DeepTech for Social Good Landscape Overview

Teaser

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www.deep-knowledge.org

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Introduction

Developed by Deep Knowledge Philanthropy, DeepTech for Social Good Landscape Overview report contains a comprehensive overview of the DeepTech impact growth in underdeveloped countries.

During the research 386 DeepTech companies, 661 investors and 441 nonprofit organisations (NGOs) were analyzed. The development of new technologies will benefit from this report, which contains a comprehensive overview of the DeepTech applications and solutions aimed at social good.

Advanced technologies (Artificial Technologies, Robotics, Advanced Materials, FinTech and others) help to drive the emergence of tech in the social sector and open up new market opportunities. Thus, start-ups play a crucial role in solving complex questions of the modern world.

The report has been compiled to provide a detailed, systematic description of the leading companies, ambitious startups, and impactful investors and charities associated with the DeepTech Investment.

Report Methodology and Approach

Methodology

In the course of the study, 386 DeepTech companies, 661 investors and 441 nonprofit organisations (NGOs), were analysed. The DeepTech companies were gathered according to the following sectors:

Financial sector	Banking	Investments	Insurance

This report serves as a comprehensive case study, which aimed to provide a detailed overview of the industry from an investment and commercial perspective, as well as major trends and a classification framework for the core technologies enabling the provision of DeepTech applications to the 2 billion unbanked. The report as a whole represents a deep analysis, having an aim to highlight the importance and multiplicity of DeepTech applications in underdeveloped world nowadays. It shows how elaborate and diversified its application is, draws insights, and emphasizes real-life examples while stating distinct facts and figures. Moreover, it reveals not only the DeepTech potential but also the obstacles met by this industry, which are restraining its full aptitude.

Approach

Relying on various research methods and analytics techniques, the analytical report provides a comprehensive overview of the DeepTech solutions. This approach has certain limitations, especially when using publicly available data sources and conducting secondary research. Deep Knowledge Philanthropy is not responsible for the quality of the secondary data presented herein; however, we do our best to eliminate the said risks using different analytics techniques and cross-checking data.

Data Sources

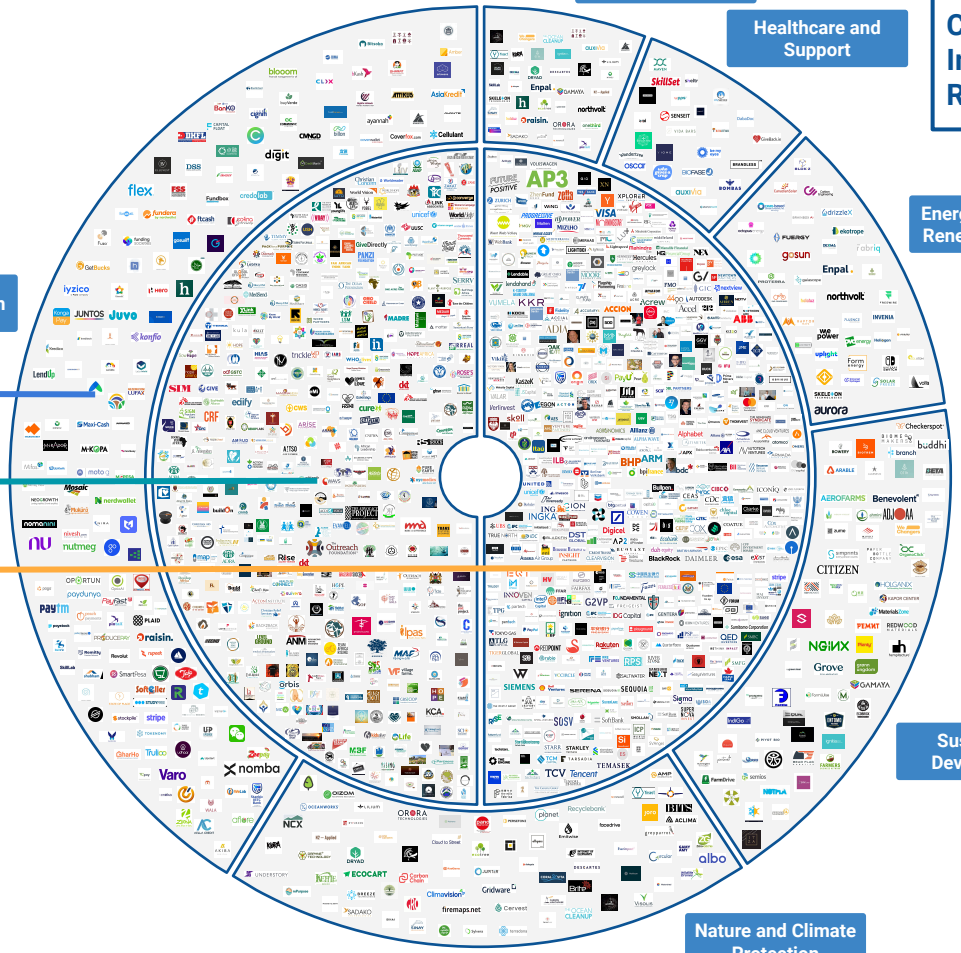
Media Overview	Industry Specialised Databases	Publicly Available Sources	Industry Reports and Reviews

Applied Research and Analytics Methods

Descriptive Analysis	Mixed Data Research	Forecasting Analysis
Comparative Analysis	Qualitative Data Collection	Data Filtering

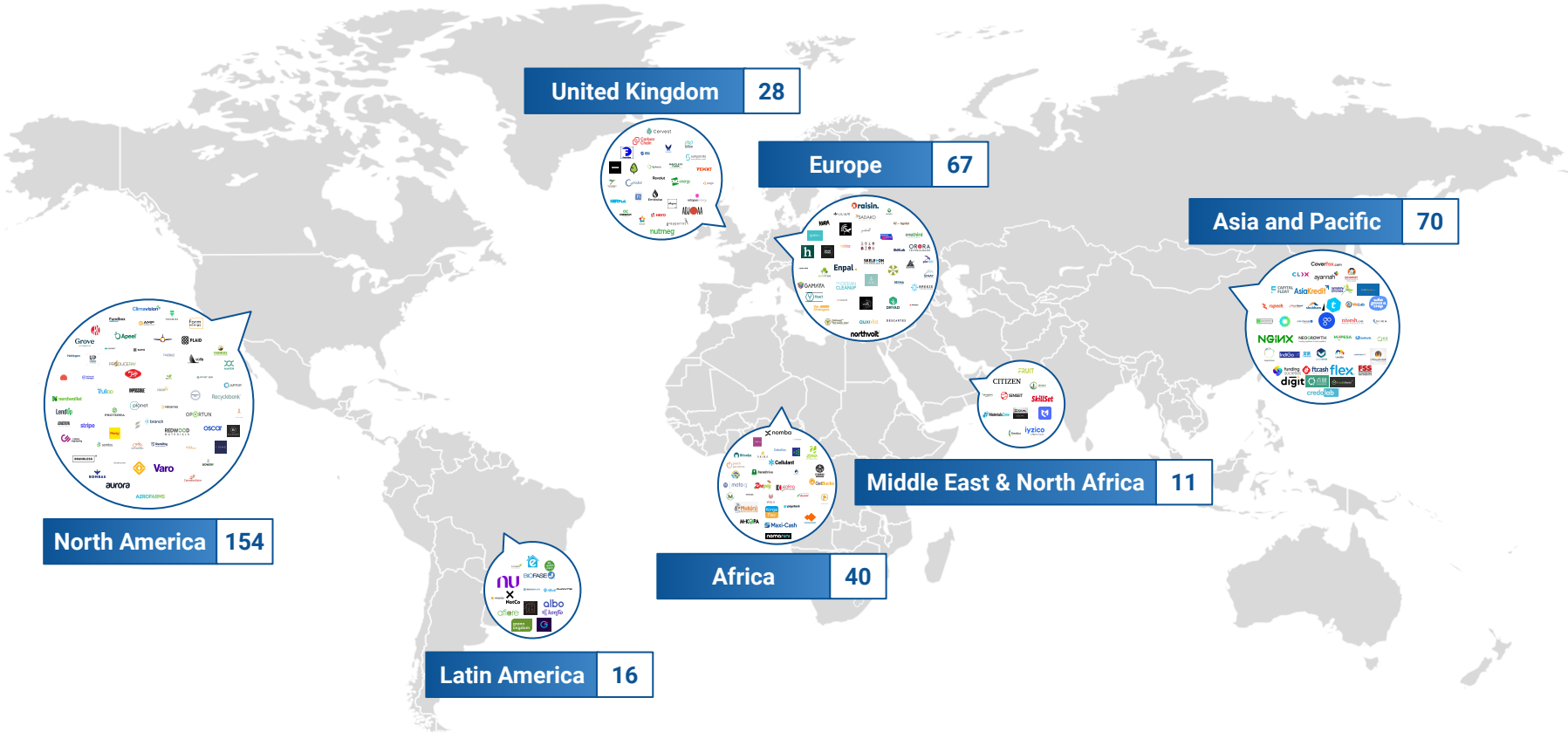
DeepTech for Social Good Landscape Overview

Companies – 380+
Investors – 660+
R&D and Hubs - 440+



DEEP KNOWLEDGE PHILANTHROPY

DeepTech Companies by Region*



*Not all companies logo are presented, the companies presented have the highest funding amounts per region

Top DeepTech Humanitarian Companies by Funding

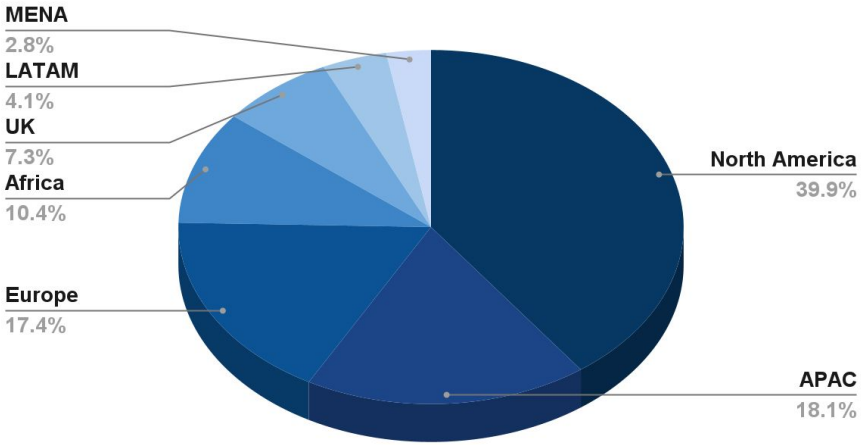
1	Rivian	$10.7B
2	Northvolt	$6B
3	Nubank	$3.9B
4	Stripe	$2.2B
5	Impossible Foods	$2.1B
6	Revolut	$1.7B
7	Oscar Health	$1.6B
8	Octopus Energy	$1.5B
9	Meicai	$1.4B
10	Proterra	$1.2B

11	Varo Money	$992M
12	Plenty	$941M
13	WeLab	$896M
14	Farmers Business Network	$870M
15	Lilium	$826M
16	Redwood Materials	$792M
17	PolicyBazaar	$766M
18	Plaid	$734M
19	Perfect Day	$711M
20	Enpal	$709M

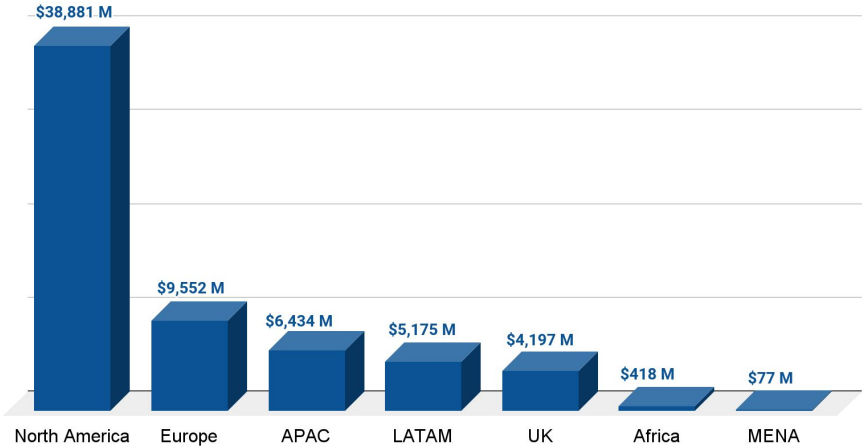
Sources: Media Overview

Regional Distribution of Humanitarian DeepTech Companies

Regional Distribution of Humanitarian DeepTech Companies



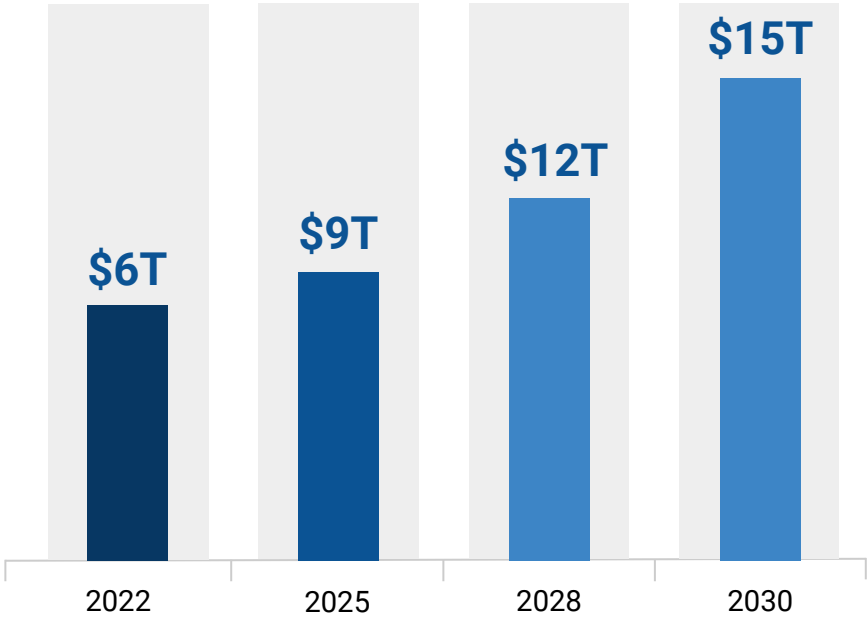
Funding of Humanitarian DeepTech Companies by Region



In regards to digital redistribution of the DeepTech companies, the North American region holds the lead with approximately 40% of the companies originating from the region. The funding map mostly corresponds to the regional distribution, with NA representing more than 60% of all of the funding in the sector. A significant notion is while both the UK and Latin America have less companies than the African region, the funding redistribution shows that there is a significant disproportionate funding between the regions and that African companies receive significantly less funding than in the other regions. Should the African companies receive more funding from the investors, the overall quality of the regional humanitarian efforts could be seen improving.

Predictions of the DeepTech Market Development

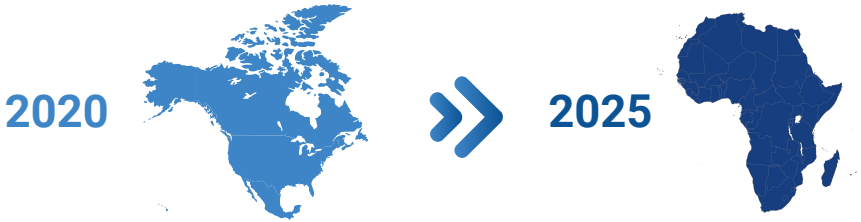
Projection of the Global DeepTech Market Growth



Various factors such as growth of data-based DeepTech and advancement in deep learning and need to achieve robotic autonomy to stay competitive in a global market are expected to drive the adoption of the DeepTech solutions and services.

The global DeepTech market size is expected to reach **$15 trillion** by **2030**, with its current evaluation at **$6 trillion** in **2022**.

DeepTech is considered to be a revolutionary technological development, and its integration across a host of applications is one of the key factors driving this market. Advances in image and voice recognition are driving the growth of the regional market. Improved image recognition technology is critical in enhanced drones, self-driving cars, and robotics.



North America held the dominant share in the global DeepTech market in 2021 thanks to the availability of high government funding, presence of leading players, and strong technical base. African market where the adoption of DeepTech technologies is lower showcased rapid growth during the past few years. Meanwhile, increasing adoption of image and pattern recognition in Africa is expected to provide new growth opportunities.

Financial Inclusion in Developing Countries (Africa)

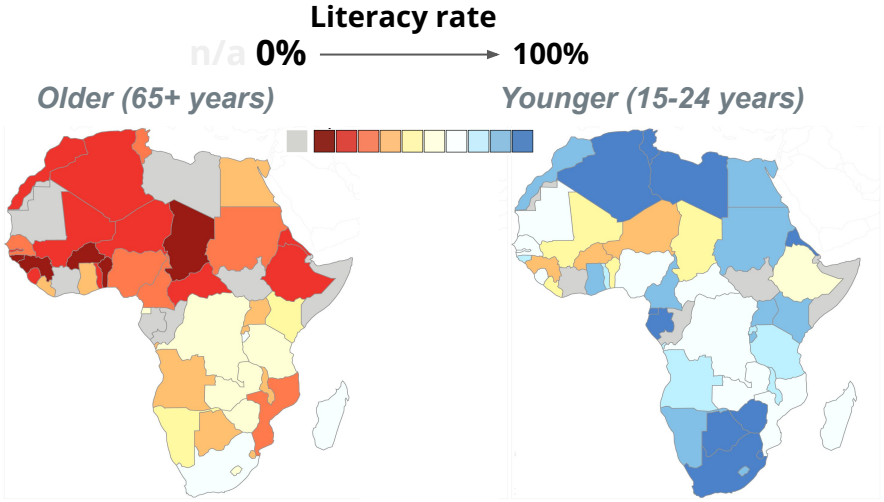
'The African continent is at a leading position concerning mobile money banking, especially in East Africa where more than 73% of Kenyans are mobile money customers. In sub-Saharan Africa (SSA), 36 countries out of 54 have mobile banking services. 2.5 billion people in lower to-middle income countries have no access to banking services.

'Saving habits are different on the African continent in comparison to the world. The main motivations of saving in Africa are 'for education' (21.3%) and 'for farm or business' (19.6%). While 23.9% of individuals worldwide and 40% of individuals of high-income economies save for old age, which is their main saving motivation, only 10.3% of Africa individuals do so.

'The main source of credit in Africa is 'family and friends' (37.5%). The second source of credit in Africa is 'a store' (7.9%), in line with the global trend (7.9%). Borrowing formally (6.7%) and borrowing from another private lender (4.7%) are less common in Africa. 41% of Africa individuals reported having borrowed from an informal source. 51.4% of Africa individuals declared having borrowed from any source in the past 12 months, a figure which is higher than the 42.4 global percent.'

'Kenya shows the highest level of financial inclusion at 67% rate and followed by Nigeria at 60%. Cameroon is at 47% inclusion rate, while the rest of the countries in the sample are all below 30% inclusion rate. The lowest rate is recorded in Mozambique at 13% inclusion rate.'

The young generation in Africa is much better educated than before



Sources: sciencedirect.com

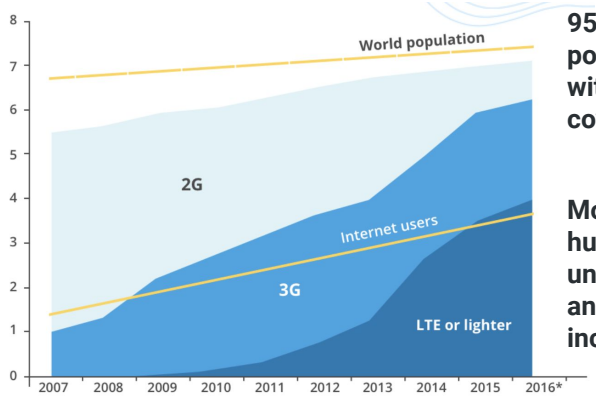
Financial inclusion in Developing Countries (Asia)

Digital financial solutions could play a significant part in closing gaps in financial inclusion. They could address about 40% of the volume of unmet demand for payments services and 20% of the unmet credit needs in the BoP and MSME segments. Digital finance alone cannot entirely close the gaps in financial inclusion. But it is estimated that the cumulative effect of digitally driven acceleration in financial inclusion could boost GDP by 2% to 3% in markets like Indonesia and the Philippines, and 6% in Cambodia. For the population earning less than $2 a day, that would translate to a 10% increase in income in Indonesia and the Philippines, and an increase of around 30% in Cambodia. 99% of Indian adults with an account at a financial institution have a bank account. Kenya's extreme poverty is ranking 187 in per-capita GDP, of the country's 47 million people, seven in 10 adults (69%) have financial accounts. The percentage of Bangladeshis with formal financial services accounts almost doubled from 20% to 34% between 2013 and 2016. In 2016, only one in 10 adults (13%) had a registered account. Many Beninese adults are financially active, with 47 percent reporting having saved in some manner and 20 percent reporting having borrowed. Mobile money awareness is high, as is access to mobile phones.

'The Singapore government is looking to boost blockchain development in an effort to improve financial inclusion for Southeast Asian countries. The neighboring nation of Malaysia is also moving to utilize blockchain technology to advance banking services across the region. Similarly, Thailand's Siam Commercial Bank is building out a Ripple-based blockchain remittance platform for cross border payments.'

(from the article entitled 'Singapore plans Blockchain push to boost Financial Inclusion', written by Wolfie Zhao).

The Mobile Network is a gateway to the Global Economy



95% of the global population live in areas with mobile network coverage

Mobile phones enable humanity to reach the unbanked population and provide financial inclusion

Sources: Coindesk

Financial inclusion in Developing Countries (Latin America)

The authors of 'Financial Inclusion in Latin America: Facts, Obstacles and Central Banks' Policy Issues' also indicate that:

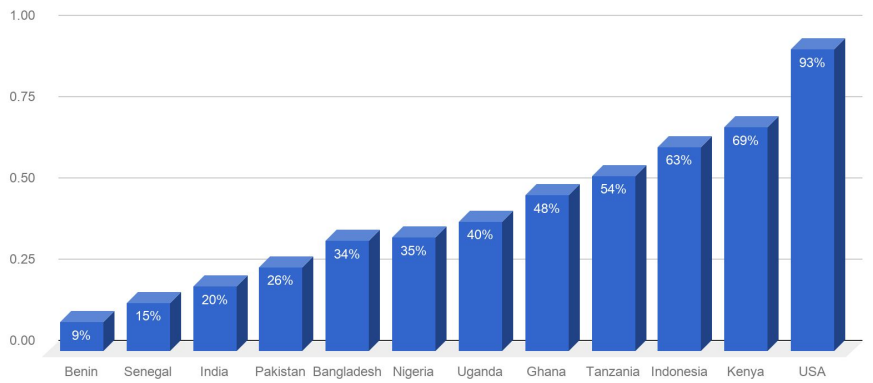
'Latin American countries do not look good relative to their comparators. Among the region, Peru, Honduras, Guatemala and Nicaragua are among the countries with the lowest quality of institutions and a low value for financial inclusion. In contrast, Chile is the only country in the region where the indicator representing institutional quality is closer to those in high-income countries. Modern Latin America is home to over 600 million people across 20 nations.

'The percentage of the Latin American population with a bank account has gone from 39% to over 50% in just the last five years. Online sales don't make up as large a portion of total GDP as regions like Europe (2.5%, $523bn) or North America (2.6%, $562bn), but Latin America still has around 300 million internet users – 135 million of whom shop online.

Over 400 million people in Latin America now own a mobile phone, and there has been significant regional investment in 3G services.'

Amanda Jacobson Manager of Latin America, Village Capital, wrote in a recent report titled 'What does "financial inclusion" really mean, and how can entrepreneurs make the difference?' that 'Low-income unbanked and underbanked people, both from big cities and small towns, often have to struggle to work a half dozen jobs with little certainty of their cash flows. Entrepreneurs across Latin America are emerging quickly to address problems in financial inclusion.'

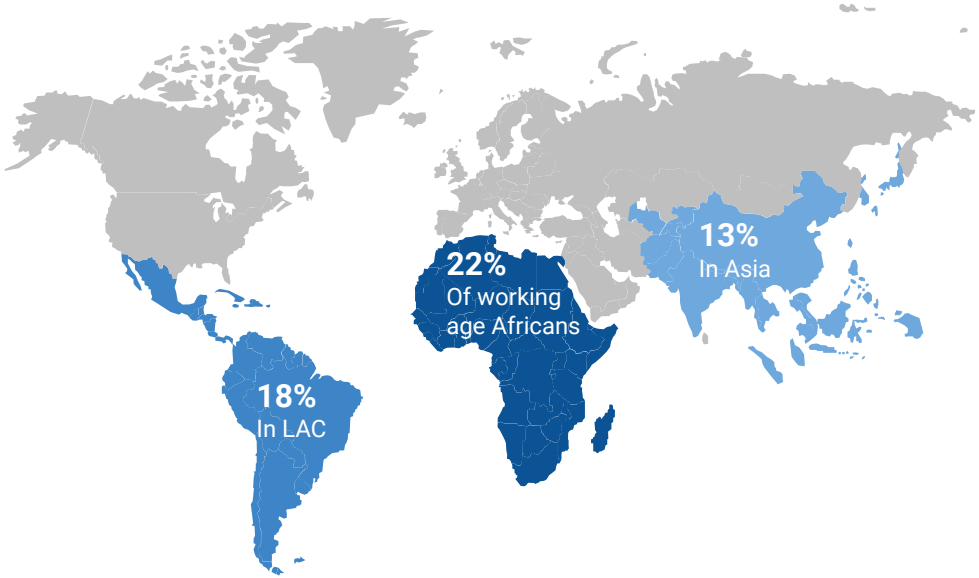
Finance inclusion in Developing Countries / USA



Sources: InterMedia's Financial Inclusion Insights, Vilcap, Paymenteye

Entrepreneurial Activity in Africa is Higher Than in Asia and Latin America

More people start a new business in Africa than in LAC or Asia



Who are the **African entrepreneurs?**

Entrepreneurship levels in Africa are the highest in the world

Loan providers need to increase their lending by at least $135 billion to meet demand by Africa SMEs

22% of Africans are starting new businesses

Young

31 years old on average in Africa

36 in Asia

35 in LAC

African women are twice as likely to start a business than women elsewhere

Mostly in services

Top early-stage entrepreneurs:

- Trade, hotels and restaurants
- Agriculture, forestry and fishing
- Manufacturing

Innovative

20% of new African entrepreneurs are introducing **a new product or service**

Sources: Africa Development Bank

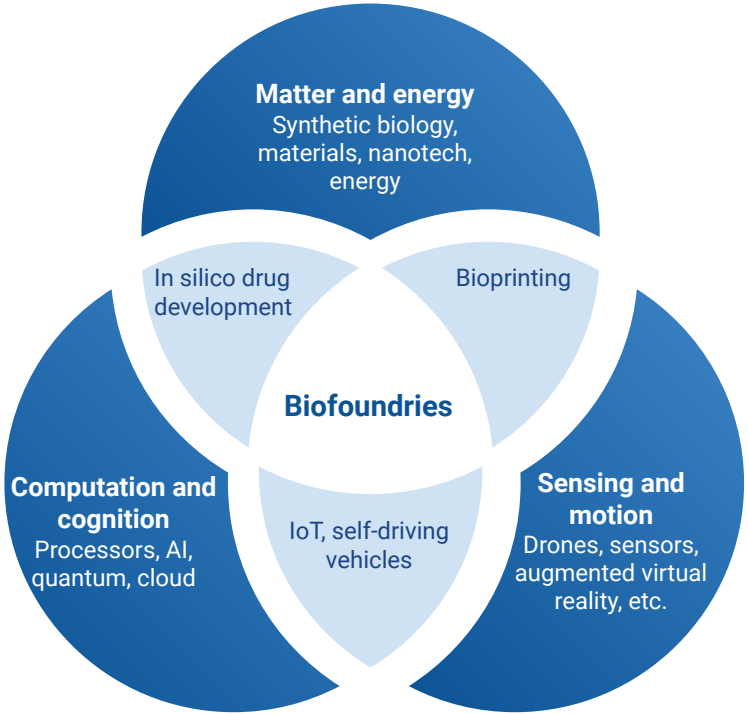
The Convergence of New Technologies Opens New Opportunities

Powerful technologies are emerging faster:

- Artificial Intelligence
- Quantum Computing
- Synthetic Biology
- Nanotechnology
- Nexten UX (AR/VR)
- Blockchain
- Robotics
- Universal Printing

They coverage to solve major business issues:

- Process automation for materials
- New chemical development via AI or QC
- Neuro-machine interface



DeepTech brings together powerful capabilities:

- Data volume
- Moore's law
- DNA sequencing cost
- DNA synthesis (in progress)
- Quantum (in progress)

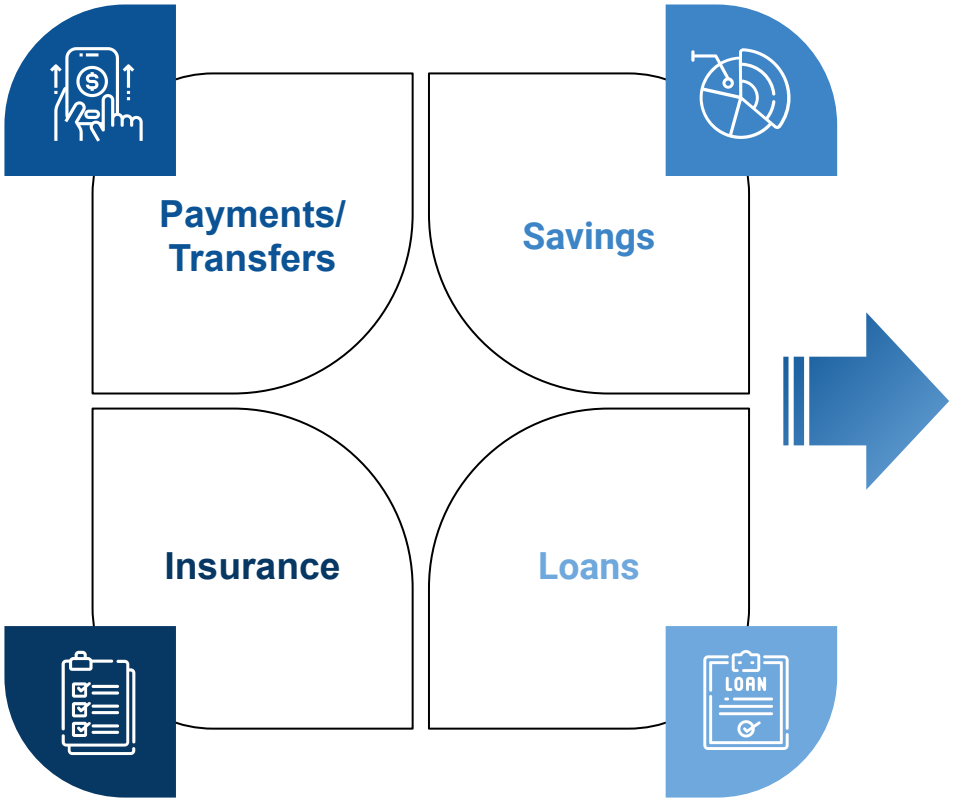
These capabilities has deep implications on its own—but when added to technological capabilities in matter and energy, computation and cognition, and sensors and motion, it allows innovative companies to address previously unsolvable problem sets. Deep tech's potential for disruption is unprecedented, and the breadth of problems it could address remains for us to uncover.

Deep Tech Trends in Underdeveloped Countries

DeepTech Trends in 2022

Acceptance of Climate Change	Alternative Energy Sources	Faster and Less Power-Hungry Chips	Cultivate the Sea
Sensors, advanced mapping technology, drones, satellites and predictive modeling of weather impacts on urban areas not only provide early warning but can also help with evacuation and rescue planning. At the same time, advances in materials technology have already led to a new generation of building materials that are more resistant to floods, earthquakes and tornadoes/hurricanes.	The most promising and mature, but also the most controversial source of energy is nuclear energy. While it produces energy with a low carbon footprint, there are safety concerns, high capital costs, and negative public opinion. With small modular reactors producing large amounts of low-carbon electricity for a third of the generation capacity of traditional nuclear power reactors, interest in this energy source could be renewed.	Cryptocurrency mining is energy intensive, but what is less known is that the carbon footprint of working AI models is growing every day. Similarly, the growing interest in the metaverse will also require increased computing power and storage resources. Developing faster, less power-hungry chips that are optimized for AI and other features will become more important if hardware doesn't become a bottleneck for adoption.	Algae and seaweed contain the same nutrients and protein as beans and soybeans. They act as natural carbon sinks, and some companies are already exploring an alternative to setting up racks in the ocean to grow algae, specifically to absorb more carbon dioxide. At the same time, it can also be processed into a cheap and rich source of biofuels.

FinTech Inclusion Framework

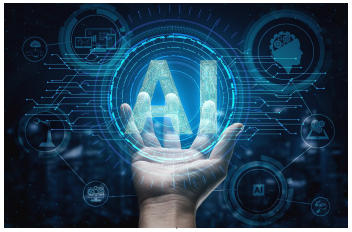


The problems financial inclusion companies are facing on the ground

- Banks which are too far away from the places that citizens are living
- The bank services are too expensive
- Lack of documentation and thus, inability to pass KYC and/or open a bank account
- The problem of trust towards institutions and banks. The lack of trust makes it impossible to increase the level of financial inclusion among researched countries
- Highly illiterate population, which makes economic and social development impossible

FinTech Inclusion Framework

A detailed overview of several technologies which serve as the hallmarks of successful financial inclusion technologies and services:



Artificial Intelligence which, for instance, is widely used by lending companies in order to choose clients.

Bio-identification mechanisms which can be used in order to integrate those who do not have a government issued IDs.

Blockchain technologies makes transaction secured and proved, using the safest cyber security protocols.

Gamification will help to optimize the technologies adoption and quick penetration into the market.

ChatBots will make the procedures look easier and reduce the documents load from social institutions.

Deep Tech Trends: Digital Identity

With an estimated 500 million people in Africa living without any form of legal identification (World Bank, n.d.), digital identities have become increasingly popular because of their relative ease, low cost, and convenience compared to more analogue systems.

With this background in mind, Research ICT Africa and the Centre for Internet and Society (CIS) partnered in 2020 and 2021 to investigate, map, and report on the state of digital identity ecosystems in 10 African countries. The project looked at local, digitised (in full or partially) foundational ID systems in Ghana, Kenya, Lesotho, Mozambique, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zimbabwe.

The evaluation framework (Centre for Internet and Society, 2020), through its rule of law, rights-based, and risk-based tests, has been used to scrutinise several African countries chances of implementation of Digital ID and it was found that although the legislation empowering the digital ID does have provisions which ensure that the digital ID programme respects human rights and minimises risk, it does not go far enough.

Risks and Recommendations of Digital ID implementation

Privacy

Policy makers are encouraged to pay closer attention to the data privacy concerns around the sharing of digital identity with public and private organisations.

Legality

The Governments are encouraged to expedite the passage of relevant bills into law.

Scope

With the scope of the Digital ID program, the Governments and the relevant start-ups should ensure as full of an implementation as possible.

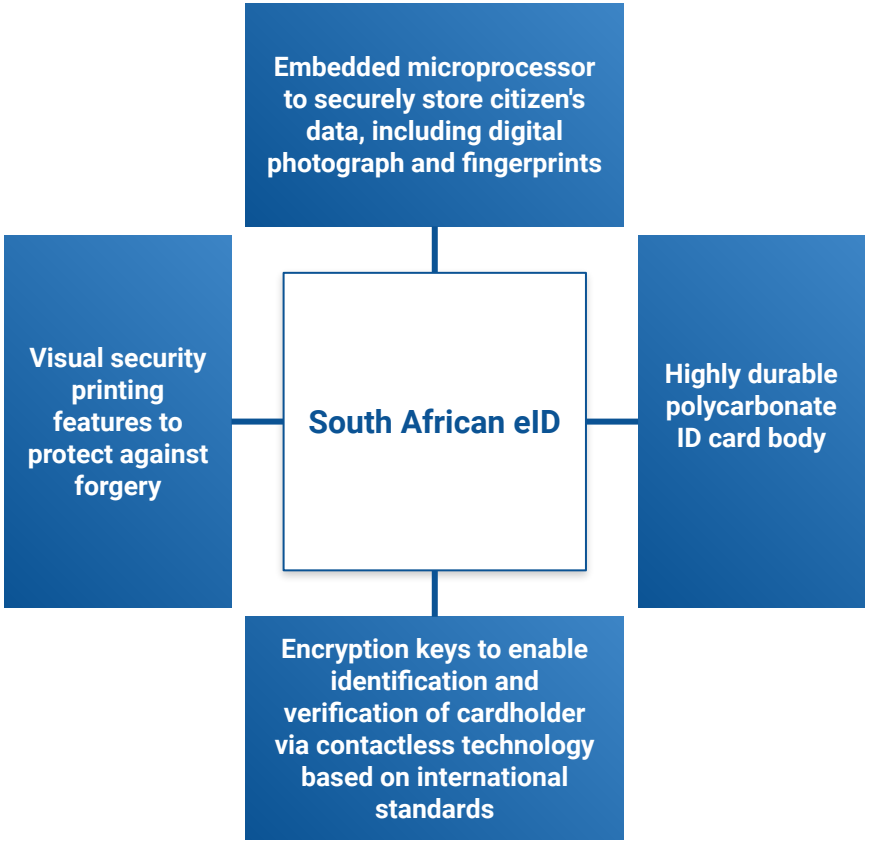
Sources: Media Overview

South African ID Card

Republic of South Africa, with a population of over 59 million, is a multi-ethnic democratic nation.The green bar-coded identity book is used as proof of identification for many uses, such as applying for a driver's license or passport, voter ID authentication, and opening a bank account. However, fraud and theft have made the paper book increasingly insecure for individuals and the authorities. As part of a significant national investment in technology modernization, the Department of Home Affairs (DHA) decided to put in place a new national identity card. Following research into national eID programs implemented by governments worldwide, the DHA opted for an eID card - for its high level of security and advanced data-protection mechanisms. Two means of authentication are implemented:

- biometric fingerprint verification
- a pin code known only to the user.

An embedded secure software with its microprocessor securely contains identification details and ensures that only authorized authorities can read and verify the card's data using contactless readers. Today, the high-end national identity card, equipped with contactless capability, is bringing added levels of convenience and security for citizens.



Sources: South Africa Government

The Digital Economy for Africa Initiative

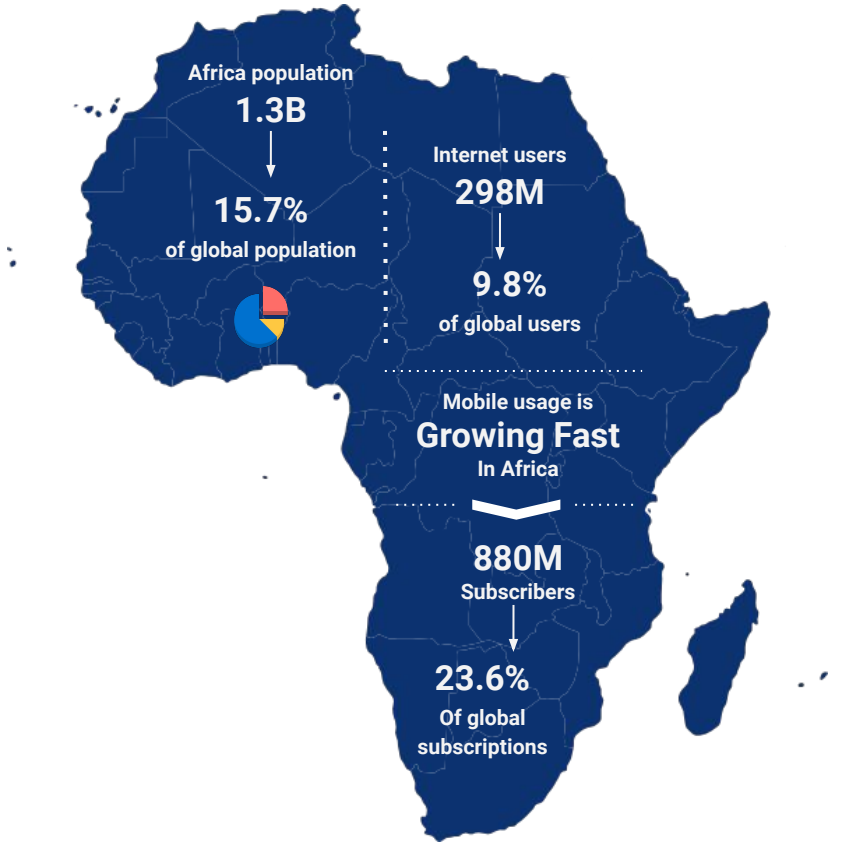
#DE4A
Digital Economy
for Africa Initiative

The Opportunity

Africa needs to think big on digital development. At the current incremental pace of economic and social advancement, too much of Africa's expanding youth population will be denied the opportunity to live up to their potential. Digital technologies offer a chance to disrupt this trajectory by unlocking new pathways for rapid economic growth, innovation, job creation, and access to services which would have been unimaginable only a decade ago. Yet, there is also a growing 'digital divide' and increased cyber risks, which need urgent and coordinated action to mitigate.

The time for action is now

Access to the internet remains out of reach for most people in the continent, with only 22% reporting having access in 2017. Too few citizens have digital IDs or transaction accounts – locking them out of access to critical services and e-commerce. Africa has the opportunity to harness the digital economy as a driver of growth and innovation, but if it fails to bridge the digital divide, its economies risk isolation and stagnation.



Sources: africacheckorg, The World Bank

Key Takeaways

Advanced technologies (artificial technologies, robotics, advanced materials, FinTech, and others) help to drive the emergence of tech in the social sector and open up new market opportunities. Thus, start-ups play a crucial role in solving complex questions of the modern world, especially those involved in the development of advanced DeepTech technologies aimed at increasing of the wellbeing of developing countries.

In the digital redistribution of DeepTech companies, the North American region holds the lead, with approximately 40% of companies originating from the region.

Among the DeepTech companies involved in humanitarian efforts, the Financial Inclusion sector is the most prevalent, with 163 companies involved. The two other major sectors are Nature and Climate Protection and Sustainable Development.

When it comes to funding, the largest amounts actually went to the Energy-Saving and Renewable Energy sectors, with Financial Inclusion taking second place. While taking second place in the number of companies, the Nature and Climate Protection sector takes second-to-last place in the amount of funding received.

The African market, where the adoption of DeepTech technologies is lower, has showcased rapid growth during the past few years. Meanwhile, the increasing adoption of image and pattern recognition in Africa is expected to provide new growth opportunities.

DeepTech's potential for disruption is unprecedented, and the breadth of problems it could address remains for us to discover. Among the most popular trends in DeepTech for 2022 are awareness of climate change, alternative energy sources, faster and less power-hungry chips, and cultivation of the power of the sea. These trends are well-aligned with the UN Sustainable Development Goals and can bring a lot of benefit to Africa, Asia, and LATAM.

Key Takeaways

The global DeepTech market size is expected to reach $15 trillion by 2030, with its current evaluation at $6 trillion in 2022. DeepTech is considered to be a revolutionary technological development, and its integration across a host of applications is one of the key factors driving this market. Advances in image and voice recognition are driving the growth of the regional market. Improved image recognition technology is critical in enhanced drones, self-driving cars, and robotics.

DeepTech brings together powerful capabilities: data volume, Moore's law, DNA sequencing cost, DNA synthesis (in progress), quantum computing (in progress). These capabilities have deep implications on their own — but when added to technological capabilities in matter and energy, computation and cognition, and sensors and motion, they allow innovative companies to address previously unsolvable problem sets. DeepTech's potential for disruption is unprecedented, and the breadth of problems it could address remains for us to uncover.

The regions of both Asia and Africa face similar challenges in the financial inclusion process. Modern companies which are operating on the ground and want to succeed need to find a proper solution. Among the challenges to financial inclusion are that banks are often too far from the place where a person lives and the services are too expensive. Other issues include lack of documentation, lack of trust in financial institutions, cultural and religious issues, etc.

One innovative instrument in impact investment is known as the social impact bond (SIB) – or, in the case of development cooperation, the development impact bond (DIB). These instruments allow private investors to pre-finance the intervention, and governments or donors provide funding solely when the intended outcome goes beyond what would have occurred otherwise. Advocates of impact investing see SIBs and DIBs as useful instruments for the financing of the 2030 agenda.

Despite the progress made thus far in impact investing, it is yet to maximise its full potential as a development financing instrument. Currently, most impact investing comes from DFIs and major social foundations. The full power of the private capital market is waiting to be harnessed. The lack of an efficient impact investing 'ecosystem' results in significant time and resources being consumed before investors can successfully venture into the market.

African Charities Analytical Dashboard

This unified platform aims to map, categorise, and rank market participants of their respective sectors by filtering them through geographical maps and mindmaps with visualised analytics of associated global challenges. The platform also features profiles of organisations, donors/investors, and tools for matchmaking impact start-ups with investors and charity organisations – donors and charities – with impact start-ups as well as with financial institutions, volunteers, and other partners.

Longevity Governance Big Data Analytics Dashboard

Market Intelligence

Longevity Governance Market Intelligence

- Full Analysis
- Interactive Mindmaps
- SWOT Analysis
- Dynamic Charts

Full Big Data Analysis

View More

Dashboard Parameters

DATA POINTS	PARAMETERS	REGIONS
11984	240	50
LAYERS OF FRAMEWORK	**DYNAMIC CHARTS**	**SWOT ANALYSIS PROFILES**
6	100	50

SWOT Analysis

View More

Longevity Governance Market Intelligence

- Pre-Subscribe for Beta
- COVID-19 Dashboard
- 3D Visualization

Search Engine

Longevity Governance Search Engine

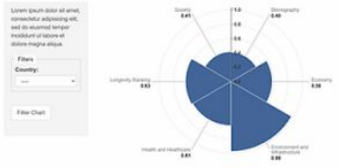
- Benchmarking Charts
- Major Trends
- Practical Recommendations
- Big Data Framework

National Healthy Longevity Interactive MindMaps

View More

Longevity Progressivness 3D Visualization

Longevity Progressiveness Benchmarking Charts



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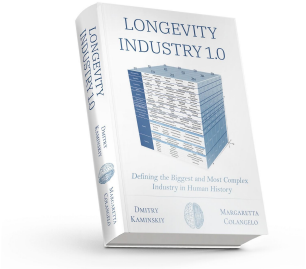
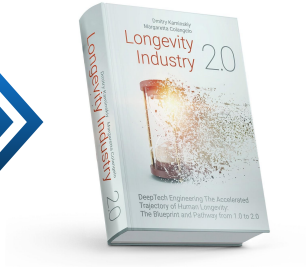
Longevity Governance Search Engine

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

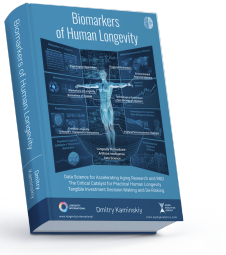
Deep Knowledge Group: Books



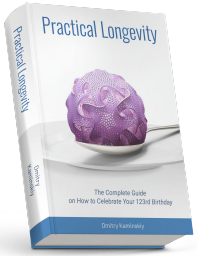
Longevity Industry 1.0
2010-2020: Evolution of the Longevity Industry from Zero to 1.0



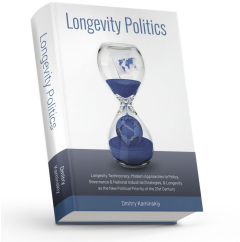
Longevity Industry 2.0
2020-2025: DeepTech Engineering The Accelerated Trajectory of Human Longevity — The Blueprint and Pathway from 1.0 to 2.0



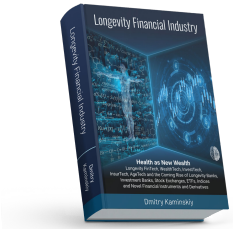
Biomarkers of Human Longevity
The Critical Catalyst for Practical Human Longevity, Tangible Investment De-Risking, and Accelerated Ageing Research and Longevity R&D



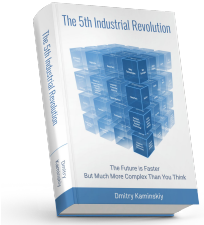
Practical Longevity
Practical, Market-Ready Tools, Approaches and Frameworks for Optimizing Personal, Practical, Healthy Human Longevity



Longevity Politics
2021-2030: The Rise of Longevity Politics, and the Solidification of Longevity as the New Political Priority of the 21st Century

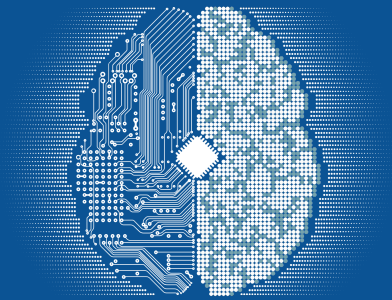


Longevity Financial Industry
Health as New Wealth, Engineered Solutions to Bridge the Longevity Liquidity Gap, and the Rise of Longevity Investment Banks, Stock Exchanges and Financial Instruments



The 5th Industrial Revolution
2030-2035: Defining, Forecasting, Optimizing and De-Risking the Accelerated Trajectory of Progress Toward the 5th Industrial Revolution

DEEP
KNOWLEDGE
PHILANTHROPY



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