycle	Collaboration	Affiliations	IP expenditures	Precarity factor
Financial position	Number of publications	Impact factor of publications	Number of formal patents	Number of collaborations with scientific establishments	
Marketing	Profitability - ROA	Return on equity	Return on investment	Series Funding Round	Participating in scientific conferences
Specialization	Rate of investment in IP produced	Number of investors	Participation in regulatory conferences	Amount of investments	Number of subsidiary companies
Targets of research	Gene therapy	Gene therapy	Gene therapy	Small molecule development	Events attended
Translational medicine	Alzheimer's disease	Alzheimer's disease	Alzheimer's disease	Regenerative medicine	Bioinformatics
Preventive medicine	Cardiovascular disease	Cardiovascular disease	Cardiovascular disease	Basic research on biology of aging	Drug discovery services
Healthcare technology	Artificial intelligence	Artificial intelligence	Artificial intelligence	Neurology	Biotechnology intermediality
Agility performance targeting	Agility performance targeting	Agility performance targeting	Agility performance targeting	Cellular	Tissue level
Team composition	Team composition	Team composition	Team composition	Biogeriatrics	Biogeriatrics
Education	Education	Education	Education	Biogeriatrics	Biogeriatrics
Technologies	Technologies	Technologies	Technologies	Biogeriatrics	Biogeriatrics

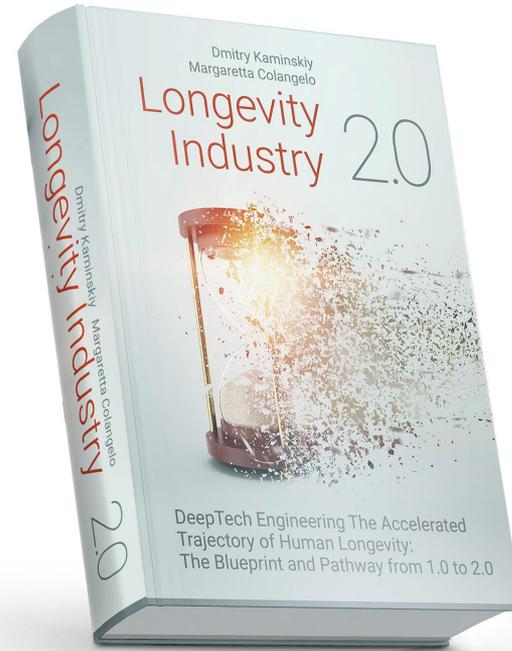
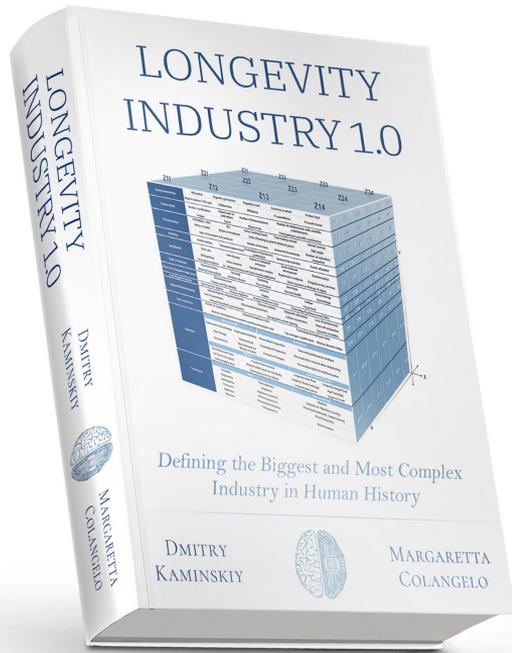
BOOK TEASER

Defining the Biggest and Most Complex Industry in Human History

DMITRY
KAMINSKIY



MARGARETTA
COLANGELO



2010-2020: Evolution of the Longevity Industry from Zero to 1.0

- *The Industrialization of Longevity*
- *The Current State of Longevity Science, Business, Finance, and Practical Applications*
- *Longevity Becomes a National Priority Item for the Strategic Agenda of Progressive Governments*
- *Transforming the Challenge and Deficit of Aging into the Opportunity and Asset of Longevity*
- *Defining and De-Risking: Hype vs. Reality*

2020-2025: DeepTech Engineering The Accelerated Trajectory of Human Longevity – The Blueprint and Pathway from 1.0 to 2.0

- *Global Industrialization of Longevity to Scale*
- *The Evolution from Longevity Start-ups to Multitrillion Dollar Longevity Corporations*
- *How AI-Driven Preventive Medicine will Disrupt the BioTech and Healthcare Industries*
- *Novel Financial Instruments and InvestTech Solutions*
- *The Rise of Progressive Longevity MegaHubs*

About the Book: Introducing Longevity Industry 1.0

In *"Longevity Industry 1.0: Defining the Biggest and Most Complex Industry in Human History"*, seasoned Longevity Industry professionals Dmitry Kaminskiy and Margareta Colangelo distill the complex assembly of deep market intelligence and industry knowledge that they have developed over the past 5 years into a full-scope understanding of the global Longevity Industry, showing the public exactly how they managed to define the overwhelmingly complex and multidimensional Longevity Industry for the first time, and how they created tangible frameworks for its systematization and forecasting.

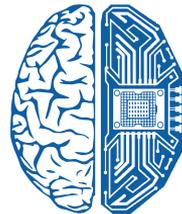
The book features first of its kind coverage of entirely new segments and sectors of the rising Longevity Industry, including Longevity Politics and Governance, the Longevity Financial Industry (including coverage of AgeTech, WealthTech, FinTech, and the coming rise of new financial instruments and derivatives), the current state and forecasts on the Global Industrialization of Longevity to Scale, and an overview of the near-future trajectory of the Longevity Industry's evolution between 2020 and 2025.

**Longevity Industry Analysis,
Systematization, Categorization
and Frameworking**

**Pragmatic Assessment
and De-Risking of the Longevity
Technologies: Hype vs. Reality**

**First-of-Its-Kind Coverage
of Longevity Financial
Industry and Policy/Governance**

**Actionable Forecasts on
the Future Trajectory of the
Longevity Industry 2020-2025**



About the Book: Introducing Longevity Industry 1.0

PART I

Longevity Industry Mega-Complexity: Challenges, Issues, Opportunities

- *The Unprecedented Complexity, Intersectionality and Multidimensionality of the Longevity Industry*
- *Why Traditional Methods of BioTech Analytics, Forecasting, Benchmarking and Investment Strategy Will Fail For Longevity*
- *The Need for New Analytical Methodologies and Frameworks Equal to the Complexity of the Longevity Industry*
- *Longevity.Capital: Specialized Hybrid Investment Fund for Longevity-Industry De-Risking and Diversification*

PART II

Longevity Policy and Governance: Longevity Technocracies & MegaHubs

- *The Rise of Progressive Longevity MegaHubs and Technocracies*
- *Longevity as a Major National Priority Item of Progressive Governments' Strategic Agendas*
- *The Emergence of Longevity-Focused Parliamentary Groups and Government Bodies*
- *National Longevity Industrial Strategies and Healthy Longevity Development Plans*
- *How Longevity Will Determine the Outcome of National Elections by the Year 2025*

PART III

The Longevity Financial Industry: Novel Financial Instruments and Health as New Wealth

- *Longevity Embraced by the World's Biggest Financial Corporations: Investment Banks, Insurance Companies, Pension Funds, Asset Management Firms*
- *Integrated AgeTech, FinTech, WealthTech, InvestTech Solutions*
- *Longevity Stock Exchanges, Financial Marketplaces and AgeTech-Longevity Banks*
- *New Financial Instruments and Derivatives: New Business Models and Novel Financial Instruments Tied to the Rising Longevity Industry*

PART IV

Longevity Industry: Science, Technology and Biomedicine

- *Global Industrialization of Longevity to Scale*
- *Precision Health and the Patient as CEO*
- *How AI-Driven Preventive Medicine and Novel InvestTech Solutions Will Disrupt BioTech and Healthcare Industries by 2025*
- *Longevity FemTech*
- *Biomarkers of Longevity 2.0: The Need for Maximally Actionable Biomarkers of Aging, Health and Longevity*

Table of Contents

Quotes and Advance Reviews	8	8. The Rise of Longevity Technocracies and MegaHubs: Governance and Policy as the Next Great Longevity Frontier <i>(Contributor: Eric Kihlstrom)</i>	114
Preface by Margareta Colangelo	11	9. Longevity Progressive and Regressive Nations: Israel, Singapore and the USA	140
Preface by Dmitry Kaminskiy	14	10. The Swiss Longevity Valley: How Switzerland May Become a Global Longevity Financial Industry MegaHub by 2025 <i>(Contributor: Stefan Hascoet)</i>	153
Facts vs. Fiction	19	11. The Longevity Leadership Role of the UK: The Emergence of Longevity-Focused Parliamentary Groups and Government Bodies <i>(Contributor: Eric Kihlstrom)</i>	170
PART I - Longevity Mega-Complexity: Challenges, Issues, Opportunities	25	12. California - Longevity Hype in Silicon Valley: Will the Traditional Approach to BioTech Investment Lead to a Longevity Boom, Bubble or Bust? <i>(Contributor: Kate Batz)</i>	188
1. The Biggest and Most Complex Industry in Human History	26	13. The Future of Longevity Governance: How Longevity Will Become a Major Priority Item for the National Agendas of Progressive Countries by 2025	198
2. Formulating the Longevity Industry Framework	40	PART III - Longevity Financial Industry	200
3. From BioTech Stagnation to Longevity Prosperity: Forecasting on the Future of Longevity Biomedicine	56	14. The Longevity Financial Industry and Novel Financial System	201
4. Longevity Investing 1.0: Disproportions in the Current Longevity Investment Landscape	64	15. Major Longevity Financial Industry Trends, Predictions and Insights	218
5. Longevity Investing 2.0: Why Traditional BioTech Analytics Fails Against the Longevity Industry's Extreme Complexity	71	16. Longevity FinTech <i>(Contributor: Sergey Balasanyan)</i>	242
6. Longevity Analytics 2.0 - Modern Analytical and IT Solutions to Manage Longevity Complexity	81	17. Longevity Finance and the Shift from FinTech 1.0 to FinTech 2.0	257
7. Longevity.Capital: Specialized Hybrid Investment Fund for Longevity Industry De-Risking and Diversification	103	18. FinTech 2.0 and the Rise of Longevity Banks: Where Healthspan Meets Wealthspan	261
PART II - Longevity Policy and Governance	113	PART IV - Longevity Industry (Science, Technology & and Biomedicine)	279

19. The Birth and Rise of Geroscience (The Science of Longevity)	280	3. Longevity Industry in Israel Landscape Overview 2019	388
20. Most Developed Domains of Longevity R&D and Top Longevity Scientists	286	4. FemTech Healthcare Landscape Overview 2019	389
21. The Current State of Longevity Clinical (Human) Trials	303	5. Longevity Industry in California Landscape Overview 2019	390
22. Precision Medicine and the Patient as CEO (Contributor: Robin Farmanfarmaian)	309	6. Top-100 Longevity Leaders	391
23. AI for Longevity and Precision Health (Contributor: Richard Siow)	321	7. Top-100 Journalists Covering Advanced Biomedicine and Longevity	392
24. The Effect of Diet and Exercise on Biological Aging: From Hype to Reality	331	8. Top-50 Women Longevity Leaders	393
25. Longevity FemTech (Contributor: Robin Farmanfarmaian)	336	9. Top-30 Longevity Conferences	394
26. Biomarkers of Longevity 2.0: The Shift Toward Actionable, AI-Empowered Biomarkers of Aging, Health and Longevity (Contributor: Franco Cortese)	343	10. Advancing Financial Industry Longevity / AgeTech / WealthTech	395
27. The Crucial and Fundamental Role of AI in Longevity R&D and Practical Implementation	358	11. Longevity Industry in Switzerland: Landscape Overview 2019	396
28. What if Geroscience Fails? - Pragmatic Optimism in the Longevity Industry and Defining Hype vs. Reality	373	12. Top-100 Supercentenarians Landscape Overview: 100 Longest-Lived, 100 Currently Living, 25 Socially and Professionally Active	397
Longevity Industry 2.0 Summary - DeepTech Engineering The Accelerated Trajectory of Human Longevity: The Blueprint and Pathway from 1.0 to 2.0	383	13. 1000 Longevity Leaders IT-Platform	398
PART V - Longevity Industry Navigator	386	About Deep Knowledge Group	399
1. Longevity Industry in UK Landscape Overview 2018	387	About the Authors	444
2. Longevity Industry in Singapore Landscape Overview 2019	388	About the Contributors	446

Longevity Industry - A Multitrillion Opportunity

While many analysts and investors consider the Longevity Industry to be of a much more limited scope, consisting of core anti-aging therapies at the forefront of advanced biomedicine, [Deep Knowledge Group](#) has been working for the past 5+ years to landscape and understand the global multifaceted Longevity Industry through the work of its analytical subsidiary [Aging Analytics Agency](#), which has gained a deep comprehension through tens of thousands of pages worth of public and proprietary Longevity Industry analytical reports.

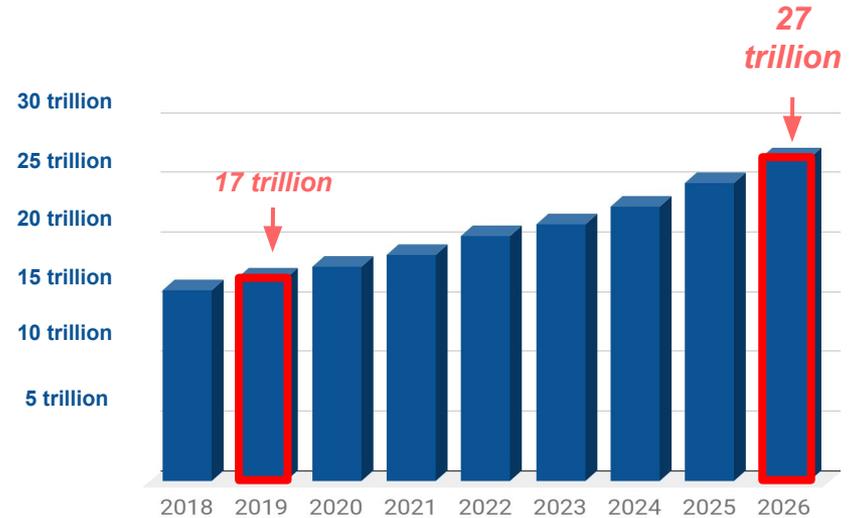
The perception of the Longevity Industry, in both its scope and its main trends, in the USA in general and the Silicon Valley in particular, most often is conflated with biomedical moonshots – very advanced biomedicine not yet on the stage of human clinical trials – and this is an angle that severely underestimates technologies which we consider to be within the scope of the Longevity Industry, which are actionable and closer to market readiness.

Our work in this area has led us to define the industry much more broadly, and to include sectors that lie completely outside of biomedicine – sectors like AgeTech, WealthTech, FinTech and the emerging Longevity Financial Industry, which are also much closer to market readiness and to market capitalization than the anti-aging biomedicine sector.

As a result of this unprecedented complexity and multidimensionality, the typical approaches used for analytics, investment target identification and due diligence that worked for the BioTech industry are destined to fail when applied to the Longevity Industry.

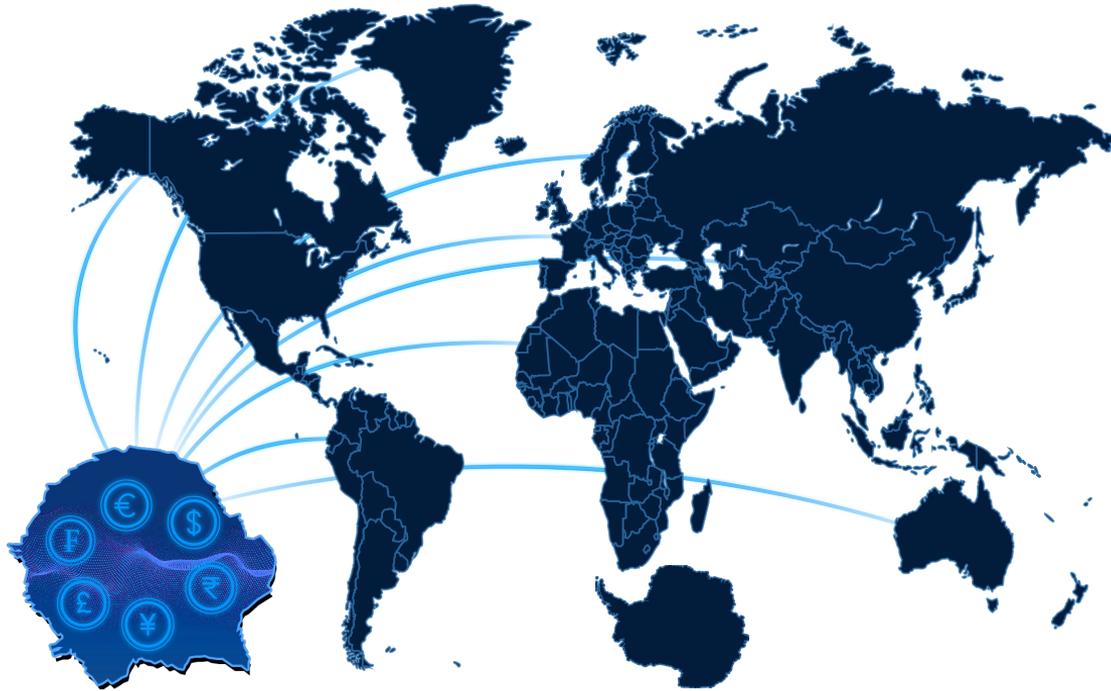
This has created an unmet need for analytical methodologies and de-risking techniques of equal complexity and multidimensionality as the industry itself. And this has been a large part of Deep Knowledge Group's mission to create a robust and sophisticated market intelligence and analytics basement that can survive under the enormous weight of the Longevity Industry complexity.

World Longevity Economy Size Projections, current US\$*



**projections are made taking into account the assumption that the share of the Longevity Economy is 20% of the world GDP*

The 7th Continent - 1 Billion People in Retirement



Older people are the fastest growing demographic group (with around 2.5% annual population growth vs. 0.7% for the overall population). With growing numbers, older adults represent a dynamic emerging market and human capital resource. The multitrillion market of 1 billion people currently on retirement can be thought of as the world's 7th continent. The Longevity Industry includes the products and services satisfying the needs of the cohort aged 50+. The substantial increase in the population of this group is the main driver of the industry.

The global longevity economy reached \$17 trillion in 2019 and is showing stable growth to achieve \$27 trillion in 2026. According to the most conservative estimates, it takes 20% of the global GDP. While the global Longevity Economy is projected to reach \$27 Trillion in 2026, the Age-Tech segment alone will reach \$2.7 trillion by 2025. This would imply a 21% annual growth in the global Age-Tech market. This growth is driven by the general development of the elderly care sector enhanced by advancing IT, FinTech and other digital technologies and solutions.

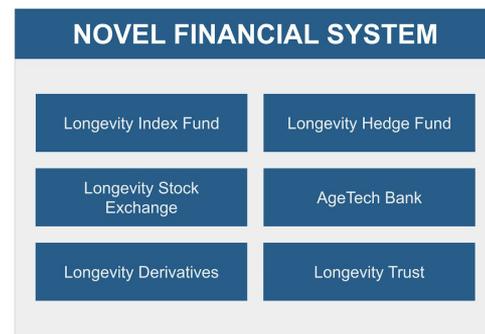
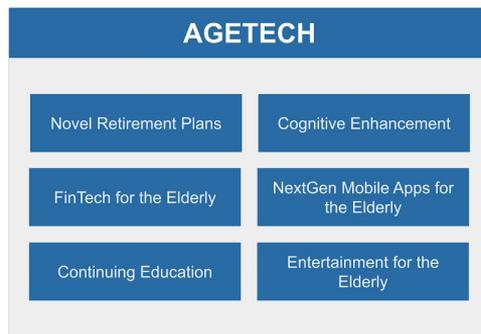
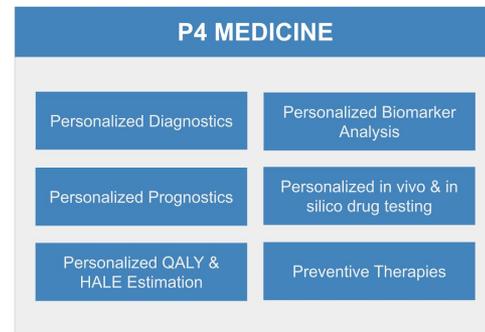
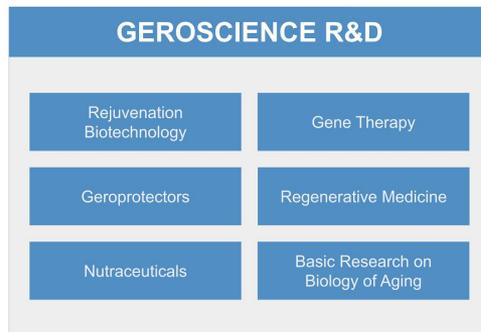
This creates both opportunities and threats for the economy as a whole and for the financial industry in particular. As for the last one, we believe aging to have rather a positive impact on the financial services industry as there will be a greater need for financial products over the longer term, but of newer types and kinds – newer asset classes, newer investment strategies, and longer-dated bonds/securities will have to be developed. This will require participation and collaboration across both the public and private sectors to have a positive effect for all long-livers.

Formulating the Longevity Industry Framework

*"A mere three years ago the current rise of the Longevity Industry would have been unthinkable. Now, a few years later, it has become unthinkable that biomedicine should not have healthy Longevity among its objectives. **The time has come to establish a framework for the rising Longevity Industry.**" - Dmitry Kaminskiy, in [Longevity Industry Landscape Overview Volume II: The Business of Longevity](#) (Aging Analytics Agency, 2018)*

Key points:

- Longevity Industry has seen rapid evolution since 2014
- Unprecedented diverse scope of sectors and domains
- Ongoing trend of growth and diversification
- Extreme levels of complexity, multidimensionality and intersectionality
- Requires novel sophisticated techniques for analysis and due diligence and modern de-risking methods
- Unprecedented opportunities for ethical profit generation
- Longevity Industry will be the biggest and most complex of all time



Aging Analytics Agency was the first entity to formulate a comprehensive and inclusive Longevity Industry Framework that encompassed the full range of its sectors, domains and technologies, which have only recently been recognized by the wider scientific, business, finance and investment communities as legitimate aspects of the industry. Utilizing this framework, Aging Analytics Agency was also the first entity to predict in 2014 the substantial rise in Longevity Industry investments that occurred during 2017-2018, three years in advance.

Preface by Margareta Colangelo

Every cause of death is, in principle, preventable. I became aware of this in the 1990s and since then I have been following aging research very closely. There are two main aspects of aging research that appeal to me. The first is that scientists who work in this area regard aging as a disease and therefore, a problem to be solved. When I realized that biological aging is malleable and that some of the world's most respected scientists are researching ways to intervene in the aging process, I read extensively about the science of Longevity.

The second is the amount of suffering that could be alleviated by curing age-related diseases. Aging is the biggest risk factor for developing many diseases including Alzheimer's, osteoporosis, cardiovascular disease and cancer. Few breakthroughs would make as profound an impact on humanity as curing aging. If we could cure age-related diseases and eliminate the suffering that they cause, it would benefit our grandparents, our parents, our children and all future generations.

Longevity science is far more advanced than other areas of science. In fact, it's considered next generation. Longevity research focuses on prevention rather than treatment. It is the most complex area in science because Longevity requires the complete optimization of health at the deepest level targeting biological systems that control disease. Longevity researchers are using the most advanced technologies including AI to exploit the full value of research data to discover new interventions and diagnostic tools to slow aging, extend healthspan, and perhaps even reverse aging.

Scientists have demonstrated that it is possible to extend lifespan. Now that they know some of the pathways that are the primary drivers of aging, they are developing novel strategies to treat the diseases of aging. A number of companies are working on developing drugs that target aging and some of these drugs are currently in clinical trials. This is why there is so much excitement and interest. Although no Longevity drugs have received regulatory approval yet, a number of Longevity therapies have passed phase I and phase II clinical trials, and a few are in phase III clinical trials.

I have been working in the software industry in Silicon Valley for over 30 years. In the 1990s I was a core member of the team that developed the first Java-based secure messaging software used by the world's top multinational investment banks at the core of large-scale stock trading applications. After three decades working in the software industry, I developed a deep and multifaceted understanding of business, science, and technology. Although I became adept at forecasting innovation in technology, it was clear to me that making realistic assessments about aging research was much more difficult. From a technical perspective, extending the number of years that humans live in good health is possible; however, it requires deep knowledge, assessment, and strategic foresight.

Preface by Margaretta Colangelo

A turning point for me occurred when I met [Dmitry Kaminskiy](#), my co-author. Through Dmitry I became aware that the Global Longevity Industry extends way beyond aging research and medicine and into all areas including government and the financial industry. When confronted with the extreme complexity in the Longevity Industry, Dmitry's response was to establish a dedicated analytical entity, [Aging Analytics Agency](#), to educate himself and to provide actionable expertise to our company [Deep Knowledge Group](#). Dmitry is the most capable and knowledgeable person I have ever worked with. Although he believes that Longevity is the greatest business opportunity of all time, he is driven more by ethical motives than by mere profit. Dmitry and I have developed a synergetic union of mission and vision.

Today, change occurs at the intersection of two or more scientific and technological domains. We are at the beginning of a trend where the degree of complexity and the number of convergence points will increase exponentially. The convergence of AI, advanced data science, and Longevity research will accelerate important medical breakthroughs that will benefit all humans. I know that advanced technologies can save lives. I know this because advanced technologies saved my life. I'm actually an early adopter of life extension technology.

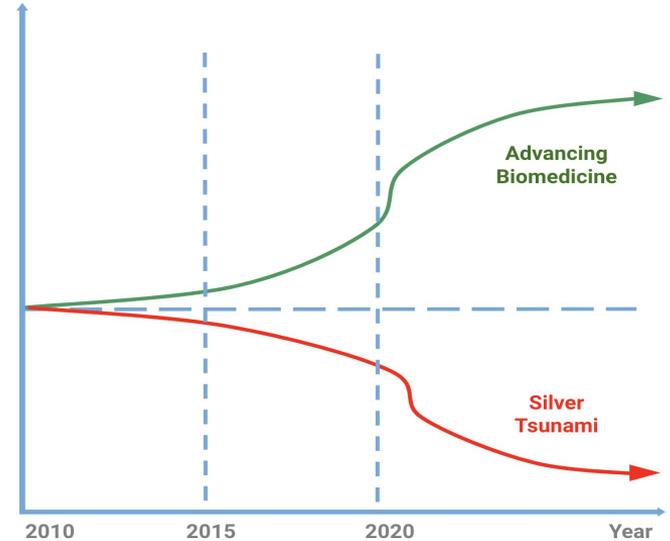
In the next decade, the Longevity Industry will impact many areas of our lives. Longevity policies enacted by governments and changes in the financial industry will transform society. Longevity companies that prove capable of achieving tangible results will become the next Googles, and investment firms that invest in those companies will become the SoftBanks and Vision Funds of tomorrow.

Achieving small but practical results in Longevity distributed at scale will have enormous and multiplicative effects on society. Extending the functional lifespan of humans by just one year will decrease suffering for tens of millions of people and will improve the quality of life for billions of people.

This **type of ROI** is much more valuable than money.

This is **the real type of return** that Deep Knowledge Group seeks.

Two Possible Scenarios of Longevity MegaTrends



Preface by Dmitry Kaminskiy

Approximately seven years ago I became acquainted with a number of scientists working in the field of aging research. The more I learned from them, the prospect of successfully intervening in aging in the next few years seemed less a mystery like time travel and more a challenge like space exploration. At the beginning of the 20th century, the sciences necessary for space travel – rocketry, Newtonian physics, mathematics and basic astronomy – were already centuries old. It was the additional powers of foresight and precision, brought about by digitization, alongside government initiatives and funding, which opened the door to another world. So it was with space travel last century, and so it is with Longevity this century.

This realisation brought with it my personal eureka moment: I understood that the extension of Healthy Longevity is scientifically feasible, and that it just requires an engineering mindset to structure, formulate and format its practical realization – that all necessary components are in place, and that these components just need to be assembled, integrated and synthesized in an optimal way.

Having understood this, I also realized that the tangible and practical implementation of Longevity technologies could create value and generate wealth far beyond any profit and wealth itself, outperforming the opportunities and impact existing in any other sector and industry, and at the same time delivering the most valuable thing that you could provide for humanity, for your family and for yourself.

In 2013, I founded [Aging Analytics Agency](#) in order to keep track of relevant technological, social and political developments as they unfolded, which I now can proudly claim has since evolved into the undoubtable leader in the Longevity Industry analytics sphere, producing a great quantity of open access and proprietary analytical reports, and being capable to monitor, analyze, forecast and ultimately understand, on the deepest level, the entire scope of the current state of Longevity science, technology, business and policy, and to predict the future trajectory of the industry, taking into account its unprecedentedly diverse scope and extreme levels of complexity, multidimensionality and intersectionality. The Longevity sphere attracts some of the brightest, most innovative and most committed talents in the world, being on the very forefront of human progress. As a result of this, it was natural and logical that during my journey along this pathway I met Margaretta Colangelo, who has since become my closest friend, business partner and confidant.



[Aging Analytics Agency](#) was established in 2013 as a Longevity-focused analytical subsidiary of Deep Knowledge Group, and began producing analytics before the Longevity Industry itself emerged. The company is exclusively focused on Longevity, Geroscience, AgeTech and Preventive Medicine, has been developing its methodology since 2015, and is the main source of market intelligence in the field.



[Deep Knowledge Analytics](#) focuses on DeepTech and frontier technology industries using sophisticated multidimensional analytical frameworks and algorithmic methods that combine hundreds of specially designed metrics to deliver sophisticated market intelligence, pragmatic forecasting and tangible industry benchmarking.

Deep Knowledge Group's activities in the Longevity field became a magnet for the talented and forward-thinking experts and specialists, and we found ourselves blessed with a stellar team of like-minded people with us, including Eric Kihlstrom, Stefan Hascoet, Kate Batz, Richard Siow, Franco Cortese, Sergey Balasanyan and Robin Farmanfarmaian, each of whom is a bright star in our constellation, and each of whom contributed a wealth of valuable content and specific chapters to this book.

This brings us to a quick note I must make on the structure of this book. The science behind the industry is highly advanced and involves a great many technical concepts, many of which are already quite well documented in other relevant books. Our concern here is presenting a broad, industry-level conceptual framework in order to provide a general overview of the industry with the degree of understanding of specific domains necessary to discern threats versus opportunities, fiction versus facts, hype versus reality, and realistically predict future scenarios. As such, in this first edition we have restricted the science to fifty pages. But as true participation in Longevity sphere will inevitably require some mastery of advanced scientific concepts, ***interested readers of the first edition can request a free of charge second edition after January 2021, which will contain hundreds of additional pages on science and technology.*** We are confident that most readers would be interested to read about the science, technology and advanced biomedicine no less than they would about the investment, financial and governance sides of the Longevity Industry.

The science and technology of Longevity is much more multifaceted than in the current biotechnology industry in general, requiring much more [sophisticated analytics](#). This is due to the highly complex and cross-sector nature of the technologies, which range from advanced biomedicine, Data Science and Artificial Intelligence to finance, investment, governance, policy, socioeconomic domains and others, and this intercomplexity requires much more sophisticated multi-tier analytical frameworks, the integrated synthesis and assembly of many frontier domains of knowledge, and novel de-risking techniques because of the wide scope for risk and failure, much higher compared with the current BioTech industry.

We at [Deep Knowledge Group](#) value knowledge as the most precious of all assets, and knowledge in the Longevity space as double precious deep knowledge. Deep Knowledge Group has an analytical GigaFactory, comprised of two major analytical arms ([Aging Analytics Agency](#) and [Deep Knowledge Analytics](#)), and seven analytical divisions within them, each focused on specific domains ([AI-Pharma](#), [e-GovTech](#), [NeuroTech](#), [Longevity-GovTech](#) and [Longevity-FinTech](#), Systemic Risk Forecaster, and InvestTech Laboratory).

We also are in possession of a specific strategy, involving first acquiring an extreme breadth of knowledge in particular domains, producing tens of thousands of pages of open-access and proprietary analytics on specific sectors, created with the primary purpose of gaining a broad understanding of the entire scope of such industries, in order to lay the groundwork for identifying all relevant players in the field, their activities and progress. We then utilize this extreme breadth of knowledge to cultivate an equally extreme depth of knowledge, sufficient to hone our strategic business agenda in each specific sector. Acquiring sufficient knowledge of the Longevity Industry was the greatest challenge, but we can feel safe to say that we have now accomplished the first level of it. And as such, we will work proactively in the following domains within the scope of Longevity Industry: Biomarkers of Longevity, Geroscience R&D, P4 Medicine, Regenerative Medicine, Advanced Cosmetics, Longevity FinTech, Longevity NeuroTech, Longevity FemTech, AgeTech and first of all AI for Preventive Medicine, Precision Health and Longevity.

Two looming global changes, one demographic, one technological, are about to shake up the global financial system. One is the "Silver Tsunami", the economic devastation resulting from the global aging demographic. The other is the advancing Longevity Industry, the complex interplay of intersecting technologies which together will give healthy productive life back to this population.

The nations who succeed to thrive rather than decline in the face of the tsunami will have reformed themselves beyond recognition, having been forced to adapt and refashion around novel business models, new types of financial institutions and entire national financial systems, supported by progressive initiatives of technocratic governments.

[Government will be responsible](#) for driving forward the development of many facets of the Longevity Industry, ranging from social care to financial reforms, and also for developing and supporting the missing technological synergies, such as the integration of Big Data and healthcare with the focus on AI for preventive medicine, the current lack of which further slows down industry growth. As such, Aging Analytics Agency is systematically producing [Longevity Policy Proposals](#) for a number of international and government entities, including the World Health Organization and the United Nations.

The Longevity Industry will be the biggest and most complex industry of all time, generating enormous wealth, and representing the most ethical way to conduct business, and its end product will be the most valuable and real asset ever conceived – Healthy Longevity. But it also inevitably carries an unprecedented number of risks. As such, Margaretta, myself and our team feel that it is our duty to demystify this sphere and to inform all future participants in this industry of potential benefits and pitfalls in equal measure.

Indeed, we would like to see a greater number of participants in the industry, an industry so big and diverse, calling upon so many forms of talent from so many sectors, from so many world regions, that there is enough space for unlimited cooperation, and zero competition, unlike any other industry before.

We want to welcome as many people as possible into this industry, which is why we decided to publish this book, bringing the actual deep knowledge of the Longevity Industry to the public.



[Deep Knowledge Ventures](#) is a data-driven investment fund focused on the synergetic convergence of DeepTech, frontier technologies and technological megatrends, renowned for its use of sophisticated analytical systems for investment target identification and due-diligence. Major investment sectors include AI, Precision Medicine, Longevity, Blockchain and InvestTech. While it's major short-term interests are AI and DeepTech, it's long term vision is focused on Longevity and Precision Health.



LONGEVITY.CAPITAL

[Longevity.Capital](#) is a specialized hybrid investment fund specifically focused on the Longevity Industry; it has unparalleled investment and exit strategies, structuring its portfolio based on sophisticated industry intelligence and advanced analytics provided by the specialized analytical firm Aging Analytics Agency.

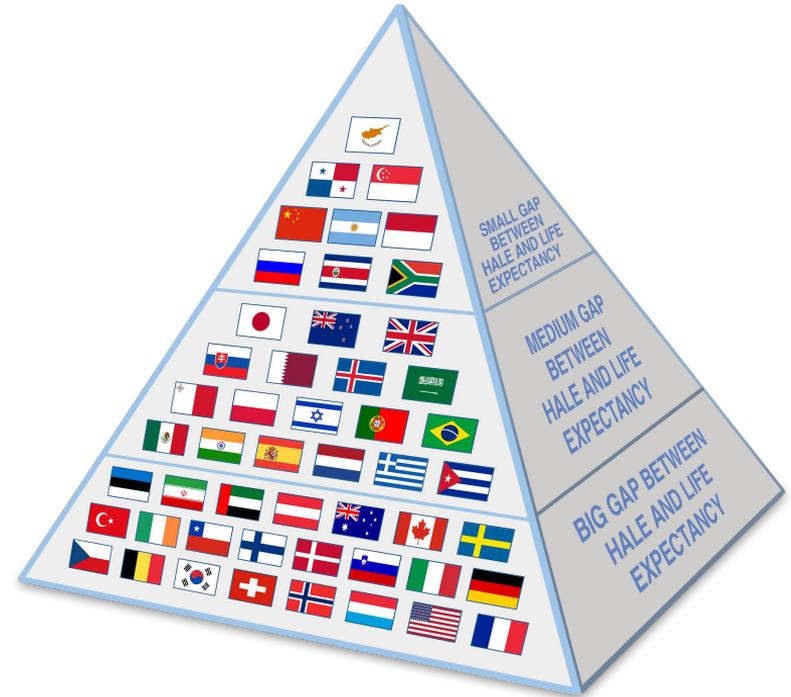
PART II - Longevity Policy and Governance

Key Points:

- *The Rise of Progressive Longevity Technocracies and MegaHubs*
- *National and international government policy can help to shape cooperation between sectors and facilitate the growth of the Longevity Industry*

Part I stated that the Longevity Industry means more than just the science of aging, it is very multi-faceted with regard to technological sectors (Geroscience Research and Development, Preventive Medicine, AgeTech, and Novel Financial System), and only a dedicated, synergistic focus on all four of these domains at once can escort the global population to a longer and healthier life, and turn Healthy Longevity into an asset.

Part II explains why the future structure of global finance, if it is to withstand the Silver Tsunami, must necessarily consist of a Novel Financial System: Longevity VC funds, AgeTech Banks, Longevity Hedge Funds and Longevity Trusts, culminating in a Longevity Stock Exchange and Longevity Index. Each of these is designed either to utilise the increased working productive life of their user population, or to extend it. The increased liquidity provided by these combined structures would set in motion a self-perpetuating cycle of growth in Longevity Finance: as soon as Longevity becomes a dividend, then the greater the progress in achieving Healthy Longevity, the more the owners of wealth will want to reinvest in the technologically reinvigorated labour force endowed with a greater healthspan, leading to further growth and a greater Healthy Longevity.



The nations that initiate these reforms would be capable of attracting several trillions of potential wealth that is currently inaccessible and locked away, and succeed in building a bridge between the currently separate spheres of the Longevity Industry on one hand, and the conservative investment community on the other hand.

Part III - Longevity Financial Industry

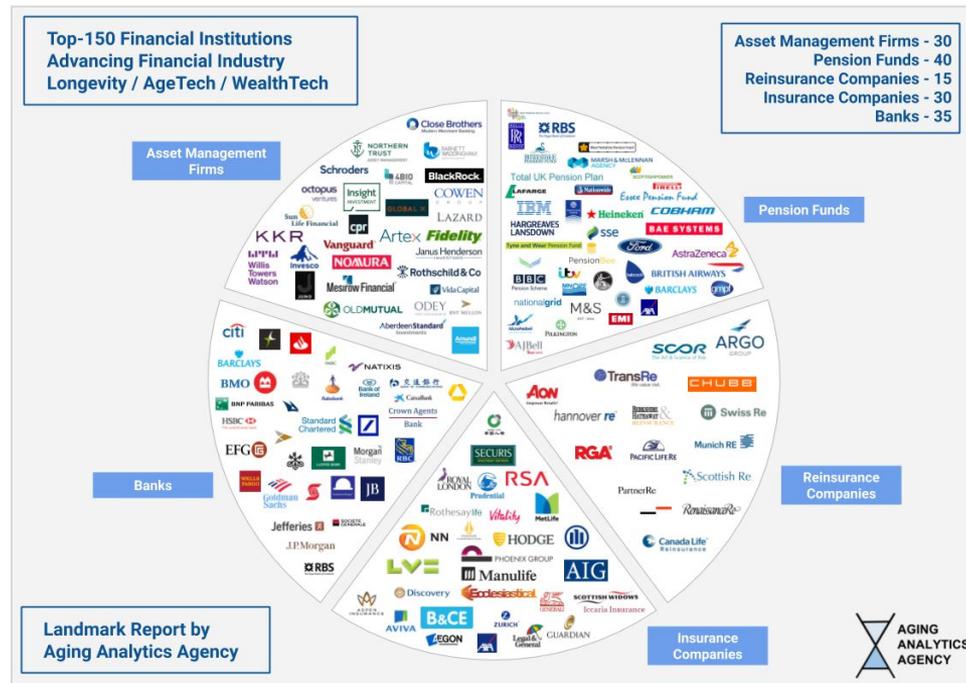
Aging and the Silver Tsunami should be considered one of the most acute problems of our time, whereas progress in biomedicine and increasing Health Longevity, one of the most promising opportunities in human history.

The upcoming collision of these opposed MegaTrends has created a massive multitrillion market for AgeTech, Longevity WealthTech and novel financial products targeted toward 1 billion people in retirement globally. The market size of the global Longevity economy reached \$17 trillion in 2019, and is expected to grow to \$27 trillion by 2026.

Financial institutions such as investment banks, pension funds, insurance and reinsurance companies, asset management firms and others can either utilize the opportunity of Healthy Longevity and thrive, or stagnate and decline when hit by the oncoming Silver Tsunami.

Whether they succeed at riding the wave or drown under it will depend not only on their willingness to deploy new business models adapted to the aging population but also on the quality of analytics and forecasting methods underlying them.

The traditional financial industry needs to adapt its products and services to respond to the challenges of an aging society. This implies creating new innovative products in the fields of AgeTech, Longevity WealthTech, Health Insurance and new financial products for clients aged 60+ and aiming to live up to 100 years and beyond.



Financial institutions that don't adapt will not survive in their present form! After the tsunami has passed, such economies will have reformed themselves beyond recognition, absorbed by novel financial institutions and systems, or transformed by government initiatives of progressive technocratic countries.

Part IV - Longevity Industry (Science, Technology and Biomedicine)

Introducing the scientific sector from which the multi-sector Longevity Industry emerged

Key points:

- The 20th century has greatly increased our understanding of the mechanisms of aging, but has also revealed the limits of our ability to intervene in bodily processes.
- The advent of the “repair approach” to aging, not presuming to intervene in bodily processes, and the discovery of the hallmarks of aging at the turn of the 21st century have opened up new doors and created new sectors to which the old limits no longer apply.

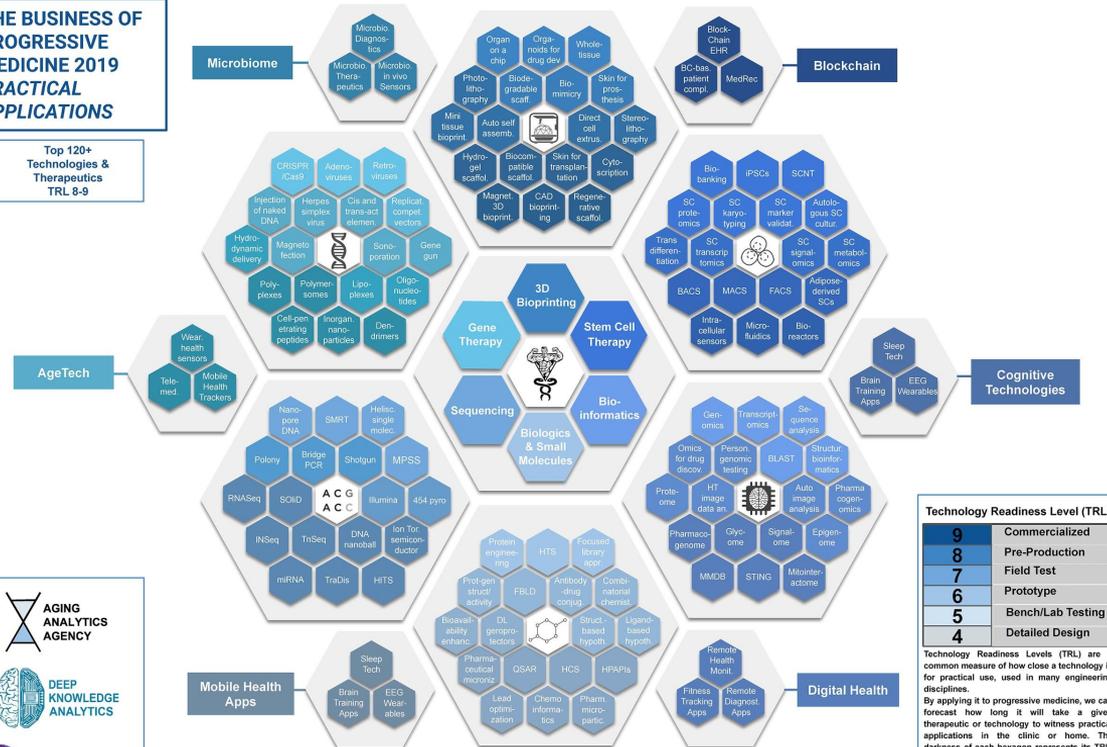
The Rise of Geroscience

The war on human illness has evolved from an invasion into a counter-insurgency operation.

With infectious diseases now under biomedical control, the stubborn illnesses inflicted from within – cancer, Alzheimer’s, arthritis, osteoporosis, not to mention more subtle defects such as progressive hearing loss and cognitive decline – are the next (and perhaps the final) challenge for the future of biomedicine.

THE BUSINESS OF PROGRESSIVE MEDICINE 2019 PRACTICAL APPLICATIONS

Top 120+ Technologies & Therapeutics TRL 9-9



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 3-9.

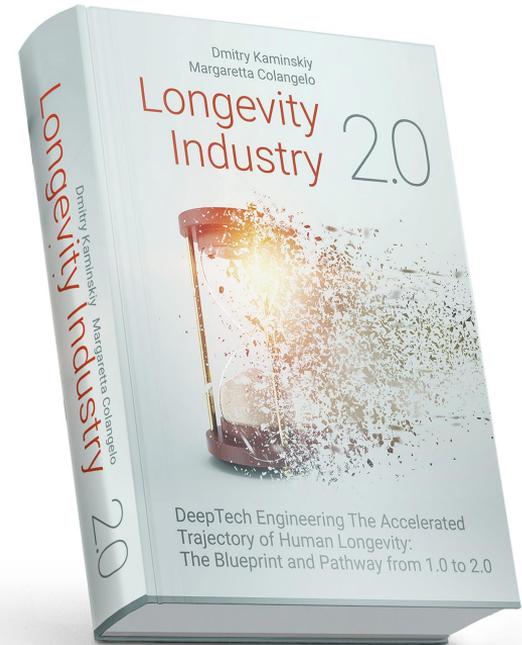
Introduction to the Next Book - Longevity Industry 2.0

The completion of the book Longevity Industry 1.0 does not bring you to the end of the Longevity story, but rather to its beginning. In Longevity Industry 1.0 we look at the factors involved in bringing us to this point.

The Longevity Industry 1.0 book is a summary of the current state of affairs and the forces at work, the challenges and opportunities that have made the industrialization of Longevity a national priority for the world's most forward thinking and progressive governments.

The Longevity Industry 2.0 book will be focused on the state of the industry in the year 2025, and the transformation of the global Longevity Industry from 1.0 to 2.0. It will take a deeper analytical, more specified look at some of the mechanisms and practical techniques that would encompass a fully realized Longevity Industry. This sequel will explore in detail how today's Longevity start-ups will become tomorrow's multitrillion dollar corporations; how AI will guide preventive medicine and how human health and vitality will be transformed in a still unimagined way.

It will also discuss the important role that Longevity focused MegaHubs will play as well as painting a detailed and knowledge rich picture of the full scope and scale of the global potential of the Longevity Industry, as BioTech and current Healthcare models are disrupted by AI driven preventive medicine and novel InvestTech solutions. If Longevity Industry 1.0 explains how we got to this point, 2.0 will give a detailed map of where we will be by the year 2025, and the hows and whys of the processes involved in every sector, from the practical applications and processes of precision medicine to a more detailed analysis of de-risking strategies for Longevity investment. In short, Longevity Industry 1.0 has brought us to the birth of not just a new asset class, but also, in its novel approaches, a new knowledge class. In Longevity Industry 2.0, we will explore this deeper realm of knowledge to its fullest extent.



Longevity Industry 2.0
2020-2025: DeepTech Engineering The
Accelerated Trajectory of Human Longevity:
The Blueprint and Pathway from 1.0 to 2.0

- ***Global Industrialization of Longevity to Scale***
- ***The Evolution from Longevity Start-ups to Multitrillion Dollar Longevity Corporations***
- ***How AI-Driven Preventive Medicine will Disrupt BioTech and Healthcare Industries***
- ***Novel Financial Instruments and InvestTech Solutions***
- ***The Rise of Progressive Longevity MegaHubs***

About the Authors



Dmitry Kaminskiy is an innovative entrepreneur and investor active in the fields of Longevity, Precision Medicine and Artificial Intelligence. He is co-founder and managing partner at Deep Knowledge Ventures, a leading investment fund focused on DeepTech, renowned for its use of sophisticated analytical systems for investment target identification and due-diligence. He is a frequent speaker on AI and Longevity including events organized in London by The

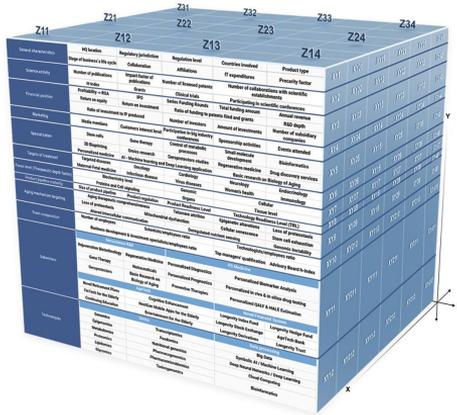
Economist (“Aging Societies and The Business of Longevity”) and organized by the Financial Times (“Smart Machines vs. Smart People” and “Global Pharmaceutical and Biotechnology Conference”), as well as the “Precision Medicine World Conference” in Silicon Valley, and other events at Oxford and Cambridge universities. He is actively involved in the work of the initiative group and was instrumental at the initial stage of the launch of the All-Party Parliamentary Group for Longevity in the UK Parliament. He now serves as co-director of the secretariat, overseeing the APPG’s international Longevity cooperation development division. He is also supervising all of the APPG’s activities related to the development of Centres of Artificial Intelligence for Preventive Medicine and Precision Health.



Margaretta Colangelo is Co-founder and Managing Director of Deep Knowledge Group, an international consortium of commercial and non-profit organizations focused on the synergetic convergence of DeepTech and Frontier Technologies. Margaretta is a native San Franciscan with over 30 years of experience in working in software companies in the Silicon Valley. She has a deep and multifaceted understanding of business, science, and technology and is highly adept at tracking and forecasting innova-

tion in technology. Margaretta has been at the forefront of emerging technologies throughout her entire career. In the 1990s she was a core member of the team that developed the first Java-based secure messaging software for stock trading platforms that is still used today by the world’s top multinational banks. She’s been a core member of teams that have influenced important technical specifications and standards, including JDBC (Java Database Connectivity) and JMS (Java Messaging Service) that have helped advance the technology industry. She has published over 100 articles on DeepTech and AI and publishes weekly newsletters on DeepTech, FinTech, and the Longevity Industry with over 40,000 subscribers. She has appeared multiple times in Forbes, MIT Technology Review Italia, Fierce Biotech, Health Management Journal, Outsourced Pharma, Pharmaceutical Executive, Healthcare IT News, Asian Robotics Review, and Bahrain Entrepreneur. Margaretta serves on the Advisory Boards of the AI Precision Health Institute at the University of Hawai’i Cancer Center and the Longevity AI Consortium at King’s College London. She has an extensive network in the technology and venture capital communities and has over 35,000 followers on LinkedIn.

LONGEVITY INDUSTRY 1.0



*Defining the Biggest and Most Complex
Industry in Human History*

DMITRY
KAMINSKIY



MARGARETTA
COLANGELO

CO-AUTHORS



Dmitry Kaminskiy



**Margareta
Colangelo**

CONTRIBUTORS



Eric Kihlstrom



Kate Batz



Stefan Hascoet



Franco Cortese



Sergey Balasanyan



Richard Siow



Robin Farmanfarmaian

www.longevity-book.com

email: contact@longevity-book.com