

A horizontal bar with a dark green segment on the left and a yellow segment on the right.

10 Trends

Artificial intelligence



Overview

Decades of development passed after scientists at the Dartmouth conference of 1956 envisaged that every aspect of learning or ... intelligence could be simulated by machines, AI came of age in 2023.

So called “Generational AI” went mainstream, differentiated from previous variants by its ability to generate novel content by learning from large datasets. ChatGBT, launched in late 2021, now attracts >1.5 bn users/mth. The AI market in the UK has been estimated at £21bn, but expected to grow to £880 bn by 2035 ([US ITA](#)).

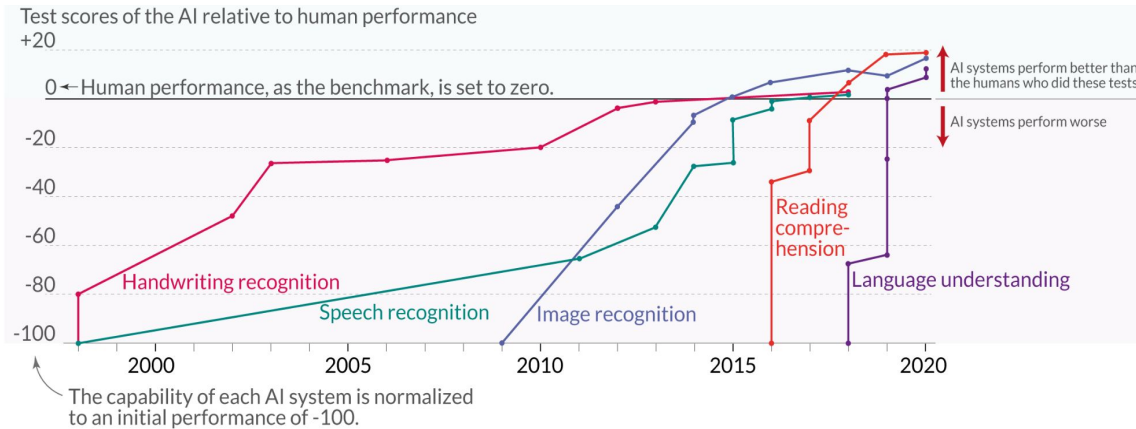
Already producing impressive results in terms of speed, accuracy and creativity, AI is yet only in its very early infancy. Utopian and dystopian visions for the technology abound and both good and bad faith actors are already embarked in battles on how the technology is used.



Global context

Global AI development can be measured in multiple ways, including adoption rates, investment, capabilities and its transformative outcomes. Over just about a decade, AI has become capable of surpassing human performance at a range of common tasks. A [global McKinsey survey](#) in August 2023 found 1 in 3 companies using AI in at least one function

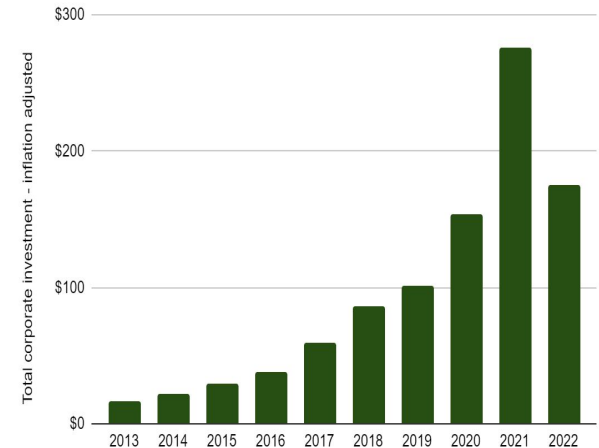
AI capability developments over time



Data source: Kiela et al. (2021) - Dynabench: Rethinking Benchmarking in NLP
OurWorldInData.org - Research and data to make progress against the world's largest problems.

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Estimated corporate investment



10 trends



01. Proliferation

02. Gold rush

03. Algorithmic advancements

04. Fear of dystopia

05. Regulators act

06. Empathy & manipulation

07. Democratisation

08. Industry 4.0

09. Uniquely predictive

10. Self-fulfilling visions

Proliferation

01



Photo by [Marvin Meyer](#) on [Unsplash](#)

Signals: PwC found 72% of businesses are currently using AI. We are seeing the early adoption of AI in core business processes across a wide range of industries, including healthcare, manufacturing, finance, and transportation ([Capital Economics](#)). AI is already painting, writing and making music, so will extend in the arts as well as business.

Outlook: AI will take “a few years” (from 2023) before having a profound impact on the economy, but will diffuse rapidly across many sectors (Goldman Sachs). In June 2023, [McKinsey](#) expected AI to be add \$2.6tr to the global economy with biggest impacts in customer operations, marketing and sales, software engineering, and R&D.

Opportunities:

- New products and services
- Cost reductions & efficiencies
- R&D advancements

Threats

- New entrants and challengers
- Competitors move faster
- Consumer and public backlash

Goldrush

02



Photo by rupixen.com on Unsplash

Signals: In 2021, global investment in AI reached \$77.6 billion, up from \$39.9 billion in 2020 (PWC). Market interest in AI has already increased rapidly, with more than 16% of companies in the Russell 3000 mentioning the technology on earnings calls, up from less than just 1% of those firms in 2016. (Goldman Sachs)

Outlook: AI investment forecast to approach \$200 billion globally by 2025 (PWC) Major B2B data service providers, including Google and Amazon Web Services are also investing heavily; the former investing \$300m in a company in February 2023, and latter allocating a further \$100m to generating AI in June 2023.

Opportunities:

- Investment in AI start-ups
- Partnerships with AI companies
- Advanced AI service availability

Threats

- Competitors take advantage faster
- Competition for AI IT skills
- Reliance on third parties.

Algorithmic advancements

03

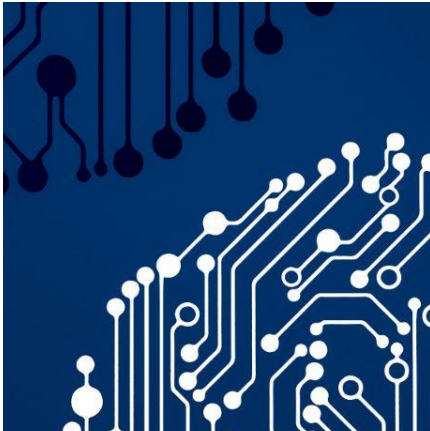


Photo by CardMapr.nl on Unsplash

Signals: In 2019, [Stanford University](#) co-authored a report that described that AI computational power is accelerating faster than traditional processor development. “Prior to 2012, AI results closely tracked Moore’s Law, with compute doubling every two years,” the report said. “Post-2012, compute has been doubling every 3.4 months.”. 5.26 new researchers entered into the field of AI each hour in 2019, more than 175 times faster than in the 1990s ([Tang AI](#)). **Outlook:** With increased processing speed, AI is more capable of executing more “human” tasks - and are being charted by several organisations ([OECD](#)). AI will move from task based repetitive tasks to being capable of developing plans and strategies.

Opportunities:

- AI assistants help workforces
- Faster, better decisions
- Ability to address bigger challenges

Threats

- Loss of human input into work
- Loss of visibility of decisions
- Rapid obsolescence of products

Fear of dystopia

04



Photo by Tobias Tullius on Unsplash

Signals: Dystopian scenarios include that AI will lead to i) mass unemployment, ii) AI ‘taking over’ infrastructure and critical systems or allowing bad faith actors to, iii) AI bias causes issues ranging from the corruption of democracy to the perpetuation of stereotypes ([Business Insight](#)). At a 2023 summit, many were alarmed when [AI robots declared that they could lead better than humans!](#)

Outlook: Although public and private sector organisations will strive to tackle the three risks above, they are unlikely to be consistently successful and so will face ongoing challenges that radically extend today’s cyber threats both to their company and wider public infrastructure.

Opportunities:

- Adopting AI transparency policies
- Developing robust systems
- Building internal knowledge

Threats

- Impact on staff and jobs
- Loss of system control/corruption
- Failing to meet ethical expectations

Regulators act

05



Photo by [Nick Kane](#) on [Unsplash](#)

Signals: Regulators start to act in response to AI fears, though with different regimes likely in the EU, US, and China. The number of AI bills that passed into law globally had risen to 37 by 2023, with the first having been in 2016 ([WEF](#)). The EU will be regulated by the [AI Act](#) while a [Liability Directive](#) remains a topic of discussion. The UK Government published their own [AI roadmap](#). A global regulators summit is due in October 2023.

Outlook: Regulators face various tensions: one is between innovation and protection of the public, the other is between political neutrality and favouring politically favourable stances. Creators and users of AI content will be expected to disclose AI generated content from human content, but this could lead to various grey areas.

Opportunities:

- Clearer rules to ensure compliance
- Reduced liability
- Protection against bad faith actors.

Threats

- Effort and cost to track & implement
- Legal ambiguity and complexity
- Innovation is stifled

Empathy & manipulation

06

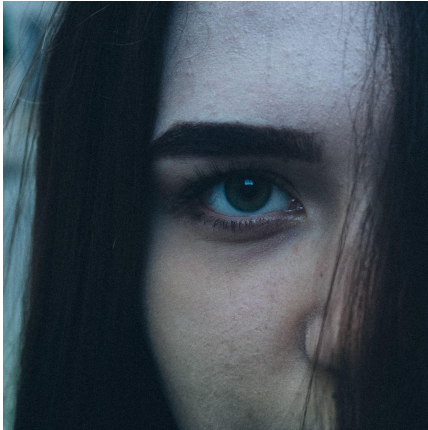


Photo by [Andriyko Podilnyk](#) on [Unsplash](#)

Signals: AI has developed capabilities to mimic aspects of human interactions that generate emotional attachments e.g. facial expression and sentiment recognition - offered by a range of new products like [IBM Watson](#). This capability has already been used to generate positive applications (e.g. apps to help with [mental health issues](#), [education](#) and provide [better customer service](#)) and negative applications (e.g. “[polymorphic malware](#)”).

Outlook: The ability for AI to understand and respond to human emotions, in order to influence people, will spur innovation across sectors while creating new ethical and social debates about the dividing line between empathic and manipulative AI content.

Opportunities:

- Helping vulnerable customers
- Better customer service
- More-effective training/education

Threats

- Learned dependencies
- Manipulation
- Impacts on human relationships

Democratisation

07



Photo by [John Schnobrich](#) on [Unsplash](#)

Signals: AI is being made available and widely adopted by users without technical knowledge, using tools like [Google Colab](#), [Microsoft Azure OpenAI](#) and [automated machine learning platforms](#). Within a week of launch, ChatGBT had reached 1m users and has 1.6bn monthly website visits by August 2023 ([Tooltester](#)). AI is also harnessed in apps using an increasing range of no-code app development tools like [Builder.ai](#).

Outlook: AI-literacy will become a necessary foundational skill of many employees. However, organisations will need to impose greater top-down governance. AI communities, training, and forums will grow, including groups working for social good.

Opportunities:

- Building internal capabilities
- Joining forums and groups
- Contributing to worthy projects

Threats

- Failing to keep pace
- Losing ambitious staff to rivals
- Losing control over staff projects

Industry 4.0

08



Photo by [Rob Lambert](#) on [Unsplash](#)

Signals: Industry 4.0 refers to the digitalisation of production processes through the development of intelligent, networked, automated systems. Organisations at the fore, like car manufacturer [SEAT](#), are using AI, virtual reality, robots and big data to help manufacturing. The market was valued at \$130bn in 2022 ([Fortune Business Insights](#))

Outlook: Manufacturing companies will increasingly benefit from “real-time data analysis, increased visibility, autonomous monitoring, enhanced productivity, and competitiveness” ([Abdelmajied](#)) Further developments are expected in each of the key components including [sensors](#), intelligence, control and robotics.

Opportunities:

- Productivity, efficiency & quality
- Building supply chain resilience
- Product customisation

Threats

- Business transformation disruptions
- Tech interoperability challenges
- High initial costs for technology.

Uniquely predictive

09

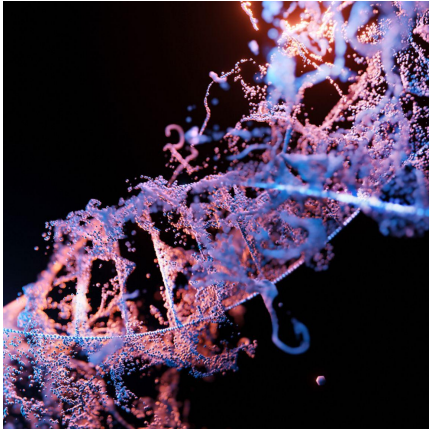


Photo by [Sangharsh Lohakare](#) on [Unsplash](#)

Signals: The ability to quickly process vast datasets is eradicating the need for coarse predictions of human outcomes based on segmentation variables like age, gender and race. Already companies are employed personalised marketing strategies which offer companies [powerful benefits](#). The personalisation software market is worth \$943m and growing at more than 20% a year according to [360 research](#)..

Outlook: In future, an individual's unique data, along with data of others, will predict individual behaviours and outcomes e.g. [Unique genome sequences are envisaged as predicting individual health outcomes](#), just as marketing might personalise marketing.

Opportunities:

- Personalised marketing/promotion
- Customised products/services
- Insight for innovation

Threats

- Customer resistance/ scepticism
- Data security concerns
- Unpredictable psychological impacts

Self-fulfilling visions

10



Photo by [Edgar Castrejon](#) on [Unsplash](#)

Signals: From submarines envisaged by Jules Verne in 1870 to video calls anticipated in a Star Trek from 1966, fiction has been credited (rightly or wrongly) with later inventions. The existence of AI itself has fuelled new visions for society and business - like the films “Altered Carbon” and “The Metamorphosis of Prime Intellect” from the early 2000s.

Outlook: [MIT](#) reported that AI is already recreating itself in 2021, so it will undoubtedly come to re-create itself and thereby start to generate new genres, techniques and visions. There remains a [broad divergence of views on when AI might reach “singularity”](#) and be capable of human level thinking. The results of what computers might create when capable of thinking at levels beyond humans is literally unpredictable. .

Opportunities:

- Continuous innovation opportunity
- Radical brands & differentiation
- Entirely new markets

Threats

- Loss of control over decisions
- Unintended consequences
- Consolidation of commercial power

Factors affecting the future





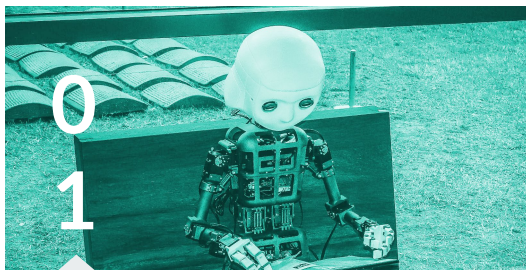
Perspectives on the future: Elon Musk

With artificial intelligence, we are summoning the demon. You know all those stories where there's the guy with the pentagram and the holy water, and he's like, yeah, he's sure he can control the demon? Doesn't work out.

Perspectives on the future: Ray Kurzweil

Artificial intelligence will reach human levels by around 2029. Follow that out further to, say, 2045, we will have multiplied the intelligence, the human biological machine intelligence of our civilization a billion-fold.

Key uncertainties affecting the future trajectory



Sentience

As AI develops it will raise questions about the levels of consciousness and self-awareness in machines, thus the ethics surrounding how those machines are considered in society.

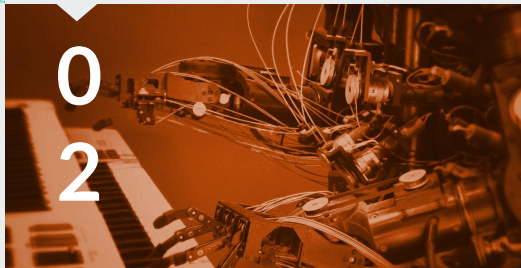
Human-AI relationships

AI can offer human benefits but also manipulate people due to information imbalances. The extent regulators will combat these factors is another uncertainty.



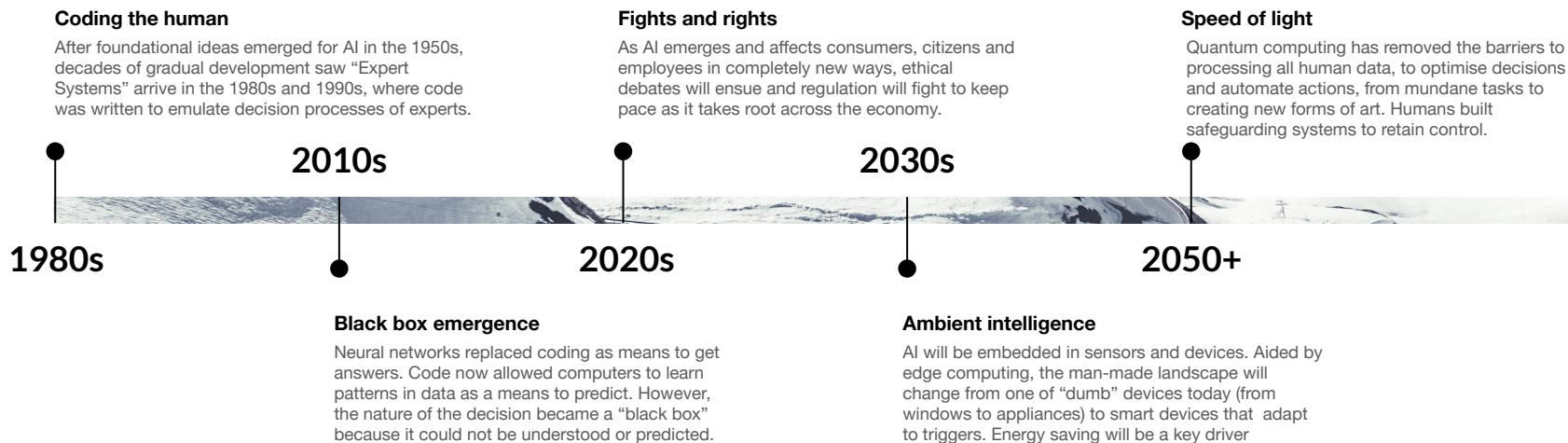
New world realities


As AI moves beyond the competences associated with human thinking, it will have the opportunity to imagine new markets, experiences and types of media yet unknown.



Timeline

Various scenarios are plausible. In this scenario, AI develops to fulfil much of its technological complexity, while humans retain control.





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