



Anticipating futures: Understanding the fundamental importance of narratives through an integrative interdisciplinary approach

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ABSTRACT

Businesses, planners and policy makers must make decisions that influence a future about which they have incomplete knowledge. Whilst knowing the future may be illusive, the capacity to adapt as required, is desirable for both organisations and society. We examine what different perspectives can offer, considering how empirical-analytical (e.g., modelling, data), narrative-experiential (e.g., fiction, history, gaming), and socio-technological (e.g., AI, social media) approaches contribute to anticipating futures. From this overview we detect a fundamental role of narrative as a framing device, and we examine various aspects of its inescapable value no matter

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what the perspective. We assert that whilst narratives are important to the success of planning activities and to their subsequent uptake and utility, they are no guarantee of success, serving only to animate the body of experience. We identify that a good narrative starts an evidence-based process which is dynamic and evolves as others engage with it; little is achieved without engagement. Narratives can shift focus or intention, or become hijacked, and the evolving narrative becomes an emergent property of a complex system with no one person or group controlling the process. We argue that an understanding of the essential role of narrative is critical in considering futures, and in achieving desirable outcomes. To this end we identify narratives as complex dynamic systems that involve multiple actors and feedback loops. A better understanding of the drivers of such dynamics is needed as a precursor to developing techniques to limit the potential for narrative distortion or derailing.

1. Introduction

Those seeking to plan for the future, in government, industry or private life, need, in some sense, to anticipate what that future might look like. Here we explore, from diverse disciplinary perspectives, how different disciplines understand and tackle futures, finding a common emerging theme of narrative. We do not consider narrative explicitly as a method or form of analysis. Rather we focus on the role of narrative in communicating ideas about the future and on the limited agency of any one group to gain acceptance of their narrative in the age of social media.

When developing a policy agenda or plan of action, there may be a need to consider a range of possible projected futures (e.g., for climate or population change). Looking ahead does not have to mean predicting or, in any way, knowing the future but rather being prepared for it. As Miller (2011, p24) has remarked “the challenge is not finding ways to “know” the future, rather to find ways to live and act with not-knowing the future”. Developing a better understanding of how people think about the future, rather than what kinds of future they anticipate, has been suggested as a possible way forward (Bai et al., 2016; Duque-Gómez et al., 2023; Miller, 2011).

Lessons from the past may provide a cultural context to inform this endeavour but requires care. For instance, Tolstoy reasoned that history is the sum of all human actions and fundamentally resists rationalisation (Berlin, 1951). This seemingly challenges the identification of possible predictor variables (Turchin et al., 2022), but can possibly be resolved by the *longue durée* as a historicised mode of analysis (Guldi & Armitage, 2014). This accords with the systematic trans-disciplinary approach to explaining structural transformations over time proposed by Wallerstein (1974). His ‘World Systems Analysis’ seeks to integrate the social and natural sciences to explain historical events. This leads to the idea of using past societal dynamics to project possible futures (Turchin et al., 2022; Van Der Leeuw et al., 2011).

Long-term planning and strategic planning have necessarily always considered what might happen in the future. This has been formalised over the last 20–30 years within the field of knowledge that is now known as “Foresight”. Foresight seeks to consider the recent past: horizon scanning to identify trends, new breakthroughs and potential futures that support analysis, the identification of strategic priorities and the development of implementation pathways (van ‘t Klooster et al., 2024). Many governments, notably in Europe, have foresight teams to support policy development, and companies are increasingly making use of these ideas to develop ‘corporate foresight’. These concepts are now maturing, although coupling futures thinking with mainstream decision-making and governance remains a challenge (Cork et al., 2023). Formal guidance has been developed (Rhydderch, 2009) and the underpinning ideas have been deployed (e.g., in the Shell scenarios: Kupers & Wilkinson, 2015; Wack, 1985a, 1985b). This is reflected in the growing literature on the topic, including dedicated journals such as *Futures* and *Futures & Foresight Science* and publications of the *World Economic Forum* (2023) and other international bodies.

The combination of information analysis and synthesis for the purpose of developing policy-relevant narratives around envisioned futures (e.g., for policymaking) differs from the system-dynamics and computational approaches adopted in the environmental sciences for climate and social-ecological modelling. The construction of qualitative “scenarios”, typically reflects the prevailing societal outlook (positive and negative) (Sarpong, 2011), preferences in governance (global/national) and socio-environmental values (exploit/sustain) (Dearing et al., 2014; Rhydderch, 2009), with wider community participation used to broaden the narratives of such scenarios (Pedde et al., 2021). Quantitative system-dynamics approaches, such as earth system models, or global climate models (Verburg et al., 2016), often make use of ensembles of models to address complex problems (e.g., Murphy et al., 2004). Such approaches are commonly used to explore regions of the parameter space and the possible range of responses to given changes (e.g., Cooper & Dearing, 2019), or to simulate changes of state that reveal transitions or so-called ‘tipping points’ (e.g., Lenton et al., 2019). These two distinct approaches come together in the form of integrated assessment models that underpin IPCC (2023) reports, when scenarios are used to identify how conditions may change, and modelled to identify, and understand, the potential range of responses.

And yet, unpredictable events might radically change scenarios. Events, such as the creation of the Internet and social media, financial crashes, armed conflict, pandemics or large-scale natural catastrophes, can quickly alter how individuals and communities respond, both locally and globally. The highly uncertain, and in some cases unknowable, nature of such dynamics means that formal methods frequently fail to anticipate key events (Haldane & May, 2011; Soros, 2008).

Any analysis, scenario planning, modelling or other foresight work, whether targeted at development projects or identifying futures, requires the existing information and knowledge to be synthesised into a coherent account set in a relevant context – that is, a narrative. Whilst this synthesis may suffice for those doing the work and other specialists in the field, a further step is required to communicate these results to a wider audience, especially when the aim is to bring change, which requires a broader narrative that

challenges prevailing context and societal paradigms.

Here we consider narratives that connect the present to possible futures, including:

- Analytical narratives, which detail conclusions generated by specialists in a particular field and synthesised for wider dissemination, either to a specialist or a more generalist audience (Ameel et al., 2023).
- Historical narratives, which provide examples and lessons when combined with counterfactual thinking ('what might have been') (Bendor et al., 2021).
- Fictional narratives, which explore possibilities, and play with concepts rather than directly facilitating strategic decisions (Liveley et al., 2021).

We will argue that all such narratives about the future achieve their purpose by placing us, the audience, in the future scenarios and/or helping us position ourselves in relation to it. In performing this personalisation, the narrative brings the future to life for the target audience. With this broader context of engagement, scenario planning can be seen as one form of analytical narrative, via the identification of plausible pathways and different modes of travel (i.e., different perspectives). Whilst scenario planning is used to support decision-making, the likely success is predicated on the framing of alternative scenarios (e.g., for climate adaptation planning), or desirable visions (e.g., in a company's or institution's Vision Statement), or undesirable threats (e.g., in a risk analysis), or robust strategies that address future uncertainties (Doncaster & Bullock, 2024; Kemp et al., 2022). Although the framing allows specific stakeholders to make decisions about the future, the narrative is still generalised. Thus, framing the narrative by the types of decisions people need to make cannot be completely personalised, as it depends on each individual's or collective's world view (Orr et al., 2025).

In this paper, we – a highly interdisciplinary group of academics - endeavour to identify commonalities in the way narratives are incorporated into exploring possible futures. To this end, we have three objectives:

- (i) to explore the approaches used to talk about futures in different disciplines, identifying an ever-present need for some form of narrative amenable to personalisation;
- (ii) to consider how the narrative may need tailoring to prevailing social norms and the nature of the changes envisaged;
- (iii) to examine how narratives can suggest routes for the translation of scenarios into desirable pathways for change and their wider acceptance and adoption by societies.

We begin by summarising a range of approaches adopted by different disciplines. We then assert the importance of narrative to all these approaches and explore the purpose of narrative in a range of contexts, how a narrative might be evaluated, and some of the issues that influence subsequent uptake of narratives.

Our synthesis distinguishes the essential roles of narrative as motivating context and a framing device, and emphasises the absence of authorial control over its development.

The organic character of public narrative means that environments amenable to imaginative exploration and experimentation, without immediate real-world consequences, can have significant benefits for policy makers and strategic planners. Such environments may include simulations, gaming hubs, or focus groups, which allow participants to explore scenarios, test responses, and challenge assumptions. In this context, such environments are often described as 'safe spaces' — not because they offer protection from risk, but because they allow risk-taking to occur within controlled, consequence-free settings. Science fiction and other types of story-telling uniquely explore new ideas from the safe space afforded by a book or film. We believe that understanding how we converge on narrative when thinking about the future will better arm us to address the many wicked problems that lie ahead.

2. Multi-disciplinary perspective of futures

To explore how different disciplines have both viewed and addressed the issue of anticipating futures, we brought together a pan-university group of interested academics, encompassing the fields of arts, humanities, business, economics, natural science and engineering for two workshops at the University of Southampton (see Box 1 for some background on the workshops). Contributors firstly sought an overview of the various approaches commonly used in planning for uncertain futures, and secondly attempted to distil the

Box 1

Background to Workshops.

The first workshop provided the opportunity for a structured discussion amongst 62 participants, from across the university, with a focus on evidence-based (academic) perspectives to anticipating futures. The second workshop focused on needs-based (industrial) perspectives, with a specific industry view provided by Jeremy Bentham, Co-Chair at World Energy Council and former head of Shell Scenarios, who discussed Shell's approach to scenario development. This was followed by five presentation-led discussions exploring the potential role of AI in foresight and strategic planning

values of different perspectives on the future. Some techniques were known across disciplines and we have endeavoured to summarise these as common approaches (the how), before presenting the differing perspectives we identified (the insights) that can contribute to anticipating futures.

2.1. Common approaches

Work to anticipate possible futures is extensively used to support policy and business planning. There is an expectation of planning to improve on the present (including mitigating situations we expect to worsen) and to be resilient or robust to shocks. A resilient system, structure, society or person continues to function through rapid or chronic change. Such systems have the capacity to resist or repel external attacks that challenge its robustness or expose its weaknesses. However, a system may be subject to transformative change, driven by external forces (e.g., the historical flooding of the Black Sea: [Ryan et al. 1997](#)), or when the need for radical systemic change is identified and implemented (e.g., the Montreal protocol: [Solomon et al. 2016](#)). Our workshops identified some common approaches across disciplines to how the future is considered.

2.1.1. Scenario planning

The development of scenarios aims to enhance our understanding of the underlying system dynamics and thereby to uncover how the future may unfold. In so doing, scenarios may also challenge conventional thinking and thereby contribute positively to the decision-making process ([Derbyshire & Wright, 2017](#)). Typically, the selection of scenarios should aim to encompass the bounds of possible futures for the particular problem and include the speculative or improbable, and various approaches that are deployed to help frame possible trajectories ([Rhydderch, 2009](#)). Even though any scenario will be uncertain, scenarios can help to shape thinking and enable better planning and preparation ([Sarpong et al., 2019](#); [Sarpong et al., 2013](#)).

2.1.2. Roadmaps and backcasting

A variant of scenario planning is the ‘roadmap’, or ‘backcasting’. This takes a desired outcome, or a particular scenario, and considers what needs to happen to get to the outcome ([Robinson, 2003](#)). Roadmaps might target various desirable outcomes such as the circular economy ([Sitra, 2016](#)), or the process of decarbonisation ([Rockström et al., 2017](#)). Equally they might target the avoidance of undesirable outcomes, such as pandemic response planning ([Heffernan, 2021](#), Ch 10). However, even when armed with a roadmap, one must recognise that setting out what needs doing is a distinct exercise from determining our ability to achieve it, which often depends on wider acceptance of the direction of travel, especially in a political context ([Helm, 2023](#)). This is the narrative that accompanies the roadmap ([Milojević and Inayatullah, 2015](#)).

2.1.3. Risk assessment

An alternative to scenarios is the use of risk assessment, or stress testing, to examine a system’s capacity to cope with anticipated events. Risk assessment is the formal process of evaluating the consequence(s) of a hazard and their likelihoods/probabilities and seeks to understand what might pose a threat, with a primary focus on crisis management, rather than motivating adaptation, although this may be an inevitable consequence in some situations ([Defra, 2011](#); [Kowalska et al., 2021](#); [Ostrom & Wilhelmsen, 2019](#)). The systemic nature of risk can result in cascading impacts which can occur across spatial scales (regional, national, global) and across sectors ([Schlumberger et al., 2022](#); [UNDRR, 2022](#)). Systemic risks are thus characterised by ([Reisinger et al., 2020](#); [Sillman et al., 2022](#)):

- the scale of the system;
- the relationships, interconnections and feedbacks between elements of the system;
- the level of understanding of the system including knowledge gaps, uncertainty, tipping points and stochasticity, the transboundary effects (cascades, complexity, non-linearity, indirect impacts and wider effects); and
- the outcomes/consequences of systemic risk sectors.

Whilst risk assessment and management quantify risks (nature of hazard and level of exposure, vulnerability and coping capacity) in relation to acceptable thresholds, stress testing is concerned with identifying points of systemic failure such that stakeholders can identify interventions to reduce or eliminate potential vulnerabilities ([Cihak, 2004](#); [Haldane & May, 2011](#)). More recently this concept has been extended to encompass the system’s capacity to adapt to change and thereby strengthen resilience (e.g. for banking: [Amini et al. 2016](#), infrastructure: [Linkov et al. 2022](#); [Wells et al. 2022](#), or supply chains: [Aldrighetti et al. 2021](#)).

2.1.4. Modelling

Scenario planning and risk assessment use a combination of qualitative and quantitative methods. A common alternative approach is system dynamics modelling, which is predominantly quantitative, and may combine physical, numerical and statistical modelling techniques with rule-based methods. The latter formalises current understanding of the behaviour of an individual or component of a system into a set of rules for incorporation into the model. Such systems models seek to represent an abstraction of reality that encompasses social, economic, health, environmental and ecological systems to explore how the combined system might evolve as conditions change, and to identify what might constitute our “safe operating space” (e.g., [Dearing et al., 2014](#)). Such models now contribute to integrated assessments on large-scale issues such as climate change and delivery of the sustainable development goals (e.g., [Gutiérrez & Tréguier, 2021](#); [Henderson & Loreau, 2023](#); [McPhearson et al., 2022](#)).

2.1.5. Digital data

Recent decades have seen rapid advances in the techniques available for remote sensing of Earth, mostly from space by satellites but also from the ground by deploying sensors (e.g., Hill et al., 2018) or by co-opting existing databases for example of mobile-phone GPS locations or call data (e.g., Peak et al., 2018; Ruktanonchai et al., 2016). These technologies are now used to help manage natural disasters, wars and crises around the world, as well as to monitor local events on global or regional scales. Similarly mobile phones and the internet have created vast data sets that can now be mined e.g., WorldPop (2025). Collectively these provide an information base with which to identify what is changing, better understand the system dynamics, and explore potential tipping points, or boundaries to life in the biosphere, that present existential threats, and hence to manage events rapidly and responsively.

2.1.6. Uncertainty

All of the above methods are constrained by inherent uncertainty. Such uncertainty can be addressed, to some extent, by considering multiple sources of evidence and synthesising what is known into a coherent and internally consistent line of reasoning. How the conclusions are communicated will depend on the audience and should distinguish between what is known (facts), what is probable (all relevant influences known *a priori*), what is based in judgement and what is speculation. Hence, presentation entails subjective judgements, even when dealing with quantitative outputs. To address this inherent subjectivity, concepts such as pedigree, consensus and quality have emerged to communicate the limitations of what we seek to assert (Kay & King, 2020; Mastrandrea et al., 2010; Shaxson, 2005). Methods have also been developed to accommodate an ensemble of models for better capturing uncertainty (Murphy et al., 2004). Since we may not be able to discern which models are more plausible there is a further need to recognise the ambiguity (Berger & Marinacci, 2020).

2.2. How differing perspectives contribute to anticipating futures

The workshops revealed varying perspectives in the use of the above approaches to think about the future. We synthesise these into three broad categories of discourse: (1) empirical-analytical approaches (e.g., modelling, data, risk assessment), (2) narrative-experiential modes (e.g., fiction, history, gaming), and (3) socio-technological mediators (e.g., AI, social media). Each offers different affordances for constructing and contesting future-oriented narratives. Interestingly, this coverage seemingly revisits the aids to thought suggested by Kahn 60 years ago (Kahn, 1962), which explored the role of abstract models, scenarios, games, historical examples and novels to increase comprehension of a particular problem; in Kahn's case, thermonuclear war.

We distinguish between narratives that motivate research agendas (e.g., through problem framing, hypothesis generation) and those that are shaped by empirical findings and reinterpretation. These categories are not mutually exclusive; rather, they interact dialectically. Research may reinforce or overturn prevailing narratives, while public and disciplinary narratives can, in turn, influence which futures are imagined or prioritised. Our focus – the anticipation of futures – is on narratives that are influenced or modified by research.

2.2.1. Empirical-analytical

When scientists and engineers endeavour to use their knowledge to examine the future, they typically use some combination of data and models. This can range from projections of historical data by extrapolation, through sensitivity and scenario modelling, to ensemble system modelling. Insofar as all models are an abstraction of reality, they must feed into a broader narrative derived from the wider knowledge base. In limited circumstances they can serve to make predictions. More generally they are used to explore system behaviour and the sensitivity of responses to forcing agents. When deployed in this way, the experimental nature of the model is clear, as illustrated by Haldane and May (2011) when studying the 2008 market crash, referring to their model as a “toy model”. This is not to underplay the contribution that models can make, but rather to clarify to the non-specialist that the outputs are illustrative aids to understanding rather than predictive forecasts.

Models for predictions, risk management activities and decision-making about futures typically comprise a composite of sub-models that target human behaviour, in relation to the domain of interest. The various behavioural sciences, including psychology, economics and operational research, have several such models. Many of these are seeking either to optimize some attribute, or to use some form of heuristic or rule of thumb. Optimization models assume that people make judgments, decisions and choices “as-if” they optimize a utility/objective function that expresses their interests and constraints. Heuristic models are an alternative to optimization that might more easily interface with simulation models and support operational or strategic decision making, and also serve as a conversational platform (Katsikopoulos, 2023). These models originate from the ideas of Herbert Simon, (1956) on ‘bounded rationality’ and try to express the ways in which human beings, or other organisms, adapt to living in a world with limited resources.

For futures work, Lustick and Tetlock (2021) have suggested using a matrix to understand the suitability of models for developing scenarios. The matrix called “What-World-Am-I-In?” combines information about entities, causation and the availability of data. For scenario development, system dynamics models can provide theory-informed computer simulations capable of generating consistent scenarios and capturing elements of uncertainty (Kunc, 2021)

2.2.2. Narrative-experiential

There is plenty of evidence that past attempts to anticipate the future often look outdated once those anticipated futures are reached (Edgerton, 2008). Nevertheless, there is also a growing understanding that many risks we now face have been self-generated. Some future risks could be avoided by paying attention to the history that created previous risks and their socio-political context. However, such efforts can still get entangled in the narrative, as illustrated by the very different trajectories, on the one hand for successfully

managing atmospheric-ozone depletion through a globally agreed ban of CFCs, and on the other hand for the ongoing inertia in international efforts to address anthropogenic climate change (Andino & Rowland, 1999; Weart, 2008). Comparing these two crises highlights how a successful outcome is predicated on broad acceptance of the narrative, and thus how successes can serve as a blueprint for the structure of narratives (Brune, 2015; McGrath, 2024). In summary, if history is the integration of all human action, then there is merit in ensuring that the history we are creating now is one that facilitates a resilient future (Berlin, 1951; Dawson & Hanoch, 2022).

There is a growing recognition that when a need for radical change is identified, this will have to be accompanied by a change in the narrative in order to achieve broad acceptance of, and engagement with, the requirement for change. Depending on the subject and societal norms this can be both complex and challenging (e.g., see Kahn, 1962; 2010 in relation to thermonuclear war). Fictional stories have a key role to play in enabling this change in narrative, by providing a safe space to explore new ideas. Such stories may help to shape values, trigger reflection about the implications of a new concept, or advance and enable collective envisioning of futures that differ from the current status quo (MMMCC, 2013). This is particularly important for policy making that requires the public to confront scenarios involving existential threats; political debate about such threats is anathema to politicians whose futures depend on an electoral cycle.

Novels and films have a long-standing tradition of helping the public to imagine different, often dystopian, scenarios and worlds, (e.g. *War of the Worlds*, *Brave New World*, 1984, and *the Matrix*). Games, in which worlds can be generated procedurally and players experience alternative versions of these worlds, now serve a similar function. Some have branching narratives (particularly in interactive storytelling), in which the player can change the narrative according to the decisions they take in the game, allowing for many possible endings. By offering alternative narratives, games allow players to learn from their mistakes in exploring scenarios with uncertain success. Computers using Reinforcement Learning algorithms can also play these games and this has already provided considerable insight into human behaviour (Christian, 2021). In some games, players can construct worlds, not just by interacting with current rules, but by building new ones (e.g., sandbox games as *Minecraft* or spaces like *Roblox* can offer resources for players to build their own playable spaces). This also brings scope for emergent narratives, which are constructed by the player, and enacted outside the game. This is also present in playful activities. For example, children create their narratives through imaginary play, helping them construct meaning and world views (Ahn & Filipenko, 2007).

There are a growing number of initiatives for writers to embed positive visions of sustainable societies into their stories, with the aim of encouraging the adoption of more sustainable policies and practices. For example, the Green Stories Project teamed with climate experts and the Climate Fiction Writers League to create an anthology of 24 short stories with climate solutions at their heart called: *No More Fairy Tales: Stories to Save Our Planet* (Robinson et al., 2022), which links to a website that allows readers to contribute solutions (Baden, 2019). One of these stories has been adapted into a play: *Murder in the Citizens Jury* (Baden, 2024) a whodunnit in which eight people debate climate policies that involve reducing consumption, a difficult topic for open discussion amongst politicians (Green Stories Project, 2025a). Preliminary evidence suggests that dramatization is an effective means to engage audiences: for example, feedback from a recent performance suggested that it had raised awareness and support for citizens assemblies as a means to address some of the shortcomings of our current system. Serious games (Wikipedia, 2025) are an extension of models into (often computational) game formats, and like stories they provide a safe space in which to develop understanding, explore new thinking and counterfactuals, communicate ideas (however fantastical) and feed learning back to other disciplines (Christian, 2021). This can have particular value to policy makers. Any announcement or public discussion of an issue can itself alter the narrative around the issue. Consequently, the safe space provided by models and games allows policy makers to experiment with ways to avoid this dichotomy to some degree. There is now a rapid development of games being played across networks, where players interact to produce collective outcomes. Such interactive games provide a vehicle for arriving at a common understanding and a new narrative (Jackson & Zenou, 2015), as well as having applications to real-world, large-scale multiagent problems that are characterized by imperfect information and considered difficult or even intractable (Perolat et al., 2022).

2.2.3. Socio-technological mediators

The ever-increasing proliferation of models based on complex numerical methods, sophisticated statistics and the rapidly advancing capabilities of AI, raises issues about which models are suitable and useful for a particular problem. More insidiously, assumptions that are made in the model but not communicated to the user, or in the case of Machine Learning (ML) unknown even to the developer, introduces an additional level of uncertainty into model results. Decision trees and evaluation matrices provide ways of navigating the first of these issues (Lustick & Tetlock, 2021; Townend, 2007), whereas the latter is very much work in progress. At this time, it is unclear where the balance will lie between AI unlocking hidden content and locking away its working. This issue is recognised within the field of Explainable AI (XAI) with a focus on understanding how and why ML/AI arrives at given results (Hassija et al., 2024). Although XAI provides tools to help both developers and users interpret the outputs and drivers of an AI model, it cannot itself provide a narrative exposition of the resulting insights. An explanatory narrative is typically constructed by the model user when communicating their results to a wider audience and is important for understanding by non-specialists.

Such developments in AI-assisted modelling and gaming are enabled by advances in computing power and increasingly supported by data analytics for decision-making based on historical data. Currently one of the most prominent applications of generative-AI, for pattern recognition, is the large language models (LLMs) that have rapidly infused into everyday use (e.g., ChatGPT, Gemini, etc). Whilst these dialogue bots offer the potential for greater synthesis of what we know, it is not yet clear what value they might have in anticipating futures. Certainly, responsibly designed LLMs conform to one of the defining features of our integrative framework - that no one controls the narrative. In so doing, they repurpose others' narratives (probabilistically) to serve the needs of the LLM user, who may adapt the original storyline to alternative contexts.

The inherent susceptibility of AI tools to subjective bias has already become an active research field. The selection and weighting of variables included in the models, and the datasets used to train the models, can reflect the biases of the developers or the material being used for training (Christian, 2021). This in turn can bias the outcomes and so mislead (MIT, 2025). Responsible AI seeks to address these issues (Cheng et al., 2021; Christian, 2021; Deshpande & Sharp, 2022), and works with stakeholders that have particular vulnerabilities to prejudice or bias (Indigenous AI, 2025).

Social media enables rapid and global propagation of narratives. Marketing strategists and community managers utilise specific tools and devices that help build ‘word-of-mouth’, to replicate the passing of information from person to person across different channels. One such device is the *meme*, which is any theme that propagates rapidly across the Internet. Social media can be purposively employed to drive narratives, as for example in the #ClimateCharacters (Green Stories Project, 2025b) that successfully raised awareness of the influence of fictional characters on behaviour.

2.2.4. Review findings

The above brief summary of a more extensive workshop output gives some sense of the insights being derived from the various approaches in current use across disciplines, with some of their strengths and weakness are set out in Table 1. However, all disciplines sought to communicate research or study outputs in a variety of ways and we concluded that the resultant narratives play an important role in the subsequent uptake of the ideas they embodied.

3. The role of narrative

Our cross-disciplinary evaluation revealed that publishing research findings starts a narrative that is often narrow and focussed. In some cases, this is given a broader context when embedded in an interdisciplinary narrative that serves a wider audience. However, the use of these narrative may then be highly selective, allowing very different narratives to be created from the same research output. For example, global warming findings can promote fictional dystopia, or positive policy making depending on the perception and motivation of the derived-narrative creator. Policy makers and businesses face a different challenge. For them, the reception of the initial narrative can shape the subsequent development of policy or business decisions (e.g., the public response to proposals to adopt GM crops: Oreszczyn 2005). This has led to the use of ‘safe spaces’ for planners, business and policy makers to test narratives using tools such as simulations (e.g., Chapman et al., 2010), gaming hubs (e.g., UK Defence Experimentation and Wargaming Hub), and control groups. More broadly ‘focus groups’ are extensively used by marketeers and political parties to establish reactions to new products or policy proposals. By highlighting the importance of the initial framing of a narrative, and recognising how this may evolve, often with limited options for any individual or group to influence that evolution, we believe we are all better placed to address complex issues and especially so called wicked problems (Rittel & Webber, 1973).

Whilst all of the approaches that we have discussed create a narrative to summarise potential change, this often takes the form of literal reporting, without necessarily considering how the framing of the narrative will influence its subsequent uptake and wider response. Framing becomes an essential consideration when the aim is to enable change, which requires broadening the narrative to challenge prevailing contexts and societal paradigms (Bazzani, 2023; Jarva, 2014) and, in some situations, a reflexive recognition of differing perspectives (Mangnus et al., 2021). Framing can involve a synthesis of multiple lines of evidence into a conceptual model, a synthesis of the past into an historical account, the construction of scenarios, or the telling of stories as a means of imagining plausible futures or credible routes from where we are now to where we want to be or might find ourselves. Framing can also make use of numerical models, games and AI to provide a parameter space for experimenting with ideas, developing awareness or strategizing (e.g., the UK Defence Experimentation and Wargaming Hub).

Synthesis involves a bringing together of what is known, to produce a summary of ‘what is going on’ (a form of abductive reasoning). This provides the individual or group that generates the synthesis with an abbreviated form of narrative. Those involved already know the context and (usually) have a detailed understanding of the information used to compile the synthesis. They can therefore make use of shorthand to explain what is going on. To communicate this explanation to others, especially in a policy or business context, requires a more complete narrative, which sets the context and presents the findings in a way that is accessible from

Table 1
Strengths and weaknesses of the approaches explored.

Perspective	Strengths	Weaknesses
Data and models	Provide ability to explore what is known in a formalised manner and explore ‘what if’ scenarios. Useful to develop deeper understanding.	Limited knowledge, and ability to capture all aspects in space and time, limit what data analysis and models can provide. Limited (but often useful) predictive capability.
History	Learn from real events. Past narratives may serve as a blueprint.	Interpretation subject to change (including the associated narrative).
Fiction	Establish familiarity with outlandish ideas. Broaden acceptance of the art of the possible.	Can be dystopian or counter-productive. Ideas may not be realisable.
Games	Safe space to explore new ideas and test options.	Do not map directly onto the real world.
Artificial intelligence	Huge ability to synthesise information and derive new understanding from very large data sets.	Hallucinations and the potential to be wrong currently a significant limitation.
Social media	Rapid and easy communication for the majority. Gives a voice to greater number of people	Can be distorted and manipulated. Impacts on individuals (especially youngsters) not yet fully understood.

within contemporary and prevailing paradigms (Haarbosch et al., 2021; Sarpong, 2011).

For evidence-based decision making, a synthesis may draw on scenarios, models, data (quantitative and qualitative) and subjective assessments. For foresight activity, the narrative is heavily constrained by what is known and what is foreseeable and such foresight techniques are now well established and discussed in an extensive literature. A more recent development is the use of narratives in the form of stories, poems, music and other media to stimulate the collective mindset (Liveley, 2017; Liveley et al., 2021). However, when pushing for adaptation to wicked problems, where a directed transition would be met with resistance or even revolt, there is a need to seek out the progressive steps that make a necessary transition acceptable and therefore possible. For example, public response to genetically modified crops was initially hostile but has changed over a period of several decades, whilst also varying globally (Sikora & Rzymiski, 2021). Another example is community response to a chronic problem such as coastal erosion. Whilst various forms of controls may provide a short-term palliative, over the longer term there will be a need to move the community to a new location (Clayton, 1989).

Scaling up from single issues to global problems, the narrative becomes both more complex and diverse. Lenton and Watson examine the step changes that have made the Earth as we know it. Looking forward they envision another step change with high energy use and high recycling, fuelled from sustainable sources and maximising our recycling of materials (Lenton & Watson, 2013). However, the current political/public narrative whilst predominantly around Net Zero is confounded by conflicting narratives on whether the global population can be sustained, or whether it needs to grow to maintain existing economic structures (Lianos et al., 2023), the limits on the capacity for growth (Meadows et al., 2004) and the Earth's ability to accommodate such growth (Fanning et al., 2022; Rockström et al., 2023). However, this is also entangled with the narrative surrounding public concerns about global growth (population and consumption) and the willingness of individuals to adopt ecologically sustainable behaviours in response to those concerns (Dawson, 2018). To some extent these are a consequence of partial perspectives of issues that are transcendent across all that we know. This is compounded by differing cultures that have different aesthetic norms and tolerances, and hence interpretations of the issues and their relative importance (Gelfand et al., 2011; Mangnus et al., 2021).

Tackling these issues raises ethical and moral considerations. Narratives are often not politically or ethically neutral. If trust is built by a straightforward and unbiased presentation of the evidence and its uncertainties, it becomes lost when the target audience suspects an attempt to persuade them of a particular point of view (Blastland et al., 2020). Thus, an engaging narrative should aim at effective communication rather than persuasion. Where persuasive use of narrative and its aims are made explicit, moral and ethical dimensions may more easily be taken into account. However, the spread of misinformation can be linked to covert attempts at persuasion; models to mitigate, or control and analyse the spread of misinformation are being developed and could play a role in the future (e.g., Alahmadi et al., 2025).

When faced with the unknown (what Kay and King 2020 call “radical uncertainty”), narratives can play an influential role. Perhaps the most famous example of a narrative focused on uncertainty is provided by the then United States Secretary of Defense, Donald Rumsfeld, speaking of ‘unknown-unknowns’ at a news briefing on February 12, 2002. Referencing this speech, Marshall et al. (2019) argue that risk intelligence work engaged with future uncertainty can usefully frame its task as being to resolve unknown-unknowns into known-knowns. Narratives that engage with uncertainty are of course not limited to consideration of future events. They also apply to historical accounts, or problem solving more generally. In such situations there are multiple lines of evidence, which may or may not be consistent and may even be conflicting. What we seek is the best explanation given the information to hand.

Problem solving requires a synthesis of what we know, to inform a conceptual model. The purpose of the conceptual model is to identify the components of the system responsible for the observed dynamics (interactions, feedbacks, etc) to provide a better understanding of the system behaviour. Synthesis is not about finding a singular solution but about making sense of multi-dimensional and multi-faceted sources of data, information and knowledge (Shaxson & Tsui, 2016). Such abductive reasoning seeks the simplest and most likely understanding of the available information, observations, or evidence. This maps well onto the idea of a narrative that explains what is going on (Kay & King, 2020). However, abductive reasoning tries neither to falsify a hypothesis, nor to account for all observations, rather it seeks a robust explanation of what is known in relation to the problem or question posed (Shaxson, 2005). In this respect, abductive reasoning (synthesis) differs subtly from deductive (logical) and inductive (generalising) forms of reasoning, often considered the mainstay of the scientific method (Medawar, 1967; Popper, 1959).

Any gain of understanding necessarily remains limited to what we know or can find out. This will always be incomplete, regardless of whether the task is to construct a history, understand the world around us, or formulate possible futures (Bendor et al., 2021; Berlin, 1951; Tolstoy, 1869). What is important for any of these activities is for them to make sense; in other words, the reader must find the narrative both plausible and credible (Eidinow & Ramirez, 2016). Here we distinguish between *plausible* as “the appearance of believability” and *credible* as having an acceptable degree of internal consistency or validity.

4. Testing the narrative

Plausibility arguably depends on cultural interaction and the resulting aesthetic (Eidinow & Ramirez, 2016). Accordingly, as Weick (1995, p61) puts it: “a good story holds disparate elements together long enough to energize and guide action, plausibly enough to allow people to make retrospective sense of whatever happens, and engagingly enough that others will contribute their own inputs in the interest of sensemaking.” and Eidinow and Ramirez argue that it is the aesthetic that determines the success or otherwise of such stories. More pragmatically, Andrade et al., (2022) explore how writing style influences understanding and recommend that this should be a consideration when developing scenarios. They suggest that “future research could investigate whether future scenarios presented in the preferred style of participants are perceived as more compelling or plausible” (*op.cit.*, p16). This idea is flipped in the concept of ‘Letters from the Future’, which explored how individuals develop their own narratives about the future (Sools, 2020).

In a policy-making context, such plausibility depends on how the evidence is presented and the extent to which different lines of evidence agree. In this context, robust evidence is seen as a key attribute of the narrative. A robust narrative meets five criteria (Shaxson, 2005). It is:

- Credible/valid - *sound line of argument?*
- Transferable - *can the specific be generalised?*
- Reliable - *can the evidence be depended upon?*
- Objective - *has residual bias been acknowledged?*
- Well-founded - *have the right questions been posed?*

Similar ideas have been used in various formal settings to communicate uncertainty by examining the quality of the information and the degree of consensus associated with it, a concept sometimes referred to as the pedigree (Funtowicz & Ravetz, 1987):

- Data input – was the data used reliable and carefully scrutinised for error or bias?
- Theory or method – does the result conform to accepted theory?
- Peer acceptance – is the result accepted by specialists in the field?
- Consensus – is there agreement amongst stakeholders?

In recent applications, this form of assessment has often been abbreviated to a vector of confidence in the result. For example, the guidance for consistent treatment of uncertainties for the fifth assessment report of the Intergovernmental Panel on Climate Change places confidence in a particular line of evidence on orthogonal axes of how robust the evidence is (in type, amount, quality and consistency), and the degree of agreement there is regarding the evidence (Mastrandrea et al., 2010). The concepts employed to communicate uncertainty associated with particular narratives can also be used to test the acceptability of a narrative. Where there are multiple narratives, often with conflicting evidence, various techniques have emerged to distil what is known (Cook et al., 2017; Dixon-Woods et al., 2005; Shaxson & Tsui, 2016), in order to inform decision makers, or the wider community.

5. Gaining acceptance

The nature of acceptance will depend on the target audience. Peer review publication is the accepted benchmark in academia. For policy makers and industrialists, the nature of acceptance is more nuanced and depends on the goals that are set. These in turn can be influenced by prevailing social norms and political imperatives (as illustrated by the widespread reversal of equality, diversity and inclusion policies in early 2025 at the behest of the Trump administration).

The development and acceptance of narratives has also changed drastically since the introduction of social media in the early 2000s. The democratised access for global dissemination allows more people to contribute to shaping narratives. At the same time there are indications that social media leads to shorter attention spans and memory loss (Paul et al., 2012; Sha & Dong, 2021) which complicates the challenge of moulding a complex narrative to gain traction.

Misinformation and propaganda have a long history as attempts by individuals, groups or states to shape narratives according to their interests (Diaz Ruiz & Nilsson, 2023; Posetti & Matthews, 2018). Yet, the advent of the internet and social media has made it possible to produce misinformation on a massive scale and to spread it globally (Adams et al., 2023). Moreover, the profit structure of social media, being based on attention and engagement (Edelson et al., 2021), has made the spreading of misinformation profitable in itself, thereby further incentivising it (Papadogiannakis et al., 2023). Generative AI tools add to these existing problems by making it much easier to generate highly believable misinformation. Altogether it has become much easier for any individuals to shape (global) narratives.

The rise of AI web tools, particularly for media generation (e.g., Midjourney, DALL-E and others) may increase the difficulty of understanding the process of acceptance and adoption of narratives. Audio-visual materials can feature synthesised world leaders, and existing images can be manipulated to false effect. It can become difficult to identify what is a deepfake and what is not. At the same time, this becomes an interesting challenge for artists who may utilise narrative techniques to develop critical approaches to AI and media literacy. Together with emotional manipulation, this creativity also raises ethical questions about image rights when designing interventions to address misinformation (Diaz Ruiz & Nilsson, 2023; Walker et al., 2023).

Ideas have windows of opportunity. At a particular point in time any given idea may or may not take hold. This will depend on the strength of the idea and the perception of the narrative in the prevailing social context. For example, extensive reporting and messaging about climate change in the latter half of the 20th century was for decades set against counter claims by the mainstream media. The publication of the so called ‘hockey stick’ graph, a key aspect of the narrative at the time, and accompanying testimony in 1988 to the US Senate by James Hansen, the Director of NASA (United States Senate, 1988), galvanised political thinking, leading to the creation of the IPCC in 1995. As the weight of the message grew, climate-change denial slowly became less prominent in mainstream media, although it remains a powerful lobby group that continues to influence industrial and political responses around the world.

In a much swifter precipitation of events in 2019, the blunt statements of one teenager on social media, pointing to the logical conclusions of what scientists were saying about the Earth’s precarious future, exposed to the world the inadequacy of prevailing political will. This protestation led to her skipping school every Friday, in order to sit outside the Swedish parliament, demanding urgent action on climate change. Her protest, represented by the hashtag #FridayForFuture, escalated to a coordinated day of school strikes by children around the world on 20th September 2019, constituting the first global climate strike. This narrative of Greta Thunberg’s came at a time when there was already substantial public awareness of the problem, and she presented it in a way that

chimed with the public, rapidly gaining international support and changing the debate within a matter of months. Scientists have taken advantage of the changing narrative to reinforce the message (Ripple et al., 2019).

A stark counter-example illustrates how ideas may languish before sparking transformative change in government policy. In the UK there has been a long-standing scandal over the prosecution for alleged fraud of sub-postmasters by their employers. It transpired that the apparently fraudulent transactions were in fact produced by an inbuilt fault in a new computing system mandated to all post offices. This scandal was reported as it developed over a period of 20 years. In April 2022, the BBC broadcast a prime-time documentary entitled “The Post Office Scandal” that exposed the injustice and its likely causes in substantive detail. Like the reporting that had gone before, it was met with concern but no transformative action. Then in January 2024, ITV ran a short drama series entitled “Mr Bates vs The Post Office”. This coincided with the timing of a public enquiry into what had happened. The public response was immense, the issue was debated in the House of Commons and the Prime Minister announced new legislation to exonerate wrongly convicted sub-postmasters and provide compensation. Clearly the combination of the timing of the ITV drama and the narrative it provided engaged and energised the public, giving the government (who own the Post Office) little choice but to act. This may in part be due to the more emotive response that a drama can elicit, but also reflects the timing (window of opportunity) and the dynamics of the prevailing narrative. Learning from examples such as this may help to identify key elements of narrative dynamics that need to be considered when developing a narrative about the future.

In all of the above examples it is important to recognise that those generating the narrative did not control how that narrative developed. The window of opportunity in relation to the prevailing aesthetic (Eidinow & Ramirez, 2016) meant that some narratives, however well presented, did not take hold whereas others did. This calls attention to how narratives can often behave with some degree of autonomy and unpredictability sometimes characterised as ‘memetic viruses’ (Blackmore, 1999; Dawkins, 1989). It would be a mistake to assume this is necessarily about rational assessment and choices. For some issues, a majority may side with a view that is relevant immediately and does not entail a change in their perceptions of the world or their current behaviour; alternative, often longer-term, visions may be more rational yet fail to gain traction. Fortunately, this limit to rationality is frequently offset by the uniquely human capacity for bold endeavours and new discoveries. Indeed, speculative, fervent and irrational beliefs may form part of our evolutionary advantage as humans (Barrow, 1995).

6. Conclusion

In seeking commonalities in the way narratives are incorporated into futures thinking, we observed a variable extent to which findings, notably science and engineering outputs, are set within a broader context, with explicit consideration of prevailing social norms and the nature of the changes envisaged (objective 1). We have used this insight to examine in more detail the purpose and potential uptake of a narrative, and to highlight cases in which the narrative can evolve beyond the control of its originator (objective 2). Narratives are themselves complex dynamic systems that involve multiple actors and feedback loops making their journeys difficult to predict. This suggests that there is a need for a better understanding of the drivers to such dynamics in relation to futures studies. This might then allow techniques to be developed to at least constrain or limit the potential for narrative distortion or derailing (objective 3).

Narratives are not normatively neutral. In the context of foresight and planning, they do more than describe futures — they shape which futures are considered desirable, achievable, or legitimate. This places ethical responsibilities on those who construct, disseminate, or institutionalise narratives. Where narratives amplify inequality, obscure structural risks, or marginalise dissenting voices, they may reinforce harmful trajectories. Future research might therefore explore mechanisms to assess the legitimacy, inclusiveness, and adaptability of dominant narratives. However, research is also needed to examine how these narratives can compete with the kind of populist narratives which, at the time of writing, are to the fore in many countries around the world. Such work could enrich the conceptual toolkit available to practitioners engaged in futures work.

Narratives about the future abound. Without a narrative we are unable to personalise the future or engage with it. At the level of the individual, organisation or government, the need is to develop narratives that help prepare for the future. For some this will revolve around ‘what’ must change, for others it will be about ‘how’ and for many it will be about credibility and belief in the narrative for change. We contend that in anticipating the future, the art of narrative is to animate the body of current evidence in order to extend its relevance into the future. This view paraphrases Ben Okri’s aphorism #10:

“It is its art, rather than its subject, which makes a work always mysteriously relevant to us. The subject is the body and the art is the spirit of a work. The art is the mysterious animating element without which a work cannot live. And if the work does not live its relevance will in time fade. It is its art alone which keeps a work alive through the long ages” (Okri, 2015).

No other framing device has this potential to connect us with the future. A successful narrative will start a process, grounded in what is collectively known and will then take on a life of its own, evolving as interactions create emergent responses and new directions. Gaining a better understanding of this dynamic will help to frame futures thinking in all its contexts of foresight and planning.

Author contribution

The project was formulated by Baker, Dbouk, Dearing, Doncaster, Eigenbrod, Hellmann, Ianni, Katsikopoulos, Kunc and Townend. Kunc and Townend managed the project. All authors contributed to the initial data gathering, review, workshops and drafting of a discipline based position paper. Townend, Doncaster, Eigenbrod and Hoyle led the initial drafting of the manuscript and all authors contributed to the development of the arguments presented and subsequent revision of the manuscript.

CRediT authorship contribution statement

Dhritiraj Sengupta: Writing – review & editing, Writing – original draft. **Doncaster Patrick:** Writing – review & editing, Writing – original draft, Investigation, Funding acquisition, Conceptualization. **Vanissa Wanick:** Writing – review & editing, Writing – original draft, Investigation. **Felix Eigenbrod:** Writing – review & editing, Writing – original draft, Investigation, Funding acquisition, Conceptualization. **Tim Hellmann:** Writing – review & editing, Writing – original draft, Investigation, Funding acquisition, Conceptualization. **Hoyle Rebecca B:** Writing – review & editing, Writing – original draft, Investigation. **Ianni Anotnella:** Writing – review & editing, Writing – original draft, Investigation, Funding acquisition, Conceptualization. **Ian Townend:** Writing – review & editing, Writing – original draft, Project administration, Investigation, Funding acquisition. **Denise Baden:** Writing – review & editing, Writing – original draft, Investigation. **Hachem Kassem:** Writing – review & editing, Writing – original draft. **Konstantinos Katsikopoulos:** Writing – review & editing, Writing – original draft, Investigation, Funding acquisition, Conceptualization. **James Baker:** Writing – review & editing, Writing – original draft, Investigation, Funding acquisition, Conceptualization. **Martin Kunc:** Writing – review & editing, Writing – original draft, Project administration, Investigation, Funding acquisition, Conceptualization. **Jan Buermann:** Writing – review & editing, Writing – original draft, Investigation. **Manfren Massimiliano:** Writing – review & editing, Writing – original draft. **Ian Dawson:** Writing – review & editing, Writing – original draft, Investigation. **Alasdair Marshall:** Writing – review & editing, Writing – original draft. **Wassim Dbouk:** Writing – review & editing, Writing – original draft, Investigation, Funding acquisition. **Wonyong Park:** Writing – review & editing, Writing – original draft. **Dearing John:** Writing – review & editing, Writing – original draft, Investigation, Funding acquisition, Conceptualization.

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Data Availability

No data was used for the research described in the article. There were no new data or code generated for this paper.

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