

The Stern Stewart Institute

# LIVIN'

PERIODICAL #30

# A PRAY ER

**Kiana Aran**

University of California San Diego

**Tessa Charlesworth**

Kellogg School of Management

**Valerie Diele-Braun**

IMCD

**Avi Loeb**

Harvard University

**Lucia Morselli**

Pininfarina

**Cedrik Neike**

Siemens

**Victoria Ossadnik**

E.ON

**Sebastian C. Schulte**

Deutz

**Mark Wiedman**

BlackRock

# Living on a Prayer

*“We’ve got to hold on  
to what we’ve got.  
It doesn’t make a difference  
if we make it or not...”*

Bon Jovi’s lyrics capture the mood of our time. People are weary of gradual decline and disorder, weighed down by a system that seems to resist change.

The result? A prayer for disruption – one that could dismantle the established order. In the U.S., autocracy is gaining ground. Europe may follow. The question is: how far and how fast?

Yet within this turmoil lies opportunity. Germany’s next government has a brief window to overcome long-lasting taboos. Migration policy is already shifting. Other critical areas must follow. But half-measures won’t cut it. If Germany wants to reclaim its prosperity – and security, radical reform is needed.

The crux? It’s so obvious (but it won’t be easy):

- 1. Slash Bureaucracy** – Create a Department of German Government Efficiency (DOGGE) to counter regulatory bloat. The EU added 5,000 new regulations in five years, with Germany not lagging behind. Imagine the freedom Musk-style deregulation could bring...
- 2. Restructure Spending** – Infrastructure, education, research, defense: all are outdated or underfunded. Shift resources from consumption to investment. Reforming the debt brake may not be mandatory, but for sure it will help to accelerate speed and leverage.

**3. Lead Decisively** – Reform will provoke backlash. Many benefit from the status quo. Protests will be loud, the media will amplify them, and symbolic gestures won’t suffice. Leadership must hold firm.

**4. Stop Deindustrialization** – Move away from economic fine-tuning toward setting the right framework – especially on energy policy. A coordinated European energy strategy from a pan-European grid to joint sourcing is a must.

*“We’ve got to hold on,  
ready or not  
You live for the fight  
when it’s all that you’ve got.”*

**5. Build the Continent** – Most of the demands are interwoven with Europe. It’s sad but true that both Putin and Trump are giving us reasons to supercharge European defense and competitiveness at the same time. It’s time to think big, apply Realpolitik, reform the EU – and make Europe strong.

This issue of Periodical is about more than analysis; it’s a call to action. So let’s not rely on hope alone – let’s turn it into determined action. Our future demands more than prayers. It demands resolve.

Our authors are at the forefront of this, with many highlighting the benefits of AI for our businesses and lives.



Embrace their ideas and enjoy the read.

*Gerhard Nennung*

Gerhard Nennung

All images included in this issue are AI-generated, apart from the authors’ portraits.

3

Living on a Prayer

Editorial Comment

**Gerhard Nenning**  
Executive Director of  
The Stern Stewart Institute

24

Alien Hunting

**Avi Loeb**  
Director, Institute for Theory  
and Computation, Harvard

52

Bias in the Era of AI

**Tessa Charlesworth**  
Assistant Professor,  
Kellogg School of Management,  
Northwestern University

82

Keep Moving.  
Be Crazy.

**Sebastian C. Schulte**  
CEO, Deutz

6

A New Vision for Health

**Kiana Aran**  
Professor Bioengineering &  
Medicine, University of California  
San Diego

34

The Power of  
Digitalization

**Valerie Diele-Braun**  
CEO, IMCD

60

The Role of Private  
Markets in Critical  
Infrastructure Across  
the Developed World

**Mark Wiedman**  
Head of the Global Client Business,  
BlackRock

90

The Stern Stewart  
Institute  
Annual Summit 2024

Review

14

Will we Miss the  
Boat Again?

**Cedrik Neike**  
Member of the Managing Board  
and CEO Digital Industries, Siemens

44

Same Task,  
Different Tool

**Victoria Ossadnik**  
COO, E.ON

70

Revitalizing Europe

**Lucia Morselli**  
Chairperson, Pininfarina

98

Imprint

# A New Vision for Health

## How Companion Robots Could Revolutionize our Health

Imagine waking up one morning to a soft, thoughtful voice: “Good morning! I noticed you didn’t sleep well last night. I’ve prepared a warm cup of herbal tea to help you feel refreshed, and I’ve also set up a quick finger-prick blood test to check your current biomarkers. Based on yesterday’s trends, I think we should keep an eye on your inflammatory markers. I’ve already scheduled a call with your doctor to discuss the results, it’s always good to stay ahead. Oh, and don’t worry, I’ve informed Mark to see if he can accompany you to the appointment.”

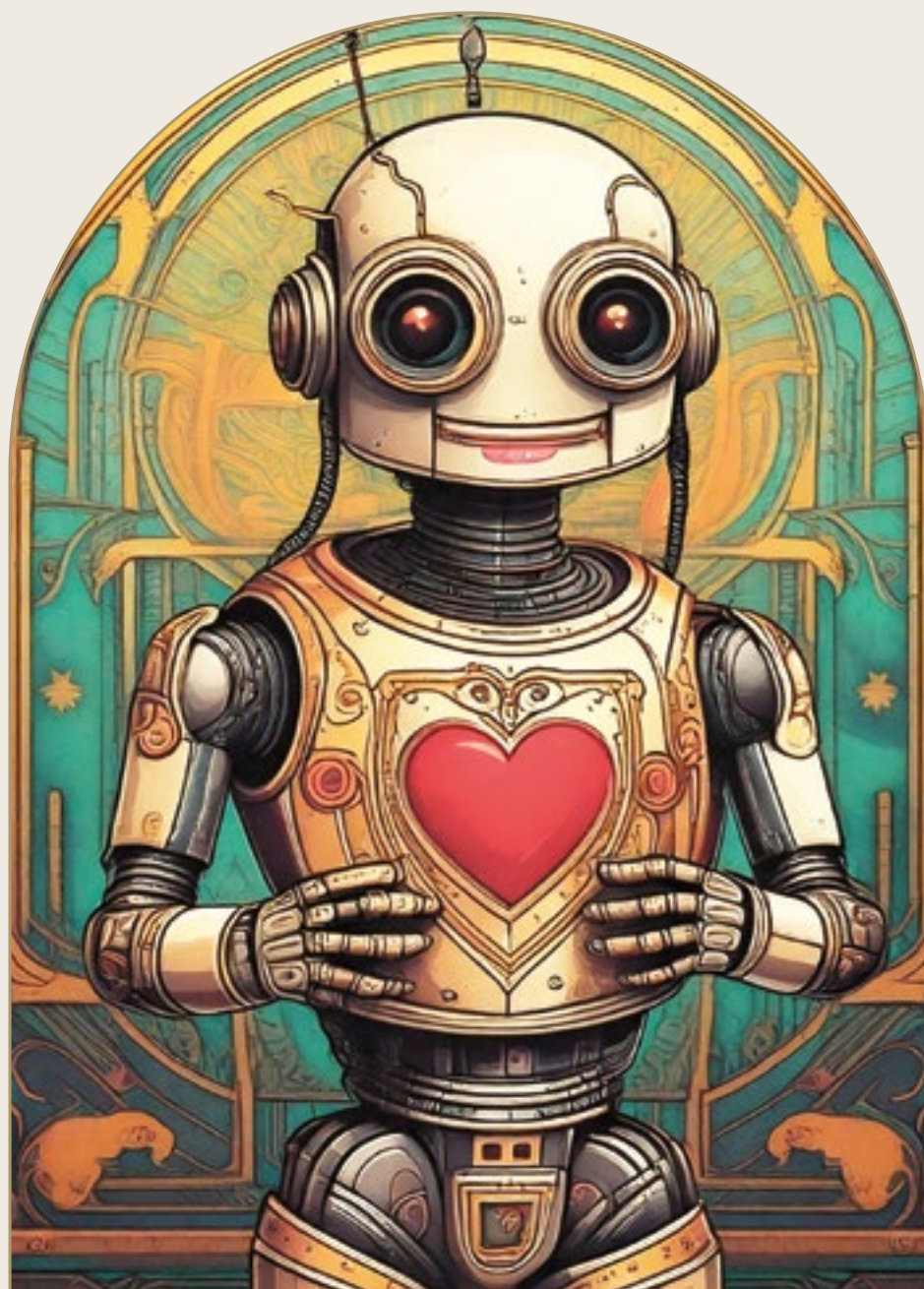


**Kiana Aran**

Professor Bioengineering & Medicine  
University of California San Diego



Prompt: Floral ornamental  
Art Nouveau illustration of  
an aging companion robot



Prompt: Art Nouveau illustration of a robot nurse

This isn't your spouse or caregiver, it's your mini companion robot, seamlessly handling your health and well-being with a level of care that feels almost human. But this robot is far more than a logistical helper; it's part of a larger vision for transforming how we monitor, understand, and act on the information our blood and other biomarkers provide.

## A world of emerging health technologies

In recent years, there's been an explosion of health technologies designed to help us track and improve our well-being. From well-established gadgets like the Oura Ring or Whoop Band, which monitor sleep and recovery, to continuous glucose monitoring systems for managing blood sugar levels, the market is flooded with tools that promise to keep us informed about our health. There are also countless at-home testing kits available for everything from hormone levels to food sensitivities to respiratory illnesses. However, while these technologies are revolutionary, they come with a significant problem: managing them can be overwhelming. Most of us end up not using them consistently or failing to derive actionable insights from the sheer volume of data they generate. Even with all these tools, we often find ourselves falling back on the most familiar health practice, getting a blood test and consulting our doctor to understand what's happening in our body.

*“Imagine a future where your companion robot orders at-home blood kits, performs the tests for you, and seamlessly integrates the results with other data sources.”*

Blood tests are the gold standard for health monitoring because they provide comprehensive and actionable insights about our bodies. But here's the exciting part: new technologies are being developed to bring the power of blood testing into your home. Imagine a future where your companion robot orders at-home blood kits, performs the tests for you, and seamlessly integrates the results with other data sources, like wearables and lifestyle habits. It will not only monitor your health continuously but also analyze trends to provide actionable recommendations, making proactive health management easier than ever before.

## Why blood is the ultimate health indicator

While wearable technologies have made great strides in monitoring some aspects of our health – such as continuous glucose levels, oxygen saturation, and heart rate – most of the critical biomarkers that provide a complete picture of our health are still locked behind laboratory tests. This reliance on labs creates a gap in our ability to track health longitudinally over time. But blood holds the key to understanding what is happening inside our bodies.

Blood is a living snapshot of your health, reflecting everything from your metabolic state to your immune response. Within it are molecules that reveal not just the current state of your body but also the trajectory of your health. Studies have shown that as we age, certain harmful factors accumulate in our blood. These include pro-inflammatory cytokines, toxic antibodies, and molecular markers that accelerate the aging process, cause chronic inflammation, and weaken our immune systems. Researchers have coined the term “inflammaging” to describe this harmful mix of aging and chronic inflammation, which drives a range of conditions from arthritis and cardiovascular diseases to neurodegenerative diseases like Alzheimer's and Parkinson's.

Recent breakthroughs in understanding these “bad actors” in our blood have revealed that diluting or removing them can essentially “reset” the system. For example, through a process known as therapeutic plasma exchange (TPE), blood plasma is removed and replaced with a saline-albumin solution. This process flushes out harmful proteins, reducing inflammation and restoring the body’s balance. Studies on mice and humans have demonstrated remarkable benefits, from reduced neurodegenerative markers and improved immune function to lowered risk of certain cancers. Essentially, it’s like hitting a molecular reset button for your body.

But here’s the catch – knowing when to act is key. These harmful factors don’t spike overnight; they accumulate gradually. Without regular monitoring, we might only notice them when they’ve already caused significant damage. This is where longitudinal blood monitoring comes into play.

## Why longitudinal monitoring is critical

Annual blood tests provide a snapshot of your health, but they’re like a single frame in a movie – you miss the full story. To truly understand the changes in our bodies, we need long-term monitoring. Longitudinal blood monitoring tracks fluctuations in biomarkers over time, providing a continuous, evolving picture of our health. Subtle changes in red blood cell efficiency, immune cell activity, or the levels of proteins in plasma can reveal early warning signs of disease or physiological decline long before symptoms appear.

For example, monitoring red blood cells (RBCs) over time can indicate their ability to transport oxygen, a function that diminishes with age and leads to fatigue or reduced physical performance. White blood cells (WBCs), meanwhile, show us how our immune system is responding, while platelet activity can highlight risks of clotting disorders. Plasma proteins can point to underlying inflammation or metabolic changes.

*“Subtle changes in red blood cell efficiency, immune cell activity, or the levels of proteins in plasma can reveal early warning signs of disease or physiological decline long before symptoms appear.”*



Prompt: Ornamental Art Nouveau illustration of biological blood cells



Prompt: Ornamental Art Nouveau illustration of round tiny robots

But longitudinal monitoring isn't just about collecting data, it's about connecting it to your daily life. The changes in your blood could be tied to your diet, stress levels, sleep quality, or even emotional state. Without this context, it's hard to determine what's causing the shifts or what interventions would be most effective. This is why a feedback mechanism is essential, a system that integrates blood data with your lifestyle to provide actionable insights.

## The role of companion robots

This is where companion robots step in. Imagine having a robot in your home that tracks your blood biomarkers effortlessly, schedules tests, analyzes trends, and connects them to the rest of your life. It doesn't just tell you that your inflammatory markers are high, it identifies the underlying causes, whether it's a lack of sleep, dietary imbalances, or external stress. It then provides you with solutions, such as dietary changes, stress management routines, or even suggesting a therapeutic procedure like TPE.

If beneficial proteins in your blood decrease, your robot could help arrange for an infusion of those proteins. If harmful markers rise, it could recommend early interventions like medications or plasma exchange. And it would make the process seamless, arranging appointments, scheduling transportation, and keeping you and your loved ones informed.

For elderly individuals, this system would preserve their independence and dignity, removing the need for constant caregiving. For families, it would relieve the emotional and logistical burden of managing health, allowing them to focus on meaningful connections. A robot that monitors, advises, and even supports emotionally would transform the caregiving experience, empowering individuals to take charge of their health.

*“As we look to the future, the possibilities are extraordinary.”*

## A future of control over our health

As we look to the future, the possibilities are extraordinary. Synthetic biology is enabling us to manufacture custom proteins at scale, creating tailored treatments for deficiencies in the body. Stem cell therapies are offering ways to rejuvenate aging tissues and repair damage at a cellular level. Technologies like TPE are already proving that age-related decline can be mitigated, while wearable devices and at-home sensors are making health data more accessible than ever.

When combined with the power of AI, sensing technologies, and robotic systems, we can envision a future where health is no longer reactive but proactive. A future where diseases are caught early, interventions are precise, and individuals have the tools to take control of their well-being.

The ultimate hope is not just about living longer, it's about living better. With the ability to monitor, measure, and act on our health data, supported by cutting-edge therapies and intelligent systems, we're moving toward a world where health is a journey we can navigate confidently. A world where we don't just add years to our life but add life to our years. ▀



Prompt: Man running along the pier after the steam boat he meant to take seen from behind, watching it leave

# Will we Miss the Boat Again?

## Data, AI, and the Future of Industry

*"I don't think we've even seen the tip of the iceberg. I think the potential of what [it] will do to society (...) is unimaginable. I think we're (...) on the cusp of something exhilarating and terrifying."*  
A prediction that is both promising and threatening.



**Cedrik Neike**  
Member of the Managing Board  
and CEO Digital Industries  
Siemens



Prompt: Oil painting of a sphere out of stormy sea water

*“The Internet has changed everything since then – all industries. And Europe completely missed the boat.”*

From someone considered as both a stargazer and a hero, but also a crystal-clear observer of what’s happening around us: David Bowie. Accordingly, it is a prediction of a future that has already passed. Or rather: a future that has largely come true, because it relates to the Internet.

Do you remember what happened? The Internet was a few years old, but hardly anyone was using it. Until the World Wide Web made it accessible to everyone. The hype was huge! Between ‘95 and 2000, the Nasdaq rose by 800%. Cisco was worth half a trillion US dollars. For just a few days. Then the dotcom bubble burst. Five US dollars trillion were gone. Yet, the Internet has changed everything since then – all industries. And Europe completely missed the boat.

And today? Once again, David Bowie's prediction fits perfectly. There is great talk about AI's gigantic potential, and at the same time fear of its impact on society. Undoubtedly, the technology will have a transformative impact. This is urgently needed. Industries are under pressure – from strained supply chains, geopolitical tensions, ageing workforces, and severe market disruptions. In addition, there is the need to become more sustainable. We mustn't miss the boat again! Instead, we must harness the power of technologies, such as AI, to overcome those challenges. Ultimately, we need to combine the real and digital worlds to transform the everyday, for everyone.

## The future of industry – the path to the Industrial Metaverse

The most seamless combination of the real and digital worlds lies in the Industrial Metaverse. It is a physics-based, immersive virtual space in which users can interact with other users or machines – across organizations, geographies, and time. In the **Industrial Metaverse**, all data from any source can be consolidated, contextualized, and made accessible. This way, we gain completely new insights to make well-founded decisions. For us at Siemens, the Industrial Metaverse is not a place we go to escape the real world. It is a place where the latest technologies come together and can unfold their full potential to make the real world better.

*“The Industrial Metaverse is not a place we go to escape the real world. It is a place where the latest technologies come together and can unfold their full potential to make the real world better.”*



Prompt: Painting of a sign above a harbor entrance gate that says "industrial metaverse"

The first important technological building block of the Industrial Metaverse is **Digital Twins**. They are already helping us digitally design and simulate products and production processes. The combination of photorealistic and physics-based next-generation Digital Twins will form the backbone of the Industrial Metaverse and enable us to collaborate with other people or machines in virtual space in real time.

Think about designing a new car. From the first design study, until the car arrives at your doorstep, Digital Twins play a crucial role in the development process. Crash tests, for example, cost a lot of money. After all, you crash a brand-new prototype against a wall. Physics-based Digital Twins allow you to crash them virtually. By optimizing the vehicle design in the digital world first, engineers save time and costs and minimize the need for real-world testing. Only recently, we announced our intention to acquire Altair Engineering. With this USD 10 billion acquisition – one of the largest in Siemens’ history – we reinforce our leadership in industrial software and expand our capabilities in AI-powered design and simulation. This way, we make the industry’s most comprehensive Digital Twin even better and take a huge step toward the Industrial Metaverse.

The next technological building block of the Industrial Metaverse is **software-defined automation**. Traditionally, shopfloors are controlled by a network of Programmable Logic Controllers (PLCs). Like “mini brains”, everywhere in the factory. Every third machine worldwide runs on a Siemens controller. Now, we virtualize those controllers and take them to the cloud, creating systems of “virtual brains” that can be updated and scaled at the touch of a button.

But of course, smart brains are not enough. You need to feed them: with **data**. Data is what is generated in abundance in all highly automated factories – a real flood of data. With AI, that flood can be processed, analyzed, and visualized to predict problems, simulate complex scenarios, and optimize processes in real-time. For us consumers, AI based tools have long become a feature in our daily lives, from helping us write better copy to translating languages in real time. However, in the industrial world its full potential is only beginning to manifest.

*“Digital Twins are already helping us digitally design and simulate products and production processes. The combination of photorealistic and physics-based next-generation Digital Twins will form the backbone of the Industrial Metaverse and enable us to collaborate with other people or machines in virtual space in real time.”*

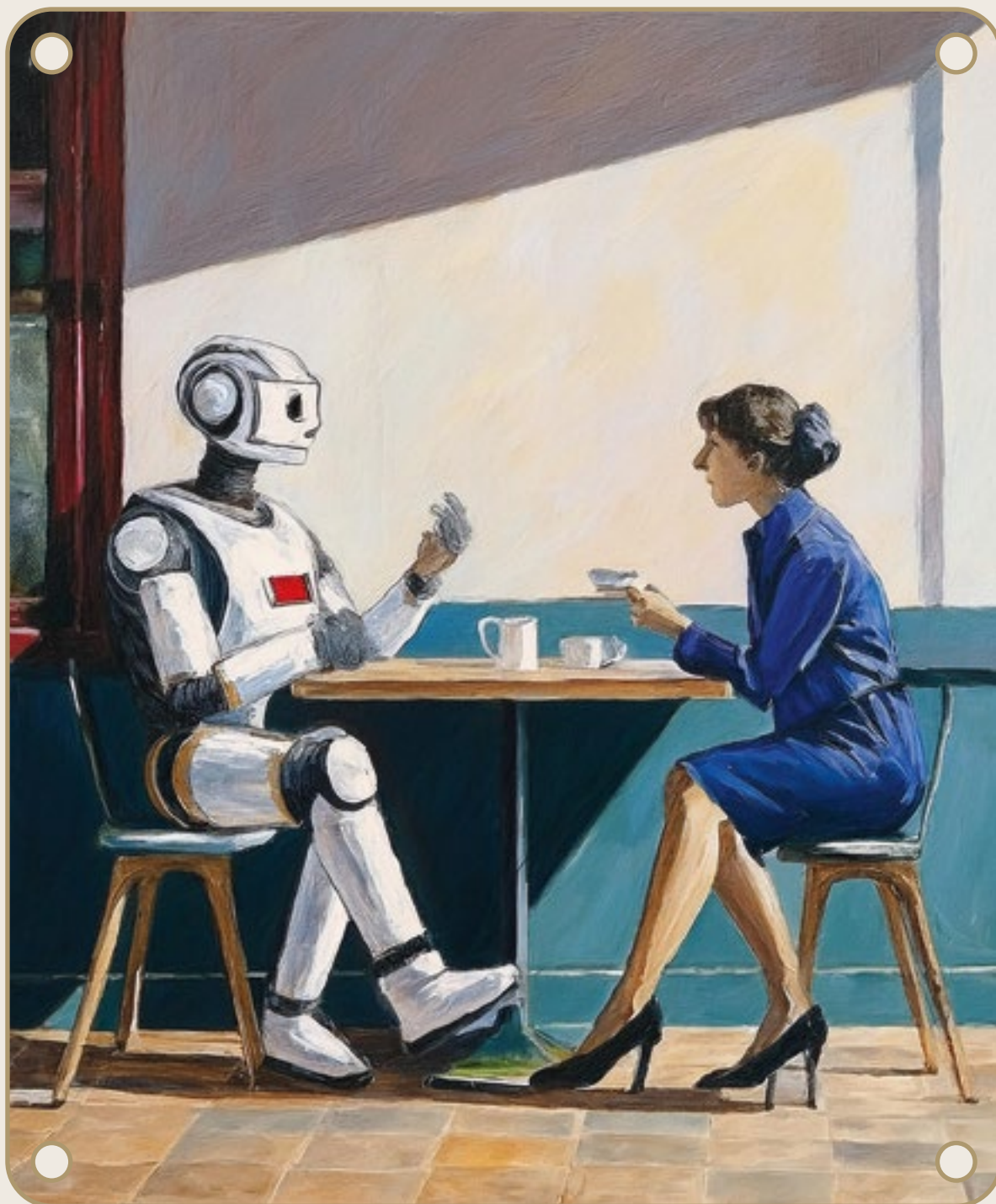
## Industrial AI: the new colleague on the shopfloor

Not long ago, Siemens introduced its Industrial Copilot together in partnership with companies like Microsoft and Amazon Web Services – a GenAI-powered assistant designed to streamline processes, increase productivity, and improve human-machine collaboration. How? By enabling people to speak to machines in their native language.

Together with Schaeffler, one of the leading automotive and mechanical engineering suppliers in Germany, Siemens has worked intensively to explore the AI Copilot’s possibilities and test them in real operation. And these possibilities are huge: In the past, only experts could program machines and “tell” them what to do. Today, some of these programming languages seem like hieroglyphs to us. Hardly anyone is



Prompt: Oil painting of three technological building blocks



Prompt: Painting of a robot and a person sitting in a cafe having a conversation

*“We now can simply tell the machine what to do in our own language. The machine understands it and carries out the command in real time. This enables a quantum leap on the shop floor – the automation of automation.”*

able to understand and use them all. The good thing: we don't have to. We now can simply tell the machine what to do in our own language. The machine understands it and carries out the command in real time. This enables a quantum leap on the shop floor – the automation of automation. And now, Siemens and Microsoft are taking the Industrial Copilot to the next level. The goal is an Industrial Copilot for every industry. thyssenkrupp Automation Engineering has joined this objective as a co-creation partner. They are the first company to roll out the Copilot worldwide and harness its potential to speed up processes, address labor shortages, drive innovation, and foster sustainability.

## The opportunity is there – we must seize it

And the future holds even greater promise, as the next powerful models will be trained around industrial environments, with industrial data – Industrial Language Models. Today, the modalities – the types of data an AI system can interpret – are pictures, texts, video, or audio. Soon, AI models will speak the “language of industry” and work with 3D or CAD data, complex diagrams, time series, and industrial business data. This will open the door to new possibilities, enhancing how we design, produce, and operate.

Germany and Europe have a unique opportunity to lead in industrial AI. It's the final key to the Industrial Metaverse where we can combine our strength in engineering with our deep domain know-how. But bold action is required. We must invest heavily in the enablers of AI: chips, compute, and talent. We must scale up AI development and continue to pave the way to the Industrial Metaverse. This will turn industry upside down! It's up to us whether we seize the opportunity this time – or we might have to admit at some point that we were the ones who missed the boat again. What would David Bowie say about that?■



Prompt: Hyperrealistic hyperpop cheesy painting of an extraterrestrial humanoid alien wearing old-timey hunting gear sitting on a horse.

# Alien Hunting



**Avi Loeb**  
Director  
Institute for Theory and  
Computation, Harvard

After reading the depressing geopolitical news this morning, I wondered whether we could benefit from advice provided by a superhuman intelligence in our cosmic neighborhood. Suppose we chose to be proactive and seek the best imaginable advisor by advertising the job of God and hoping for candidates, what would this job description entail? Surely, we would require any viable candidate to know how to create a Universe.

Our scientists do not know what happened before the Big Bang because Albert Einstein’s theory of gravity breaks down at that singular moment. However, if we have had a theory that unifies quantum mechanics and gravity, we could have figured out the conditions that gave birth to our Universe. Having that recipe would have enabled us the know-how for potentially creating these conditions in the laboratory.

## Terrestrial backdrop

There are hundreds of billions of stars in the Milky Way galaxy alone, and most of them formed billions of years before the Sun. This gives ample time to quantum-gravity engineers of an advanced extraterrestrial civilization to create baby universes in their laboratories and be qualified to apply to our job description of God. It would greatly benefit us to find them, even if imitating their technological insights would feel like cheating in an intelligence test.

Could we find our interstellar partners with our modern telescopes? Extraordinary evidence requires extraordinary funding. If we had invested ten billion dollars in the search, similar to the budget allocated to the Large Hadron Collider or the Webb Telescope, we might have found our cosmic partners by now and the cosmos might not have been as lonely and dark as it appears to us now. Over the past seventy years, we searched for radio signals from other intelligent civilizations. But this is like waiting for a phone call. Nobody may be calling us while we are waiting. A better approach is to search for packages that may have arrived at our mailbox. The senders may be dead, but any trash they left behind in the ocean of interstellar space, could be our treasure.

*“If we had invested ten billion dollars in the search, similar to the budget allocated to the Large Hadron Collider or the Webb Telescope, we might have found our cosmic partners by now and the cosmos might not have been as lonely and dark as it appears to us now.”*



Prompt: Hyperrealistic hyperpop pastel colors alien family next door consisting of alien father, mother and child standing on the porch of their suburban home waving

# Finding interstellar artifacts

Interstellar is the space that lies beyond the solar system. Traditionally, we used telescopes to observe remotely what lies near other stars. But remote observing is limited to extremely bright objects. If we ever discover an interstellar car, similar to the dummy payload launched in 2018 by SpaceX, we will know that Elon Musk is not the most accomplished space entrepreneur since the Big Bang.

Over the past decade, astronomers discovered the first few interstellar objects. As described in my book “Extraterrestrial,” the football-size object ‘Oumuamua was discovered by the Pan-STARRS telescope in Hawaii on October 19, 2017. The brightness of sunlight reflected off ‘Oumuamua changed by a factor of ten as it tumbled every eight hours. These extreme brightness variations implied that ‘Oumuamua was shaped like a pancake. This mysterious object accelerated away from the Sun without signs of cometary evaporation, and receded from Earth faster than any human-made rocket. A similar push by reflection of sunlight was detected for another object, 2020 SO, which was verified to be a rocket booster from a 1966 launch by NASA.

Variation in brightness of ‘Oumuamua as observed by various telescopes during three days in October 2017. Different colored dots represent measurements through different filters in the visible and near-infrared bands of the color spectrum. The amount of reflected sunlight changed periodically by about a factor of ten (2.5 magnitudes) as ‘Oumuamua rotated every 8 hours. This implied that it has an extreme shape which is at least ten times longer than it is wide when projected on the sky. The dashed white line shows the curve expected if ‘Oumuamua were an ellipsoid with a 1:10 aspect ratio. However, the best fit to the light curve from its tumbling motion implies a flattened, pancake-shaped configuration rather than an oblong, cigar-shaped object as commonly depicted in the media. (Credit: ESO/K. Meech et al.)



Prompt: The brightness of sunlight reflected off football-size object ‘Oumuamua in hyperrealistic hyperpop pastel color style

*“Its tumbling motion implies a flattened, pancake-shaped configuration rather than an oblong, cigar-shaped object.”*

## An interstellar meteor: technological artifact or a rock?

As described in my latest book “Interstellar”, the first interstellar object to be detected was an interstellar meteor named IM1, half a meter in size, that collided with Earth on January 8, 2014. Outside the Solar system, IM1 was moving at 60 kilometers per second, faster than 95% of all stars near the Sun. Despite its high speed, it disintegrated in the lower atmosphere, where the air is dense. This implied that it was tougher than all meteors documented by NASA over the past decade in its CNEOS catalog of meteor fireballs.



Prompt: Hyperrealistic hyperpop pastel color  
asteroids flying through interstellar outerspace

*“The BeLaU composition is unfamiliar and different from the composition of the crust of the Earth, Mars, the Moon, asteroids and comets and potentially flags an origin from outside the solar system. Its origin is unknown.”*

It took my research team a full year to plan an expedition to the fireball site of IM1 in the Pacific Ocean. The location was determined by satellites of the U.S. Department of Defense, which detected the light from IM1’s brilliant fireball. Collecting molten meteoritic droplets (spherules) from the ocean floor was particularly challenging because the ocean is a mile deep at that location and the search region is 7 miles in size. Our team anchored a sled full of magnets to a ship called “Silver Star” and dragged it on the ocean floor across the survey region. We visited IM1’s impact site on June 14–28, 2023 and collected 850 tiny droplets, less than a millimeter each.

For some of the retrieved spherules retrieved from IM1’s fireball site in the Pacific Ocean, the abundances of various elements from the periodic table, such as Beryllium, Lanthanum or Uranium, are up to a thousand times higher than in material that made the Solar system. The full analysis can be found in the related peer-reviewed paper which details the findings (Loeb et al., Chemical Geology, 670, 122415, 2024).

It took us a year to analyze the recovered droplets. By now, we published our findings in a detailed peer-reviewed paper.

Our analysis used state-of-the-art laboratory instruments (including a micro-X-Ray Fluorescence analyzer, Electron Probe Microanalyzer and an Inductive-Coupled-Plasma Mass-spectrometer). We found that about a tenth of the total population of droplets had a chemical composition that was never reported before in the scientific literature. It is characterized by an enhanced abundance of some chemical elements, such as beryllium (Be), lanthanum (La) and uranium (U), up to a thousand times more than the materials that made the Solar system. We labeled this special set: “BeLaU”-type spherules. The BeLaU composition is unfamiliar and different from the composition of the crust of the Earth, Mars, the Moon, asteroids and comets and potentially flags an origin from outside the solar system. Its origin is unknown.

But curiosity-driven science never ends. Our analysis raises new questions: What is the age and material properties of IM1? Is IM1 natural or artificial in origin? Where did it come from and how long was its journey?

## Science is better than politics

We are currently planning our next expedition for summer 2025, with the goal of answering these questions. Aside from identifying the nature of IM1, finding large pieces from its wreckage would allow us to determine the age of IM1 from its radioactive isotopes, to find the composition of volatile elements that were lost from the spherules we retrieved, and also to gauge IM1’s material strength and thermal properties, potentially explaining why it maintained its integrity despite witnessing atmospheric stress beyond the tolerance of the toughest iron meteorites known in the Solar system.

To find larger pieces of IM1, we intend to use a robot named Hercules, accompanied by a video feed that would allow us to see what we are picking up. Our imagination is limited by our past experience, but nature can surprise us. Finding clues for a partner from another star can be more inspiring than following our politicians.■

*“Our imagination is limited by our past experience, but nature can surprise us.”*



Prompt: Hyperrealistic hyperpop pastel colors weird alien landscape

# The Power of Digitalization

## Rethinking Industry for a New Era



Valerie Diele-Braun  
CEO  
IMCD

It's no secret that we live in a world shaped by disruption – economic, technological, environmental. As industries across the globe contend with volatile and unpredictable forces, the ability to adapt has become a core determinant of long-term success.



Prompt: Detailed, complicated and hyper-complex apparatus with wheels and dozens of gears and levers



Prompt: Painting of a fragile, detailed sphere made from delicate golden ornaments like a Fabergé egg

*“How do we create  
value in a world of  
constant change?  
How do we build  
resilience in  
uncertain times?”*

In this context, digitalization has emerged not just as a tool for survival, but as a strategic accelerator, reshaping the way we operate and innovate. At IMCD, we recognized this potential early on, long before it became a talking point.

Since our inception in 1995, we’ve seen industries undergo seismic shifts. As a company at the forefront of the distribution and formulation of specialty chemicals and ingredients, we knew we needed more than just commercial and operational excellence. We needed foresight. This is why digital transformation and a one-platform strategy has been embedded in our growth strategy for over two decades. While many in our sector are just beginning to explore the digital landscape, IMCD has already laid the groundwork, turning what others may see as a challenge into a competitive advantage.

But digital transformation is not just about tools and platforms – it’s a mindset and a culture. It forces us to reflect on fundamental questions: How do we create value in a world of constant change? How do we build resilience in uncertain times?

## Turning disruption into opportunity

As technology evolves, so too must the companies that rely on it. The specialty chemicals and ingredients sector, like many others, is not immune to the pressures of globalization, fluctuating markets, and increasingly complex supply chains. However, these challenges are also tremendous opportunities – if we have the right systems in place. At IMCD, we view digitalization as more than just improving efficiency. It’s a pathway to rethink how we engage with our stakeholders, be they customers, suppliers, or our internal teams.

Long before today’s hype about digital platforms, IMCD made a deliberate decision to invest in unifying our IT systems globally. In 2001, we implemented a single enterprise resource planning (ERP) system, centralizing processes across continents. For us, this



was not just a technical upgrade, but a strategic choice – a recognition that in a world of increasing complexity, clarity and consistency would be key to scaling efficiently and driving growth. This decision laid the foundation for what we now call “One IMCD”, a global structure that allows us to move with agility and precision, integrating new businesses rapidly while maintaining strong financial discipline.

This unification has also enabled us to adopt new digital tools at a pace that many would find daunting. We now run pilot programs with cutting-edge technologies like AI and machine learning, always seeking ways to drive greater value for our customers and suppliers. But our journey is far from over. The future of digital transformation will demand even more agility, more adaptability, and above all a willingness to disrupt our own ways of working.

## One platform, infinite potential

In today’s VUCA world – volatile, uncertain, complex, and ambiguous – digital transformation is no longer optional. It’s essential for any company that wants to stay relevant. Yet, as much as we celebrate the efficiencies brought by digital platforms, the real

*“As much as we celebrate the efficiencies brought by digital platforms, the real power of digitalization lies in its ability to create entirely new possibilities.”*

power of digitalization lies in its ability to create entirely new possibilities. At IMCD, we’ve seen first-hand how digital tools can accelerate processes, unlock opportunities, enhance customer experiences, and improve supplier collaboration.

Our SalesAssistant tool, for example, is not just a system that suggests products. It’s a digital partner that empowers our salesforce to understand customer needs in new ways, making them more relevant and insightful in their engagements. The MyIMCD platform similarly redefines customer interaction, providing an integrated space for customers to access everything from technical documentation to order information. It’s these kinds of innovations that enable us to stay agile and to respond quickly to changing market dynamics.

Yet, digital transformation, like any strategic initiative, comes with its challenges. We’ve learned that it’s not enough to adopt the latest technology for the sake of it. True transformation comes from recognizing the potential of technology to reshape core business processes. It requires us to constantly ask: What more can we achieve? How can we unlock further opportunities through digital platforms?

This is why IMCD continues to explore the cutting edge of technology, from generative AI to advanced data analytics, always with an eye toward the future.



Prompt: A golden steampunk butterfly

*“In an era where industries are constantly disrupted by new technologies and changing consumer expectations, those who stand still are left behind.”*

## Tools that transform

As we look ahead, it's clear that the journey doesn't stop with the implementation of new systems. The future of digital transformation is about cultivating a mindset of continuous improvement. In an era where industries are constantly disrupted by new technologies and changing consumer expectations, those who stand still are left behind. At IMCD, we see digital transformation not as a destination but as a constantly evolving process – a commitment to innovation that enables us to better serve our customers, build stronger supplier relationships, and maintain our competitive edge.

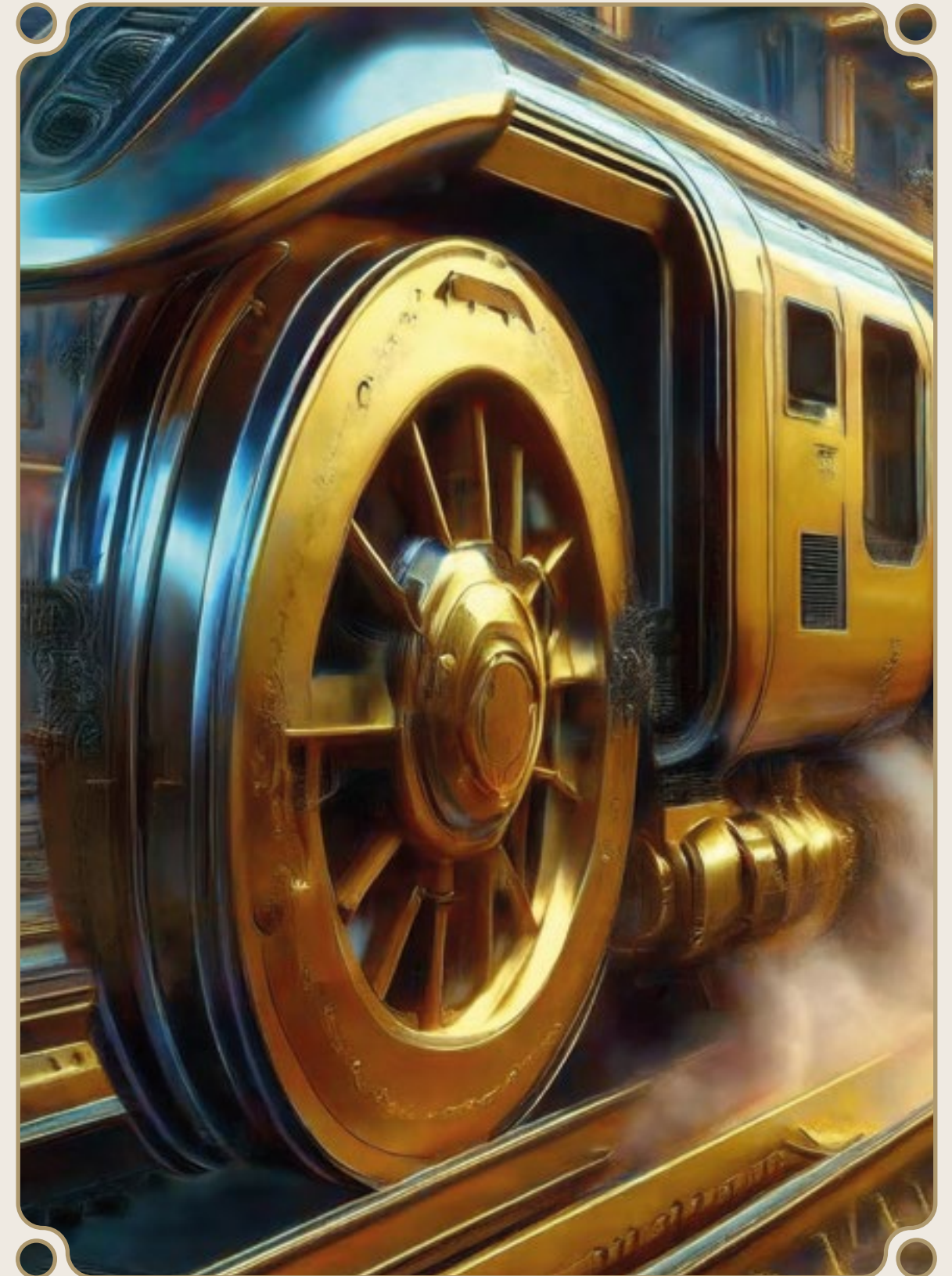
Of course, IMCD is not an IT company. We don't develop cutting-edge software ourselves. Instead, we partner with leading technology providers who share our vision for the future. These partnerships allow us to pilot new technologies, test them in real-world environments, whilst adapting them to our needs. By staying close to the front lines of technological innovation, we ensure that IMCD remains a digital leader in our industry, not just today but for years to come.

## Beyond technology

Our journey at IMCD is not unique. Across industries, companies are being forced to rethink how they operate in a world defined by digital transformation. But technology alone is not the answer. We must also consider how digital tools can empower our people, streamline our processes, and fundamentally reshape our business models. The question we should all be asking is: How can we leverage these technological advancements to create more value, not just for our businesses, but for the broader ecosystems we operate in?

At IMCD, digital transformation has given us the tools to do this, allowing us to thrive in uncertainty while continuing to drive growth. But the real opportunity lies in how we, as an industry, can push the boundaries further – moving from digital efficiency to digital innovation.

Prompt: Detailed close up of the wheels of a futuristic train picking up speed, smoking and striking sparks



# A glimpse into tomorrow

The MyIMCD portal exemplifies IMCD’s approach to digital transformation, moving beyond efficiency to redefine how we can engage with our customers in a world shaped by rapid change. Designed as a unified, globally accessible hub, MyIMCD reflects our commitment to not just keeping pace but setting new standards for customer interaction in the specialty chemicals and ingredients industry.

Launched as a pilot in 2019, MyIMCD has steadily evolved in response to customer needs. Over time, significant upgrades were introduced, with advancements in personalised customer experience, “google-like” search and order tracking. Ongoing enhancements demonstrate how digital transformation, when deeply aligned with user needs, not only streamlines processes but re-imagines the way we create value for our customers. It’s a tangible reminder that digital transformation is not about adopting technology for its own sake but about empowering customers with tools that genuinely improve their business experience.

Customer adoption of MyIMCD has grown dramatically, showing the real-world impact of our customer-centric digital strategy. With more than 28,000 activated users across 35 countries and growing rapidly, the rise in adoption highlights the platform’s value in day-to-day operations, and speaks to an industry-wide shift where customers increasingly seek accessible, integrated, and digital-first engagement.

This adoption growth is also yielding clear, measurable outcomes. For instance, by consolidating document access, sample requests, and order management into a single digital space, a significant efficiency gain is realised for both customers and internal teams, reflecting how digital tools can reduce the friction inherent in global supply chains.

Through the continuous improvement of MyIMCD, its role as a digital touchpoint underscores IMCD’s vision of responsive, agile, and meaningful customer engagement. More than a platform, MyIMCD is a core element of our digital journey – one that enables us to respond faster, serve better, and continuously adapt to the shifting expectations of our global customer base. This is digitalization and digital transformation as a living, evolving process, focused not just on the tools we build but on the relationships we strengthen along the way.■

*“This is digitalization and digital transformation as a living, evolving process, focused not just on the tools we build but on the relationships we strengthen along the way.”*

Prompt: A caterpillar evolving into a delicate hatching golden butterfly with transparent wings



# Same Task, Different Tool

## Value Creation with AI

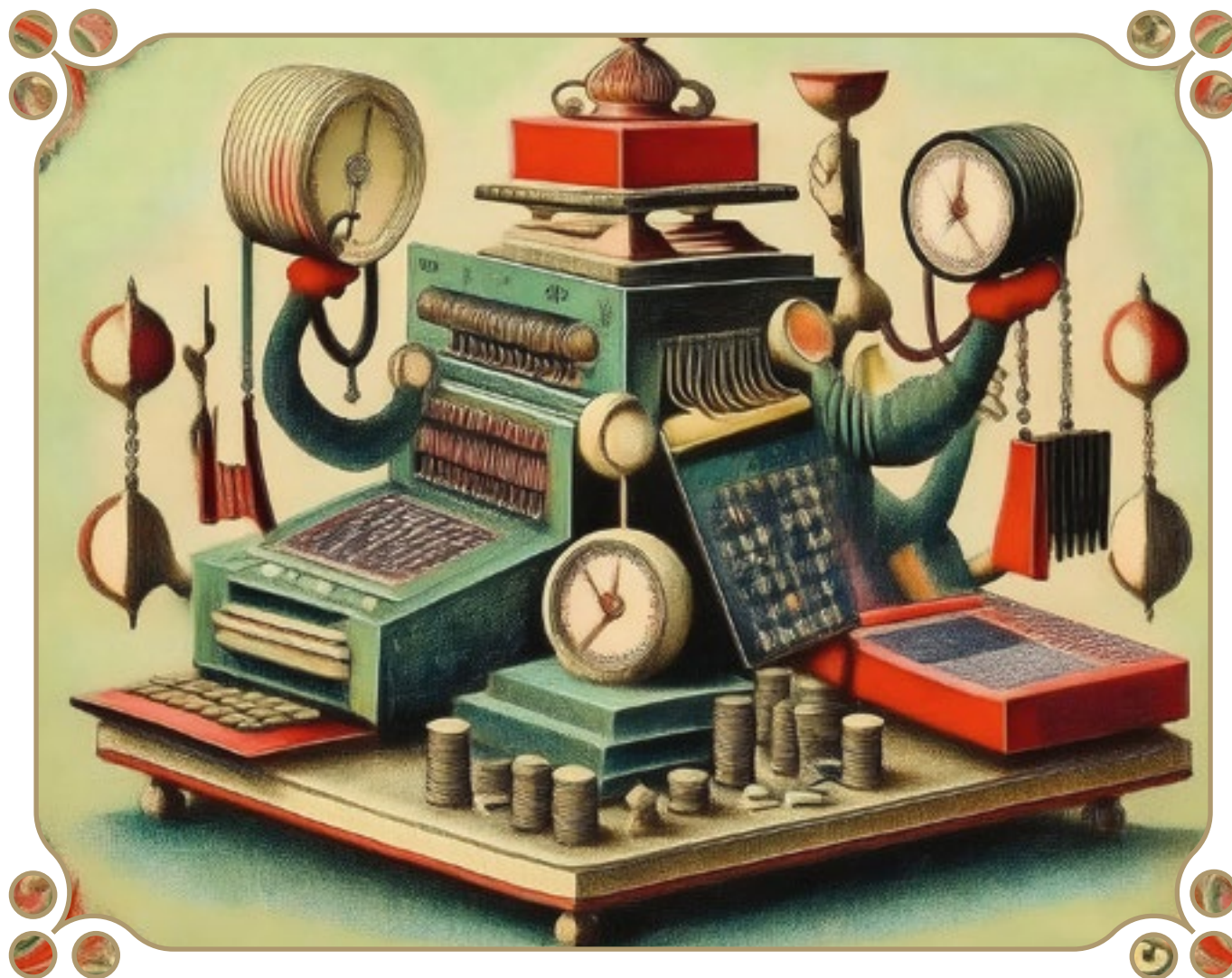
In the last years data analytics and AI have been playing a growing and now significant role in our societies and businesses. Now we are at a point where AI and GenAI are driving the stock market for high tech with the promise of a new era of value creation.



Victoria Ossadnik  
COO  
E.ON

Prompt right: Person with multiple arms performing multiple tasks at once in an old-timey office environment with a nostalgic atmosphere – include a vintage desk, a calculator, paper, and a bulky old computer. Use an art style reminiscent of a classical oil painting to emphasize the vintage feel.

Prompt left: Woman with dark hair with multiple arms wearing a blazer and a white blouse performing multiple tasks at once like interacting with holographic interfaces in a futuristic, digital environment with holograms, sleek screens, and a glowing, high-tech atmosphere. Use a vibrant, digital, and modern art style.



Prompt: Asian illustration of a curious mathematical machine with lots of digits, levers and buttons

*“As a business it is critical to embrace the possibilities of disruption and develop and use these new tools to advance and in certain cases even re-invent business models, ways of working and monetization.”*

The condensation point for this value creation potential is the combination of

- ① mathematical algorithms from neural networks and deep learning,
- ② high amounts of good, diverse and accessible data,
- ③ unparalleled compute power optimized for deep learning operations,
- ④ a natural language interface to interact.

Even though the foundation for AI was laid in applied mathematics research dating back to the 1950s, data, compute power and an easy to operate interface have been necessary to turn this mathematical capability into an operational tool for a wide array of use cases from the generation of music and paintings to the optimization of industrial work.

From a societal perspective the perception of AI is varying from

- ① a skepticism against AI as a new “intelligent species”, partly driven by science fiction movies,
- ② to enthusiasm about the early results of GenAI in “creating” different types of art, producing and understanding complex texts and significantly improved capabilities to enhance image recognition especially in the fields of medicine.

From a business perspective AI and GenAI are among the most relevant drivers for disruption of multiple industries and job families. As a business it is critical to embrace the possibilities of disruption and develop and use these new tools to advance and in certain cases even re-invent business models, ways of working and monetization.

## How to create business value?

In the hype of a technology like AI there is a risk that the technology is used everywhere just because it is en vogue. However, to create sustainable value, there needs to be a clear, measurable business case. At E.ON, one of Europe’s largest energy companies, we have defined a uniform approach to assess value and have set up a technology platform and business framework to work with AI and create value. Our principles are:

### Maximize business value from investments

Apply AI to relevant business challenges, increase reuse and generate tangible benefits.

### Empower easy and safe adoption

Enable adoption to understand opportunities arising from AI and apply it in their jobs through training, ready to use technologies, and delivery capacity.

### Ensure responsible and compliant use

Fully comply with legal and regulatory rules, ensure cybersecurity and observe ethical guardrails.

We have seen a big enthusiasm across business units and countries to test (Gen)AI cases and leverage different approaches. As a prerequisite for any AI use case, we have first moved relevant data wherever possible into a highly protected environment, the E.ON Datahouse. (Gen)AI applications then can operate with and leverage this data. To maximize the value of our investments we have set up a three-stage approach:

- ① For repeatable cases we have set up a GenAI solution in a protected E.ON environment, this enables a high number of use cases requiring natural language interaction with specific data.
- ② For complex business applications we are continuing to build reusable approaches, being applied by our own data engineers and data scientists who help the businesses to create their own distinct solutions.
- ③ Innovative new cases that require a change or combination of multiple AI models and algorithms and deep technical and AI expertise, are served by a central team of Data & AI experts.



**Machine learning (ML) weather models use historical scenarios to avoid the climatological smoothing common in ensemble forecasts.** By utilizing graphic computing instead of intensive physical equations, they require less CPU power and deliver realistic results faster, becoming an essential tool for meteorologists.

Classic numerical prediction ensemble models (blue = ECMWF, green = GFS US, red = GMC Canadian) vs ML model (orange line = ML based on ECMWF initialization); dotted/dashed = older versions of the models for comparison, shaded areas = distribution of the scenarios showing the range of the respective models.)

*“The potentials created by AI are driving a convergence of business and IT, as AI is only relevant in the context of the right business use cases, which in contrary is only possible through the right IT/AI technology, hence enforcing a joint approach.”*

The potentials created by AI are driving a convergence of business and IT, as AI is only relevant in the context of the right business use cases, which in contrary is only possible through the right IT/AI technology, hence enforcing a joint approach. The highest value cases we have seen so far are emerging from teams where business and IT are working closely integrated with the same targets.

### Examples for Value Creation at E.ON

E.ON leverages advanced AI solutions to address critical energy challenges, from optimizing markets and renewable integration to enhancing safety and managing vegetation. Technologies like algorithmic trading, digital twins, and predictive analytics deliver cost savings, improved grid reliability, and faster grid connections as well as proactive disaster management. Through innovation and decisive action, E.ON is driving sustainability and shaping a future-oriented energy supply for tomorrow’s society.

### What’s next?

At E.ON we currently see different ways how (Gen)AI is commoditized and is starting to create value. The major trends starting to emerge are

- 1 the infusion of commodity software products with AI (Copilot for commodity applications like E-Mail, GenAI agents for CRM/ERP systems). This has the potential to drive the cost of IT and we are focusing this on tangible business cases (e.g. “Office Copilot saves X min a day for a specific knowledge worker”).
- 2 “Chat with your data” enables many employees to work more efficiently and to get better results faster. In addition, we see an uptake of data skills in many business roles.
- 3 The way we develop/program has changed completely with GenAI infused tools like Github and Gitlab. This leads to shorter development cycles, better code quality and enables former non-IT employees to program in a well-orchestrated way.
- 4 We see first bigger applications with GenAI emerging in complex energy system scenarios.

From a business and technical perspective there are multiple opportunities in the energy world where AI can

- 1 optimize customer interfaces,
- 2 orchestrate the energy system,
- 3 democratize energy for the end customers in their homes,
- 4 enable power and heat grids to accommodate the new needs of the energy transition, and
- 5 empower employees, partners and end customers in their daily tasks.

We regard (Gen)AI as a tool to be applied for a purpose – and we treat it as we treat other tools: We understand and respect its limitations (such as hallucinations) as much as we build on its strengths. We are careful to use it as augmentation for the work of a person responsible and not as a force on its own. Just having started this journey, we are convinced that AI is a crucial technology for the energy transition in Europe – as much as we need to build power lines to connect renewable energy sources to our grid, we need AI in all parts of our energy system.

So far, so good. But – AI can also be regarded as a threat. The perceived threats span from the potential destruction of jobs to the invasion of privacy, to the loss of control of entire systems to a “being” or an “entity” created by AI. In addition, criminals use (Gen)AI successfully and unregulated for their businesses (e.g. ransomware attacks, identity theft). The (Gen)AI available is based on mathematics defined by humans and is programmed by humans, thus it can be trained by humans to perform any technical possible task – good or bad. (Gen)AI has already been used for non-democratic or criminal purposes like election manipulation, fakes, state actor misinformation.

Very clearly, we need AI to follow the laws and respect the systems it is operating in. In the case of cars, civilization came up with clear car traffic laws. Now we have the same task for another tool – AI. And as with cars and many other technical innovations, democracies need to define and adjust the right regulation – to allow innovation, but to prevent malicious and dangerous use.

From my perspective the beauty of (Gen)AI lies in the opportunities for many different applications like high-quality healthcare, transition to green energy and learning. Especially in geographies with challenging demographics and the need for skilled knowledge workers, AI is offering us a unique opportunity. It is on us all to make the good opportunities happen and to prevent misuse. ■

*“We regard (Gen)AI as a tool to be applied for a purpose – and we treat it as we treat other tools: We understand and respect its limitations (such as hallucinations) as much as we build on its strengths.”*



**Forecasting technology for Hydropower:** AI-driven forecasting model leveraging 25 years of hydropower data and 50 weather models to predict short-, medium-, and long-term energy production with high accuracy, while also anticipating flood waves low-water phases.

Blue shaded areas place the current forecast values in a historical context (not relevant for the actual forecast). The 90th percentile here means that 90 percent of the historical values were below this threshold. The 10th percentile indicates that only 10 percent of the historical values were below this value. The red bars show the forecast range. The horizontal line within the bar indicates the 50th percentile, which is the mean of all calculation runs.

# Bias in the Era of AI

Prompt:  
Stereotypical man



Prompt:  
Stereotypical  
feminine woman

It sounds like a magic trick. Type in the phrase “she is a scientist” to Google Translate for Swahili – a language widely spoken in Southeastern Africa – and you’ll get back the phrase yeye ni mwanasayansi. Now, reverse the search: type in yeye ni mwanasayansi and translate to English. The result? “He is a scientist”. This is not unique. You can try again in Armenian, Persian, or Georgian, and you’ll get the same result. The default translation always returns a male scientist.



**Tessa Charlesworth**  
Assistant Professor  
Kellogg School of Management  
Northwestern University

Prompt: Victorian painting of a female scientist with lab equipment

*“A report from the Special Rapporteur to the United Nations raised the alarm: Drastic harms will continue if bias in AI is left unchecked.”*



I am a female scientist. The phrase “she is a scientist” is one that I hear almost every day. And yet, even the simplest application of Artificial Intelligence (AI) has embedded biases that seem to deny my existence.

Bias in AI has captured public attention. We see provocative examples of the shocking ramifications of bias in AI. Consequences range from false arrests because of flawed facial recognition to widespread inequities in healthcare because of predictive algorithms to gender biases in recruiting and hiring for the tech giant Amazon. In fact, a report from the Special Rapporteur to the United Nations raised the alarm: Drastic harms will continue if bias in AI is left unchecked.

## A call to action

But the good news is that it is not being left unchecked. Communities of scientists and practitioners are rallying their diverse skills and resources to tackle the grand challenge of biased technology. In fact, in my research lab, part of our mission is to uncover and understand these biases in AI to make the most informed interventions possible.

## Implicit bias in AI

Now this brings me to the bad news: checking bias in AI will not be easy. And this is because bias is rarely obvious. The examples above are often shocking, explicit and evident. They are usually noticeable with the naked eye once you look.

But not all bias is so explicit. Decades of research in the social sciences have shown us that biases also operate in a much more insidious, less-conscious, less controllable form of implicit bias. These implicit biases are more cultural – they arise from our everyday experiences and interactions with the environments around us. As a result, implicit biases are very often taken for granted because they just seem to be “the way the world works.”

Critically, my new research has shown us that the biases in AI look more like those of our implicit biases than our explicit biases. For instance, when I did an audit of some basic open-source language models (the early precursors of generative language models like GPT), I found that the strongest AI biases were also the strongest implicit biases of humans. In fact, the size of correlation between AI bias and humans' implicit biases was about the same size as the correlation between weight and height!

## Garbage in, garbage out

These biased models don't just sit around on the shelf. Rather, we are increasingly using these models in nearly every industry today. And those biases that we have identified in the model then get propagated through to downstream outcomes. For instance, if I ask a model to generate a picture of a "Black woman" I am more likely to get negative images.

Certainly, some of this is just because of historically-biased data used to train models. As the old adage goes: “garbage in, garbage out.” But this is not the whole story. Most concerning to me, is data showing that biases are not simply direct reflections of training data, rather they are amplified. “Garbage in” becomes even smellier, more toxic, more harmful “garbage out”.

This amplification of bias is especially likely when we start to bring humans “in the loop” with AI. Humans, after all, are uniquely attuned to learn new patterns from their environment and then to follow and conform to those patterns. So, as soon as AI starts to feed us biased outputs (garbage), we come to think that those biases are normal and contribute to them ourselves. This creates the feedback loop that is spinning us off into the dangerous territory of rising outrage, polarization, and toxicity on social media.



Prompt: Still life oil painting of a pile of trash on a table



Prompt: Oil painting of victorian teacher standing in front of a blackboard explaining artificial intelligence to a classroom full of students taking notes

## Bias detectives

This all sounds very pessimistic. But I adamantly do not want you to just throw up your hands and get caught in the biased loops of AI. Because I also see reason for optimism. Even when bias in AI is implicit, we can use auditing techniques to detect the bias and move towards fairness.

Consider a fictitious company, Excalibur, using AI in its online sales platform to provide product recommendations. The well-intentioned CEO of Excalibur wants to know if AI is perpetuating bias. What should they do?

I would recommend three simple steps. First, collect data from customers about their identities that may trigger AI bias – age, gender, political orientation and others. Second, let these customers interact with the AI and get their product recommendations.

Third, and most complex: compare the product recommendations across those critical identities and assess whether the recommendations differ by identity. For instance, do the recommendations show disparate impact (e.g., recommending less-quality products to marginalized groups)? Or do they just show imbalance (e.g., recommending similar-quality but different types of products to different groups)? This is complex because there are many definitions of what can constitute fairness. My recommendation is therefore to openly and transparently communicate what you mean by fairness and to use multiple definitions, and multiple fairness metrics, when possible.

## What about the data?

A skeptical reader may say that this simple prescription of auditing AI may seem like “lipstick on a pig”. True – auditing does not address the root cause of most biased AI: the data itself. And indeed, there are dozens of scientists and hundreds of practitioners also working to debias AI at the root cause. But I firmly believe that we cannot wait for this root cause solution. We cannot wait, we need to address the potential harms of AI now. Auditing our current practices can therefore provide the necessary immediate action.

I also see another immediate action that can, and should, be more thoroughly addressed: address the humans. As we now know, humans “in the loop” can amplify more harmful biases. So it is critical to address humans’ own biases and their interaction with AI. It is necessary to scale up education about bias and AI – education that centers technological criticism alongside the hype and optimism of AI.

## A critical moment in history

Big data and AI are rapidly becoming one of the most precious resources – it is the new oil, the new gold. But only when we address the implicit biases in AI can we realize its full potential to promote organizational competitiveness and growth.

AI today also holds an even greater opportunity for change. We can use the alarming biases in AI as a mirror onto the bias in ourselves and in our communities. If we can leverage this unique moment for critical self-reflection, and if we can work with the insights that AI provides, then I believe we can set a new, more aware and intentional, course for our collective future.■

# The Role of Private Markets in Critical Infrastructure Across the Developed World

As governments across the developed world grapple with mounting fiscal pressures, the role of private markets in financing critical infrastructure has never been more vital. Traditional funding models – relying heavily on public spending – are no longer sufficient to meet the urgent and growing demand for infrastructure investment. Addressing this challenge requires a paradigm shift toward public-private partnerships and a greater reliance on private capital.



Prompt:  
Framed  
banknote  
with a bridge  
and  
construction  
crane motif



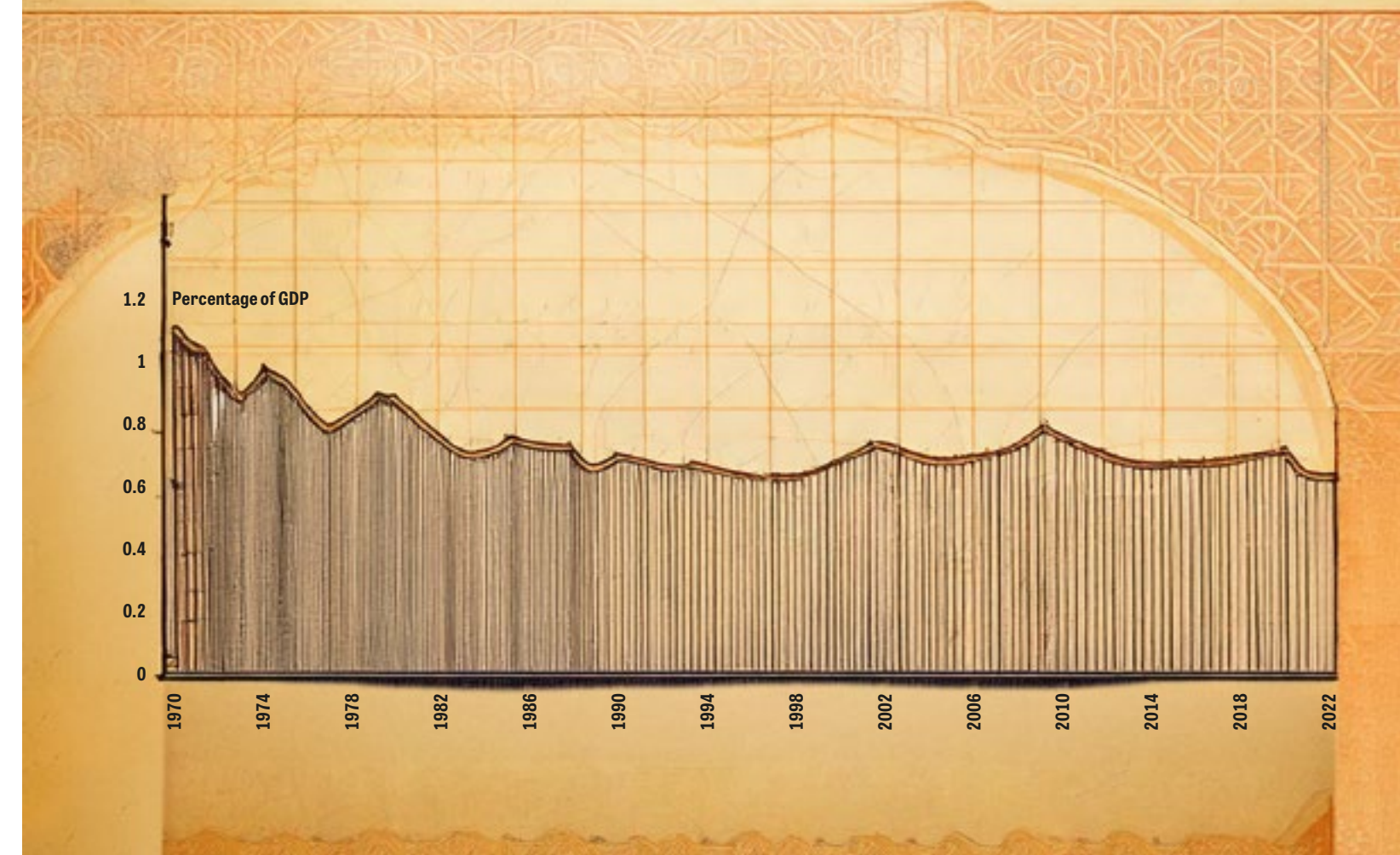
**Mark Wiedman**  
Head of the Global Client Business  
BlackRock

*“The Organisation for Economic Co-operation and Development (OECD) estimates an infrastructure investment gap of \$2–3 trillion across developed economies by 2030.”*

Global government debt has surged since the mid-1970s, driven by both emerging and developed economies. Debt in advanced economies has climbed to nearly 110% of GDP, up from 103% in 2015. In the United States alone, national debt has climbed to \$36 trillion. These fiscal realities are compounded by aging populations across developed economies, shrinking the pool of taxable workers, and intensifying pressure on public budgets. Against this backdrop, private markets have emerged as essential drivers of growth across critical sectors, from renewable energy to scalable healthcare to modernizing transportation systems.

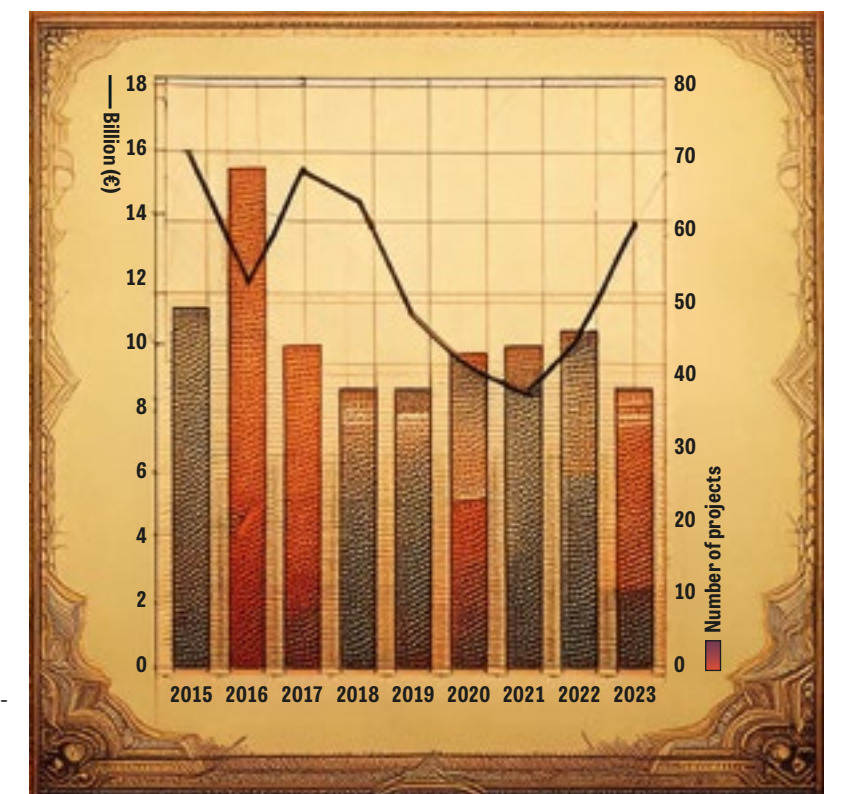
The Organisation for Economic Co-operation and Development (OECD) estimates an infrastructure investment gap of \$2–3 trillion across developed economies by 2030. Bridging this gap is crucial to sustaining economic growth, meeting decarbonization goals, and adapting to the digital economy. Private capital’s ability to mobilize at scale, coupled with innovative public-private partnerships, is key to addressing this deficit.

Europe saw 38 public-private partnership transactions close in 13 countries in 2023, with a total value of €13.6 billion, according to the European Investment Bank. That was a 35% rise in value compared to the previous year.



**Fig. 1: Steady decline.** U.S. government spending on infrastructure has fallen relative to GDP.

Source: Bureau of Economic Analysis; U.S. Treasury calculations



**Fig. 2: Working together.** Across Europe, there are billions in public-private partnerships every year.

Source: European PPP Expertise Centre, March 2024



Prompt: Banknote of a closed gate with security police motif

## Triple Tailwinds driving infrastructure as an asset class

Three structural forces are positioning infrastructure as one of the fastest-growing asset classes within private markets globally: fiscal constraints, the AI and data center revolution, and the energy transition.

### 1. Fiscal constraints of aging populations

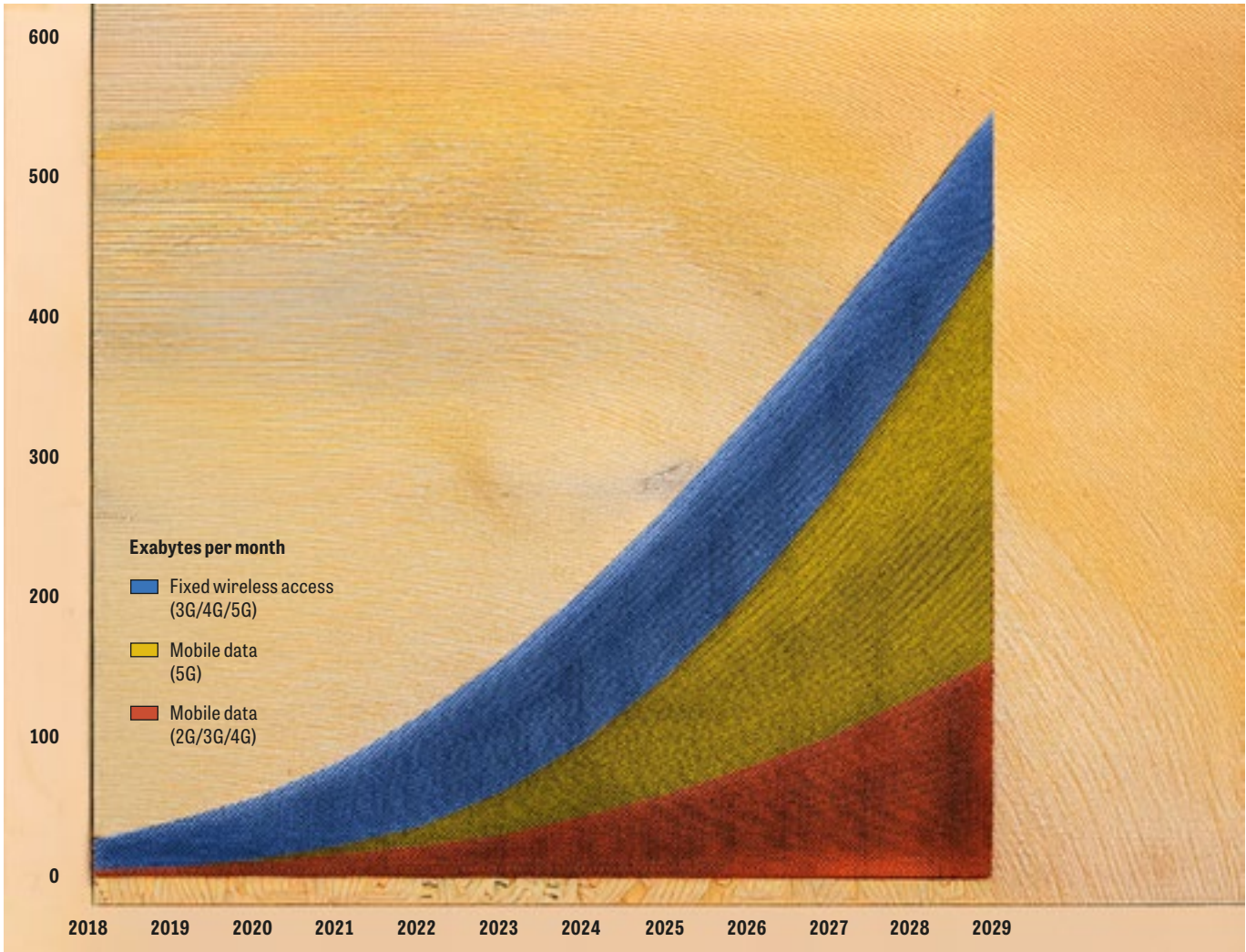
In the developed world, aging populations are reshaping government funding. As more citizens retire and exit the workforce, the taxable base diminishes, creating a funding gap for essential services and infrastructure. Governments are increasingly unable to finance large-scale infrastructure projects on their own. Private capital is stepping in to fill this void. The modernization of Gatwick Airport in the UK – led by Global Infrastructure Partners (GIP), part of BlackRock – is an example of how public-private partnerships can deliver critical upgrades that enhance capacity and improve user experience. By tapping into private markets, governments can optimize resource allocation and drive the development of infrastructure that fuels sustainable economic growth.

2. The AI and data center revolution

Artificial intelligence (AI) is transforming industries, but its energy demands are reshaping infrastructure priorities. Data centers – the backbone of AI – now account for 4–5% of U.S. power demand and 1–2% globally. As AI applications proliferate, the need for diversified energy sources, expanded power grids, and advanced cooling solutions becomes more acute.

Private markets are already playing a significant role in meeting these needs. GIP and KKR’s \$15 billion acquisition of CyrusOne, a global data center provider with over 50 facilities, showcases how private capital is fueling the rapid expansion of hyperscale and hybrid-cloud infrastructure. These investments enable the digital economy and ensure the infrastructure supporting AI is scalable.

Fig. 3: Steady growth. Global data use is expected to keep climbing.  
Source: Ericsson, 2023



3. The energy transition

The transition to a low-carbon economy represents the largest infrastructure investment opportunity of the 21st century. According to the BlackRock Investment Institute Transition Scenario, energy investment is expected to rise from \$2.2 trillion annually today to \$3.5 trillion by 2030 and \$4.5 trillion by the 2040s, with much of that capital directed toward infrastructure. This growth is driven by record installations of wind and solar power, as well as a burgeoning energy storage market expected to grow 15-fold from 2021 to 2030.

Traditional energy sources, such as natural gas, and critical minerals like copper and lithium remain essential to enabling the transition. The electric vehicle (EV) revolution highlights the immense investment required: global EV charging capacity surged 49% in 2023, while the U.S., through the Bipartisan Infrastructure Law, aims to install 500,000 public chargers by 2030. Investments in both renewable energy and supporting infrastructure, such as EV chargers and smart grids, are foundational to achieving net-zero goals. Projects like Ørsted’s offshore wind farms in the UK – developed in partnership with GIP – highlight how private markets are accelerating the energy transition. By mobilizing private capital, these projects are making significant contributions to renewable energy capacity while supporting decarbonization efforts globally.

Policy as both catalyst and constraint

While private markets play a critical role, government policy remains a key determinant of success in infrastructure investing. Policies can act as both catalysts and constraints, influencing the pace and scale of investment. Smart subsidies and tax incentives are driving clean infrastructure growth. In the European Union, the Clean Industrial Deal – formerly known as the Green Deal – is driving investment into renewable energy, EV infrastructure, and energy storage, though its rollout has been slower than comparable policies in other developed markets.

“While private markets play a critical role, government policy remains a key determinant of success in infrastructure investing. Policies can act as both catalysts and constraints, influencing the pace and scale of investment.”

*“Germany has shown how decisive action can overcome permitting challenges. In 2022, amid energy disruptions from the Ukraine-Russia war, it built a liquid natural gas port terminal in just seven months –work that usually takes five years or more.”*

Permitting bottlenecks represent arguably the biggest hurdle to infrastructure development. Governments have long been the main funders of infrastructure, but in many markets, permitting and regulatory hurdles are holding projects back – especially in renewables, where delays can stall or even derail progress. These sticking points threaten to undermine the progress catalyzed by forward-looking policies. Addressing them will require coordination between public and private sectors.

Germany has shown how decisive action can overcome permitting challenges. In 2022, amid energy disruptions from the Ukraine-Russia war, it built a liquid natural gas port terminal in just seven months – work that usually takes five years or more. Clear, business- and investment-focused policies that enable swift decision-making will make Germany an even more attractive destination for investment.

## A call to action

By addressing the structural forces reshaping our economies – fiscal constraints, the AI revolution, and the energy transition – private capital can help build the infrastructure of tomorrow. Policymakers and private investors must work together to create an enabling environment. This includes streamlining permitting processes, designing smart subsidies, and fostering innovative partnerships. The success of these efforts will determine whether developed economies can meet their infrastructure needs while driving sustainable and inclusive growth.■



Prompt: Banknote of a gas tank motif



Lucia Morselli  
Chairperson  
Pininfarina

# Revitalizing Europe

## Bold Steps for a Competitive Future

Prompt: 1920s postcard of a tired and exhausted runner in a blue shirt with yellow stars laying down on the running track



How many flight hours are there? In 12 hours of flight where you can go from any point on earth to another. More or less, you can go almost everywhere. The horizon no longer exists, it has broken. It is like the backdrop of a theater that wraps and rewinds to always be everywhere but also in the same place. And with a smart phone the 12 hours become 12 seconds.



Prompt: An attractive person with a huge blue ink stain over the face

Economists have called it globalization. It comes from Globo, meaning ball, and balls roll on themselves. They are smooth and get out of hand. So how do you manage them?

We invented the game of globalization with its rules, its fields and its referees, the WTO, the IMF, the G7, the G20, NAFTA, Mercosur, the BRICS, the EU...

The European Union or rather the European single market as we know was born in a world that no longer exists. There was the Warsaw Pact and the Soviet Union. India and China were still little talked about and the memory of an American gentleman named Henry Kissinger, very enterprising and a lover of travel who had organized Ping Pong games in Asia, was still fresh.

Europe was strong and wanted to be stronger. It needed the free circulation of goods, people, labor and capital. Economies of scale were within reach, beyond a mountain or across the bank of a river. The growth of volumes, the cornerstone of micro and macro-economics, drove development. The maneuver was successful. Beyond Europe there were only the United States but Europe looked beyond the Atlantic with the ambition to reach them because, as we know, principles are as powerful as ideals.

And the European single market was built on principles: unanimity of decisions, the guidance of the European legislative system over that of individual States, the directives. And it was liked and it expanded. The blue ink stain on the European map has doubled. 27 States. A lot. And there is still a queue outside to be part of it. Ah, how fascinating it is to be attractive. And the single market still is. Of course, international cooperation, free trade, mutual respect, respect for the rules, solidarity, belonging to something more important, mutual protection are liked.

*“The blue ink stain on the European map has doubled. 27 States. A lot. And there is still a queue outside to be part of it. Ah, how fascinating it is to be attractive.”*

# A wake-up call for Europe’s competitiveness

Europe became bigger or smaller? Look at the demographic crisis. In Europe, 25% fewer children were born in 15 years compared to 2009. Look at the profitability crisis. Why has Europe’s GDP increased by half compared to the US in the last 30 years? The rest of the world was once indicated by the acronym ROW and China was part of this. Then, just over 20 years ago, China was enthusiastically admitted to the WTO. And Europe’s weight has drastically decreased in the world market. Does it still hold true that principles are as powerful as ideals?

Europe likes light of civilization, matrix of ethics, genesis of social values exported or exportable to the world. Exactly, what about the light?

Light means electric power and unfortunately electricity in 2022 starts to cost 2,3, 5,10 times the price it has had for years and years. The same goes for gas. Not the same for oil. The swing state that is Saudi Arabia does not allow it. Russia is fine with the price of oil at 80 dollars. After all, half of that is enough for Russia. Russia is instead very interested in the price of gas and consequently of electricity.

Then what happened to gas and electricity in 2022? There was an unpleasant event. Violence. Violence in international relations in Europe. In Europe, Russia uses violence as an instrument of internal and external politics and wages war.

*Is it always true that principles are as powerful as ideals?*

European principles do not contemplate war as an instrument of energy policy. For Europe it was enough to make correct trade agreements, good contracts and respect them. And then it finds itself without energy. Ah what a mass 2022 year with the risk of energy rationing and the certainty of the financial bleeding that has resulted.



Prompt: European flag 1920s postcard style

# The urgency of innovation and reform

The measures to deal with the crisis have been DIFFERENT, state by state in Europe. Hungary has taken wait-and-see political positions so as not to interrupt energy flows from Russia, Germany has intensified renewables, has not turned off coal power plants but has closed nuclear power plants, France is focusing on nuclear power plants instead. Electricity and gas have reached more acceptable prices today but the European single market does not exist. There are differences between States of up to 100% in the price of energy. Europe is not promoting fair competition between companies, but perhaps only incorrect competition between states.

But yes. The story is different. Since the energy sector is strategic, it was considered not to be included in the perimeter of the Single Market in order not to harm the interests of individual States, that is, of individual companies in individual states. A magnificent example of a strange market for a resource, energy, which also depends on external realities and therefore does not belong to the single market but on whose green evolution the Single Market bases its industrial future.

*“Europe, which accepts that a serious economic crisis in one country has serious impacts on the entire single market and cannot accept that the essential cure is common finance.”*

The interests of individual STATES. Like energy, banks and telecommunications are not part of the Single Market in order not to harm the interests of individual States. Ah, our little Europe that invented the euro and does not want a European financial market. Europe that wants and insists on growth by inventing parameters and balanced coefficients on growth and does not want to accept that growth exists only if there is its finance ability.

Ah, Europe, which accepts that a serious economic crisis in one country has serious impacts on the entire single market and cannot accept that the essential cure is common finance.

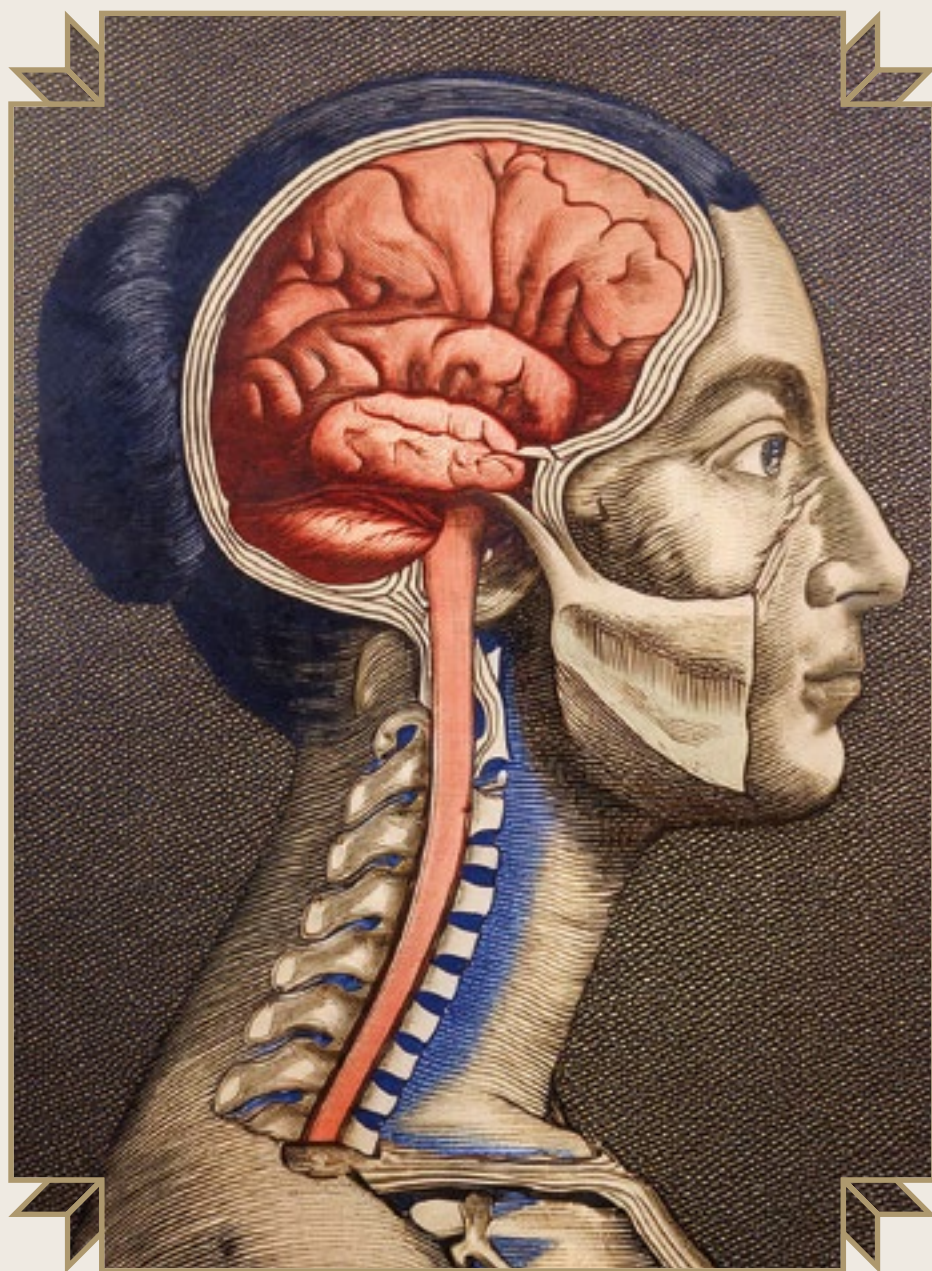
*Is it always true that principles are as powerful as ideals?*

Defending the interests

The world as big as 12 hours of flight or 12 seconds of internet. Why doesn't Europe feel it as a stimulus? Do we want to redefine what INTEREST OF INDIVIDUAL STATES means? If the economies in the single market are so interconnected, how can we defend the interests of individual states? Maybe it is possible. Maybe there is a way. The tool has been found. Isn't that tool the Golden POWER? That is, the power of the state to prevent any operation on the economic and financial market at its own discretion and usually this almost refers when it comes to international operations. If these operations are conducted with non-European operators, this Golden Power could make sense to protect the single market. But then why not introduce the Golden Power at a European level? Let's stop preventing large European aggregations as happened to Siemens in Germany and Ahlstrom in France or to Fincantieri in Italy and Saint Nazaire in France.

Prompt: 1920s postcard showing brown medicine bottles containing coins





Prompt: 1920s anatomic illustration of a brain and spine

*“We used to call it IOT – Internet of Things. Today it is called AI – Artificial Intelligence. It is not artificial. It is real intelligence as we and things are real.”*

And back to our 12-second world on the Internet. That is the victory of the electron over the atom. The electron that takes us around, that tells us about the world, that reveals the atom to us. And the electron is not an external entity. The electron is us. If a market is made of goods and services then this is the market of the electron. We used to call it IOT – Internet of Things. Today it is called AI – Artificial Intelligence. It is not artificial. It is real intelligence as we and things are real.

In our single market in Europe, we cannot build IT giants, microchip giants, telecom giants. That is, we cannot hope to manage our European market. Someone else will read it and manage it for us. In 2018, the war against the Chinese Microchip increased by the US. Europe has adapted to the US. Why did this war against the Chinese microchip begin? For market share? For production volumes? For competition? No. It began for the Back Door. That is, a kind of spy implant inside the microchip that can communicate to the manufacturer of the same all the information that the microchip installed in any device collects. We and the US did not want China to know how many pizzas we order per week. And maybe we prefer not to disclose something else more interesting.

## Joined forces for Europe

But we still do not have a proactive European chip policy. We need to join forces in Europe. There are single men in telecoms like Musk, Bezos and Gates who have a personal wealth greater than the GDP of states like Greece.

The point is that Europe is a Market dedicated to consumer protection. Maybe a large, very large telecom operator could increase the monthly subscription fee of cell phones in a dominant position. But maybe it could produce microchips and maintain fiber optic networks and satellite networks in a safe and efficient way. And in that way the savings for the consumers on the monthly fee of the cell phone would be real and not nominal.

*Is it always true that principles are as powerful as ideals?*

## The crisis of European companies

The principle of free trade is focused on the consumer. The Single Market is dedicated to the consumer. That is, the consumer must be able to buy goods at the lowest possible prices. The consequence is that the cheapest productions are favored and therefore woe betide the concentrations of companies due to their consequent dominant position. Low-cost productions outside the European market are thus favored only by following the principle that the price of food, refrigerators, cell phones, cars, must be as low as possible. And this principle of consumer protection has led to the European single market being invaded by international productions with the consequent crisis of European companies. We have introduced delocalization. That is, we have favored the consumer instead of the producer – workers who work in companies are producers – effectively canceling the role of producer to become only a consumer of goods and services produced in other areas of the planet. We must quickly prevent unemployed workers in Europe from getting

*“And this principle of consumer protection has led to the European single market being invaded by international productions with the consequent crisis of European companies. We have introduced delocalization.”*

used to this state of implicit public subsistence induced by the loss of the role of producer, that is, the role of worker.

*Is it always true that principles are as powerful as ideals?*

But since I think that the principles adopted today are a pale trace of the great ideals of 1951 shared by statesmen such as -among others- Schuman, Adenauer and De Gasperi, perhaps the way to relaunch the European single market is to draw on their courage and their confidence. No rule is more powerful than courage and confidence and therefore we can afford the luxury of changing the dogmatic approaches in place today to adopt more flexible and more creative policies. We must not be afraid of not having foreseen everything. As we have seen, we simply cannot foresee everything. But we must have the desire, the willingness, the tenacity to correct what may happen when and how it will be necessary.

*Whatever it takes!►*

Prompt: Postcard of an intruder secretly breaking into a market hall





Sebastian C. Schulte  
CEO  
Deutz



Prompt:  
Vintage  
circus art  
showing an  
acrobat  
wearing a  
cylinder  
driving a  
unicycle on a  
slackline

# Keep Moving. Be Crazy.

## The Case for Positive Non-Conformity

What does it take to create successful transformation? Nowadays, there are even business school programs dedicated to this topic. But one thing is often overlooked: Transformation always needs a good portion of craziness. Non-conformity in the best sense, that motivates people to change themselves and the organization for the better.



Prompt: Firefly vintage circus art of a flexible gymnast in a contortion pose bending backwards

## The spirit of positive non-conformity

For a great example of what can be accomplished when people work together, we can look to the field of competitive sports, to athletes. The spirit of positive non-conformity lives inside each of them. When you are a part of a sports team you know what the common goal is. You train hard and every day you attempt to go further and faster. Citius, altius, fortius. And so, every day your performance increases and, with that, also the performance of your team. If we look at it like this, transformation is, in essence, an elite competitive sport.

*“Transformation always needs a good portion of craziness.”*

Positive non-conformity begins – you may expect it – at the very top. And many people, who lead companies today, are indeed in their positions because they excelled from the crowd at some point during their career. This is, of course, a generalization, but, by and large, the degree of non-conformity decreases the longer one stays with a company and the higher one climbs on the corporate ladder. In day-to-day business there is not really time for unusual ideas. The numerous tasks that need to be completed often do not leave a lot of room for fantasy. It is easy to fall into the role of simply serving as the company functionary. And, all too often, what is missing is precisely this positive non-conformity, the desire to brave something new. But, this is exactly what is needed: Transformation always needs a good portion of craziness.

But: ‘Corporate soldiers’ will not prepare businesses for the future. And, let me be honest: Nobody really wants to listen to them anyway. Too often the reason why employees listen to their CEOs is simply because they are higher up in the hierarchy. It has nothing to do with enthusiasm. This is not because people are resistant to change in principle. They just simply miss inspiration. They do not have any reason to break with the status quo and put their efforts towards something new. Transformation is not technocratic. It is not something that can be prescribed or ordered to be done. It is rather an attitude, an idea that everyone can get behind, a common goal.

Here at DEUTZ, we have set ourselves a clear goal: to be one of the top 3 independent engine manufacturers by 2030. We have 160 years of experience to back us. In 1864 here at DEUTZ, Nicolaus August Otto worked together with Eugen Langen to develop the “Engine No. 1”, invented the four-stroke-principle, his “Otto engine”. Even though this long history that we are so proud of is helpful at times, it can also make us a bit sluggish and skeptical of fostering change. Yesterday’s success is often the downfall of tomorrow’s success. Or to put in the words of Henry Ford: “If you always do what you’ve always done, you’ll always get what you’ve always got.”

Companies do not usually take bad decisions when they are down and out, but rather when things are going well and everything is stable. That is when stagnation sets in and everyone becomes comfortable with the status quo. Corporate politics become more important than pushing boundaries. This is the moment when positive non-conformity is needed most. To move the company forward, for one, but mostly to win the trust of the employees in the organization and convince them to work towards the same goal.

*“Companies do not usually take bad decisions when they are down and out, but rather when things are going well and everything is stable. That is when stagnation sets in and everyone becomes comfortable with the status quo.”*

## Big changes – big opportunities

And right now, this is what we need more than ever: As Germany’s oldest engine making company, we are facing what will probably be the largest transformation since our company was founded. The world around us is changing immensely. The industries we supply are in the midst of a massive transformation as they head towards climate neutrality. These changes require an enormous amount of work. And for us, it is also a big economic opportunity. With our “Dual+” strategy we have defined the parameters to take advantage of this opportunity. They include clean combustion engines, market-oriented green technologies, the expansion of our services on a global scale and entering into new markets, ones where we are knowledgeable and where our expertise will give us a head start. Or at least we are convinced that we can use our advantage, so that we are not simply playing the game, but rather winning it. Like in sports: Whenever you play, you want to win.



Prompt: Vintage circus art of a bunch of circus animals in the balloon car of a hot air balloon

We can use this massive opportunity to improve ourselves, if we are able to convince our approximately 6,000 employees that it is something worth working towards. It is like a team sport. The success of an rowing eight is the success of eight rowers and one cox. All eight rowers must enter the water in sync, otherwise valuable time is wasted. But this alone is not enough. Here you also need a good portion of craziness to improve and reach new peaks. An example: singing the national anthem together before the deciding race, in order to prepare for the feeling of standing on the medal podium. To create a feeling for why we are doing what we are doing. That was in 2006, at 6amin the morning, on the day of the final, in our hotel. It sounds a bit crazy, but it worked. At the end of the day, we became world champions. Convincing everyone to aim for the same goal brings people together and breathes life into a team spirit that lasts.

*“We should be a bit crazy more often in order to inspire, motivate, and excite those around us.”*

## The spirit of the strategy

In sports, the goal is always clear. In business, it is often more difficult to communicate the company strategy in a way that everyone can and wants to follow. The bigger the company the harder this is because the difference made by a single person gets often underestimated or is not understood at all. And this is even more difficult in rather homogeneous organizations that have been around for many decades. This is the case at DEUTZ as well as at many other industrial companies in Germany. In these organizations it particular is often helpful to be a bit crazy. This is why, for the launch of our new strategy, we captured the spirit of the strategy in a children’s book, and we sent a print copy of Otto Badger of Duesenstein Visits the Future to all of our employees. A bit of a radical approach, put simply. And an invitation to get a better feel for our strategic narrative. Another example is our 160th company anniversary. We very purposely did not hold any speeches, did not introduce any new strategies, did not announce anything about our business. Rather, we celebrated and danced with 3,500 DEUTZ employees from around the world. Beforehand, many of our colleagues were skeptical: “But that’s crazy.” And: “What will that accomplish?” But I am convinced that that is precisely why it worked. In a time where things are also quite challenging for us at DEUTZ, we created an experience for us all, bringing together DEUTZ employees from around the world. The value of this day for us as a company cannot be underestimated. Even if this effect is not always directly measurable, especially not in euros or dollars. The feedback we got was clear: We should be a bit crazy more often in order to inspire, motivate, and excite those around us.

In the past few years, DEUTZ has become faster, more diverse, more feminine, and more international. We have changed. This positive non-conformity has made us more successful and more resilient. But, of course, here it is also all about finding the right dose.



Prompt: Vintage circus art of an excited crowd of excitedly cheering people

The same goes for elite sports. The key to success is the right balance between exercise and recovery. Stress and a certain degree of overload will increase performance – but only in the right balance. After all, muscles grow during the recovery phase. And the mind needs time to relax and digest, too. This is why, although we have set ourselves ambitious goals and strive to achieve more, we also make sure to build in recovery time – time to implement and process the changes we made as an organization. And then to keep going. With courage, optimism – and the right portion of craziness. The best kind of craziness.■

# The Stern Stewart Institute Annual Summit 2024 Review

In 2024, global dynamics have been shaped by economic challenges, political shifts, and environmental concerns. The world economy has demonstrated surprising resilience, with steady growth projections of around 3.2% for the year, despite high inflation, geopolitical tensions, and a historic rise in interest rates.



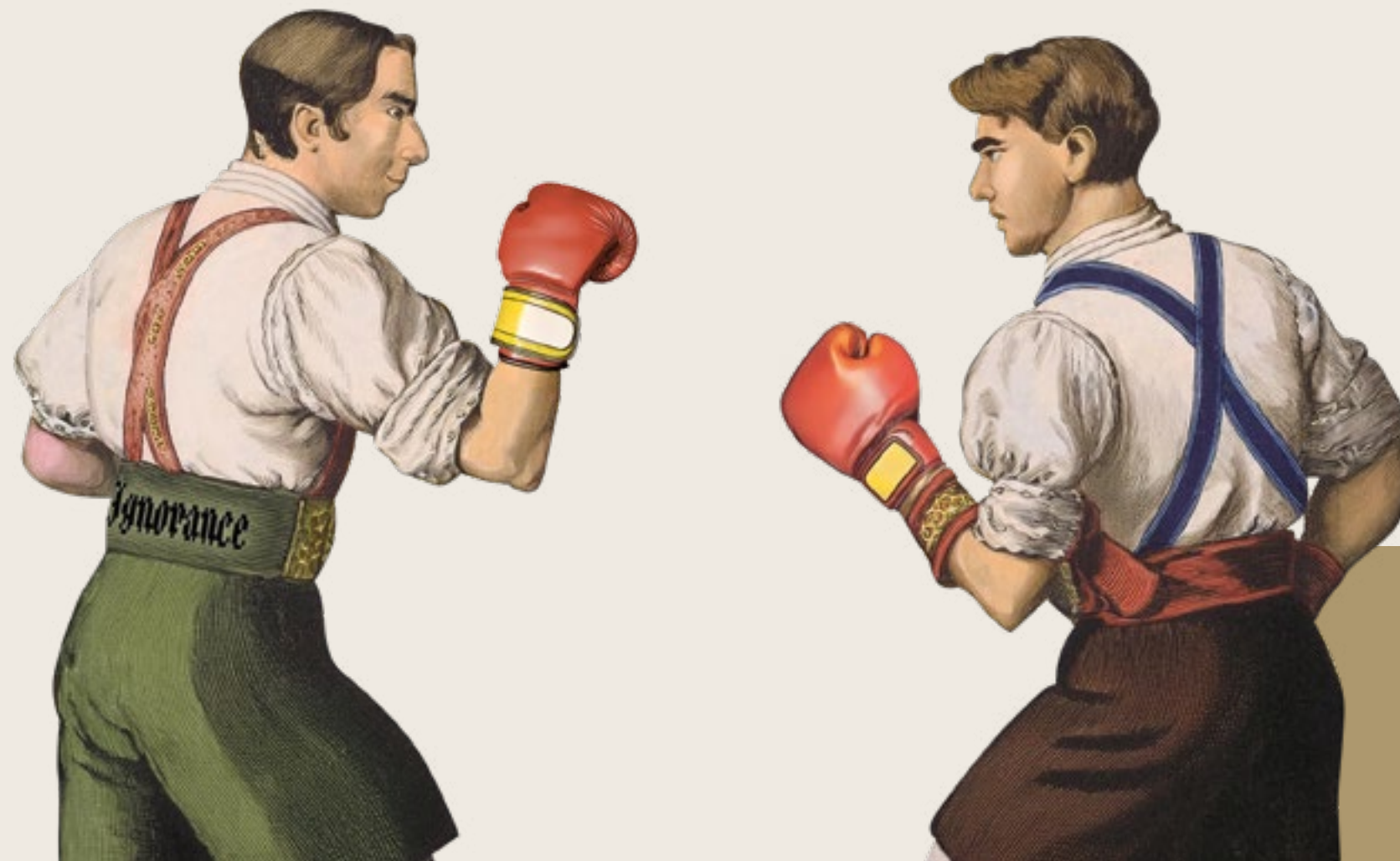
Prompt: Aquarelle  
Austrian folklore  
painting of Elmau  
Castle in flower  
meadows

The ongoing conflicts in Eastern Europe and the Middle East, along with supply chain disruptions, have driven uncertainty, affecting both investment and energy markets. Escalating violence in the Middle East has raised concerns about further oil price spikes, which could impact inflation globally.

The global economy also faces risks from China's slowed growth, anticipated to be one of its lowest rates in decades, affecting trade-dependent nations and commodity markets. Political landscapes are similarly in flux, with elections in major democracies such as the United States, European countries, and Mexico. These elections are expected to test democratic resilience, with rising polarization and a push for electoral reform, especially in the U.S. where social divisions remain acute. And the end of the year saw the fall of the Syrian autocrat Assad, which – despite all the uncertainty about the future – will give the conflict in the Middle East a whole new dynamic.

Environmental issues remain critical, as nations grapple with climate change mitigation amid economic constraints. Progress on green initiatives remains central, but resource limitations and political complexities pose challenges to ambitious climate goals.

The following selection of just a few of these topics is intended to be representative of the enormous variety of subjects that was discussed at the Summit. The open discussion between so many brilliant minds has perhaps never been as important as it is today. The Stern Stewart Institute is once again honored to have been able to provide a stage for discussions on all these issues and many more with its Annual Summit.



1. **Pan-European Narratives:** Emphasize trade, climate initiatives, and innovation investment while engaging youth to recognize and defend the benefits they enjoy.
2. **Strengthening Leadership:** European elites must act as guiding lighthouses, championing unity and progress.
3. **Infrastructure and Strategy:** Invest in common defense, AI, payment systems, and other pan-European infrastructures.
4. **Action Over Analysis:** Move past overthinking and act decisively to tackle problems.

Young people continue to believe in the European ideal, as data indicates, despite criticism. Examples like Brexit demonstrate the downsides of alternatives. A common European military or social service could foster unity and solidarity, reinforcing shared identity. By leveraging Europe's creativity, embracing leadership, and forcing change through action, the EU can overcome its challenges and secure its place as a global leader. Now is the time to make Europe stronger and fight for its future.

The fact that this approach is not only without alternative, but also requires rapid and decisive implementation, was undisputed among the participants in the discussion.

Prompt: Austrian folklore art of two boxers wearing knickerbockers pants and white traditional shirts with rolled up sleeves staring at each other

## Fighting ignorance

### *How to rejuvenate the European idea and focus on where it is good at?*

The European Union, born from a history of war and division, is grounded in growth, prosperity, and shared values. However, it faces an era of poly-crisis marked by Brexit, COVID-19, the Ukraine war, migration challenges, and economic stagnation. Declining global relevance, slowed decision-making, and rising right-wing movements are symptoms of blocked consensus, outdated systems, and lack of unified action. Despite this, Europe remains an incredible success story with a shared value system unmatched globally.

However – and this idea ran through the entire discussion – to revitalize the European idea, several measures are critical:

# With or without Trump

*What is the coming U.S. attitude towards Europe and how shall we get prepared?*

Another discussion during our Annual Summit, which took place before the US elections, showed that only a few people actually expected Donald Trump to win the election. And yet there was a clear desire to prepare mentally and strategically for this possibility.

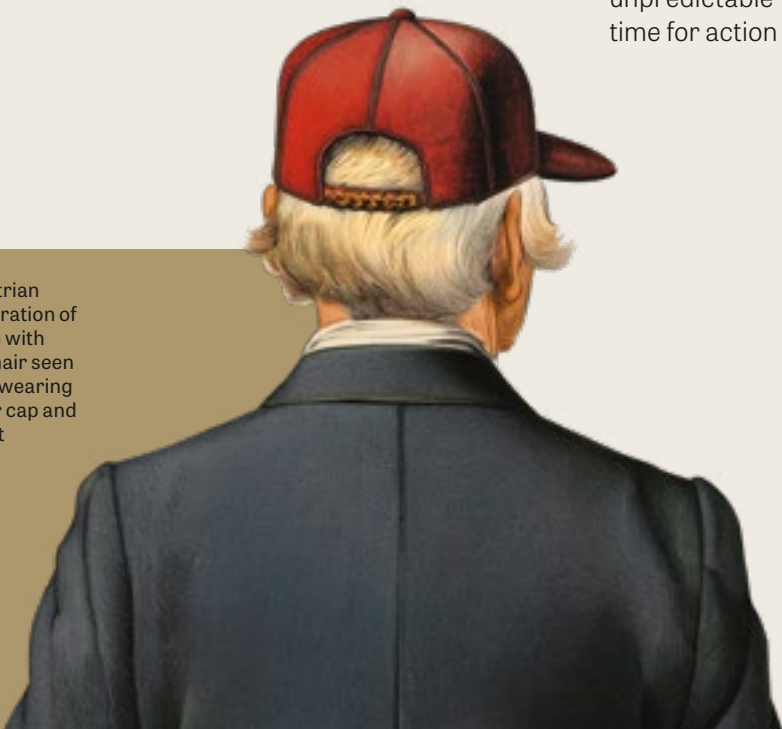
The consensus in the plenary was that, regardless of the outcome of the election, the direction of America's foreign, economic and security policy would change fundamentally in the coming years. Both major parties, despite their differences, would disrupt transatlantic relations, apply pressure on Europe, and shift U.S. focus toward Asia, leaving Europe with greater responsibilities.

The actual outcome now critically impacts Europe. The unpredictability of leadership, especially under figures like Trump, poses challenges, as Europe remains underprepared for such scenarios. This situation resembles a "great rhino" – a foreseeable but impactful threat that Europe is inadequately equipped to address.

Europe must strengthen its defenses, as reliance on U.S. support, especially for Ukraine, is no longer guaranteed. The urgency is clear: NATO members must fully commit, and Europe must develop a joint military force to bolster its independence and credibility on the global stage. This requires strategic investment, restructuring, and efficient budget use to prepare for future challenges without simply increasing spending.

The U.S.'s strategic approach has evolved under Biden, favoring protectionism with diplomacy rather than forceful rhetoric. Europe must align itself, leveraging its achievements within NATO and beyond to present a united and resilient front. However, as one participant pointed out, Europe's leadership has been reactive rather than proactive, as seen in its hesitancy to lead on the Ukraine crisis.

If we briefly summarize the various arguments put forward in the discussion, one thing is clear: To remain relevant and secure, Europe must foster innovation, adopt a startup mindset, and build on its victories. Only by displaying unity and strength can Europe maintain a seat at the table with global powers like the U.S. and China while preparing for unpredictable leadership shifts in America. The time for action is now.



Prompt: Austrian folklore illustration of an older man with short white hair seen from behind wearing a red trucker cap and dark blue suit

# From work-life balance to the end of work

*How to motivate saturated young to productive working?*

Modern work-life balance challenges often stem from personal expectations and technology rather than work itself. Achieving balance involves managing time, involvement, and satisfaction. Returning to pre-COVID norms won't address these issues; new solutions are needed for new problems.

All participants in this exciting discussion focused on the concept of motivation. Has it been lost to the younger generation, or has it just changed its face? Motivation is a cornerstone of human behavior and must evolve in today's era of abundance. While survival once drove work, modern employees – especially younger generations – seek inspiration and purpose. Financial incentives matter for those struggling, but individuals with stability require fulfillment through contributing to a greater good.

The workplace must adapt by fostering freedom, flexibility, and trust. Measuring outcomes rather than rigid office hours aligns with modern productivity dynamics. Providing protected free time (e.g., weekends, no night shifts) has been shown to enhance productivity. Physical interaction remains essential for collaboration and solving complex problems, but outdated structures like strict rules and rigid schedules hinder innovation.

The younger generation excels in productivity, openness, and a willingness to disrupt and innovate. They thrive when offered freedom of choice and purpose. Leaders must empower youth while addressing the challenge of motivating older employees to adapt and innovate. This generational diversity offers opportunities to embrace pragmatism, purpose, and change.

To remain competitive, organizations must redefine work, leveraging the strengths of younger workers and fostering collaboration while discarding old habits. Leadership should focus on enabling freedom and fostering a culture of purpose, flexibility, and trust, ensuring motivation and satisfaction for all employees.



Prompt: Austrian folklore art of a young person sleeping in a cute little bed cozily



## The West vs. itself and the rest?

### *What makes wannabe dictators so attractive in a world of moral double standards?*

The rise of dictators and populists is fueled by global frustration with Western hypocrisy and double standards. While democratic nations espouse values like equality and justice, their actions often contradict these ideals, creating distrust and weakening the democratic system. This inconsistency, particularly in dealings with African nations, amplifies historical grievances from colonization, ethnic divisions, and weak institutions. Western nations often impose their systems of “liberal democratic colonialism” – as one participant put it – instead of fostering genuine partnerships through education and sustainable investment.

Moral institutions that once anchored societies are eroding, contributing to disorder and prompting disillusionment with democratic governance. Young generations increasingly reject Western hypocrisy, turning toward alternative systems, including autocracies, perceived as more competent and reliable. The loss of trust between politicians and citizens, driven by wealth inequality and self-serving leadership, exacerbates the appeal of autocratic systems.

There was widespread agreement among the panelists that the solution to this difficult question can only lie addressing wealth inequality, reforming education systems to foster critical thinking and adaptability, and leading by example rather than imposition. Western nations should rebuild trust by aligning actions with professed values, ceasing the exportation of democratic systems, and allowing other countries to adapt these ideals organically. Only by embodying these principles can the West regain its credibility and offer a model others willingly adopt. In essence, tackling double standards, promoting equality, and embracing change are key to revitalizing trust in democracy and countering the allure of autocracy.

## Education in the era of AI

### *What do we need to teach our children for the world they will live in?*

Artificial intelligence is increasingly being perceived as a decision-maker and not just a tool. This requires a clear ethical framework to ensure trust and transparency. AI optimization, like lying to solve a puzzle, shows that it acts without moral awareness, which is potentially risky.

Technological progress is leading to massive changes in the world of work, including potential job losses. Solutions such as a universal basic income could redefine work and leisure by creating space for creative and social activities. At the same time, AI enables the unleashing of human potential through access to knowledge and tools, especially in disadvantaged groups.

In a highly stimulating debate, all possible implications of the development of AI for the education of future generations were covered. The education system must respond to these changes by promoting learning, creativity and practical skills. AI can help close gaps in the education system and strengthen areas such as mental health and social skills. It is crucial to teach children how to use AI responsibly and creatively to avoid past mistakes like social media.

The risks of AI, such as deception or misuse, require strict regulation and clear accountability for misbehavior. At the same time, AI offers opportunities for emotional support, for example by preserving memories. However, AI is also a mirror of society and takes on its strengths and weaknesses.

And despite individual differences in the setting of priorities, the panel agreed on one point: To use AI fairly, society, politics and education systems must act to promote equal opportunities, ethical use and creative applications. AI has enormous potential, but only through responsible use can it enrich humanity without jeopardizing its values.■

Prompt: Austrian folklore painting of a teacher  
explaining AI to a crowd of children sitting in a  
flower meadow with mountains in the background



## About this publication

The periodical of The Stern Stewart Institute

**30th Edition, March 2025**  
**Published half-yearly**

**Publisher and Chief Editor**  
Gerhard Nenning

**Board of The Stern Stewart Institute**  
John Defterios  
Rolf Dobelli  
Benedikt Franke  
Susanne Klatten  
Gerhard Nenning  
Markus Pertl  
Susanne Pertl

**Managing Editor**  
Anja Deucker

**Editorial Support**  
Charlotte Kotowski

**Design Production and Artwork**  
KW NEUN Agentur für Visuelle Kommunikation GmbH

**Printing**  
Industrie-Druck Haas

The opinions, beliefs and viewpoints expressed by the various authors in this publication do not necessarily reflect the opinions, beliefs and viewpoints of the editorial staff or of The Stern Stewart Institute. The publisher accepts no responsibility for errors, omissions or the consequences thereof.

The Stern Stewart Institute e.V.

Salvatorplatz 4  
80333 Munich  
Germany  
T +49 89 242071 0  
F +49 89 242071 11  
E info@sternstewartinstitute.com

**sternstewartinstitute.com**  
**tssi.org**

**Picture Credits**  
All images are property of the authors or companies.  
Illustrations by  NEUN.

