CoSTAR
THE UK R&D NETWORK FOR CREATIVE TECHNOLOGY

ForesightLAB

UKRI Arts and Humanities Research Council

Certain Uncertainties
A Foresight Lab Report

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The CoSTAR Foresight Lab

Driven by the UK's leading Creative Industries experts, the CoSTAR Foresight Lab is researching the adoption, use and impact of new, emergent and convergent technologies in gaming, TV, film, performance and digital entertainment.

Our findings will inform research, development and innovation across the Creative Industries, including the R&D taking place through the convergent screen technologies and performance in real time (CoSTAR) programme, the UK R&D network for creative technology.

CoSTAR is a £75.6 million national R&D network of laboratories that are developing new technology to maintain the UK's world-leading position in gaming, TV, film, performance, and digital entertainment. Delivered by the UKRI Arts and Humanities Research Council, the programme is supporting new innovations and experiences that will enrich the UK's creative industries, economy, and culture. The network comprises the National Lab, the Realtime Lab, the Live Lab, the Screen Lab and the Foresight Lab. CoSTAR is funded through UK Research and Innovation's Infrastructure Fund, which supports the facilities, equipment and resources that are essential for researchers, businesses, and innovators to do groundbreaking work.

You can find out more by visiting www.costarnetwork.co.uk.

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Mapping the wider context

Our social fabric has frayed, and technology has made us vulnerable as much as powerful. Economies are exceedingly complex, and our changing environment will demand new ways to anticipate chaos. Politics are transactional, in flux, and the old rules no longer apply. This is a model of our present moment.

This report presents foresight research conducted by the CoSTAR Foresight Lab in partnership with i2 media research. Presented from a UK perspective, it has identified forces affecting the world in which CoSTAR and the wider creative sector's activities are unfolding.

Forces, or drivers, are a common method in foresight studies, and can be used to make sense of the wider context. Often this allows us to hypothesise around possible cause-and-effect relationships in emergent, on-the-ground issues. Forces driving change are certain and well-known, though their trajectory is uncertain. Typically, they have a clear presence dating back a decade and are expected to influence the next decade in uncertain ways. They are **certain uncertainties**.

They have been scoped for the CoSTAR programme by Goldsmiths University and i2 media research, developed through an extended period of cross-disciplinary research, environment and horizon scanning, iterative frameworking, as well as feedback loops with stakeholders within and outside the CoSTAR Foresight Lab.

We have developed this research framework with the following in mind.

I. Forces are highly certain, distinct changes of an era, present for at least a decade to illustrate a clear systemic change and are expected to be present for the next decade. While they are certain, their trajectory is uncertain. They are complex, multi-dimensional issues.

II. Forces should not be excessively normalised (by being present for several decades) because this can dilute the aim of the task, which is to orient oneself to the most pressing and certain issues at this moment in time, with salient future influence.

III. Because forces are driving change, they should reflect the cause, not the symptom of change. This can be tricky to tease apart and requires collective sensemaking. Forces often evolve as years go on and our understanding of them becomes clearer.

Forces at a glance

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A political status quo in question

- Tech wrangling
- Planetary policies
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- Challenging global order
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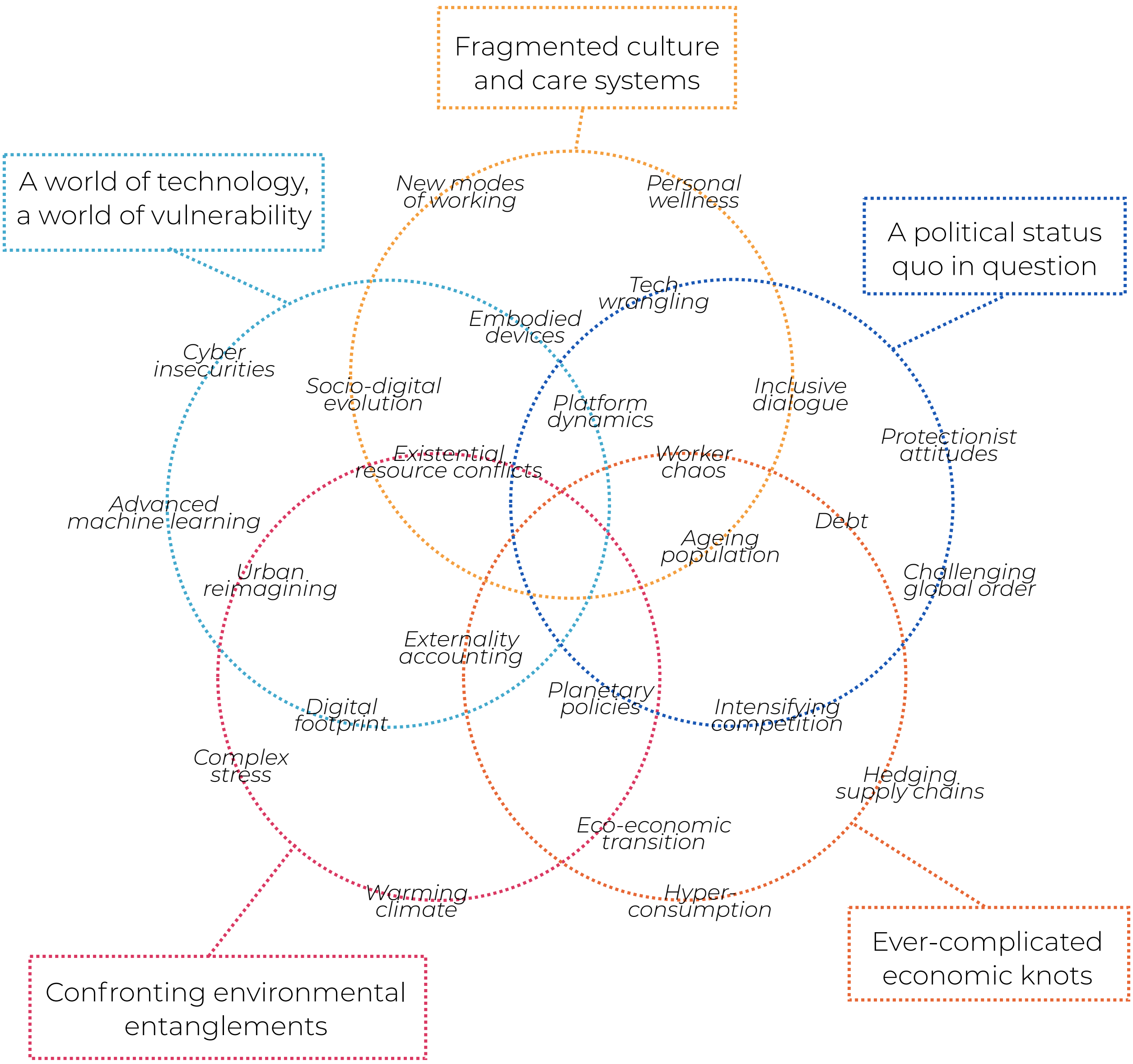
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Fragmented culture and care systems

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Personal wellness

The traditional medical model has evolved, becoming more intergrated with other health and wellness philosophies. The healthcare sector, and more recently the wellness movement, have been transitioning into a more precise and personalised form, with patient-centricity, precision medicine, the mind-body connection, social and environmental determinants of health, as well as individual beliefs around care and bodily autonomy becoming central to health decisions. Over the next decade, tricky rhetoric around longevity, personal optimisation, and 'natural' views on health will be further corrected to allow for more nuanced thinking around what it means to live, transition, give birth, and die, by your own creed.

- Accessibility, types, and performance of **biomarker technologies** are increasing, observed in the uptake of blood glucose monitors for diabetic and non-diabetic individuals (Nachiappan, 2024). There has also been a steady increase in fitness tracker ownership in the British population between 2019 and 2024, indicating a growing interest in monitoring lifestyle for enhanced wellbeing (YouGov, 2024).
- **Social prescribing** is now a part of the NHS's strategy to support those with a range of health conditions, reflecting the effectiveness of community interventions in enhancing outcomes (NHS England, n.d.).
- The increase in mental health challenges across the developed world, as well as the effect of the pandemic has seen to the rise of **mental health apps**, with the market size valued at $5.05B in 2022 and projected to rise to $16.50B in 2030 (Rawal, 2024). Chatbots are progressively being used as stand-in virtual therapists where there are gaps in support, however relying on these apps poses some risks and further design improvements are needed (Haque & Rubya, 2023).
- Growing evidence suggests that **personalised nutrition** is more effective than general dieting (Bermingham et al., 2024).
- Post-pandemic expansion of **telehealth** is allowing patients to increasingly access healthcare via the internet or telephone (Murphy, 2023), including online talking therapies (National Institute for Health and Care Excellence, 2024).
- **Biohacking** and the growing popularity of DIY healthcare, ranging from self-administering gene-editing therapy on the extreme, to simply using personal health data sources to make changes to one's lifestyle, is becoming more commonplace (Geng, 2022).
- An essential aspect of preserving wellbeing and immunity, there has been a proliferation of **sleep-related technology**, including earbuds designed specifically for sleep, wearable sleep trackers, white noise machines, heating and vibrating sleep masks and more (Hill, 2022).
- **Alternative therapies are growing**, with increased circulation of anecdotal and empirical evidence supporting ancient and lesser-known health philosophies. For example, there has been a rise in psychedelic therapy and businesses built around supporting alternative therapies (George et al., 2022)
- **Increasing popularity of wellness tourism**, now worth $651 billion annually, has a forecast average annual expenditure growth of 16.6% until 2027, expecting an increased prevalence of wellness festivals such as Medicine Festival, Buddhafest, retreats, and others (Global Wellness Institute, 2024).

Ageing population

Across the globe, but notably in more developed nations, populations are ageing. This means the median age of the population is gradually increasing, as the birth rate lowers. For many countries, ageing populations will shape products, services, media, the built environment and cultural norms as demographic influence shifts toward a wealthy older cohort. The shape of the labour force and economy are expected to evolve in many developed nations, and pressure on the welfare state and healthcare system will likely increase. Ageing populations also bear implications on immigration policy as a protective economic measure. While more speculative, geopolitical security and inflationary pressure have also been discussed as potential vulnerabilities needing mitigation.

- The coming decade will see the continued **widening of the 'population pyramid'**, a trend expected to progress until the end of the century. Population pyramids were previously used to describe how the bulk of a population veered toward youth, and tapered off into old age, however this is projected to reverse toward the end of the century (Ritchie & Roser, 2019).
- **State pension age may need to be extended** to 70-71, up from 66, to maintain the required ratio of workers per state pensioner (Mayhew & Himawan, 2024).
- New studies are highlighting techniques to **prolong health spans**, such as the importance of strength training in old age to preserve muscle tone and bone density (Freeborn, 2024). This is contrasted with traditional beliefs around old age and rest or inactivity.
- **More smart technologies are being leveraged as a solution to elder care**, from stove and hob monitors like Heber's Pippa (Lillywhite et al., 2024) as well as care home room acoustic sensors that can detect signs of distress and alert staff (Lancaster, 2024).
- As societies age, there will be **greater numbers of older LGBTQ+** people over 55, including others leading lifestyles outside historic nuclear family norms. For example, older LGBTQ+ people are more likely to be single, more likely to live alone, less likely to have children and less likely to be in regular touch with their family. This adds complexity to care situations for these people (Pereira & Banerjee, 2021).
- Housing has long been an area of necessary change and innovation for older people. **Calls for more homes that can be adapted for later life** as well as housing with integrated care and support are argued to reduce the likelihood that residents will go into hospital or residential care, as well as prevent loneliness by fostering communities (National Housing Federation, 2022).
- With an increase in older consumers comes **expected growth in a range of sectors**, like medicine and wellness interventions (e.g. personalised diet guidance, alternative therapies for longevity) as well as consumer health products (e.g. over-the-counter medicines and dental care products) (Morgan Stanley, 2024).
- Emphasis on a certain style of age-related intervention can lead to alienation or gaps in care for other groups of people. For example, a new study from machine learning experts at the University of Oxford and the University of Melbourne revealed that men are much more likely to support the idea of being **cared for in their homes by a robot** when they are elderly than women are, leading to potential care inequalities in later life (Hertog et al., 2024).

Inclusive dialogue

Conversations around cultural capital and political power have increased especially in developed nations, with increased attention on how plural forms of diversity — race, gender, sex, ethnicity, abilities, illness, neurodiversity, socioeconomic status and more — influence our seat at the table. Both government and business have prioritised policies addressing historical injustices toward groups of people, including removing barriers for women and parents to balance work and family. However, the plurality of what makes someone disadvantaged and how this should be prioritised is a complex conversation area, with different perspectives on solutions. Political struggles remain around what it means to effectively scope and implement a policy to ensure equity and fairness for all.

- Across the mid-20-teens, various protests have advocated for the **right to safety and equality among Black people**, originating in the United States and spreading to other developed nations. These movements advocated for not only an end to police aggression and violence, but challenging cognitive biases, micro-aggressions, and systemic exclusion (Howard University, n.d.).
- The *#MeToo* movement, starting in 2017, has become a watershed moment for recognising both **sexual abuse and misconduct toward women** in workplaces. While originating in media and entertainment around sexual abuse, it has become a global reference to disclose experiences where women have felt sexually unsafe, perpetuated by power imbalances (Stubbs-Richardson et al., 2024).
- There has been a **rise in awareness of menopause** and its impact on women participating in the workplace with the Equality and Human Rights Commission issuing guidance to clarify legal obligations to workers, including providing rest areas, flexible hours, and the relaxing of uniform policies (Ahmadi, 2024).
- **Neuroinclusion** has become a topic of discussion for workplace inclusion, though conditions that are celebrated and openly discussed remain narrow. Neurodivergent employees still face many barriers and obstacles including stigma, fear of discrimination, and lower wellbeing (McDowall et al., 2023).
- **Measuring, assessing, and interpreting gains in gender equality remains complex**, for example, while women have become the majority of the college-educated labour force, the implications of what this means for men remain unclear. (Schaeffer, 2024).
- Since Donald Trump's 2024 victory, large companies like Meta, Amazon, and McDonalds have begun to roll back or even **scrap their diversity programmes** citing reasons ranging from changing political landscapes to legal issues (Paul & Babu, 2025).
- Though more individuals are more likely to openly support **LGBTQ+ rights**, acceptance levels across the United States have dropped from their all-time high in 2023, signalling a shift in attitudes (Gambino, 2024).
- The 2024 Modern Families Index report outlines the continued **pressures parents face in the workplace**. The risk of working parents leaving their employer and seeking new employment rose from the previous year to 42%. There was also a decrease in the proportion of working parents who felt that their employer was supportive of their family (Bright Horizons, 2024).
- **Miscarriages allowing for bereavement leave** are being called for in the United Kingdom and could be used in cases where parents lose a child or a baby after 24 weeks. This could be added to the Employment Rights Bill and expand rights for workers (Carr, 2025).
- Since 2017, the United Kingdom has seen 1.3 million **more people with disabilities in the workplace**. This achievement has occurred alongside other strides in recent years, including passing the British Sign Language Act and the Down Syndrome Act (GOV.UK, 2024).

Socio-digital evolution

Over the last decade, the proliferation of digital devices, platforms, and networks in daily life has fundamentally shaped how we think, feel, behave and gather as people. Attention spans are decreasing; public persona expression is increasingly plural; and how we influence culture has fundamentally changed. Some theorise that always-on access to platforms, and the fragmented cultural experiences inherent to these spaces, have permanently distorted some people's relationship to time. In the early 20-teens, Bruce Sterling referred to this as *atemporality*: a cessation of our culture's relationship with a shared sense of time, and the start of a nonlinear, disorganised, and plural period. Underlying this transformation are the new potentials of digital production and distribution.

- Concerns have been raised over **screentime and social media amongst children**, as well as multiscreen usage, all having potential negative effects on attention span (Ofcom, 2024). Australia's recent decision to ban social media for anyone under 16 reflects this growing caution around digital media's psychosocial effects.
- Results from the Millennium Cohort study find that almost **half of British teenagers feel addicted to social media**, with girls more likely to agree than boys (Devlin, 2024). The normalisation and lack of understanding around cryptocurrencies and gambling features in online gaming remain an ongoing concern as well, driving calls for reform around how the government mitigates online harm (GOV.UK, 2023).
- Evidence has surfaced that digital media has **differential effects on emerging and established democracies**, growing participation in the former and reducing trust in the latter (Lorenz-Spreen et al., 2023). This may suggest a need to customise digital media infrastructure according to a nation's wider political needs.
- Social media fosters **persistent toxicity** across platforms, with longer conversations showing higher toxicity and user debates fuelling hostility related to polarisation and partisanship in developed nations within the Global North (Avalle et al., 2024).
- Links have been made between **right-wing populism and conspiracy theorists**. An analysis of hundreds of conspiracy theory accounts on the messaging app Telegram reveals they embraced Reform UK ahead of other political parties. This reflects similar trends across the Atlantic in the United States (Cheshire, 2024).
- **Short form media** is regarded as the most engaging type of content on social media, with most accessing it on mobile devices, extending the reach of such content (Wong & Bottorff, 2023).
- **AI influencers** on platforms have become more popular in recent months, and with them come new ethical challenges like risks of misinformation as well as body image and transparency issues (Singh, 2024).
- Platform design can deeply influence social behaviour. X's verification system, which gives verified users priority in algorithms, can increase polarization and trigger the **formation of echo chambers**. Researchers used computational modelling to simulate how verified users affect the spread of political opinions on social media (Neuroscience News, 2024).
- A study investigating the customisation process of **metaverse avatars** revealed a uniform creation process which takes core self-identity markers and decouples them from the social restraints of real life. This results in a spectrum of digital expression, ranging from avatars that realistically embody the user, to enhanced features and the representation of divergent user personas (Taylor et al., 2024).

New modes of working

The shift toward a service economy, the adoption of cloud-based software and platforms, as well as recent advances in automation have enabled new forms of working. The rise of the gig economy has provided both flexibility and precarious forms of contracts. Meanwhile, debates around productivity and how it happens, especially around remote or hybrid white-collar work continue, as does the concern for loss of shared places, rituals, and communities from more fluid ways of working. In developed countries, more people are questioning the role of work in their lives and what it means for work to coexist harmoniously with their health and sense of self. In the years to come, it's expected more emphasis will be placed on what constitutes good work, with implications for education, automation, and platforms.

- The **creator economy**, a class of workers developing businesses off the back of platform proliferation since the 20-teens, is expected to double in size in the next 5 years and approach a half-trillion-dollar market size (Goldman Sachs, 2025).
- Keir Starmer's Labour government has outlined a desire to strengthen **protections for freelancers** and independents, such as banning zero-hour contracts (The Herald, 2024).
- **Coworking spaces** have become prevalent over the last decade and are expected to grow, providing essential space, resources, and networking for emerging entrepreneurs and the self-employed (Howell, 2022).
- Workers in the United Kingdom have been given the right to request **four-day workweeks**, while 30% of large organisations in the United States are exploring condensed workweeks and other forms of work schedules (KPMG, 2024).
- Preferences for **hybrid and remote working** among British employees are now commonplace (Demetriou, 2024). Meanwhile, 'proximity bias' is becoming a more prevalent concern for employees given the rise of hybrid working (Tandon, 2024). Other reports indicate companies are planning return to the office policies, citing the importance of company culture (Smith, 2023).
- The growing popularity of the **'anti-work movement'** which includes the notion of 'quiet quitting' and even recording quitting and lay-off conversations for online platforms, questions and criticises concepts of modern employment in many developed nations in the Global North (O'Connor, 2022).
- Given the prevalence of hybrid and remote working, **spending on office-related assets and services (e.g. real estate, transportation) is changing**. Meanwhile, more is being spent on home office and recreation goods, changing the shape of the economy (US News, 2024). Half of major global companies will need less real estate in the next three years, with San Francisco being an extreme example (Ziady, 2023).
- There has been a rise in the **'overemployed'** trend which especially characterises gig work, where remote workers have two or more jobs at one time. Virtual workers often use tools like ChatGPT to help keep up with work demands, especially in the marketing sector (Chung, 2023).
- First initiated by France in 2017, the **Right to Disconnect** gives workers in companies of 50 or more employees the right to ignore emails and other work-related tasks outside of office hours (Hurst, 2024). This has also been indicated in the Labour government's manifesto (Labour Party, 2024b).

A world of technology,
a world of vulnerability

Platform dynamics
Advanced machine learning
Cyber insecurities
Digital footprint
Embodied devices

Platform dynamics

The proliferation of data is due in large part to the rise of platforms, cloud-based software applications where businesses can collect and monetise user data. Today, every business wants to be a platform. Some of the largest companies in the world are platform technologies, including multi-sided marketplaces, social and community platforms, as well as product-tech (Software as a Service (SaaS)) platforms. The dynamics of platforms will continue to be shaped by issues like data ethics, social polarisation, cybersecurity, intellectual property, criminal organisation, and pathological economic influence.

- **Data penalties are being imposed by authorities**, for example LinkedIn was fined 310 million Euros by the Irish Data Protection Commission. LinkedIn allegedly did not obtain user consent lawfully for its data processing, violating GDPR, possibly using data for **targeted ads** (McCurry, 2024).
- Introduction of the Digital Services Act in Europe has aimed to create a safe, predictable and trusted online environment by **influencing how platforms interface with the public**, protecting rights and ensuring transparency (ISD Global, 2024).
- Arrest of Telegram founder under complicity charges may reflect a trend where **platforms are being held accountable for facilitating crimes**, as seen with the Unilateral Legal Action Against Platforms and Pressure on Platforms for Greater Data Sharing and Cooperation (Tennant, 2024)
- The rise of platforms has shown several **advantages of big data** (Knerl, 2024) including better flagging of credit fraud, the creation of personalised healthcare, and e-commerce insights.
- **SaaS platform business models may be on the decline** as companies take advantage of a more democratised software environment, with lower barriers to develop and build (Predin, 2024).
- Maggie Appleton and Venkatesh Rao's **'Dark Forest and Cozy Web' theory is growing in relevance**, describing the distinction between safe, gatekept digital spaces inhabited by trusted communities, and unsafe platforms where advertisers, trackers and more roam, expected to expand with the explosion of synthetic content making it harder to differentiate humans from bots (Appleton, 2023).
- The rise of alternative platform design in recent years, from Discord to the federated social web and Authenticated Transfer (AT) Protocol, suggests a growing desire for **community platforms underpinned by different technical and cultural philosophies**. This has been observed in the broad adoption of BlueSky instead of X or Meta-affiliated companies, and the 'splintering' of social media (MIT Technology Review, 2024).

Advanced machine learning

Important developments in machine learning, notably in neural networks, including generative adversarial networks (GANs), transformers, and stable diffusion, have all occurred in recent years. Machine learning applications are challenging ideas around what it means to be human, including how we work and experience art. Today, they are increasingly open source and productising, suggesting a transformation not unlike the rise of cloud computing and SaaS over a decade ago. While this change is placed in opposition to artistic interests and freedom, it has been theorised new applications could be a path forward for future creativity. As observed in Brian Eno and Refik Anadol's generative works, it can be used to break out of repetitive signs, images, sounds, and formats, to then conceive of new ways of seeing things.

- Multiple lawsuits are being raised against artificial intelligence (AI) developers like OpenAI, Midjourney and Runway among others (Akers, 2024) for **using intellectual property and artists' creations in their training datasets** for models. This has the potential to set a precedent for future intellectual property ownership law and future machine learning practices.
- On the other hand, various machine learning models have made tasks and entire sectors **more accessible** to everyday people. Software can be developed, 3D models can be synthesised, and content can be personalised with the help of AI, fuelling a counter-argument around democratisation (Duggal, 2024).
- The cost of computational resources and data quantities required to train models has produced inequalities. **Access to high-quality training data is especially a barrier**. New entrants are at a disadvantage as more organisations are opting to block data crawlers, in contrast companies like Google and Meta already control huge data reservoirs (Korinek et al., 2024).
- There are calls to **decentralise AI development**, allowing for more access to individuals and small businesses to participate in the development of models, allowing for greater diversity (Khanna, 2023).
- The Competition and Markets Authority (CMA) is looking into foundation models and how their control and ownership may lead to reduced choice, lower quality, and higher prices, as well as stunting unprecedented innovation and wider economic benefits from AI. These were all cited as **potential harms of unchecked AI monopolies** (Vallance, 2024).
- The **industry of graphics processing units (GPUs)** has grown in step with the rise of AI, with Nvidia stock rising 2,081% over the last five years (Ruane, 2025).
- While large models have gained public attention since the release of Chat-GPT in late 2021, **'small is the new big'**, (Tiwary, 2024) with small language models (SLS) and narrow yet context-rich applications becoming a bigger opportunity for companies.

Cyber insecurities

The rise of the dark web, sophisticated social engineering techniques, global IT failures, feelings of platform exploitation, as well as fraudsters hijacking tech hype as seen in the recent cryptocurrency cycle, all suggest increasing insecurity around digital networks. With the rise of artificial intelligence, issues around political and even intimate deepfakes, the erosion of intellectual property law, as well as the vulnerability of current infrastructure to cope with energy demands remain urgent. Questions remain around the extent foreign actors are engaging in internet cable tampering, and state-coordinated hacks. More, while quantum computing remains in its infancy, its advancement could pose further risks to how we think about the resilience and dependability of digital networks.

- Increasing prevalence of **ransomware attacks** on companies with a majority of companies being in the United States, United Kingdom, Canada, Germany, and Italy (Black Kite, 2024).
- The emergence of **Zero Trust Architecture** reflects depth of digital trust issues. It is a security model that assumes a breach has already occurred and requires strict verification for every access request, regardless of the user's location or device. This approach helps to mitigate the risks associated with traditional network security models that rely on perimeter defences (Edwards, 2024).
- **Data localisation** (the practice of storing and processing data within specific geographical boundaries, often mandated by national laws or regulations) has become a strategy as governments ensure regulatory access for taxation and sector oversight, to safeguard national security, improve data security and system integrity, and support domestic digital industries. However, this could increase costs, operational constraints, and cyber security risks in some cases due to data-limited threat detection and service quality (Del Giovane & López González, 2023).
- **State-linked groups may be targeting large platform companies**, for example Microsoft confirmed partial loss of security log data across several platforms, likely due to state-linked threat (Jones, 2024).
- Increasing connectivity may lead to more cyber risks, especially **state-sponsored misinformation** campaigns, increasing the importance for organisations to evaluate cybersecurity from a geopolitical lens (Durbin, 2023).
- New interventions are needed as **cybersecurity risks become more material**. For example, notification fatigue poses security risks as users habituate to warnings and are often the last line of defence before a person or organisation is compromised (Vance et al., 2022).
- **Data collection is becoming riskier with changing political landscapes**. After Roe v Wade's overturn, female reproductive health apps could represent a serious risk to American women, facing the risk of discrimination and even blackmail if data is misused (McCallum & Singleton, 2024).
- Cybersecurity threats are likely to increase as quantum computing progresses; **modern encryption methods may be rendered useless**, with web interactions at risk along with unforeseen security challenges (Forbes Technology Council, 2022).
- **Foreign states are taking advantage of hype cycles** and the vulnerabilities of unsuspecting users. Over the last year, North Korea has stolen at least $659 million in cryptocurrency. It is reported that they posed as recruiters on LinkedIn, convincing employees of software companies to unknowingly install malware on their computers allowing them to rig cryptocurrency transactions (Kan, 2025).

Digital footprint

Everyday digital technologies are part of a complex value chain with increasing social and ecological impacts. With the wide adoption of smartphones, platforms, and growing renewable demands, this impact has only accelerated. From e-waste sites in Ghana to complex networks of servers with profound energy and water needs, there is a growing understanding that modern technology is based on new forms of exploitation. Large tech companies optimise their operations for shareholder value, which includes designing obsolescence into products and funding new launches with negligible impact. In the background, right to repair, the sand crisis, and resource conflicts could challenge these ageing principles, and usher in new ways of designing technology.

- European Parliament has ruled manufacturers will have to provide **timely and cost-effective repair services** and inform consumers about their rights to repair. Goods repaired under warranty will benefit from an additional one-year extension of the legal guarantee, further incentivising consumers to choose repair instead of replacement (European Parliament News, 2024).
- There is increasing user, commercial, and governmental awareness of the **resource intensiveness** of artificial intelligence, with the technology being carbon- and water-intensive (Sellman & Vaughan, 2024).
- Rising awareness of the **environmental cost of cloud computing** (Lawrence, 2023). As more services like TV, film, and gaming shift to streaming technologies, the environmental cost of the cloud will continue to grow.
- **Blockchain technologies** continue to gain traction across multiple sectors, however, these technologies require high amounts of energy especially via proof-of-work protocol, becoming huge contributors to global emissions. Different policies like decreasing reliance on fossil fuels as well as considering the proof-of-stake protocol, a lower energy alternative, have been discussed (Onat & Kucukvar, 2024).
- **Planned obsolescence is under pressure**. Apple has been consistently accused of this practice over the years by retracting support for older devices and introducing security chips and activation locks that make it harder for third-party companies to refurbish older models (Collins, 2024). The company has also been sued for deliberately slowing down older iPhones by a number of parties over the years (Gerken, 2024).
- Companies like BMW are implementing **circularity**, with the automaker engaging in closed-loop battery manufacturing for their EV offering. This process involves the reuse of old batteries from which rare earth metals like cobalt, nickel and lithium can be extracted. This recycling process has won numerous global awards and could herald a new wave of innovation in the EV battery industry (Brown, 2025).
- There is evidence that **digitisation, on a micro-firm level, can promote green innovation**, though financing and management play important roles in this effect, at least in the East (Sun & He, 2023).
- The digitisation of services and media has led to the rapid expansion of global **digital infrastructure** and subsequent emissions. However, this footprint varies depending on region, seeming to reduce emissions in the Arab region and Africa, while increasing emissions in Europe. A more nuanced and region-specific perspective on digital footprint may need to be considered (Che et al., 2024).

Embodied devices

Since the 20-teens, smartphones have become an extension of the human nervous system and are practically inseparable from our bodies. They hold our work, finances, schedule, healthcare, relationships, sense of navigation, and portal to the rest of the world. In this sense, we are already cyborgs, alongside our smartwatches, VR headsets, and modern prosthetics. The progression of robotics, and the expected wave of exoskeletons and xenobots for various bodily functions will only cement this reality, while brain-computer interfaces remain a highly uncertain, ethically contentious development.

- The first patient for Musk's Neuralink, a brain-computer interface, is able to move a cursor on a computer. It suggests brain-computer interfaces could play a role in giving **more autonomy to those with disabilities** (Oi, 2024).
- Apple to scale back its production of Apple Vision Pros due to **disappointing sales, a pattern echoed in other virtual reality device manufacturers** like Microsoft, though a less expensive model could be on the horizon with the hopes of addressing a mass market. Though it remains disputed whether there are more existential issues with the technology and its role in people's lives (Heater, 2024).
- Exoskeleton technologies are gaining more exposure in the tech world with this class of technologies with 2025's CES, showcasing **exoskeleton use cases in medicine and care, heavy industry, and leisure** (Marinov, 2025). A recent example in leisure includes Arc'teryx and Skip's MO/GO trouser to enhance movement for those with mobility challenges.
- Using RFID technology, **companies are starting to experiment with implant technology**. VivoKey has recently announced their new subdermal contactless platform which can hold payment, identity and other security information, all within a small chip inserted beneath the skin (TokenPost, 2024).
- **Soft robotics** have also been gaining traction. For example, grain-sized "soft robots" controlled by magnetic fields have been developed for targeted drug delivery to improve outcomes and reduce side effects of drug interventions (Yang et al., 2024).
- The US Defense Health Agency has partnered with Ouraring Inc. for the use of **biometric sensors** in order to track the health and wellness of personnel, demonstrating the expansion of biometric monitoring to more parts of society (Kimery, 2024).
- Many embodied device innovations are borne out of **transhumanist, extropian, singularitarianism, and cosmism (TESCREAL) ideologies** (Gebru. & Torres, 2024). However, especially with the rise of artificial intelligence, more human rights advocates are speaking out to challenge the historical underpinnings and plausible trajectories of these ideas (Montreal AI Ethics Institute, 2025).

Ever-complicated economic knots

Externality accounting
Debt
Worker chaos
Hedging supply chains
Hyper-consumption

Externality accounting

Sustainability disclosures, the sharing of information around environmental, social, and governance (ESG) issues appropriate to one's industry, have been standardised with the International Sustainability Standards Board (ISSB). ESG regulations have grown in various parts of the world, as observed with Europe's broad accounting framework, having far-reaching effects on comprehensive reporting for multinationals across the globe. Ambiguities remain around definitions, aims, and uses of externality accounting in certain regions, however as investment products, adherence workflows, and its role in investment decision-making are clarified, accounting for externalities could have one of the most influential impacts on the shape of commerce since deregulation in the 1980s.

- MSCI, a leading ratings provider in ESG factors, has observed an upward trend over the last decade in company interactions with verifying ESG research, across sectors and regions. This reflects an **increasing and sustained engagement with new financial norms around reporting externalities** (MSCI, 2024).
- Despite facing performance challenges, **ESG-focused funds are becoming increasingly popular** among asset managers. This may represent the effects of modern regulatory frameworks, pushing investment companies to clarify their ESG offerings and driving a shift toward transparency in how financial products address environmental, social, and governance impacts (Wilkins, 2025).
- Aligning on best practice has been an **iterative process**. Sustainable Finance Disclosure Regulation (SFDR) has come under criticism for being too vague and broad in its categorisation, leaving room for greenwashing. Other organisations have since proposed new SFDR categories to help combat this. (ESG News, 2024).
- Despite having received pushback in the United States and having a libertarian approach to climate issues, as of 2024 the **SEC released new rules to disclose and standardise climate-related risks**, including disclosing strategies to mitigate such risks (SEC, 2024).
- A product of years-long implementation of the European Green Deal, the Corporate Sustainability Reporting Directive (CSRD), coming into force in 2023, will require **all domestic organisations to report comprehensive ecological and social risks**, as well as any foreign bodies with a meaningful presence in Europe (European Commission, 2024).
- **Passing regulations around sustainability disclosures has gone global**. Jurisdictions across the globe are adopting ISSB sustainability disclosures, with many either already finalising disclosure rules, launching consultations, or operating under a grace period for a few years until they become mandatory (S&P Global, 2024).
- As the cost of living crisis and geopolitical concerns became pronounced post-pandemic, **investors have leaned back on ESG factors** to inform investment decisions, however this is likely temporary (FT Adviser, 2024).

Debt

Influenced in part by the 2008 financial crisis and 2020 pandemic, public debt has increased in the United Kingdom to 100% of GDP, just in the last two decades. Today, global public debt is estimated to sit around nearly $100 trillion US dollars. The popularity of quantitative easing and cash transfer programs has facilitated debt growth. The United Kingdom, United States and other developed countries make up the lion's share of debt, and bear implications for a government's ability to invest in the future of their economy, including important public services like education and healthcare.

- The **financialisation** driven by 2012 funding reforms that shifted the financial burden to students with high tuition fees has led to a financial crisis as capped fees, eroded by inflation, can no longer meet rising operational costs. This has forced universities into budget cuts that threaten educational quality andinstitutional stability (Laker, 2024).
- **Global public debt** to hit $100 trillion this year, says International Monetary Fund (IMF), as economic uncertainty threatens financial stability and growth. This is a concern as high debt reduces the fiscal space available to governments to respond to economic downturns (Wearden, 2024).
- As the United States approaches its debt ceiling, fissures in the GOP begin to show between more fiscally hawkish politicians who do not want to raise the ceiling, and Donald Trump who wants to do away with it entirely. **Either decision will have major implications for American economic policies going forward** (Bolton, 2025).
- There is growing pressure for developed countries like the United Kingdom and United States to not only start paying down the debts, but do more to support **developing countries crippled by repayments** (Inman, 2024a).
- **Public debt could be far higher, with worse prospects than initially imagined**. A bias toward optimism, spending pressures, and large unidentifiable debt are listed as potential causes for concern by the IMF. Countries have been urged to confront their debt challenges and implement fiscal policies to safeguard growth (IMF Blog, 2024)
- Donald Trump's strategy to impose **extreme tariffs and describe deficits as subsidies** has been viewed as a negotiating tactic by foreign leaders. Underlying this geopolitical behaviour could be the anxiety around a potential default on the United States debt (Reuters, 2025).
- Central to a changing administration and budget in the United Kingdom has been the discussion of **managing debt with an uncertain economic growth outlook**, focusing on growth above all else to prevent worst-case scenarios (Inman, 2024b).

Worker chaos

Workers are widely treated like a financial asset, observed in the normality of hiring and layoff cycles. While this is influenced by transient issues like interest rates, inflation, industry disruption, and growth challenges, there are systemic problems too. Over the last decade, employment contracts have become more precarious, skills gaps have widened as technological adoption evolves and industry needs change overnight, and increased automation is already affecting entry-level and junior work. Youth economic activity is considered a problem, which creates concern alongside the student debt burden and fissure in the university-industry relationship. Coupled with ageing populations and increasing retirees, it is unclear how this knot will shake out.

- The **skills gaps** in the United Kingdom span high-demand technical fields (like engineering, IT, and design) and essential service roles (such as sales, care, and administration), reflecting a dual need for both advanced technical expertise and client-focused interpersonal skills (British Chambers of Commerce & The Open University, 2024).
- Increasing skills gaps are evident as millions of workers in declining occupations, such as secretarial and administrative roles, often lack the Essential Employment Skills (EES) needed to **transition successfully to growing job sectors**, which increasingly demand higher qualifications and adaptable skill sets. The mismatch between the qualifications of workers in high-risk roles and those needed in expanding occupations poses a barrier to workforce mobility, risking unemployment and economic inactivity for many as opportunities in their current fields dwindle (Scott et al., 2024).
- The **introduction of AI** into many workplaces is threatening to exacerbate labour issues, especially for certain groups that may be less interested or adept at using these technologies, raising questions about who gets left behind by these decisions (J. Cox, 2024).
- ‘Dark-’ or ‘ghost kitchens’ which initially supported traditional restaurants with offsite food preparation during peak online order times, have a range of ethical implications for the workers they employ. Run according to algorithmic models, these kitchens **perpetuate gig dynamics by reducing employees to components of a machine**, with ongoing worker issues like lack of rights, benefits, and protections (Giousmpasoglou et al., 2024).
- Over 3 million or over 40% of young people in Britain are **economically inactive**, which means they are not in work or looking for work, an upward trend captured over two decades (Powell et al., 2025).
- Recent reactions to the threat of automation, surveillance, and potential inequities caused by its application, as seen in broad unionisation within entertainment and instances of cross-sector worker organising (Johnson, 2025), suggest **workers are disillusioned with the direction of the economy**.
- Marc Andreessen, an influential investor in venture capital, has described younger workers at AI startups as ‘America-hating communists’ seeking to sabotage companies he’s invested in from the inside, suggesting a deeper **philosophical divide in areas of technological advancement** (Futurism, 2025).

Hedging supply chains

The dominant economic narrative of the 1990s — liberal, global free trade — has been gradually coming apart and shaping into something new. The rise of multiple economic superpowers, and ultimately trust issues among countries, as well as climate goals and efforts to bolster domestic industry have all contributed to this development. Some of the strongest recent examples include the United Kingdom's Local Industrial Strategy and introduction of Great British Energy; America's Inflation Reduction Act and the Made in America initiative; as well as the European Union's Green Deal, which will widely influence investor and industry control over supply chains.

- Britain's commitment of over £400 million to fusion energy development underscores the **growing need for clean, secure energy sources** that reduce dependence on fossil fuel imports, mitigating both environmental risks and vulnerabilities in national energy security (GOV.UK, 2025c).
- Freight rates are currently over twice the cost they were in 2016. This is partially attributed to **disruptions at the Suez and Panama canals**, having profound ripple effects on global trade and economic stability (UN Trade and Development, 2024). Responses to this have been increases in protectionist policy as well as hawkish posturing from Donald Trump (Davies, 2025).
- Attacks on subsea internet cables in the Baltic Sea have sparked discussions on how to **better secure connectivity in increasingly volatile times**. Calls for hybrid satellite-based space/submarine infrastructure have been made to counter this phenomenon (Woollacott, 2024).
- The Clean Industrial Deal is an example of international effort to enhance Europe's competitiveness in the global green economy by fostering investments in sustainable technologies and boosting clean energy industries. This initiative aligns with broader efforts to **strengthen domestic industries and supply chains while addressing climate change**, contributing to Europe's role in reshaping the global economic landscape (Zajmi, 2025).
- Outsourcing is now described as an existential economic issue that has offered geopolitical rivals leverage, as observed in the trade rhetoric between China and the United States. Over the last decade, American politicians have placed more emphasis on **reviving manufacturing**, with the Inflation Reduction Act being a significant step in reshaping the economy (World Resources Institute, 2023b).
- **Re- and near-shoring** has increased since the pandemic and in response to geopolitical conflict as a way to minimise risk and protect supply chains, with nearshoring to Europe broadly increasing over the last decade (FDI Intelligence, 2024).
- Semiconductor policies passed in the United States, United Kingdom, and Europe reflect new recognition of **safeguarding technological advancement** within domestic borders (World Economic Forum, 2024).

Hyper-consumption

Consumption patterns are increasingly unpredictable. They are intensely shaped by social platforms and transient, viral phenomena, with increasingly chaotic effects. Just over the last decade, traditional marketing cycles have irreversibly changed, for example, going from select celebrity endorsements to countless influencer partnerships; from fast to viral fashion. Bad press can severely damage a business or public persona overnight, resulting in extreme economic consequences even if information is proven incorrect later. Today, companies are transfixed with mining insight via audience analytics and online community platforms, to secure any advantage possible, while minimising any misstep. It is for debate whether this shift has been good or bad for creativity, entrepreneurship, and culture.

- **'Deinfluencing'** content is growing online, aiming to raise awareness of excessive and often trend-based consumption (Chokrane, 2023). Other reasons for participating in deinfluencing include concerns for the environment and mental health (Cernansky, 2024).
- **Influencer marketing** is worth billions and continues to grow as an industry. Marketers have shifted focus from solely celebrities to micro and nano influences as they exude authenticity and greater influence in smaller followings (Vitasek, 2024).
- E-commerce sites like Temu take advantage of consumer psychology, leading some to online **shopping addiction** (Imtiaz, 2024).
- **More young people are falling into debt**. One potential driver is the 'infinite loop of shoppertainment' pushed by sites like TikTok and the ease of online purchasing. New trends like 'cashstuffing' are attempting to bring awareness to mindless shopping and the importance of saving (Bain, 2023).
- With retail companies taking up space in the **metaverse to create brand awareness**, avatars could become more important for consumers as they traverse the virtual world and purchase both physical and digital items, like designer clothing from 'Gucci Vault Land' (Singh et al., 2024).
- Growth in online shopping has resulted in **warehouse and logistics premises doubling over the last decade** in the United Kingdom (Office for National Statistics, 2022), a stark change in commercial systems shared by nations across the globe.
- The capacity to start businesses using platform services has allowed for instantaneous value creation and capture in response to viral events, but also **new issues stretching the confines of intellectual property**, like influencers being sued for copying someone's 'vibe' (The New York Times, 2024).

Confronting environmental entanglements

Existential resource conflicts
Eco-economic transition
Complex stress
Urban reimagining
Warming climate

Existential resource conflicts

Energy is scarce, but how we use it to manage our resources is political. Conflicts around land, wildlife, water, and other resources have become increasingly politicised given the rise of ecological and climate anxiety; however, this has caused controversy around the balance between social and ecological protections. In addition, concerns around key areas to protect, like the Amazon rainforest, the Congo basin, and Canada's boreal forest have raised uncomfortable questions around the politics of these areas: Who gets to decide policy, the locals or the international community? Over the next decade, conflicts around environmental governance are expected to intensify.

- Conflict points have appeared all over Central Africa due to **climate change-induced resource scarcity**. Lack of arable land has caused clashes between different ethnic groups; water scarcity has caused conflict between cattle ranchers and fishermen and a general lack of rainfall is said to have increased recruitment to Boko Haram and the Islamic state in the region (Onuoha et al., 2024).
- The Netherlands' **Farmer-Citizen Movement** has now become the first activist farmers' political group to break into government. This is the result of the backlash of farmers against the Netherlands' attempt to reduce its nitrogen emissions by initiating policies to reduce livestock numbers in the country (Fortuna, 2024).
- After the ban of hunting grizzly bears in Alberta, Canada, the **hunting of the threatened species has been re-legalised in specific situations** after record bear attacks, especially involving farmers and livestock (Cecco, 2024), demonstrating the nuance of species protection issues.
- Longtermism, the dominant philosophy underpinning much of Silicon Valley's movements, creates **a 'means to an end' conundrum where resource decisions may be harmful to present populations and ecology** for the sake of an imagined better future, that can only be brought forward by the tech sector (Kemper, 2024).
- Interest in deep sea mining is fuelled by the presence of valuable minerals used in renewables, however **ironically it could destroy important biodiversity and oceanic ecosystems** (US Department of Commerce, n.d.).
- The fashion industry represents a significant contributor to carbon emissions and material waste, therefore is under political pressure to transition to a more sustainable model. The rise of alternative secondhand markets is posing questions around the **extent the industry will become circular** (Butler, 2024).
- **Water conflicts are ongoing** in the Middle East and North Africa, and are considered a key issue to ensuring future peace and stability within the region given the pressures of climate change (Carnegie Endowment, 2024).

Eco-economic transition

We are undergoing an energy and materials transformation, driven by consumer interest, academic insight, investor direction, government spending and supportive regulations. Across the globe, countries are collectively transitioning toward renewable power, increasingly circular systems, and new forms of eco-friendly materials. The rise of low-carbon timber building, green hydrogen infrastructure, virtual power plants, and biopolymers are all substrates of a very different world unfolding. While some debate this transition will only rearrange where externalities happen, new forms of accounting are positioned to ensure the truth of these choices.

- A new **green hydrogen power plant** has been approved by Pembrokeshire planners which is said to produce power that would otherwise produce 90,000 tonnes of CO2 per year (Sinclair, 2024). More renewable projects are expected as commercial interest, and a supportive political environment will facilitate growth in new energy sources.
- Despite the lull in overall vehicle sales in the United Kingdom, **electric car sales** continue to grow, this may be due to a number of factors including, the government's zero-emission vehicle (ZEV) mandate, manufacturer competitive pricing, and a consumer shift to avoid fuel costs or prioritise ecological impact in their purchases (Jolly, 2024).
- The **biodegradable** plastics market is experiencing significant growth, driven by heightened environmental concerns, stricter government regulations, and growing consumer awareness about sustainability (Open PR, 2024).
- World's first **bio-circular data centre** launches, turning algae into energy, reflecting further innovation into new energy methods. This process uses the heat generated by data centres to grow algae that can then be used as biomass for other processes creating circular systems (MacRae, 2024).
- Copper prices have risen due to lack of supply and increased demand from **energy transition applications** like electronic vehicles and a range of renewables (Desai, 2024).
- Recent **budget allocations by the British government** have been given to initiatives like green hydrogen projects, offshore wind projects and decarbonisation and household energy efficiency projects, reflecting a commitment to broad investment in renewables (Ross, 2024).
- **Timber shortages** are exacerbated by increased demand, partially driven by the growth of the bioenergy sector (Wood Central, 2024).
- More banks like HSBC (Baird, 2024) and Halifax (Rolt, 2024) are offering **cashback schemes for making sustainable decisions**, from mortgage owners who install green energy units like heat pumps to homes with higher energy performance certificates.

Complex stress

Beyond increasing carbon levels in the atmosphere, various ecological systems are being stressed, including nitrogen and phosphorus cycles, deforestation, ocean acidification, and biodiversity loss. While climate gets the headlines, all these systems work in complex ways to regulate our environment, and these interactions pose an existential risk of their own — even if they appear positive at first, like the Sahara desert's historic rainfall. The next decade will see continued, unpredictable expressions of various ecologies under complex stress, in need of more nuanced solutions.

- Despite Brazil's historically low deforestation under President Lula da Silva, **deforestation continues to increase** due to increased demand for beef, soy, palm oil, and nickel (valuable partly due to its usage in energy storage technologies) (Carrington, 2024).
- The **hydrological cycle has accelerated** and is becoming more unpredictable due to climate change as flooding in the Sahara (Egbejule, 2024) and snowfall in Saudi Arabia (Singha, 2024) are observed.
- The Los Angeles wildfires in early 2025 have been worsened by large amounts of dry vegetation, encouraged by **rapid swings between dry and wet conditions** in the region. Climate change has been blamed for these conditions, shedding light on this emerging phenomenon (McGrath, 2025).
- Evidence has shown **microplastics can be devastating to long-term health of humans, animals, and the pollution of entire ecosystems**, and have worsened following the exponential rise of plastic masks during the pandemic (Ziani et al., 2023).
- Ocean acidification, among other negative effects, has been **impairing shark behaviour and hunting, which affects entire food webs** within the ocean (Pistevos et al., 2015).
- Flooding in the United Kingdom is becoming more prevalent and is expected to worsen with climate change, with **rainfall over the last decade being 10% higher than the period 1960-1990** (Met Office, n.d.).
- The composition of forests is rapidly changing, reflecting **potential significant release of carbon-storing permafrost** in northern environments (Milman, 2022).

Urban reimagining

Urbanisation is widely seen as a transformative force across the globe over the next few decades, however much of this movement will be occurring in developing nations. In more developed countries, there will be urbanisation but with more emphasis on issues like retrofitting for ecological goals and/or climate adaptation, creating safe and dynamic cities for changing demographics, as well as managing gentrification and urban sprawl. Moreover, expected challenges with climate refugees will require new ways to think about temporary housing and social integration into the urban environment.

- The Night Time Industries Association (NTIA) reports that **nightclubs could be 'extinct' by 2030**. The figures show 37% of clubs have permanently shut since 2020. The NTIA calls for extended business rates relief, recognition of nightclubs and venues as cultural institutions as well as policy reform and regulatory support to curtail this trend (Dunworth, 2024).
- Extreme weather events are **requiring cities to reconsider their design for minimal risk and optimal resilience**, with Arup's City Resilience Index launching to benchmark these strengths and weaknesses across cities (Arup, n.d.).
- The British government has pledged to **build 1.5 million new homes** to tackle the country's housing shortage. This is being achieved through the conversion of brownfield sites as well as poor-quality greenbelt areas to residential zones (BBC News, 2024b).
- **Young families are leaving many large American cities**, citing reasons like cost of living, quality of education systems, crime, and environmental concerns. This may have negative impacts on these cities as young families are seen as positive contributors to urban spaces (e.g. stimulating the economy and demanding higher quality services, etc) (Das, 2024).
- **Paris' notion of the '15-minute city'** has sparked a movement among urban planners to consider how to design human-centric, accessible cities, where emphasis is placed on active and self-sufficient neighbourhoods (World Resources Institute-a, 2023a).
- Experimental cities like Toyota's 'woven city' (Toyota, n.d.) in Japan and Saudi Arabia's Qiddiya gaming district (Qiddiya, n.d.) are seeking to **prototype new forms of urban living**.
- **Transnational gentrification has accelerated across the 20-teens**, with tourism, state-led initiatives for urban revitalisation, and lifestyle-driven migration driving this change (Sigler & Wachsmuth, 2020).

Warming climate

Warming climates will undeniably change our experience of local environments over the coming decades. Global warming will reach at least 1.5 degrees over the next decade, with recent years already breaking heat records. It is estimated London could have a climate like Barcelona's by 2050, bearing implications for how we think about retrofitting buildings for cooling, as well as future-proofing local ecologies. Long-term projections suggest the planet will register a +3 degrees Celsius change by the end of the century, which most scientists consider catastrophic to all forms of life.

- Panama Canal officials have had to reduce the number of ships allowed through the waterway due to a **lack of rainfall** to fill the lake that feeds the canal, indicating climate change could challenge current shipping routes (Dahl, 2025).
- The world could warm up to **3.1C this century**, causing extreme weather events and making working outside almost impossible in some places (BBC News, 2024a).
- Cases of West Nile viral fever and Eastern equine encephalitis may be on the rise in the United States due to the **increase in mosquito populations from climate change** (D. Cox, 2024).
- Architects are exploring floating buildings (which are already used in the Netherlands) and homes **as a response to rising sea levels** caused by global warming (Kaysen, 2023).
- The United Kingdom could begin adopting a **Mediterranean style of living** and cultural knowledge due to rising temperatures according to academics. Common cultural and architectural norms found in countries in warmer climates could be part of the solution to adapting to warmer summers (Loughborough University, 2024).
- **Fungi are critical organisms to healthy ecosystems, but many species can only thrive within certain temperatures**, with studies already indicating lower fungal productivity in changing climates in the northern hemisphere (Morera et al., 2022).
- **Solar geoengineering** is being widely studied to curb potential global warming, however most scientists recognise its unknowable risks are not worth any potential deployment (Cho, 2024).

A political status quo in question

Tech wrangling
Planetary policies
Protectionist attitudes
Challenging global order
Intensifying competition

Tech wrangling

The last decade has seen policymakers attempt to regain control of the tech sector and its outsized influence on society and politics, through policies like the General Data Protection Regulation (GDPR), the Cookie Act, anti-trust lawsuits, Federal Trade Commission (FTC) and parliamentary investigations, and AI governance more recently. In a short period of time, technology companies like Meta, Apple, Amazon, Netflix, Google (MAANG) have developed an almost cartel-like influence on government, where it's unclear who is in control. Today, it is widely recognised platforms have had an impact on democratic backsliding and radicalising groups of people, even if tech leaders deny these claims. The next decade will see continued efforts by governments to regain direction over the tech sector.

- Highlighting the power of **dominant platforms to manipulate markets** and shape competitive dynamics to their advantage (White & Micheletti, 2024), Meta faced a significant fine from the European Commission for leveraging its dominance in social networking to unfairly promote its Marketplace service, disadvantaging competitors in online classified ads.
- Significant elections in the 20-teens, such as the 2016 election for Donald Trump and voting 'Leave' for the United Kingdom to exit Europe, were seen to be **influenced dramatically by platforms**, observed in the Cambridge Analytica scandal (BBC News, n.d.).
- The introduction of the European AI Act, representing the **world's first comprehensive AI legislation** is designed to regulate the use of AI across member states, though it will take a few years to come fully into force (Slama et al., 2024).
- It has been widely reported that Donald Trump will repeal the AI Executive Order issued by Joe Biden, reflecting a regulation-heavy, multi-agency approach to AI. On the other hand, it is likely that AI-related export regulations will be tightened to **impede China's AI development** (Villasenor & Turner, 2024).
- The United Kingdom is currently operating under a more **flexible AI legislative framework** compared to the EU, with the aim of the AI revolution driving economic growth, observed in the most recent AI Opportunities Action Plan (GOV.UK, 2025a).
- In a final speech by Joe Biden exiting as president, he **warns of the rise of an oligarchy in America**, implying many of these figures are in the tech sector (BBC News, 2025).
- The economy has tipped in favour of a **handful of highly powerful tech companies** over the last decade, with 'The Magnificent Seven' having a market capitalisation representing over 30% of the entire S&P 500 (Oaktree Capital, 2025).

Planetary policies

From the Paris Agreement in 2015 to Glasgow's COP26 in 2021, a system of climate goals and incentives has emerged on the global stage between political decision-makers. Countries are politically motivated to reduce carbon and invest in an eco-economictransition, with varying levels of success to date. Regulations around carbon and externality reporting, political emphasis on future generations, increased influence of Millennial values in the workforce, and fusion between political and economic spaces, as observed with ecologically motivated investor activists, have catalysed a new kind of global governance. Various theorists suggest we are undergoing a paradigm change in our political and economic system toward stakeholder capitalism.

- The United Kingdom has recently pledged £7.2 million to support **nature-positive economies in developing countries**, in an effort to support these countries in preserving their rich ecological systems and biodiversity (Gross, 2025).
- The United Nations Environmental Assembly (UNEA) resolution on land degradation and plans for COP16 highlight the growing focus on integrating climate, biodiversity, and sustainability goals. These developments may signal **a shift toward more unified global policies addressing environmental challenges**, with potential implications for political and economic frameworks worldwide (United Nations Convention to Combat Desertification, 2024).
- With the announcement of last year rising to 1.5C (Stellard, 2025), the effectiveness of **international climate policies is being called into question**. This is exemplified by the internal issues with COP29 in 2024 (McGrath, 2024).
- **Carbon pricing systems** are gaining traction with more regions implementing direct carbon pricing instruments, compliance instruments and carbon crediting mechanisms in order to fight climate change (Morales, 2025). However, other regions are approaching a more indirect approach, believing competition will resolve carbon issues rather than punitive measures.
- More signatories have joined the Artemis Accords, a set of non-binding principles designed to encourage and guide the **peaceful and responsible exploration of space**. Russia and China have opted for their own policies, highlighting the drive towards more guidance when it comes to extraterrestrial activity (Luscombe, 2024).
- Politically motivated financial investors, **'activist investors' have grown by over 100%** in the past decade (Accenture, 2024), with many driven by ecological agendas.
- Wales' Protocol for Future Generations is serving as a **prototype of stakeholder capitalism** for other regions, where economic development policies are viewed through a lens of welfare for following generations (The Future Generations Commissioner for Wales, n.d.).

Protectionist attitudes

Protectionist attitudes across issues such as domestic industry, energy security, nationalist identity, geopolitical concerns, and immigration crises have grown over the last decade. Brexit and various forms of protective tariffs like America's CHIPS Act have signalled an end to free-flowing global trade relations, meanwhile hard stances on immigration have crossed the aisle in various developed nations. There is also increased political, economic, and defence cooperation around mitigating risks from foreign economic superpowers, especially China. If the 20th century symbolised an endearing look outward to a globalised world, the 21st century is shaping to look increasingly inward.

- **Ongoing trade wars** between the United States and China on the trade of electric vehicles is an example of a wider trend of protectionism that threatens to curtail global economic relations (Josephs, 2024).
- Donald Trump will likely push for further **tariffs** if elected, even threatening 100% tariffs on all countries that snub the dollar as their reserve currency (Butts, 2024), reflecting a darker chapter of the MAGA brand.
- Mexican cartels are now recognised as terrorist groups by the United States, indicating a more severe and **heavy-handed approach to border, immigration, and narcotics control**, which could have broad implications to commercial relationships between Mexico and the United States (FTI Consulting, 2025).
- Issues of resource scarcity like **lack of housing** in developed countries has been linked with the rise of anti-immigration sentiment in places like Canada, arguably representing one of many causes of the downfall of Prime mister Justin Trudeau (Hatton, 2025).
- The recent Brexit row over fishing rights between the United Kingdom and Europe despite efforts to reset the relationship exemplify ongoing, **inward-looking stances being taken by countries to safeguard resources** (Seddon, 2025).
- There have been calls for vigilance in Europe to strengthen scrutiny and transparency of research funding due to **fears of Chinese and Russian espionage** in European universities (Hess, 2024).
- **Economic distress has been labelled as a prominent driver** of populist parties and protectionist policies in the United States, United Kingdom, and other developed nations, however it has also been recognised as having a complex relationship to excessive dependence and national identity challenges (European Consortium for Political Research, 2024).

Challenging global order

Whether it's China and Taiwan, Israel and Palestine, or Russia and the previous Soviet Union, authority around land and sovereignty is being tested. Since the fall of WW2, the US has overwhelmingly played the role of global police officer, however in a world with a large handful of economic superpowers, nuclear warheads plenty, and enduring frustrations of the past, this role is being challenged. Between NATO and backdoor conversations among the aggrieved, the next decade spells tricky negotiations, high-stakes responses to failed agreements, and increased defence spending.

- **Russia and North Korea strengthen their ties**, with Russia delivering the latest technology to North Korea and North Korea helping with Russia's war in Ukraine according to NATO chief (Reuters, 2024).
- **Pressure on NATO members** to increase spending from Donald Trump, with the potential to cause fractures in the block (Stavridis, 2024).
- Donald Trump's threats to **annex and invade** various countries and regions including Canada, Greenland, the Panama Canal and more show a departure from the previous American diplomacy and could signal a change in the country's role on the world stage during this administration (Davies, 2025)
- After **Elon Musk's** selection to lead the Department of Government Efficiency (DOGE), he has been using X to attack and discredit various political figures and governments across Europe (Kirby & Gozzi, 2025) and the United Kingdom (Mason, 2025). This may signal continued blurring lines between business leaders and politicians.
- **Land grabs over the last decade** have been tied to historical disputes around a nation's true borders, sovereignty, and how the region should orient itself politically, economically, and culturally, observed in Vladimir Putin's letter describing Ukraine and Russia as 'one people' (Putin, 2021).
- There have been multiple examples of **legal loopholes being used to get around migration laws** challenging traditional notions of sovereignty and border control. For example, a lawyer has recently admitted that he illegally fast-tracked asylum applications for profit by coaching applicants to claim they were victims of domestic abuse (Fitz-Gibbon, 2024).
- Balaji Srinivasan and other blockchain and cryptocurrency enthusiasts have framed their beliefs as **an 'exit' from the financial and political system as we know it and an embrace of network states**, positioning this movement more with a form of anarchy (The Network State, n.d.).

Intensifying competition

Over the last decade, foreign economies have become increasingly powerful, politically and economically, with India surpassing the United Kingdom's GDP in the last couple of years. It is unclear if China will surpass the United States as a global economic superpower, however it is plausible this may happen in the next 10 years. Moreover, new forms of economies cultivated through blockchain networks, a significant increase in free trade zones, emerging start-up cities, as well as criminal organisations challenging traditional governance structures, as observed in Mexico, could transform the locus of power and how projects are funded.

- The **centre of economic gravity is moving east and south**. Emerging economies, led by China and India, have accounted for almost two-thirds of global GDP growth and more than half of new consumption in the past 15 years. The dynamism of these economies has gone hand in hand with the rise of highly competitive emerging-market companies (McKinsey, 2018).
- China has been filing patents for AI and machine learning at a greater pace than the United States, with double the number of patents in the year 2023 alone, indicating **potential for Chinese innovation to outpace America** (Singer, 2024)
- The **'Green Rivalry'** between the United States and China highlights intensifying global competition, with their subsidy-driven green industrial policies reshaping economic power and sidelining smaller nations like those in the Caribbean. This reflects how geopolitical tensions and unilateral actions are eroding multilateral governance, creating a fractured global economic landscape (Darnal et al., 2025).
- The United Kingdom under Keir Starmer's leadership is positioning itself as a country **urgently focused on growth** and foreign investment, with the Labour Party Manifesto striving to 'reconnect Britain' internationally, pledging to become a clean energy superpower (Labour Party, 2024a), and recently announcing plans to become a global leader in AI, describing this as an opportunity for 'national renewal' (GOV.UK, 2025b).
- African countries, especially in the east of the continent are pulling in large amounts of investment, specifically towards their tech sectors. Kenya has large companies like Microsoft and Google introducing development centres in the last few years. In addition, the region's youthful, digitally savvy and well-educated population bolster the region's position as an **'international cradle of the tech startup ecosystem'** (Clarys, 2024).
- The ongoing war between Mexican cartels seems to be escalating as more innocents are injured in the conflicts and **their power and influence grows** (Graham, 2024). These organised crime syndicates generate billions of dollars and control much of the flow of drugs into the United States (Perez, 2025).
- The Próspera project in Honduras highlights how **emerging economic models** like private charter cities can reshape global governance. Initially promoted for its minimal taxes and streamlined regulations, Próspera now faces significant challenges, including a $10.77 billion investor claim against Honduras after the repeal of its legal framework — illustrating the risks of navigating sovereignty and alternative economies (Surma & Kusnetz, 2024).

Moving forward

The aim of this research was to focus on forces of change shaping the landscape of CoSTAR's research area. As a framework it is deliberately high-level and can be used across sectors in the United Kingdom. We welcome readers to drag and drop pages from this report, to run workshops and bring people together around making sense of change, and what wise decision-making looks like today.

Forces are a mental model, they are not an endeavour in accuracy but in plausibility. They are a tool we will adapt as events unfold. We will review them at the end of each year to ensure their continued relevance, and we plan for this research to be a live, interactive resource for public use in due course.

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