



NEW TECHNOLOGIES AND THE FUTURE OF INDIVIDUALS, ORGANISATIONS AND SOCIETY

Impact Papers digest 2023



CONTENTS

4 Foreword

B. Business Impact

- 8 The key to unlocking new sources of competitive advantage?**
AI-human collaboration
Louis-David Benyayer,
Hao (Howard) Zhong
- 10 Why governments should coordinate AI regulation**
Pramuan Bunkawanicha,
Diego Abellán Martínez
- 12 Are NFTs really so futile and how can companies make them less so?**
Perrine Desmichel, Isabella Maggioni,
Saeid Vafainia
- 14 When technologies invalidate theories**
Frederic Fréry
- 16 How policymakers can overcome the ethical challenges posed by generative AI**
Diana Garcia Quevedo, Caroline Verzat,
Tristan Dupas Amory
- 18 Revolutionizing healthcare: The role of AI in transforming cancer treatment**
Frédéric Jallat, Rym Aouchiche
- 20 Four solutions from football to create unique and novel brand experiences through NFTs**
Vitor Lima, Marc Oberhauser
- 22 The intelligent hand, mind & heart: Unlocking human potential in the age of AI**
Chiara Succi
- 24 Empowering leaders: AI's transformational impact on strategic decision-making**
Maximilian Weis

E. European Impact

- 28 No, strict environmental rules do not harm global high-tech firms' competitiveness**
Régis Coeurderoy, Valérie Duplat,
Duong Nguyen Huu Thi Thuy
- 30 Offshore wind power: both a threat or opportunity for offshore oil and gas incumbents**
George Horsington
- 32 Take the bull by the horns: Surveillance capitalism in the public policy sphere**
Philipp Richter, Benedikt Kapteina

S. Societal Impact

- 36 The role of technology in sustainability strategy: Moving from “What do we do?” to “Who are we?”**
Phil Glynn
- 38 Intellectual ethics in the age of strong AI: a new Copernican revolution?**
Erwan Lamy
- 40 How (and why) to boost carbon capture, usage and storage to move towards net-zero**
Wioletta Nawrot

T. Teaching Impact

- 44 Learning to use generative AI for academic work Insights from the ESCP Business School Prompt-o-thon workshop in Berlin**
Markus Bick, Jessica Breaugh,
Chuanwen Dong, Gonçalo Pina,
Carolin Waldner



FOREWORD

A new edition of impact papers addressing **how technologies are transforming our lives, both personally and professionally**

After the success of its first three impact papers series, ESCP Business School is proud to publish a new one: *“New Technologies and the Future of Individuals, Organisations and Society”*. What you will find, therein, is a collection of articles based on these – most of which have been or will be published in the press.

“After three successful and impactful editions, marked by their alignment with macro-economic, social and environmental challenges, [the fourth edition](#) focuses on emergent and future technological challenges,” explain the school's former Associate Dean for Research, newly-elected Faculty Dean and Editor-in-Chief of the impact papers – Pramuan Bunkanwanicha –, the series' Editorial Coordinator - Sonia Ben Slimane – and the new Associate Dean for Research: Professor Régis Coeurderoy. *“We have been living in a rapidly changing world of technological disruptions driven by the digital revolution. Many researchers have identified tensions between benefits and challenges arising from technological innovation for organisations (on one hand) and individuals (on the other hand). At the organisational level, emerging technologies imply more opportunities to compete in fast-moving contexts, but also implementation challenges in incorporating them to their business processes.”*

Like the previous ones, this fourth edition aims to explore a current and challenging topic through the multi-faceted prism of ESCP Business School's B.E.S.T impactful research strategy (Business; European and worldwide; Societal and environmental; Teaching) and multi-disciplinary contributions based on the expertise and experience of the school's faculty. With a view to stimulating

creative ideas and innovative perspectives that could inspire its many stakeholders. *“The underpinning idea is to investigate the following under-explored question: What will the implications of new technologies be from a holistic perspective and across the various levels of impact?”* the editors add.

Unique implications and cross-sectoral impacts

“At the time of writing this Editorial and Executive Summary, we are witnessing the extraordinary properties and widespread effects of generative Artificial Intelligence (AI), notably the widely discussed ChatGPT, which illustrates how a technological innovation may impact our futures at all three levels (individual, organisational and societal). As researchers and educators ourselves, we begin to face [some of the unique implications that generative AI is having for our own jobs](#). Our position is that these technological innovations have cross-sectoral impacts, and it is for this reason that we have put together the present Impact Papers series,” add Daniele Battaglia, Lorena Blasco-Arcas, Petros Chamakiotis, Alessandro Lanteri and Yannick Meiller.

This edition's guest editors believe that this series of impact papers represents a significant step towards fulfilling the school's commitment: *“Through these papers, we*



Emmanuel Surun
Head Populariser,
Research & Faculty
(Paris campus)

Contributions and themes per pillar in the B.E.S.T. framework



BUSINESS

AI and human interaction

[Benyayer and Zhong](#)
• [Hoang, Lee and Lup](#) • [Succi](#)

AI impact on strategy, innovation disruption, and management

[Jallat and Aouiche](#)
• [Martinez Abellan](#) • [Weis](#)

Critical perspectives on AI

[Fréry](#) • [García, Verzat and Dupas](#) • [Vasquez](#)

NFTs and VR impact on marketing

[Lima and Oberhauser](#)
• [Maggioni, Vafainia and Desmichel](#) • [Nuedling](#)
• [Preece](#)



EUROPEAN

Data management

[Macé, Parguel, and Aubert](#)
• [Richter and Kapteina](#)

Metaverse and European regulation

[Chan](#)

Impact of technology in critical European industries

[Beyneix](#) • [Coeurderoy, Duplat and Nguyen](#)
• [Horsington](#) • [Venuti, Hossfeld and Le Manh](#)



SOCIETAL

Technology and sustainability strategy

[Glynn](#)

Technology and ethics

[Lamy](#)

Technology and environmental transition

[Raghavan](#) • [Nawrot](#)



TEACHING

Generative AI and higher education

[Venuti, Pucciarelli and Mucharraz Y Cano](#)

Generative AI and scientific writing

[Bick, Dong, Pina and Waldner](#)

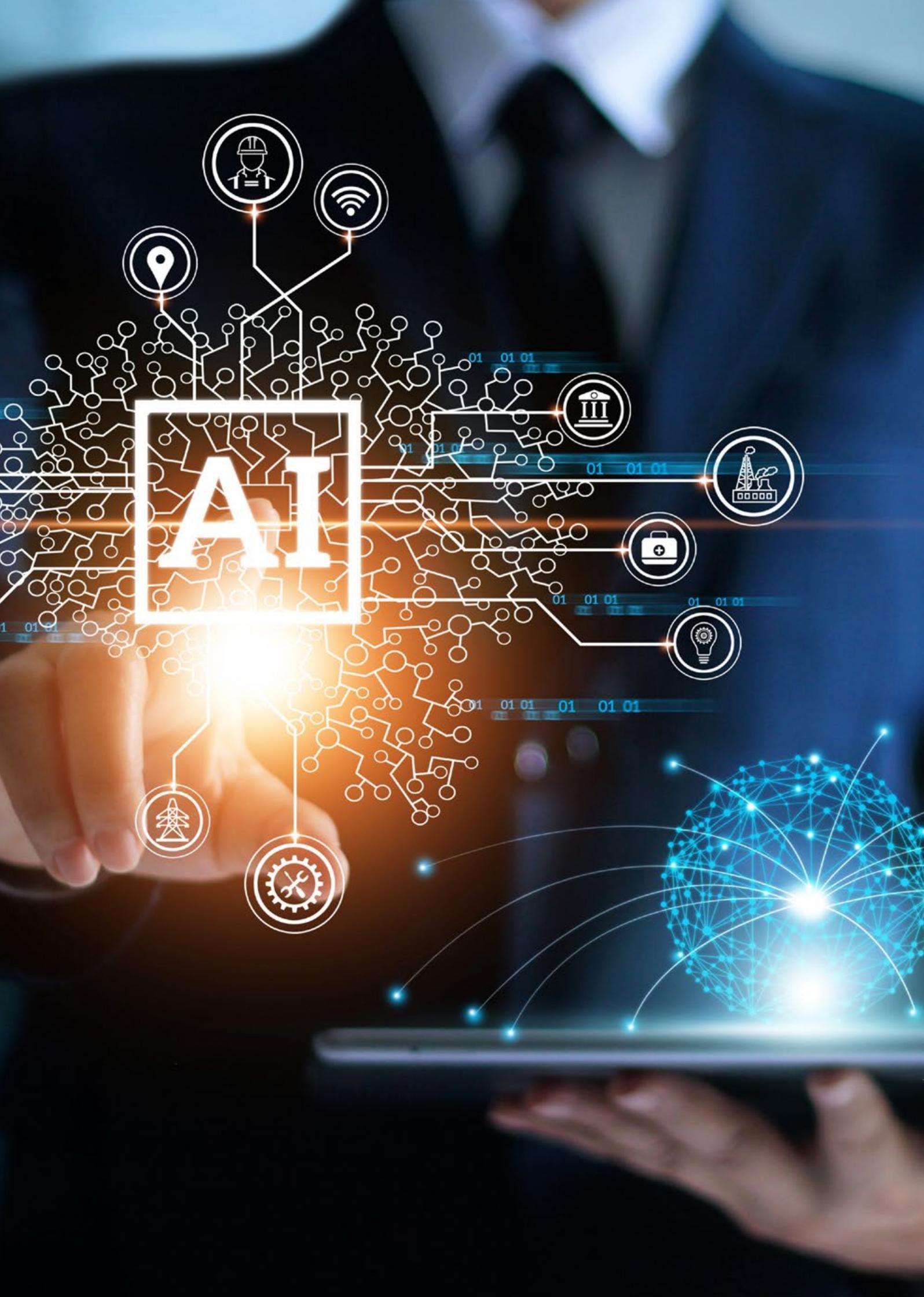
aim to provide our stakeholders with useful insights and some of the tools needed to navigate today's complex landscape of technological innovation, with all its opportunities and challenges. More importantly, we hope that this collection will spark conversations, inspire ideas, and shape a better understanding of the role that we can all play in harnessing the power of technology for the benefit of individuals, organisations, and our society at large," they write. "After all, the future is not something that merely happens to us; it is something that we shape through our ideas, our actions, and our collective will. We hope this fourth Impact Papers series will be a catalyst for such shaping, as we embrace the promise and navigate the complexities of new technologies in our shared journey towards the future."

True to the words of Rabelais or Stephen Hawking?

ESCP Dean and Executive President Léon Laulusa couldn't agree more: "The following contributions reinforce ESCP Business School's commitment to developing dual skills in all students and stakeholders. Our Chairman Philippe Houzé regularly reminds our Board that more than ever, our mission is to educate responsible and purpose-driven leaders and entrepreneurs who will have a

positive impact on businesses and the world. The expertise, creativity and ambition that drive every member of the ESCP community are nothing if they are not at the service of this common goal," he writes in his foreword. "The emergence of information flows, generative artificial intelligence, machine learning, robotization and all that is known as Industry 4.0 certainly holds great promises [...], just as much as it raises strong societal challenges. Like a double-edged sword, today's technologies have the virtue of our uses. 'Science without conscience is but the ruin of the soul,' wrote Rabelais nearly 500 years ago. The phrase still rings true today. From this point of view, we are aware of the responsibility of a business school as an institution of higher education and research."

According to Pramuan Bunkanwanicha, Sonia Ben Slimane and Régis Coeurderoy, ChatGPT illustrates how new technologies allow us to do things at an exponential pace and with efficient results. However, they write, "these technologies call for a comprehensive and nuanced exploration of this transformation. It is particularly important to focus our attention on human, ethical and regulatory aspects, to avoid losing human control." Because as Stephen Hawking once said, "success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks..."



AI





BUSINESS
IMPACT



THE KEY TO UNLOCKING NEW SOURCES OF COMPETITIVE ADVANTAGE? AI-HUMAN COLLABORATION

Louis-David Benyayer and Howard Zhong describe how AI reduces some traditional sources of competitive advantage and how combining AI and human expertise can lead to new ones. They highlight the transformation required and provide practical guidance for decision-makers seeking to navigate this complex and rapidly evolving landscape, helping them to identify new opportunities and stay ahead of the competition.

Artificial Intelligence (AI) is rapidly transforming the business landscape, and [companies are scrambling to adapt to this new paradigm](#). AI has the potential to [deeply alter the sources of competitive advantage](#) by reducing the importance of some traditional factors and introducing new ones.

sources of advantage and can be used to create new, sustainable ones.

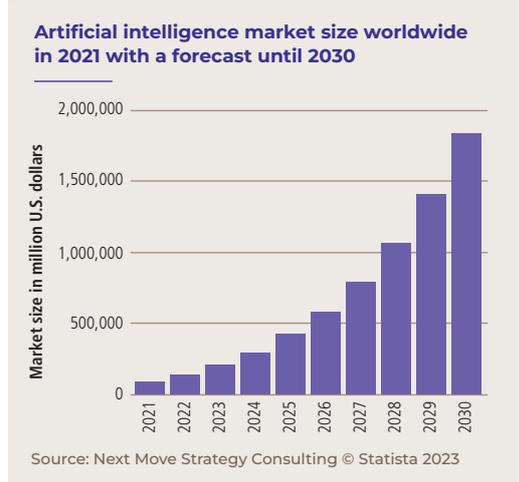
AI erodes human-based competitive advantages and constitutes only a temporary advantage

To be a source of competitive advantage, resources must be valuable and rare. With AI, many tasks previously performed by humans are automated (e.g., setting a price, writing a memo, organising work, etc.). Given their superior computational capabilities, [algorithms process more information more rapidly than humans](#).

Consequently, given the wide scope of activities under threat of being automated, companies that built an advantage out of their human talent and processes see this advantage vanishing. Conversely, companies using algorithms to make decisions see their advantage increasing (e.g., credit scoring, risk assessment, insurance premium calculation).

However, for a resource to form the basis of competitive advantage, it must also be difficult to imitate or copy. Since the information to train an algorithm for making a specific decision is widely available, as are the necessary talent, software and infrastructure to create and run it,

For example, Generative AI tools such as Chat-GPT and DALL-E [may potentially impact the key success factors of many industries that rely on human talents for some of their processes](#). In the [impact paper](#) we wrote as part of ESCP's *New Technologies and the Future of Individuals, Organisations, and Society* series, we examine how AI affects existing human-based



Louis-David Benyayer
Permanent Affiliated Professor at ESCP Business School (Paris campus)



Hao (Howard) Zhong
Assistant Professor at ESCP Business School (Paris campus)

the uniqueness and distinctiveness of such an algorithm are reduced.

All this means that we may expect automated decision-making to become somewhat of a commodity: more available and easy to access at first, then less distinctive and a weaker source of competitive advantage (unless the company has proprietary access to a very specific and valuable dataset to train the model). Technical capabilities constitute imitable and thus outsourceable non-core resources.

Combining AI and human expertise leads to more sustainable advantages

In order to serve for building a competitive advantage, resources also need to be embedded in the organisation's processes. This is why technical AI-related resources and capabilities must be combined with human-based ones.

Firms can perform better than their competitors when they develop capabilities that combine technical and social assets. In particular, the ability to interpret data insights and make decisions on the basis of such insights are core internal capabilities that create value. Personnel and management capabilities [cannot be easily imitated and are, therefore, an important source of competitive advantage](#).

Several aspects of human expertise are difficult for AI systems to imitate:

- First, AI systems, while highly advanced, [may still fall short in the exercise of good judgment or common sense](#). Unlike machines, humans are capable of bringing their intuition and judgment to the table when making decisions.
- Second, in certain contexts, [AI algorithms may inadvertently introduce biases](#) based on factors such as race, gender, or socioeconomic status. Human experts play a vital role in ensuring that AI systems are designed and trained in an ethical and unbiased manner, reducing the risk of unintended consequences and negative impacts on society.
- Third, while AI algorithms have made it easier to analyse data and make predictions based on past patterns, they still have limitations when it comes to adapting to new situations. A human expert with experience in the industry might be able to draw on their own knowledge and experience to make decisions that take into account a wider range of factors.
- Fourth, while AI systems can perform complex tasks and analyse large volumes of data with ease, human experts are able to bring their creative thinking to the table, helping to come up with new approaches and ideas.

The transformation required to embrace this combination

Synchronizing human and technical resources, then, is a clear path for achieving a sustainable competitive advantage. However, this combination constitutes a significant challenge.

One thing that organisations may want to consider is developing new job roles that require a combination of artificial intelligence and human skills. In the meantime, with the increasing adoption of human-AI collaboration in the workplace, a redefinition of performance metrics is necessary to account for the changing nature of work in an AI-enabled environment. In order to facilitate better collaboration between human and AI workers, they may also choose to



“ORGANISATIONS MUST BE WILLING TO INVEST IN THE NECESSARY RESOURCES AND CAPABILITIES TO SUCCESSFULLY INTEGRATE AI AND HUMAN EXPERTISE”

develop training programs that help employees augment their existing skills and make them more effective at their jobs. Lastly, organisations need to recognize the paramount importance of data and shift their focus from being merely data-driven to data-centric.

In the context of human-AI collaboration, another key question is how to choose AI models wisely. When choosing between in-house and off-the-shelf models, organisations should consider factors such as the complexity of the problem addressed, the availability of data, and the required level of customization. When it comes to infrastructure, organisations must consider many different factors. These include not only cost, scalability, and security, but also the specific needs of the organisation, the level of technical expertise available, and the potential impact of any outages or downtime.

In short, organisations must be willing to invest in the necessary resources and capabilities to successfully integrate AI and human expertise. This may involve investing in new technologies, hiring new talent, and developing new job roles and training programs.

It may also require a cultural shift as organisations move from a traditional, hierarchical model to a more collaborative, cross-functional approach.

WHY GOVERNMENTS SHOULD COORDINATE AI REGULATION

Artificial intelligence has become one of the greatest challenges for the economy and society. As with nuclear power, AI requires global regulation to promote its safe, secure, and peaceful use. Otherwise, countries individually have incentives to apply loose laws to compete and attract investment opportunities in AI.

Disruptive innovations accelerate economic growth by modifying established market principles. Artificial intelligence (AI) has emerged as the most significant disruptive innovation because it will profoundly affect the market structure of all industries and people's lives. Andreas Kaplan and Michael Haenlein [define AI](#) as "a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation". AI is already transforming companies' business models and has many applications (in industries such as healthcare, automotive, and finance) expected to change people's lives.

Regulators and business leaders are anticipating the negative effects of AI on the labour market. In 2020, the European Parliament's Think Tank assessed the potential adverse effects on the labour market; specifically, that 14% of the jobs in OCDE countries were potentially automatable, and 32% could be severely impacted by AI. In [a recent interview](#), Arvind Krishna, IBM's CEO, supported this view and estimated that AI could replace thirty percent of its company task force in five years (7,800 jobs). However, quantifying the consequences is still complex, and complementary (vs. substituting) effects [may appear](#).

As Diego explains in [his impact paper](#), AI is among the greatest challenges posed to governments, who have a difficult task: Improve efficiency through maximizing AI's home-grown products and, at the same time, minimize this technology's adverse effects.

Risks and challenges with AI

AI's capacity to perform routine and non-routine cognitive tasks generates high expecta-

tions of productivity improvements. However, there are risk factors associated with AI use:

• Impact on the labour market:

AI is a disruptive technology across industries and society, and using AI to automate processes will potentially affect every sector of the economy. The main concern with using AI is the potentially massive layoff generated by substituting workers with the technology. This effect may not be homogeneous: high-skilled workers have more options to adapt to the new technology and use AI as a complementary tool to improve productivity, which may not be the case for white-collar workers. Two additional effects can amplify this impact: 1) The increase in productivity will benefit shareholders instead of labour share, increasing income inequality, and 2) emerging economies will lose labour cost advantages resulting in a shift of investment to developed countries where automation is already established, increasing the economic gap across countries and ultimately leading to a rise in forced migrations.

• Algorithms with bias:

Algorithms are black boxes and may contain bias in their design, which may cause harmful effects on society. One relevant case affected the Netherlands. In 2022, the Dutch government admitted that the Dutch Tax Authority had used algorithms with racial discrimination to spot suspected childcare benefit fraud, causing irreparable damage to the wrongly accused victims. Also, the black box methodology may result in undesired effects, such as monopolistic behaviour if the algorithm establishes that the monopolistic equilibrium is the best solution and, on top, can define strategies to anticipate and eliminate this scenario in the early stages by destroying competitors when they are not a threat. Even if the algorithms are well-implemented, the lack of transparency



Pramuan Bunkanwanicha
Professor of Finance and Faculty Dean at ESCP Business School (Paris campus)



Diego Abellán Martínez
Co-founding partner of Outliers Ideas, Global Executive Ph.D. candidate at ESCP Business School

can generate distrust. Apple card was accused of gender discrimination a few months after its launch in August 2019. While this news raised concerns about AI bias, the investigation found no evidence of unlawful discrimination.

• **Cyberterrorism:**

With AI technology, “bad users” can severely damage democracy by manipulating elections by disseminating fake information more effectively, identifying the audience, the timing, and the right channel to affect the will of voters. Similarly, the United Nations Office of Counter-Terrorism (UNOCT) also identifies additional risks of malicious AI use. The UNOCT highlights that it is a powerful tool to facilitate terrorism through physical attacks with drones and self-driving cars, raising cyberattacks on critical infrastructures, or enabling the incitement to violence more effectively using social media.

AI is the most relevant disruptive innovation, potentially affecting all industry dynamics. Contrary to the belief of market self-regulation, government intervention is necessary to limit the adverse effects of AI. So far, countries have made individual efforts at different speeds. The main concerns with local law are the incentives for governments to issue loose regulations to compete for AI activities and the influence of powerful domestic players – mainly large corporations and economic interest groups – aiming to capture the benefits of regulation. These elements significantly limit the efficiency of individual policies to control the harmful effects of AI.

We can use the comparison with nuclear energy to address the need for coordinated AI regulation. Atomic power can generate destruction and devastate regions. It can also be used to improve citizens’ welfare, for example, by producing energy. Countries must coordinate a global initiative through a supranational regulatory body to ensure AI’s safe, secure, and peaceful use. Like the International Atomic Energy Agency (IAEA), which was created in 1957 as a global initiative within the United Nations system to promote and control the use of nuclear technology, and ensure the technology is not used for any military purpose...



**“COUNTRIES MUST COORDINATE
A GLOBAL INITIATIVE THROUGH
A SUPRANATIONAL REGULATORY
BODY TO ENSURE AI’S SAFE,
SECURE, AND PEACEFUL USE”**

ARE NFTS REALLY SO FUTILE AND HOW CAN COMPANIES MAKE THEM LESS SO?

Despite their popularity, NFTs have been the subject of hype, commotion, and drama as their utility and contribution to value creation have been heavily questioned. To help marketers select which to implement, Perrine Desmichel, Isabella Maggioni and Saeid Vafainia propose a typology of NFT products based on the type of value generated for customers.



Perrine Desmichel
Assistant Professor
of Marketing, ESCP
Business School
(Paris campus)



Isabella Maggioni
Associate Professor
of Marketing, ESCP
Business School
(Turin campus)



Saeid Vafainia
Assistant Professor
of Marketing, ESCP
Business School
(Paris campus)

[Non-fungible tokens \(NFTs\)](#) include a wide range of digital assets, from virtual real estate, to collectible art pieces, and other unique identifiers recorded in the [blockchain](#). They became widespread in 2021 and the global NFT market [is expected](#) to grow at a rate of 34% per annum to reach USD 212 billion by 2030.

There are numerous types of NFTs [available in virtual marketplaces](#) and they can be either associated with physical products or solely represent virtual assets. NFTs can be displayed in public (e.g., social media) or just in private settings.

In the [impact paper](#) we wrote as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations, and Society* series, we identify four primary categories. NFTs mainly fall into: collectibles, digital ornaments, digital twins, and digital free passes (illustrated below). However, a question remains: what is the type of consumer value generated by these NFTs?

We argue that, like physical goods, NFTs satisfy key psychological needs. Indeed, digital possessions can both serve as cues for others [to form impressions and as markers](#) for individual and collective memory.

More precisely, previous studies have investigated how possessions can contribute to the definition of self-identity and the communication of one's identity in social settings, [proposing that](#) consumption serves both self-development and self-enhancement goals.

In a similar vein, we propose that NFTs can act as [transformational value propositions](#) since they provide opportunities to alter consumers both in the digital and sometimes in the offline world. Therefore, NFTs mainly satisfy:

- **Self-enhancement motives:** NFT consumption can serve as a motive for projecting a positive image of oneself to social groups, and to achieve a sense of social distinction and pre-eminence.
- **Self-development motives:** NFTs are acquired to [increase consumer self-efficacy and improve consumers' skills and abilities](#).

By reviewing recent business cases in the light of academic research, we present a typology of NFTs which should help marketers decide which NFTs to develop and how to implement them so as to satisfy specific consumer goals.

Proposed Typology of NFTs

- **First, 'collectibles'** refer to series of virtual items with certified ownership and uniqueness. They can serve self-enhancement motives by generating status value and projecting a positive self-image in virtual settings. Collectibles can also address self-development motives by providing the opportunity to acquire unique items that increase in value over time. Crypto-Kitties, Bored Ape Yacht Club, and the Limited Porsche NFTs illustrate this category.

- **Second, 'digital ornaments'** are incorporated by consumers into their virtual selves, such as virtual clothing or accessories for avatars in virtual worlds or online gaming environments.

Proposed Typology of NFTs

	COLLECTIBLES	DIGITAL ORNAMENTS	DIGITAL TWINS	DIGITAL FREE PASS
For Self Enhancement	Series of NFTs that can be collected and publically displayed e.g., Bored Ape Yatch Club, CryptoKitties	Digital products that can be displayed in virtual worlds e.g., Burberry on Blankos Block; virtual real estate	Digital twins that consumers can use and display on virtual platforms e.g., Nike 2019 CryptoKick	NFTs that give access to perks or fancy events e.g., Starbucks Odyssey loyalty program
For Self Development	Limited edition NFTs expected to appreciate in value over time e.g., Porsche NFT series	Digital trophies (/ certificates) in video games e.g., Axie Infinity Battles	NFTs that provide certificate of authenticity for exclusive product e.g., Bulgari Octo Finissimo Ultra watch	NFTs that give access to exclusive discussions or online discussion events (for instance on Discord) e.g., VeeFriends platform

They serve self-enhancement motives by allowing individuals to craft a social image and act as status signals in virtual spaces. Digital ornaments also serve self-development motives by representing consumer achievements, such as game rewards in Axie Infinity. Other examples include Burberry’s collaboration with the Blankos Block party and the ownership of virtual real estate in blockchain-based virtual worlds like Decentraland and Sandbox.

They serve self-enhancement motives by offering access to exclusive brand communities and providing perks like air-dropped tickets. Digital free passes also fulfil self-development motives by providing access to events or discussions that offer exclusive knowledge and greater visibility and status. Starbucks Odyssey and Gary Vaynerchuk’s VeeFriends platform are examples in this category.



“LIKE PHYSICAL GOODS, NFTS SATISFY KEY PSYCHOLOGICAL NEEDS”

Overall, NFTs have the potential to enhance the customer experience by satisfying self-enhancement and self-development goals. Marketers should assess which psychological goal they are trying to satisfy before designing any NFT-based offering, and be mindful of the different implications associated with different types of NFTs.

- **Third, ‘digital twins’** create identical digital versions of real-world objects, offering extra value for brand enthusiasts and collectors. They can be used for self-enhancement by allowing customers to showcase their purchases before receiving the physical items, fostering a perception of scarcity and rarity. Digital twins also provide practical benefits like authenticity certification and delivering exclusive information about the product. RTFKT Studios’ collaboration with Nike for Cryptokicks personalized sneakers and Bulgari’s NFTs for the Octo Finissimo Ultra watch are examples in this category.

- **Fourth, ‘digital free passes’** are NFTs that act as digital loyalty cards, granting access to spe-

WHEN TECHNOLOGIES INVALIDATE THEORIES

In management, as in other disciplines, new technologies sometimes force us to reconsider the conclusions of established theoretical models. This was the case for digital platforms. Other advances, such as generative AI, may have the same kind of disruptive impact.

Research is sometimes ahead of practice. As far back as the early 1990s - some 15 years before Airbnb (2008) and Uber (2009) arrived on the scene - some scientific studies had already theorised about the emergence of digital platforms linking independent service providers with end customers. However, this hypothesis came up against a practical impossibility: transaction cost theory had shown that these digital platforms were intrinsically less efficient than integrated companies with their own assets and employees. Digital platforms were therefore a potential curiosity, but certainly not an organisational reality.

The unavoidable theory of transaction costs

The transaction cost theory stems from [Ronald Coase's insights](#), which were largely developed by the [work of Oliver Williamson](#), for which both won the Nobel Prize in Economics (in 1991 and 2009 respectively). This theory provides an answer to this fundamental question: "Why are there companies rather than a fragmented market?" It justifies the existence of integrated companies on the grounds that markets involve specific costs, known as *transaction costs*: each time you want to do something on a market, you have to find financial backers, hire equipment and draw up contracts with service providers. The main advantage of companies is that these transaction costs only have to be paid once: financial backers, equipment and service providers are turned into long-term shareholders, investments and employees, respectively. As a result, companies are much more efficient when it comes to recurring activities.

There is another dimension to this. According to [the work of George Akerlof](#), who was also awarded the Nobel Prize in Economics in 2001,

one-off transactions between individuals who do not know each other engender mutual distrust that encourages cheating by both parties.

Overall, digital platforms have traditionally been reduced to nothing more than a theoretical curiosity: not only would no one agree, a priori, to host strangers in their home or to be driven around by a non-certified driver, but these approaches were also structurally less efficient than using integrated companies. Platforms therefore seemed to have no future. But all that changed profoundly in the 2000s, as a result of a series of technological developments.

Thanks to the sea container, the Internet, followed by the development of the web, smartphones and finally social media, it has become very inexpensive to coordinate independent service providers, find individual customers and set up digital platforms that make it easy to connect the former with the latter. In fact, the same arguments that led us to favour integrated companies can now be reversed. It was this reversal, which moved from a purely theoretical hypothesis in the 1990s to a practical reality a decade or so later, that legitimised the emergence of digital platforms such as Airbnb and Uber.

At the same time, we must pay tribute to eBay, which came up with the idea of asking its users, both buyers and sellers, to rate each other by awarding stars. This simple idea, scaled up massively by the spread of the web and then smartphones, and subsequently adopted by almost all digital platforms, circumvented Akerlof's conclusion about the opportunism of transactions between strangers. Without smartphones and mutual evaluation, trust between strangers could never have been established and these business models could never have existed.



Frédéric Fréry
Professor of Strategic
Management, ESCP
Business School
(Paris campus)



By drastically reducing transaction costs and providing a way to establish trust between strangers, a series of technological developments has led to a rebuttal of the conclusions of three Economics Nobel Prize winners.

How generative AIs impact other theories

In [the impact paper I wrote](#) as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations and Society* series, I explain that other management theories could see their conclusions refuted by technological developments, in particular generative Artificial Intelligences (AIs) such as ChatGPT, Bard, Bloom and Copilot. There are three possible consequences:

1. This technology could turn the mythical *Homo economicus* into a reality where humans are capable of making decisions to maximise their utility in any situation. This would mean challenging much of behavioural finance or economics, while giving new operational effectiveness to conventional models. Generative AI is likely to give every investor, every customer and every manager the ability to consistently make optimal decisions in real life. If this is the case, it could invert a whole area of contemporary research.

2. By the same token, because of how they work (generating the most likely text in a given context from a pre-established corpus), generative AIs could be a tenfold reflection of bounded rationality, and therefore provide a much better understanding of the limits of human rationality. This could boost interest in finance and behavioural economics, but also in the study of consumer behaviour in marketing or individual and collective decision-making in management.

3. We might even consider that generative AI is a good analogy for the way human thought works. Some psychological and sociological studies, along with research into cognitive biases, suggest that human thinking often follows an automatic, preconditioned path. Like ChatGPT, humans have a natural tendency to complete sentences with the words that seem most likely to fit the context. Generative AI could therefore provide a better understanding of

“A SERIES OF TECHNOLOGICAL DEVELOPMENTS HAS LED TO A REBUTTAL OF THE CONCLUSIONS OF THREE ECONOMICS NOBEL PRIZE WINNERS”

how human intelligence works, which would undoubtedly have an impact on a number of established research outcomes in management.

For the moment, there is no way of predicting the impact of these technologies on management models, but it is likely to be significant. This re-reading of old theories in the light of new tools reminds us that models are only valid in relation to a certain state of knowledge. As the biologist Jean Rostand mischievously put it: *“Theories come and go, but the frog remains.”*

HOW POLICYMAKERS CAN OVERCOME THE ETHICAL CHALLENGES POSED BY GENERATIVE AI

Despite some people's fears and others' enthusiasm, or even the technical aspects, according to Diana Garcia Quevedo, Caroline Verzat and Tristan Dupas-Amory the real question may be how to distinguish between good and bad use of generative AI.

With the arrival of ChatGPT and GPT4, generative artificial intelligence (AI) – focused on textual, video and audio content production from existing data – is receiving unprecedented media coverage.

Science in a frenzy

The frenzy around this technology reflects the limiting fear and the enthusiasm that it generates in equal measure (or with equal excess). [2023 is expected to see](#) a real boom in generative AI with [many business applications](#). Generative AI has the ability to revolutionise literary, video and audio content creation practices... but also to generate strong controversies.

In [the impact paper we wrote \(in French\)](#) for ESCP Business School's *New Technologies and the Future of Individuals, Organisations, and Society* series, we explain that an ethical framework would appear essential to make good use of this dizzying potential. As with any innovation, questions are raised not so much about understanding the technology as about its applications. Experts have been developing generative AI algorithms for years but their recent massive dissemination is leading to [major uncertainties about its uses and their consequences](#).

Ethical, environmental and social impacts

In the same way as other widely-used technologies, of which the Internet is the obvious example, the spread of generative AI leads to a whole range of new possibilities that are also potentially dangerous.

Based on several reports and scientific articles, [Rodolphe Koller's summary](#) warns against

underestimating the environmental and financial risks linked to the volume of data and calculations, but also the social and political risks linked to disinformation, the protection of individuals' privacy and the conversion of some work roles into 'bullshit jobs'.

[According to philosopher Paul Ricoeur](#), ethics may be defined as aiming at *"a good life lived with and for others in just institutions"*. We must hope that the policymakers tasked with designing, deploying or controlling the use of generative AI-based applications have the necessary space and time to ask themselves about this technology's contribution to three, not necessarily compatible, overall aims: the economic performance of businesses, the common good of the planet and/or the development of individuals, regardless of their status in the use of applications. And to distinguish what is good and just. There is nothing innate about this discernment: it must be learned through critical reflection and confrontation with reality through action.

By definition, this discernment is outside the scope of AI, which does not act, has no emotions, does not consider contexts and reproduces content – including any errors – with no awareness of the consequences. It is thus vital to help managers identify the conditions of use – and the potential consequences – of this new tool.

How policymakers could practice ethical discernment

The following questions could be asked:

- For whom and for what do policymakers think that the application they intend to design, deploy or distribute could be used now or in the future?



Diana Garcia Quevedo
PhD student at ESCP Business School (Paris campus)



Caroline Verzat
Professor at ESCP Business School (Paris campus)



Tristan Dupas-Amory
PhD student at ESCP Business School (Paris campus)

- To what end: the economic performance of businesses, the common good of the planet and/or the development of individuals?
- Do potential (or already proven) applications help people to live better together?
- Which stakeholders are already or potentially affected (the environmental and social risks go far beyond companies' traditional stakeholders)?
- To which negative externalities (CO₂ emissions, loss of data confidentiality, manipulation of opinions, bullshit jobs, etc.) does the use of a generative AI-based application contribute?
- Does this tool increase inequality or does it lead to greater justice?

Quantified impact measurements are essential but limited in terms of thinking about ethics. That's because they are based on normative indicators that require discussion, while their intangible, impersonal nature can lead policymakers to lose sight of human issues. It is thus essential for the latter to meet affected individuals and to listen to their experience and their definition of what is right.

Before making a decision, policymakers could map out the issues in relation to a wider range of stakeholders (users, clients, prime manufacturers, regulators, etc.) in order to identify socially important questions and to substantiate their ethical convictions beyond an implicit belief in progress. This would help

to limit the risk of [ethical dissonance](#) between personal or societal values and economic choices dictated by a profit-at-all-costs approach.

The organisational decision-making process is complex and [strongly error-prone](#). Taking ethical decisions would suppose the implementation of systematic, regular evaluation procedures for the different risks and the establishment of open discussion groups involving the systematic application of critical thought.

Regulation is highly desirable but it requires time and perspective to observe uses and to negotiate rules acceptable to all those involved.

In the meantime, in the absence of codification based on the good or bad use of generative AI, it seems essential to give policymakers the necessary space for calm, in-depth examination of the conflicts and tensions between the values or issues with which they are confronted. This could take the form of [co-development circles](#), whose procedure allows systematic questioning of the different facets of a complex, real-life problem.

Whatever solutions are chosen, the use of generative AI will require a great deal of work, not only technological but also regulatory, organisational and interpersonal, in order to ensure its fair, safe and ethical use.

“REGULATION IS HIGHLY DESIRABLE BUT IT REQUIRES TIME AND PERSPECTIVE TO OBSERVE USES AND TO NEGOTIATE RULES ACCEPTABLE TO ALL THOSE INVOLVED”

REVOLUTIONIZING HEALTHCARE: THE ROLE OF AI IN TRANSFORMING CANCER TREATMENT

According to Rym Aouchiche and Frédéric Jallat's research, Artificial Intelligence has the potential to transform the healthcare sector by offering new solutions to significantly improve the treatment of cancer, which is set to remain the leading cause of mortality in Europe.

Therapeutic innovation and digital health are poised to revolutionize the healthcare landscape, particularly in the treatment of cancer, which claims [more than 1,300,000 lives annually](#) in the European Union. This is a rising trend that is set to continue, with [an estimated 21% increase in new cancer cases by 2040](#) linked to the ageing of the population. There is growing interest in harnessing Artificial Intelligence (AI) to address this pressing public health challenge, especially as a substantial share of cases could be prevented.

many focus on improving the patient care pathway (see below).

The landscape of AI in healthcare is marked by a proliferation of players. Among the 47 multinational corporations involved in AI, [18 offer AI healthcare solutions](#). Of these, 80% concentrate on innovative treatments, while the remaining 20% emphasize efficiency-based solutions aimed at optimizing resources and enhancing overall healthcare performance. Six key areas of action stand out:

- **Medical research:** AI can expedite the development of new treatments by analysing extensive datasets to identify promising chemical compounds and predict their efficacy. It also accelerates clinical research by identifying eligible patients for clinical trials and analysing trial-generated data.

- **Medical diagnosis:** AI can help healthcare professionals in making quicker and more accurate diagnoses by scrutinizing medical data, such as X-ray images, lab results, and patient histories. AI algorithms can detect early disease

AI in Healthcare: A game-changer

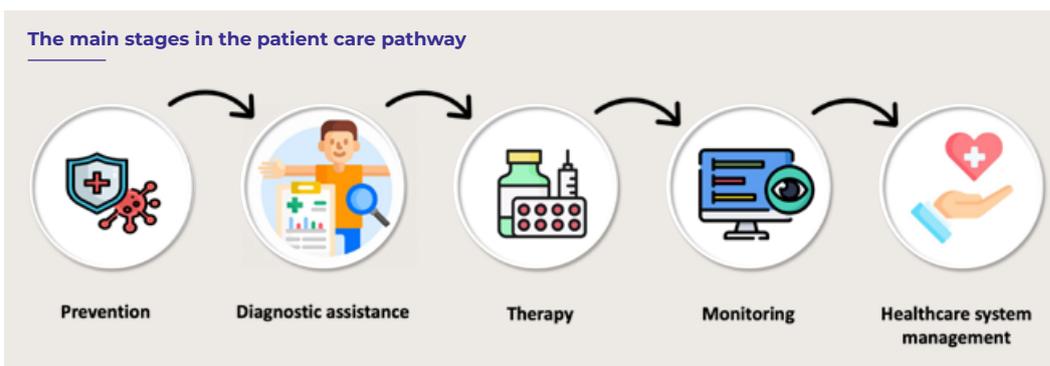
AI holds immense potential to transform the healthcare sector, offering novel approaches to enhance the prevention, diagnosis, treatment, and management of diseases in a wide range of therapeutic areas (including oncology, cardiology, ophthalmology). This transformative potential spans the entire healthcare industry value chain, encompassing research, development, production, and marketing, with a pri-



Frédéric Jallat
Professor and Academic Director of the MSc in Biopharmaceutical Management at ESCP Business School (Paris campus)



Rym Aouchiche
Associate Consultant at IQVIA, graduate of the MSc in Biopharmaceutical Management at ESCP Business School



indicators and recommend appropriate treatments.

- **Surgery assistance:** AI can assist surgeons in planning and performing complex surgical procedures. AI-powered surgical robots enhance precision, leading to quicker post-operative recovery for patients.
- **Patient monitoring:** AI can enable real-time monitoring of vital signs (e.g., heart rate, blood pressure, blood sugar levels), allowing healthcare professionals to promptly respond to any abnormalities. This facilitates the management of patients with chronic illnesses and early intervention when complications arise.
- **Personalized treatment:** AI can consider extensive medical data to determine the most suitable treatment options for individual patients, taking into account genetic profiles, medical histories, and lifestyle factors. This personalized approach leads to improved treatment outcomes.
- **Medical record management:** AI can automate the management of electronic medical records, streamlining the process, enhancing accuracy, and ensuring the confidentiality and security of patient information.

AI's potential contribution in oncology care pathways

The concept of a care pathway seeks to enhance the efficiency of treatment processes, ensuring that patients receive preventive care and seamless coordination between primary care and hospital care.

In the context of cancer care, three compelling reasons led us to focus on oncology to explore how AI impacts care pathways:

- **Complexity:** cancer care pathways involve numerous care providers and multidisciplinary teams, with each patient following a series of chronological steps. This complexity includes various healthcare professionals, such as general practitioners, radiologists, surgeons, and more, making the treatment process intricate for patients.
- **Variability:** cancer care pathways can vary significantly based on factors like the type of cancer, its stage at diagnosis, tumour severity, and the patient's medical history.
- **Digitization gap:** despite their complexity and significance, care pathways for cancer patients are still rarely digitized.

AI can enhance the care pathway in oncology by improving the diagnostic process, treatment management, and post-treatment monitoring:

1. AI is experiencing rapid growth in medical diagnostics, particularly in medical image analysis, with [a market expected to reach](#)

[5.4 billion dollars by 2030](#). This growth is driven by the demand for cloud-based medical image analysis software. AI's role in medical imaging spans mammography, CT scans, MRIs, PET scans, and anatomical pathology. However, technical limitations, such as the digitization of pathology slides, and potential resistance to change must be addressed for AI to reach its full diagnostic potential.

2. AI contributes to all stages of the cancer care pathway, allowing healthcare professionals to focus on high-value tasks. Three categories of AI-powered solutions aid in treatment management and support: organizational management tools, predictive analytic tools, and AI-powered surgical assistance tools. These solutions streamline tasks, enhance treatment efficacy, and improve surgical precision.



“COLLABORATION BETWEEN HEALTHCARE STAKEHOLDERS IS ESSENTIAL TO TAKE FULL ADVANTAGE OF THE TREMENDOUS POTENTIAL OF AI”

3. The digitization of cancer patient monitoring has accelerated, driven in part by the COVID-19 pandemic. Remote monitoring and the integration of AI-driven chatbots have emerged as valuable tools. Remote monitoring allows healthcare professionals to interpret patient data collected at home, while chatbots offer continuous support during the monitoring phase - a critical period for patient care.

AI's potential in healthcare is vast, offering the means to combat medical deserts, streamline care coordination, and enhance administrative management while reducing wait times and improving treatment. The widespread use of AI solutions promises to transform medicine, enabling earlier disease detection, risk reduction, and prevention-oriented medicine.

However, collaboration between healthcare stakeholders is essential to take full advantage of the tremendous potential of AI. Together, doctors, nurses, administrators, and external care providers can usher in a new era of medicine, benefiting both patients and the healthcare system.

FOUR SOLUTIONS FROM FOOTBALL TO CREATE UNIQUE AND NOVEL BRAND EXPERIENCES THROUGH NFTS

Vitor Lima And Marc Oberhauser highlight the opportunities and challenges of using NFTs as a marketing tool. They derive four insights from the football industry because of its pioneering marketing initiatives.

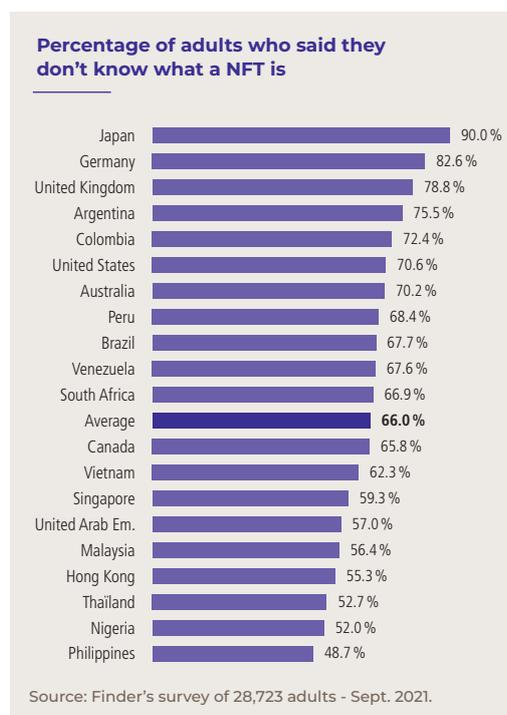
The big picture

In March 2021, a digital piece of art called [Everydays: The First 5000 Days](#) was sold as a non-fungible token (NFT) for a staggering \$69 million. This marked the beginning of a global NFT market, which [reached a value of \\$15.7 billion in 2021 and was expected to keep growing at 34% per annum until 2028](#).

NFTs, which are certificates of authenticity on a public blockchain network, have revolutionized the concept of ownership by providing a secure and immutable record of digital assets. Managed through smart contracts, which is a pre-defined agreement with conditions on what, how, when, and by whom actions can be done, NFTs offer unique opportunities for various industries, especially marketing-driven ones.

Despite their acceptance in the arts, broadcasting, and sports industries, NFTs are only just beginning to attract the attention of marketing managers, who see increasing opportunities for many industries. However, companies are unsure about how to approach this new technology and may miss out on valuable brand-building opportunities. This failure to benefit from NFTs is not only related to firms' internal lack of knowledge but also to their external stakeholders. [For instance](#), 90% of the Japanese population, 83% of Germans, and 79% of British citizens do not know what an NFT is.

In addition, [a recent survey](#) showed that a lack of understanding of NFTs is the second most reason why people do not invest in them. This is followed by the high inherent risk of los-



ing money. Lastly, critical voices have pointed to the fact that NFTs are highly energy-intensive and thus detrimental to the environment, while not providing a larger societal value. Thus, while providing unprecedented opportunities, before using NFTs as a marketing tool firms will need to address NFTs' legitimization issues.

Sports, as an institution, intuitively followed the hype around NFTs and football as an "industry", in particular, has been quite successful making the promise a reality. In the [impact paper](#) we wrote as part of ESCP Business School's *New Technologies and the Future of Individu-*



Vitor Lima
Assistant Professor
of Marketing
at ESCP
Business School
(Madrid campus)



Marc Oberhauser
Assistant Professor
of Management
at ESCP
Business School
(Madrid campus)

als, *Organisations and Society* series, we looked at this far-advanced case and identified four ways these issues can be addressed:

Solution #1 – Educational content

In spite of [NFTs being recognized as the Word of the Year in 2021](#), some sceptics consider them a passing fad, while a large ratio of society simply doesn't know what they are and how they work. To overcome the challenge of legitimization issues due to a lack of knowledge, marketing managers should invest in educational strategies.

These strategies need to make NFTs and their functionality transparent and explain, to both, internal, e.g., employees, and external stakeholders, e.g. consumers (fans) what value NFTs create for them. This can be implemented considering branded content explaining what NFTs are, how they work, and why they are relevant to the business (e.g., a new line of revenue) and consumers (fans) (e.g., a unique souvenir from football clubs).

Solution #2 – Collectibles

The association of NFTs with cryptocurrencies and their volatile market dynamics make them a risky marketing resource. If the hype diminishes, the financial value dissipates, leading to fan frustration. Football clubs' managers emphasize the need for solid investments rather than speculative ones like NFTs, citing cases like [Paul Pogba's involvement in a failed crypto scheme](#). The uncertain nature of NFTs presents challenges from both a fan and institutional perspective, with limited knowledge and regulatory absence hindering their use in marketing campaigns.

Framing NFTs as collectibles, such as an NFT Panini sticker album, rather than as financial assets, and detaching them from the volatility of the speculative market, could reduce their inherent risk. For instance, traditional Brazilian club Santos launched [an NFT marketing campaign called "Santos of the World"](#) in celebration of its 110th anniversary offering exclusive NFTs related to its rich club history.

Solution #3 - Influencer marketing

Players like [Lionel Messi](#) and [Neymar Jr.](#) have already embraced NFTs as digital collectibles, contributing to their framing as the future of art collecting. The emotional connection between fans, players, and clubs influences managerial decisions to work with NFTs, as they offer a unique source of income and enhance brand perception.

Football players are playing a crucial role in legitimizing NFTs as marketing tools for their

clubs. They serve as "agents of legitimacy" [according to Richard Scott](#), and also act as brand influencers from a marketing management perspective. To leverage these dynamics, marketing managers should consider investing in influencer marketing strategies to strengthen the positive associations between football clubs and their players. This approach aims to enhance fan interest and increase the likelihood of success in future initiatives.

Solution #4 - NFT 2.0

Today, hardly any product or technology remains non-questioned for its environmental and societal impact. NFTs are subject to so much criticism, particularly due to their high energy consumption, while their societal value is questioned.



“THE MAJOR CHALLENGE REGARDING NFTS’ LEGITIMIZATION AND ADOPTION IN BUSINESS AND BEYOND SEEMS NOT TO BE TECHNOLOGICAL BUT SOCIOCULTURAL”

Thus, managers drawing on NFTs to create unique and especially novel brand experiences need to think beyond their current scope and aim for a reduction of the environmental harm or create an additional societal value through them. Such NFTs 2.0, which go beyond the monetary value and potential profitability for the consumer, are more likely to receive broad societal legitimization.

For better or for worse, NFTs seem to be here for the long haul. The major challenge regarding its legitimization and adoption in business and beyond seems not to be technological but sociocultural. All actors, including internal and external stakeholders, need more information about what NFTs are and their technology can be used to create a (societal) value beyond a highly energy-intensive Panini sticker album.

As many critiques highlight, we find ourselves in the rare situation of having a chance to look at a harmful technology before it is deeply embedded in societal systems and simply say: should we?

THE INTELLIGENT HAND, MIND & HEART: UNLOCKING HUMAN POTENTIAL IN THE AGE OF AI

Chiara Succi proposes to reflect on the advent of AI technologies and identify key implications for the development of 'Human Intelligence'. On one side, there is the risk of weakening human capabilities that are delegated to machines but, on the other, there is the opportunity to acquire more efficient practices and focus on more relevant tasks.

The heated debate about artificial intelligence and its “extraordinary potential” is surprisingly leading to a rediscovery of humans' contribution to work. If robots can bring speed, precision, and strength, we still need fantasy, intuition and affection.

In [the impact paper](#) I wrote as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations, and Society series*, I explain that it is important to debunk the belief that machines will steal the jobs of human beings unless they are asked to repeat only one single task. In fact, we will not see the elimination of our occupations, but artificial intelligence applications will certainly impact and modify them deeply.

The risk of weakening human capabilities

Automation will change the behaviours of workers and the risk is that some abilities could be undermined, such as memory, attention, accuracy, manual precision, and many others. How can we leverage new technologies without diminishing our competencies? Which human assets are in danger and do we need to protect?

It is not easy to describe the magnitude of Human Intelligence (HI) and the literature has not yet presented an exhaustive taxonomy of relevant human capabilities in the digital age. As a starting point, I propose a description structured over three levels:

1. The intelligent hand

Some manual skills cannot be replaced by machines while keeping the same versatility and level of quality. In every organization, we can identify some activities that require a particular know-how and a great amount of knowledge that is transferred over time, through on-the-job training. Several lines of manual work require the ability to solve complex changing problems that are always slightly different because the raw material is different, the temperature is different or the context is different. It would make no sense to program a robot to solve a problem that occurs differently almost every time.

The world of luxury, in particular, strives for authenticity and values artisanal processes, which make some handmade goods unique. [Contemporary research](#) finds that products, services and organizations perceived as authentic carry value that consumers are willing to pay for.

Finally, as a side effect, if we push to replace manual work with AI, we might miss some parts of the work experience such as technical mastery, dedication to the job, experimentation, apprenticeship, concentration, and caring about excellence, with possible implications and impacts difficult to assess for the workplace.

2. The intelligent mind

Matthew Crawford warns us regarding the risk of a “learned helplessness” as an effect of



Chiara Succi
Associate Professor
of Organizational
Behavior at ESCP
Business School
(Turin campus)

automation and digitalization. People display a lower level of individual agency and a higher level of dissatisfaction. Office jobs often don't allow us to experience the direct effects of our actions and to see tangible results.

In fact, we have a greater amount of data at our disposal, but an inferior capacity to read them, and probably at a lower speed in comparison with an algorithm. It appears natural to delegate complex tasks and difficult decisions to machines, the danger being to lose critical thinking. This might weaken our exercise of judgment and we may face problems more superficially and impulsively, without going in-depth and without analysing root causes.

This might represent a problem considering that cognitive skills – problem-solving, creativity, innovativeness, and learning to learn – are becoming increasingly important in the workplace. Decisions are taken by managers largely based on their intuition and not based on a mere analysis of data.

AI doesn't have the sensitivity to manage unexpected events or crises. A self-driving car cannot enter a complex roundabout, as it cannot identify a zero-risk condition. Human drivers, instead, find the courage to travel adapting to the flow and moderating their speed to avoid accidents, as a robot will (probably) never be able to do.

It is necessary to acquire a higher awareness of the potentiality of our mind and its ability to find mental shortcuts, the so-called heuristics, which allow us to [source daily experience to survive and overcome obstacles](#).

3. The intelligent heart

Communication among human beings is becoming more complex and more frequent; it can be supported, facilitated, "augmented" by technologies, but never fully substituted by a remote system. Mysteriously, the hormone oxytocin, which is essential for the development of trust and emotional engagement, is produced only when we interact in presence.

Emotional intelligence and even [a sense of humour](#) can be extremely powerful, especially in the workplace. Only real interactions and laughing together release 'feel-good' hormones, such as endorphins, dopamine and oxytocin.

Finally, the moral question - distinguishing between good and bad - is central, when we discuss artificial intelligence. Computers alone are not able to work ethically and, consequently, discrimination and injustice might be automated.

If Steve Jobs said that "computers are like a bicycle for the mind", AI represents its racing car. In fact, there are several areas in which AI can effectively support HI, such as offering new paths for exploration, [enhancing the creative process](#), saving time and focusing attention on relevant tasks.

First, in organizations, AI can facilitate the imagination process in the development of new products or new ideas. The exploratory phase typically requires access to information, multiple experiences, time, and space to take place. AI can accelerate this phase, removing several roadblocks and quickly testing new directions.

An opportunity to develop human potential

AI and technological developments have begun to transform and aid creative and complex processes, as well as challenge what we believe to be advanced reasoning ability. After losing to a computer program for the first time, the Go world champion declared "I'm learning new moves and I'm becoming a better player thanks to AlphaGo..."



“THERE ARE SEVERAL AREAS IN WHICH AI CAN EFFECTIVELY SUPPORT HI, SUCH AS OFFERING NEW PATHS FOR EXPLORATION, ENHANCING THE CREATIVE PROCESS, SAVING TIME AND FOCUSING ATTENTION ON RELEVANT TASKS”

The complexity of the context is forcing companies to redesign their organizational model and to clarify the contribution of employees, in particular of managers. This can represent an opportunity to develop human potential and [to increase people's effectiveness and satisfaction](#).

It is necessary to acquire a higher awareness of human capabilities and personal talents. Organizations and educational institutions play a crucial role in developing it. They have to create environments in which people can express themselves, make mistakes, restart, create and innovate and not just execute tasks or process information (like robots).

EMPOWERING LEADERS: AI'S TRANSFORMATIONAL IMPACT ON STRATEGIC DECISION-MAKING

To make sure AI is used ethically and successfully, the CEO, top executives, and the board of directors all have responsibilities and important roles to play. Effective communication and collaboration across different levels of the organization are critical.

In an era of rapid technological advancements, the strategic decision-making landscape is undergoing a transformative shift. Artificial intelligence (AI)-based technologies have introduced new possibilities and challenges for organizations aiming to stay competitive and thrive in the digital age. A recent [survey](#) conducted among CEOs by Gartner has revealed that AI is considered the most significant technology that will impact their industries over the next three years.

With AI offering various decision-making approaches, such as decision automation, decision augmentation, and decision support, the role of CEOs, top executives, and boards of directors becomes crucial in leveraging these technologies effectively and ethically. In the [impact paper](#) I wrote as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations, and Society* series, I explore the different types of decision-making and the pivotal role of organizational leadership in harnessing AI for strategic decision-making.

The changing paradigm of decision-making

Traditional decision-making processes rely heavily on human judgment and experience. However, with the advent of AI, organizations now have the opportunity to augment and automate decision-making processes to enhance efficiency, accuracy, and innovation:

- *Decision automation* involves delegating decision-making tasks to AI systems, where algorithms process data and make decisions independently. This can [improve profitability and competitiveness](#).
- On the other hand, *decision augmentation* empowers human decision-makers with

[AI-driven insights and recommendations](#), enabling them to make more informed choices.

- Lastly, *decision support* leverages AI as a tool to assist decision-makers by [providing relevant information and analysis](#) to aid the decision-making process.

The CEO's strategic vision

At the helm of an organization, the CEO plays a vital role in shaping the strategic vision and determining the adoption and integration of AI technologies for decision-making. The CEO must possess a comprehensive understanding of AI's potential, its limitations, and its ethical implications. By embracing AI as a strategic enabler, CEOs can drive organizational transformation and foster a culture of innovation.

Moreover, CEOs must ensure alignment between the organization's strategic goals and the implementation of AI-driven decision-making processes. This entails evaluating the benefits and risks associated with each decision type and determining the most suitable approach based on the organization's context and objectives.

Top executives as champions of AI

While the CEO provides the overarching vision, top executives within an organization serve as key champions for AI integration in decision-making processes. These executives, such as Chief Technology Officers or Chief Data Officers, possess the technical expertise and domain knowledge to understand AI's capabilities and its potential impact on strategic decision-making.



Maximilian Weis
Assistant Professor
of Strategy at ESCP
Business School
(Berlin campus)

They are responsible for driving the implementation of AI solutions, overseeing data governance, and ensuring the ethical use of AI algorithms. Collaboration between top executives and the CEO is essential in establishing an AI roadmap that aligns with the organization's strategic objectives and mitigates potential risks.

The board's role in ensuring responsible AI adoption

The board of directors holds a fiduciary responsibility to safeguard the organization's interests and ensure responsible AI adoption. Boards must actively engage in discussions about AI integration, seeking expertise and insights from diverse perspectives, including technical experts, ethicists, and legal professionals.

By establishing clear guidelines and policies, boards can govern the use of AI technologies, address ethical concerns, and provide oversight to minimize biases and algorithmic risks. Regular evaluations and audits of AI systems can help maintain transparency, accountability, and fairness in decision-making processes.

Additionally, boards should foster a culture of continuous learning and adaptability to keep pace with AI advancements and their implications for strategic decision-making.

Balancing ethical and legal considerations

As AI becomes more embedded in decision-making processes, ethical and legal considerations become paramount. CEOs, top executives, and boards must proactively address concerns related to privacy, data security, algorithmic bias, and the potential impact on employees and society at large.

They should establish frameworks for responsible AI use, including robust data governance practices, ethical guidelines, and mechanisms to address biases and ensure algorithmic transparency.

Additionally, organizations should prioritize investments in AI education and training to equip employees with the necessary skills to navigate and to effectively collaborate with emerging AI systems.

While AI technologies offer unprecedented capabilities, it is essential to emphasize the importance of human judgment and expertise in strategic decision-making. Organizations'

leaders must foster a collaborative environment that encourages human-AI partnership. Instead of viewing AI as a replacement for human decision-makers, organizations should recognize its potential to augment human intelligence and enhance decision-making outcomes.

This partnership allows AI systems to leverage vast amounts of data, analyse complex patterns, and provide valuable insights, while human decision-makers contribute contextual knowledge, intuition, and ethical reasoning. Together, humans and AI can create a synergy that leads to more informed, effective, and responsible strategic decisions.

A cultural change for the benefit of all

The integration of AI technologies in strategic decision-making processes holds immense potential for organizations to gain a competitive edge in the digital era. However, the responsible and effective use of AI requires the active involvement and leadership of CEOs, top executives, and boards.



“ORGANIZATIONS’ LEADERS MUST FOSTER A COLLABORATIVE ENVIRONMENT THAT ENCOURAGES HUMAN-AI PARTNERSHIP”

As organizations embrace AI, they must balance the benefits of decision automation, decision augmentation, and decision support with the ethical and legal considerations that arise. By fostering a culture of collaboration, organizations can harness the power of AI while leveraging human judgment and expertise. This human-AI partnership can lead to more informed, innovative, and responsible strategic decisions.

Ultimately, the role of leaders is to guide organizations in harnessing AI's potential, while ensuring that it is used responsibly, ethically, and in alignment with the organization's strategic objectives. Through their leadership, organizations can navigate the evolving landscape of AI, seize competitive advantages, and shape a future where humans and AI systems collaborate for mutual benefit.





**EUROPEAN
IMPACT**



NO, STRICT ENVIRONMENTAL RULES DO NOT HARM GLOBAL HIGH-TECH FIRMS' COMPETITIVENESS

Strict environmental norms are supposedly detrimental to the performance of global high-tech industries, particularly European ones, subject to some of the strictest regulations in the world. Not only do ESCP Professor Régis Coeurderoy and his co-authors debunk this ready-made idea, but their study based on a unique dataset of the world's leading pharma and biotech firms shows exactly the opposite: that environmental sustainability may be a key competitive advantage on the global stage.



Régis Coeurderoy
Professor in Strategic Management & Innovation, and Associate Dean for Research at ESCP Business School (Paris campus)

Offhand, you don't think of the pharmaceutical and biotech industry as the greenest one around. It makes heavy use of chemicals and solvents, not to mention large amounts of water, and its complex supply chains sprawl across the world. The result is a hefty carbon footprint, according to [the impact paper](#) we wrote as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations, and Society* series: The healthcare industry's net emissions (nearly a third of which come from the pharmaceutical industry) are estimated to be 4.4% of global net emissions, and if left unchecked this figure will triple by 2025.



Valérie Duplat
Assistant Professor of Strategy at the Vrije Universiteit Amsterdam

No wonder these businesses are under pressure to cut their emissions. Innovative technologies such as biotechnologies, which often substitute biological activity for unnatural chemical reactions by adopting and modifying mechanisms that evolved in nature, are often seen as the solution to sustainability problems. Indeed, 80% of the most cutting-edge pharmaceutical companies have committed to net-zero or carbon-neutrality goals by 2050 and many others have developed radical plans to reduce greenhouse gas emissions.



Duong Nguyen Huu Thi Thuy
PhD Student at ESCP Business School (Paris campus)

But can the global pharma and biotech players act as true agents of change?

Regulatory pressure

They don't have much of a choice, really. In most parts of the world, these companies are subjected to increasingly stringent environmental regulations.

For a start, they are required, as per new European rules applicable to all firms, to practice materiality reporting, which entails disclosing their environmental and societal effects and acknowledging the financial risks associated with sustainability concerns. In addition, Big Pharma is in the crosshairs of the EU, which has developed a unique strategic plan for the pharmaceutical industry to reduce its environmental impact and encourage the sharing of best practices.

Other major markets such as Japan and China are continuously updating their environmental protection laws, although environmental policies vary greatly among other countries in the Asia-Pacific region. The United States, however, tend to lag behind other developed countries in enforcing environmental standards, partly as a result of the Trump administration loosening regulations.

So, are such constraints likely to be detrimental to firms' global strategies? Managerial and



corporate rhetoric tends to claim that strict environmental standards have a negative impact on the global competitiveness of EU multinationals.

Environmental sustainability as a competitive advantage

Instead, at odds with this commonly-held view, we found that compliance with strict environmental rules does not harm the competitiveness of high-tech multinationals. In fact, our observations suggest the opposite: that environmental sustainability can be a key competitive advantage on the global scene.

We reached this conclusion by collecting extensive data on 195 leading companies in the pharma and biotech industry listed in the European Scoreboard Database, which ranks the top 2,500 R&D spenders, with rich information about R&D expenditure, sales, etc. We then compared the companies' geographic sales in the Americas and the EMEA (Europe, Middle East and Africa) and APAC (Asia Pacific) regions.

What we observed was that pharma and biotech MNEs with a global strategy (i.e., at least 20% of revenues from each region, but less than 50% from one region) specifically exhibit the highest levels of environmental performance. This association between corporate globalization and environmental performance was found regardless of the environmental stringency of the region or country of origin.

Our explanation is simple: Environmental laws and regulations serve as key incentives for MNEs to support green innovation, and by so doing they can reach a global footprint. Our findings tend to suggest that simultaneously applying strict environmental standards and being globally competitive is not a paradox.

When looking at each region separately though, we observed some nuances. In the Americas, the top 5 companies (including Merck US and Johnson & Johnson) tended to follow

a "home strategy" focused on their home region, despite their high environmental performance, likely because of the ample size of the US market, large enough for companies not to venture farther. In the other regions, on the other hand, globalization is one of the most adopted strategies (for instance by AstraZeneca in EMEA and Takeda Pharmaceutical in APAC). It once again affirms the role of sustainability for MNEs to maintain their competitiveness in the global market. Still, the home region strategy (as opposed to bi-region or host region) is observed to be another favourite one for the top sustainable MNEs. Although the more rigorous rules impose costs on operations, innovation is believed to make the business run more efficiently, offsetting this cost.

“ENVIRONMENTAL LAWS AND REGULATIONS ARE CRUCIAL MOTIVATORS FOR MNES TO ENCOURAGE GREEN INNOVATION AND, IN DOING SO, MAINTAIN THEIR WORLDWIDE COMPETITIVENESS”

The conclusion will no doubt comfort activists and policy-makers, while reassuring the corporate world: Environmental laws and regulations are crucial motivators for MNEs to encourage green innovation and, in doing so, maintain their worldwide competitiveness.

On the academic side of things, our observations open new avenues for future research. For instance, the large adoption of the host region strategy (more than 50% of revenue comes from a region other than the home region) by MNEs in some key countries such as Japan, China, Denmark and Ireland, where green standards are high, opens the question of how the regulations in the host region, compared with those in the home region, might affect the adoption of their globalization development strategy.

OFFSHORE WIND: BOTH A THREAT AND OPPORTUNITY FOR EUROPE'S OIL AND GAS INCUMBENTS

The rapid deployment of this emerging renewable energy technology has seen many leading European oil and gas producers bid to develop and operate offshore wind farms themselves. However, the transition is not easy for these incumbents – resurgent oil and gas prices now threaten to draw their investment capital back into hydrocarbons, and a cost crunch undermines the financial assumptions of many wind projects.

Offshore, a revolution in energy supply, is underway. It threatens state oil companies, like Saudi Aramco and Russia's Rosneft. Investment in wind turbines is creating renewable power generation capacity on an unprecedented scale. Worldwide, installed offshore wind capacity reached 58 gigawatts (GW) last year, up from just 7 GW in 2013. It [is forecast to grow 10-fold by 2035](#).

As I explain in [my impact paper](#), this puts the oil and gas incumbents in a dilemma. One option is to ignore wind, which Exxon and Chevron have done. ExxonMobil recently launched a US\$59 billion bid for shale oil producer Pioneer Natural Resources... Saudi Arabia, which received over US\$300 billion in oil revenues last year, has chosen to delay and dilute international action against fossil fuels. With eight billion tons of coal still burnt worldwide annually, gas producers like Qatar point to methane being a cleaner "transition fuel".

There are not just more turbines, but the turbines themselves are larger and more powerful. In 2009, Vestas launched a three-megawatt (MW) turbine. In 2021, it unveiled a 15-MW unit. For three decades, this technological innovation drove down unit costs. Unfortunately, that cost decrease came to a grinding halt this year, as inflation in steel, installation costs, raw materials, labour and logistics hit offshore wind projects.

European majors saw oil profits slump in 2020

After a boycott of the British government's last round of wind farm concessions, operators have been demanding higher electricity prices. As demand for electricity in the UK is forecast to rise after twenty years of decline, driven by widespread electric vehicle adoption and the potential phase-out of gas boilers, that doesn't look an unreasonable request.

The gas price shock in the run-up and aftermath of the Russian invasion of Ukraine encouraged more countries to recognise offshore wind as a means of achieving both greater energy independence and the emissions goals agreed at the Paris Climate Conference in 2015. The United States, Australia, Japan and Korea are building their first offshore wind projects. China currently has the largest installed base of offshore wind capacity, followed by the United Kingdom. Last year, European states increased their 2030 targets for offshore wind to 165 GW.

It was only when the Covid pandemic struck that Europe's largest oil and gas companies committed to ramping up investment. Before 2020, wind projects had largely been developed by electrical utilities. When crude fell below US\$30 per barrel in March 2020, the economics of oil production were pummelled. European oil companies faced pressure to change.



George Horsington
Head of Offshore at
ABC Maritime AG,
Global Executive PhD
candidate at ESCP
Business School

Repurposing for renewables

Within three months of the oil rout, BP, Shell, TotalEnergies and Eni had announced net-zero strategies for 2050; Equinor quickly followed suit. Shell stated that the company would never again produce as much oil as it had in 2019, focusing on “value not volume”. BP predicted that in 2030 it would be producing 40% less oil. Equinor announced its oil production would peak in 2026 and then fall thereafter. The cause of this Damascene conversion was the impact of low oil prices on balance sheets and profits. The major European oil and gas producers suffered combined losses of around \$40 billion in 2020.

What Greta Thunberg had failed to achieve during years of campaigning, falling oil prices fulfilled within weeks. Shell, BP, TotalEnergies and Equinor [will likely spend](#) around US\$8bn a year in 2025 on offshore wind - more than 18 times the investment they made in 2020.

The rush to develop offshore wind portfolios had predictable consequences: costs for new projects rose, returns fell. In November 2021, [Norwegian researchers announced that Equinor’s Dogger Bank project had a negative net present value](#). It was value destructive, with the internal rate of return (IRR) of only 3.6%, and a payback period of 17 years.

Hangover hits when oil prices recover and wind costs surge

Equinor was soon telling investors that its aim of owning up to 16 GW of offshore wind capacity by 2030 was not a goal, merely an ambition. The contrast was starker in its results after the Russian invasion. Equinor’s net income for 2022 was \$29bn, but its renewables business division lost \$184m.

This cost pressure had an immediate negative impact on the pureplay wind and renewables operators. Denmark’s Ørsted has developed approximately 30% of the world’s offshore wind power capacity (excluding mainland China). Unfortunately, profits in 2021 were 35% lower than in 2020. Having doubled between 2019-2021, Ørsted shares subsequently fell 70% by this October. Over the same period, the MSCI World Oil and Gas index more than doubled.

BP announced record results for 2022, with \$40bn of free cash flow. It raised its dividends and announced share buybacks. BP guided analysts that hydrocarbon production would fall more slowly than projected— rather than

40%, BP now expected a 25% fall in oil output in 2030. TotalEnergies also forecasts that its carbon emissions will not fall sharply by 2030, as it wants to increase gas production. TotalEnergies “should not be held accountable for its customers’ combustion of fuels it sells,” its CEO said. Shell warned that “if society is not net zero in 2050, as of today, there would be significant risk that Shell may not meet this target [either].” This volte-face from renewable energy [has angered climate activists and even investors](#) and [the companies’ own staff](#).

The spike in hydrocarbon prices in 2022 certainly changed the climate: the climate of investors towards the European oil majors as their profits from hydrocarbons soared, and the climate of those companies towards renewables. This transmits the destructive boom and bust cycles of the oil and gas industry into the wind sector.



“THE FLIP-FLOP – AND CYNICALLY OPPORTUNISTIC – APPROACH TO RENEWABLES FROM THE INCUMBENTS IS SELF-DEFEATING”

However, offshore wind has now achieved scale. It has public and government support. It will continue to take market share from fossil fuels in coming decades, whilst the adoption of electric vehicles diminishes demand for petrol and diesel.

The flip-flop – and cynically opportunistic – approach to renewables from the incumbents is self-defeating. Investment in renewables will not depend on volatile fossil fuel prices, nor on geopolitics. Instead, offshore wind should be part of the long-term portfolios of the incumbent oil and gas operators as a natural hedge to hydrocarbon decline.

TAKE THE BULL BY THE HORNS: SURVEILLANCE CAPITALISM IN THE PUBLIC POLICY SPHERE

A rapidly growing form of market power exercised by technology corporations, 'surveillance capitalism' affects public policy processes and democracies, but corporate political responsibility can help keep the business and policy sphere in check.

How does technology change firms' political activities? As we explain in [the impact paper](#) we wrote as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations and Society* series, this novel question is important because technological opportunities [deliberately change firms' well-established strategies to exert influence on public policies](#). Specifically, new technologies adapt both the way we collect, analyse and use information, and how we build public opinions.

The market for public policy

Public policy markets are characterized by [transactions between demanders for and suppliers of policy outcomes](#). They are highly fragmented because each policy issue is considered a separate market. For example, Volkswagen is involved in policy issues regulating emissions, but not in nutritional applications. These markets are characterized by competition between demanders and suppliers.

The supply side includes prime ministers, cabinets, and government agencies. These roles act as self-interested individuals like consumers in economic markets. Valuable resources for suppliers include information, financial contributions, and votes from supporting interest groups. Demand-side actors encompass firms, individual voters, and other interest groups. These individual actors differ in their preferences for policies, such as regulation for automated mobility or environmental standards. Companies have special positions because they can activate the interest of their stakeholders and thus support vote-seeking demanders.

Surveillance as a technological-driven form of capitalism

In her seminal work, *The Age of Surveillance Capitalism*, Shoshana Zuboff describes a variety of capitalism, particularly technology-driven capitalism. Like in other forms of capitalism, corporations' profit-maximizing activities are at the core of this form of economy. They have built a technical infrastructure that systematically collects large volumes of information about the behaviour of internet users, which eventually becomes big data. Google and Facebook, among others, collect data through every digital user's activity. It is important that user activity is not limited to being on a computer but extends into our everyday lives. For example, the Internet of Things collects behavioural data about TV viewing or our daily routes. Such behavioural data is the raw material of surveillance capitalism.

Data is needed to operate and evolve the technology, such as making social media platforms more user-friendly, while the surplus of raw material leads to accurate predictions about user behaviour. These predictions are monetized by selling tailored advertising and, at best, influencing user behaviour. Surveillance capitalism per se enables the prediction of behaviour and allows 'behavioural underwriting' (the assessment by insurance companies of individuals' risk profiles)

Surveillance capitalism methods and policymaking

Firms [use three types of political activities to influence the supply side of policy issues](#): in-



Philipp Richter
Lecturer in accounting at Martin-Luther-University Halle-Wittenberg (Germany), Fellow at and PhD graduate from ESCP Business School (Berlin campus)



Benedikt Kapteina
PhD student and research assistant at the Chair of Business Ethics and Management Control at ESCP Business School (Berlin campus)

formation strategies (i.e., lobbying), constituency-building strategies (i.e., grassroots support), and financial incentives. Surveillance capitalism reshapes information strategies in different ways. One aspect is that policymakers are increasingly using data to inform policymaking processes and proactively asking companies for information.

Constituency strategies are an indirect way to influence policymakers. Surveillance capitalists can leverage constituency-building strategies through behavioural underwriting. Companies can use the big data advantage to create targeted messages and advertising campaigns designed to sway public opinion. Specifically, [‘astroturfing’](#) is a widespread disinformation practice. It disguises the author of a message to make it appear to come from a member of a grassroots movements. By deliberately hiding information about the originator’s financial ties, the statements are given credibility. Corporations use them to promote their own interests and denigrate those of their competitors.

Financial strategies are of indirect importance. However, corporations can accumulate high levels of liquidity because margins in this capitalistic field are enormous. At the same time, these companies have created entirely new, innovative markets that provide new areas of regulation for public policy. The corporations of surveillance capitalism therefore use parts of their surpluses for their political activities.

Surveillance capitalism’s power can be truly problematic, and not only in the case of harmful extremes and abuses. Cases like [Cambridge Analytica](#) impressively demonstrated how tech-

nology, coupled with know-how, can be directed towards political goals to influence people’s behaviour. The events surrounding the Israeli consulting firm [Team Jorge](#) also impressively demonstrate the methods used to manipulate elections. The tools for manipulation are constantly evolving and now range from writing viral posts to using artificial intelligence to influence opinions through social media. These excesses show how new technological capabilities might contribute to the steady erosion of democracies.

The involvement of businesses and all types of stakeholders in policy formulation will continue to be essential, as it is an illusion that policymakers have a high level of understanding of all policy issues. It is therefore inevitable that companies will be involved in policy processes. The trade-off, however, is the need to balance the interests of different stakeholders. Therefore, firms’ political activities under surveillance capitalism methods require strict rules. Following [the concept of corporate political responsibility](#), activities should always take place in a transparent and accountable discourse, should distinguish between legal (e.g., informing decision-makers) and illegal actions (e.g., astroturfing), while illegal actions should be prohibited, and regulation should also apply to grey areas.

Corporate political responsibility can play an important role in promoting ethical practices that help control the negative effects of surveillance capitalism on society. By calling on companies to prioritize the public interest, adopt transparent and accountable practices, and support privacy-enhancing technologies, it can help to ensure that the benefits of technologies are realized in ways that are fair and equitable.



**“CORPORATE POLITICAL RESPONSIBILITY
CAN PLAY AN IMPORTANT ROLE IN
PROMOTING ETHICAL PRACTICES THAT
HELP CONTROL THE NEGATIVE EFFECTS OF
SURVEILLANCE CAPITALISM ON SOCIETY”**





SOCIETAL IMPACT



THE ROLE OF TECHNOLOGY IN SUSTAINABILITY STRATEGY: MOVING FROM “WHAT DO WE DO?” TO “WHO ARE WE?”

Does a technology-based response to the ecological crisis offer a path toward real sustainable solutions or does an over-reliance on technology have the potential to make the problem worse? Leaders can lead conversations about the worldviews team members bring to sustainability challenges, thereby helping them expand the range of possible solutions.

Gunfire rattles across Ukraine; alarm bells ring across the financial sector. Our world is noisy. This can sometimes drown out the background hum of the [looming ecological crisis](#).

Meanwhile, in the business world, managers must [embed sustainability](#) in their strategy. But how do the dynamics in our organizations help or hinder this effort? I often hear people talk about “rewiring” our economy. It’s an interesting metaphor. But we must remember that it is possible to expertly rewire a house without asking certain questions: Is the foundation sound? Is the roof watertight? Is the house in the path of a hurricane?

We tend to think of the ecological transition in technological terms. It makes sense. Solar panels and modular reactors are among the tools we’ll use to build a sustainable future. However, as I explain in [the impact paper](#) I wrote as part of ESCP Business School’s *New Technologies and the Future of Individuals, Organisations and Society* series, this transition won’t just involve rewiring but also rethinking. Yet, our economy is like a construction site so alive with the sound of tools that it’s hard to have a conversation about whether the blueprints make sense.

We need to ask ourselves how our mental models define the limits of what’s possible. The world abounds with examples of how technology grows fortunes and extends lives. But [recent academic research](#) illustrates how a technolo-

gy-centric mindset can also create blind spots. Scholars and popular thinkers have described the technological mindset in several ways. Do any of these sound familiar to you?

Technological fix

We live in the Anthropocene era — a new geological age in which human activities are re-configuring nature. One of the archetypes — ways of viewing the world — of our Anthropocene Society is called Technological Fix. Under this archetype, society should be led by scientific institutions. Other institutions are subordinated to these technological centres of power.

Wizards

How do we feed the world? Should we re-organize society to live within resource constraints? Or should we breed plants that grow any time anywhere? The former point of view is that of a prophet and the latter is that of a wizard.

The mental model of the wizards was embodied by Nobel Laureate Norman Borlaug for his ground-breaking scientific work on increasing crop yields. He and his fellow wizards led the green revolution in which technology-based farming techniques spread throughout the world.

Technocentrism

Academic work on sustainability discourses identifies two patterns: the localist discourse that emphasizes grassroots organizing and the technocentric discourse that focuses on tech-



Phil Glynn
President of Travois,
Global Executive PhD
candidate at ESCP
Business School.

nological and economic processes. It focuses on the power of existing institutions to address sustainability challenges.

Techno-market imaginary

This is the belief that the power of technology can be fused with people's inherent tendency to profitably pursue their interests. People can be incentivized to pursue activities that benefit the environment for purely economic reasons.

Sustainability strategies also need a social component

People who hold the mindsets listed above have a great deal to contribute. They are often optimistic; they persevere in the face of problems. But there are potential downsides to a purely technological mindset.

Consider the rebound effect. Technology can make a product or service more efficient. This also decreases its cost. As a result, people do the individually rational thing. They consume more of it. At the societal level, even more resources get consumed. It's a reminder that sustainability strategies must have a social component alongside the technological one.

Fortunately, technology can often be highly efficient from a market perspective and [deeply questioning of society's assumptions](#) at the same time. Cryptocurrencies raise unsettling questions about centralized power. Dating apps have changed the way people fall in love.

The technology mindset is useful in sustainability not because it can crack some secret code to permanent sustainable growth. It is useful because it can show society many possible paths. Then society must use the social processes of politics and organization to choose the best one. We can't just tinker; we have to talk.

Leaders like to think we promote ideas because they are the best. Yet, a point of view often accrues legitimacy within an organization [because it aligns with powerful interests](#). This can create blind spots within organizations that have a technology-centric culture.

Overly technology-focused sustainability strategies might carry the day because they align with the power structure of the firm, leaving important social questions neglected. We can't only ask "What shall we do?" We must also ask, "Who are we?"

Technological Fix

According to this view of the world, many of the other institutions that have things to con-

tribute are subordinated to scientific institutions. So, ask your team: do we want to engage in subordination or service?

Society needs scientific institutions to play a leadership role in this transition. But leadership by subordination in a hierarchical society is just one of many potential paths. Managers can talk to their team members about the kinds of leadership roles they already play in their own communities. Managers are likely to find a strong spirit of leadership based on service that can help drive the company's transition.

Wizards

The battle between the wizards and the prophets comes down to one central idea: limits. We see science as the solution to every problem because science has provided abundance. This has fueled a popular belief that scientific solutions should pave the way for never-ending growth. Is this really the message you want to send? Or would you also want to balance this with a message of thrift and moderation?



“THE TECHNOLOGY MINDSET IS USEFUL NOT BECAUSE IT CAN CRACK SOME SECRET CODE TO PERMANENT SUSTAINABLE GROWTH. IT IS USEFUL BECAUSE IT CAN SHOW SOCIETY MANY POSSIBLE PATHS.”

Technocentrism

The scientists who have had the greatest social impact have all been great communicators. Is managerial discourse only taking place within corporate and research settings? There is probably a place for your team members' voices in the popular media too.

Technomarket imaginary

People indeed need to see sustainability as being in their economic interest. But, again, consider the rebound effect. Will your company truly be better off if landfills go from being overwhelmed by inefficient devices to being overwhelmed with efficient ones?

I don't think that people with technological mindsets should abandon them. But we must get people talking about their values—about how they view the world. This will help our teams use their worldviews as soil for growth, not ideological prison cells.

INTELLECTUAL ETHICS IN THE AGE OF STRONG AI: A NEW COPERNICAN REVOLUTION?

The prospect of ‘strong’ AI is beginning to appear more credible, as is the decentring of humans for the second time following the Copernican Revolution. Just as we need to cultivate certain intellectual virtues to work in a human-based organisational group, Erwan Lamy believes we need to consider cultivating certain other virtues to work with strong AIs.

Four centuries ago, the Copernican Revolution decentred humanity for the first time and today, we are beginning to realise (once again) that [humans may no longer be at the centre of intellectual life](#).

In the [impact paper](#) I wrote as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations and Society* series, I explain that the impact could be as great as that caused by Copernicus. The new generations of artificial intelligence (AI), which were revealed to the world just a few months ago, and their successors in particular, could decentre us for a second time.

The deep disquiet caused by these new machines, like the disquiet caused by the new Copernican ideas in our ancestors' minds, is evident in the reactions they are provoking. There has already been an endless stream of articles and speeches reminding us that AIs are intelligent in name only and that nothing can match the human mind.

Let's not get side-tracked

All these reactions are perfectly valid, but they should not detract from the potentially disruptive nature of these technologies. The first point to remember is that these technologies are still in their infancy and have already made a spectacular start.

Secondly, very few people imagined a few months ago that machines could produce intelligible, structured language and that we

could interact with them just as we do with a human being. This is already an amazing feat, and it would be unwise to underestimate this breakthrough.

Lastly, there are several factors suggesting that these machines, with all their limitations, [are now creating a credible path towards strong AI](#), something that was still the stuff of science fiction not so long ago. [Strong AI](#) stands out for its ability to reason, learn and adapt autonomously, overcoming the limits of [weak AI](#), which can only perform specific tasks.

It is not clear whether this now-emerging strong AI is truly intelligent in the same way as humans are intelligent. But this philosophical debate is unlikely to be of much practical interest, no more than asking whether an engine produces the same kind of ‘work’ as a human being. What is important is that it could be capable of performing the same intellectual tasks as a human being, and in a completely indistinguishable way. This is something we need to prepare for. Yet there is one aspect of this preparation that is far too frequently overlooked: intellectual ethics.

New intellectual ethics

Intellectual work is not just about applying certain methods; it is guided by moral rules that need to be incorporated as part of that work. Not telling the truth, or refusing to respond to criticism, is not only an act of misconduct with potentially harmful consequences, it is also blameworthy.



Erwan Lamy
Associate Professor
in the Information
and Operations
Management
Department at ESCP
Business School
(Paris campus)

Intellectual ethics involve cultivating certain virtues, and combating certain vices, that promote the pursuit of a healthy intellectual life. These virtues include intellectual honesty, rigour, open-mindedness and [epistemic responsibility](#). This question of 'intellectual' (or 'epistemic') [vices](#) and [virtues](#) has been attracting attention for a few years now. With the arrival of strong AIs, it needs to be addressed in a new light: what will happen to these virtues when strong AIs burst onto the scene?

Intellectual ethics require us to look past the moment of disbelief accompanying the advent of our intellectual decentring, this second Copernican revolution, and accept the arrival of non-human intelligence.

Being open-minded for OpenAI

This already involves a high degree of open-mindedness. Open-mindedness is our intellectual readiness to consider something as worthy of interest even if it appears to be strange. Being open-minded means accepting that our intellectual habits may be disturbed in order to open up new epistemic horizons. This is already an important virtue when it comes to teamwork.

With strong AIs, it will no doubt be crucial. These non-human entities will unquestionably follow non-human lines of reasoning, and the results of this reasoning may appear quite unusual. We will need to be prepared to listen to them. This may involve some radical questioning of our most deeply-rooted certainties.

Accepting the loss of our monopoly on intelligence

This would also imply accepting this second decentring, in other words a new form of intellectual humility. This virtue, which of course would only be valid for as long as it takes us to get used to the decentring, would involve recognising our limits as a species (and no longer

just as individuals) and accepting the loss of our monopoly on intelligence.

When dealing with a strong AI, this humility would allow us to accept that these entities may possess knowledge or intellectual skills equal or superior to our own and that they may be capable of a genuine intellectual life as important and worthy as ours, albeit different.

Lastly, there is a third intellectual virtue for working with strong AIs: the ability to synthesise and provide epistemic leadership. We will need to be able to lead AIs that are more intelligent than we are, just as business leaders lead the combined cognitive efforts of employees who may also be more intelligent than they are. Leaders are not experts, but they must be capable of leading experts.

The virtue of epistemic leadership also involves the ability to stimulate intelligence, to guide it without crushing it, to lead it while respecting its autonomy. It also involves the ability to reap the benefits of these intelligences by synthesising them. Working with strong AIs will not involve understanding the details behind their reasoning, but knowing how to synthesise it.

It is clear that these three virtues are not the whole story when it comes to new intellectual ethics that may emerge with the advent of strong AIs. The aim of my impact paper was of course not to provide an exhaustive list of the epistemic virtues that need to be cultivated to work with strong AIs in the future. It was to point out the kind of thinking that will soon be needed in every organisation.

Of course, this has not happened yet. Strong AIs are not here yet. But their arrival is becoming more credible by the day, and we need to prepare for it. Preparing for strong AIs must not be limited to the usual technical discussions or ethical considerations. It must involve a whole epistemological strand and include the problem of intellectual ethics.

“STRONG AIS ARE NOT HERE YET. BUT THEIR ARRIVAL IS BECOMING MORE CREDIBLE BY THE DAY, AND WE NEED TO PREPARE FOR IT”

HOW (AND WHY) TO BOOST CARBON CAPTURE, USAGE AND STORAGE TO MOVE TOWARDS NET-ZERO

To reach carbon emission targets laid out in the Paris Agreement, one promising process is carbon capture, usage and storage (CCUS). But the current shortcomings of these technologies (high costs, low efficiency) need to be addressed before CCUS can be deployed at scale – and turned into an effective climate solution.

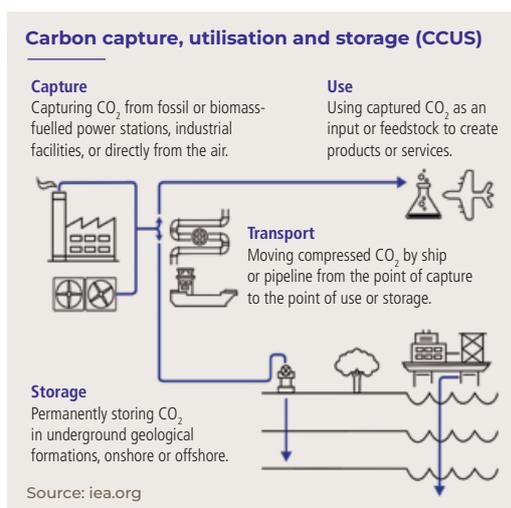
Unlike the proverbial cat let out of the bag, carbon dioxide, once let out into the atmosphere, may be recaptured. As climate urgency mounts, one promising path to keep greenhouse gas levels in check is that of [Carbon Capture, Usage and Storage \(CCUS\)](#). CCUS technologies enable the reduction of carbon dioxide (CO₂) emissions from large, polluting industrial facilities and/or the removal of existing CO₂ from the atmosphere. Various methods exist to separate and capture CO₂ from flue gas streams, with the CO₂ either reused (directly or after transformation) in industrial processes or stored underground, for instance in saline aquifers or depleted oil and gas wells.

Another 11 are in construction and 153 are in development (in 2022 alone, 61 new CCUS projects were initiated). Yet it is now time to step on the gas, so to speak, and change scale. That's what we argue in [a recent impact paper](#) we wrote as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations and Society* series.

Climate scientists claim that it is impossible to reach net-zero targets without CCUS deployment on a wide global scale and several organisations, including the [Intergovernmental Panel on Climate Change](#) (IPCC), the [International Energy Agency](#) (IEA) and the [International Renewable Energy Agency](#) (IRENA) advocate an effective acceleration of CCUS globally if we are to reach climate targets. Also, an acceleration of the deployment of CCUS technologies would enhance energy security, especially in times of significant geopolitical reconfigurations. The possible use of CCUS technologies to produce low-carbon hydrogen, with its potential of serving as a source of energy of various applications after carbon dioxide is set to be permanently removed, offers another argument in support of the acceleration of CCUS deployment. Yet a number of significant obstacles stand in the way of the expansion of CCUS projects.

Expensive, under-performing operations

We identify three main challenges. The first is cost, as CCUS facilities are both capital-intensive to deploy and energy-intensive/expensive to operate. Some technologies are pricier than others: for instance, natural gas processing (from highly concentrated CO₂ streams) is way less expensive than direct air capture – for the moment.



An underdeveloped path towards carbon emission targets

While such technologies have been commercially available for decades, only 30 CCUS projects are currently in operation across the globe [according to the Global CCS Institute](#).



Wioletta Nawrot
Associate Professor of Economics and Sustainable Finance at ESCP Business School (London campus)



Tomasz Walkowicz
Consultant at Deloitte (Banking Analytics Team)

Indeed, costs go down as technologies mature: in large-scale facilities, the cost of CO₂ capture in the power sector has already dropped by 35% since the first deployments according to IEA estimates. But for heavy industries like cement production, that struggle to achieve necessary emission reductions, even the most expensive technologies can be cheaper than other alternatives – or than having to shut down altogether in a restrictive future scenario.

A second challenge is the underperformance (and sometimes outright failure) of CCUS operations, possibly due to their relative technological youth. For example, according to recent reports, the world's only large power station with CCUS, SaskPower's Boundary Dam in Saskatchewan, Canada, underperformed by close to 50%.

Finally, CCUS operations are not free of environmental concerns. One risk is CO₂ leakage from storage, though we can be reasonably reassured about the solidity of natural geological formations that have already stored gas for millions of years. CCUS systems increase environmental damages from toxicity, acidification, eutrophication, etc. However, the literature also concludes that there is a net environmental benefit if we compare the reduced environmental damage from climate change achieved by CCUS systems with the environmental and health damage induced by CCUS itself. Still, the complex climate implications of carbon uses, especially the controversial [Enhanced Oil Recovery \(EOR\)](#) technology that ultimately serves to produce more fossil fuel, require more research.

The solution: boosting innovation

Costly, under-performing and potentially risky technologies perhaps don't sound like a very apt climate solution, yet many aspects of these challenges can be effectively addressed by boosting innovation. It is normally expected that a cost and performance gap (with established technologies) will be closed when the deployment of CCUS moves to the mainstream. In turn, the pace of innovation will depend on the involvement of various stakeholders and the policies governments introduce today.

This is why we call on further significant public and private investment in R&D. As knowledge and practical know-how accumulate, the market will grow and economies of scale will help lower costs, as happened with the solar photovoltaic industry.

Through funding and incentives, governments can also support building and improving CCUS infrastructure. For instance, developing

industrial clusters is especially beneficial to generate economies of scale.

We also argue that once the technologies become mainstream, governments need to consider making carbon capture, usage and storage a legal requirement for the most polluting industries. We suggest initiating policy consultations as soon as possible, for companies to start preparing operationally and financially, incorporating the requirements of future climate legislation into their budgets and long-term business models.

“IT IS OF HIGH IMPORTANCE THAT GOVERNMENTS PLACE CCUS POLICY HIGH ON THE LIST OF THEIR NATIONAL PRIORITIES AS THE RECENT UN IPCC ASSESSMENTS LEAVES NO REASONABLE DOUBT THAT THE TRANSITION TO NET-ZERO CANNOT BE DELAYED IF THE WORLD IS TO AVOID A HUMANITARIAN CRISIS ON AN UNPRECEDENTED SCALE”

Some governments have already launched initiatives to strengthen investment in CCUS development. We single out the US as a leader, with a recent \$US62 billion budget for the Department of Energy, including \$10 billion earmarked for carbon capture, direct air capture and industrial emission reduction, and Canada, which has established a CAN\$2.6 billion tax credit budget for CCUS projects. In Europe, the UK, Norway and Denmark are also investing. It is of high importance that governments place CCUS policy high on the list of their national priorities as the recent [UN IPCC assessments](#) leaves no reasonable doubt that the transition to net-zero cannot be delayed if the world is to avoid a humanitarian crisis on an unprecedented scale.

Other countries must follow suit, as we point to the evidence that government incentives do influence companies' investment commitments. We also warn Western governments against the temptation to heavily tax the windfall profits of energy companies, which may slow their investments towards net-zero. Instead, we suggest encouraging fossil fuel extractors to invest in technologies to dispose of carbon dioxide safely and permanently, not only with EOR, possibly through such requirements as a [“carbon takeback obligation”](#).





TEACHING
IMPACT



LEARNING TO USE GENERATIVE AI FOR ACADEMIC WORK



Markus Bick
Professor of
Business Information
Systems

Artificial intelligence is rapidly changing academic work. After experimenting with AI tools during a 'Prompt-o-thon workshop', Profs. Bick, Breugh, Dong, Pina and Waldner provide some interesting insights into their use and the potential challenges ahead.



Jessica Breugh
Lecturer of CSR
and Business
Ethics

A transformative force has emerged in the ever-expanding landscape of education, poised to disrupt the way we learn and teach: Artificial Intelligence (AI), which has the potential to revolutionize what we do and how we do it, leading to significant productivity gains and improved performance in tasks traditionally performed by humans. This explains why the global market for AI in education is expected to grow at [up to 46%](#) per annum over the coming years.

benefits and challenges of using LLMs and other AI tools in academic work, and the exploration of potential policies to ensure ethical and responsible use of LLMs.



Chuanwen Dong
Assistant Professor,
Information
& Operations
Management
department

In the [impact paper](#) we wrote as part of ESCP Business School's *New Technologies and the Future of Individuals, Organisations, and Society* series, we explain that Large language models (LLMs) like ChatGPT and other AI tools are expected to transform how academic work is conducted, particularly in relation to written assignments. Recent research has shown that [using LLMs decreases the average time taken to complete writing tasks while improving the quality of the output](#) and that [the use of an AI pair programmer leads to faster completion of tasks](#).

During the event, students learned about the use of LLMs and other AI tools. They were shown how different prompts deliver different results, and how LLMs are prone to '[AI hallucinations](#)' – an industry term for spewing nonsense, making up academic papers for example.



Gonçalo Pina
Associate Professor
of International
Economics

AI tools put to the test by students

However, the integration of AI tools into academic work raises important questions for both students and professors: How should we use these tools in universities? What policies can be implemented to make the best of these disruptive technologies while maintaining academic integrity?

We then asked teams of students to draft a mock bachelor's thesis in 45 minutes using LLMs. The students' varied use of LLMs to structure their work, conduct literature reviews, summarize data, and improve language revealed the potential benefits of these tools. One group asked the chatbot to summarize existing literature and then to identify gaps in the literature. Another group asked it to develop computer code to analyse data (incidentally, the data was also made up by the LLM itself).

Potential benefits and challenges

While the initial output highlighted gains in efficiency, upon review we found that the generated theses tended to lack depth, with limited critical analysis, incorrect citations, and fabricated references. The average grade for the three theses written during the event fell below a passing grade. This has to be reflected against the background of the short time frame for the task (45 minutes), which suggests that with more time, students can overcome such flaws.



Carolin Waldner
Assistant Professor
of Sustainability
Management

All at ESCP
Business School
(Berlin campus)

To explore these issues, we held an interactive event called a Prompt-o-thon with students on the Berlin campus of ESCP Business School in March 2023. The event showcased the potential of AI, discussed its use in academic work and included an activity for students to use the AI tools themselves. Discussions included the

In the discussion part of the event, students shared both why LLMs are useful – for generating ideas, understanding the research landscape, and providing structure – and how they should be used responsibly. They cautioned

against total reliance on LLMs and stressed checking the content generated, citing their use transparently, and working to avoid bias.

The event also exposed gaps in our knowledge as professors. We realized very quickly that clearer guidelines for students to use LLMs with academic integrity were necessary. Therefore, we created a draft code of conduct after the event advising on the proper use of LLMs in their academic work, including among other things: avoiding copying text directly from LLM output; double-checking LLM-generated information; being responsible for the integrity of the information supplied by LLMs; and being transparent about the use of LLMs in their work.

Our experiment reinforced that simply banning LLMs is unrealistic - we must adapt the way we teach to this new reality. Incorporating LLMs into courses ensures students learn how to leverage these tools appropriately and ethically.

There is much we still do not understand about the impacts of LLMs on learning outcomes, writing quality, instructor workload, student equity, and more. Future research and shared experiences are therefore crucial for developing evidence-based policies and norms to improve higher education in the future.

We came away viewing LLMs as disruptive technologies offering students new tools – when used with proper oversight and guidance. The onus is now on us, as educators, to reimagine academic work for this AI-empowered age. We suggest the following basic guidelines while encouraging other educators to refine and build on them:

1. Embrace LLMs and try them out for yourself and your own work as a teacher.
2. Let the students explore the ups and downs of LLMs, for example by using AI in the classroom - together.
3. Rethink traditional assignments by developing and writing assignments collaboratively with students and supervisors.
4. Enable and drive a debate about the ethical issues and potential risks that exist (and will emerge) in the use of LLMs.
5. Start to develop standards on how to use (and not use) LLMs for yourself, your team, your course, your department. Don't wait for others to come up with rules, take the driving seat and co-create the rules.



“WE CAME AWAY VIEWING LLMs AS DISRUPTIVE TECHNOLOGIES OFFERING STUDENTS NEW TOOLS – WHEN USED WITH PROPER OVERSIGHT AND GUIDANCE”

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