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Olivia Brown [1], Robert M. Davison [2], Stephanie Decker [3,4], David A. Ellis [1], James Faulconbridge [5], Julie Gore [6], Michelle Greenwood [7], Gazi Islam [8,9], Christina Lubinski [10], Niall G. MacKenzie [11], Renate Meyer [12,10], Daniel Muzio [13], Paolo Quattrone [14], M. N. Ravishankar [15], Tammar Zilber [16,10], Shuang Ren [15], Riikka M. Sarala [17] and Paul Hibbert [18]

[1]University of Bath, UK, [2]City University of Hong Kong, Hong Kong, [3]University of Birmingham, UK, [4]University of Gothenburg, Sweden, [5]Lancaster University, UK, [6]Birkbeck, University of London, UK, [7]Monash University, Australia, [8]Grenoble Ecole de Management, France, [9]IREGE, France, [10]Copenhagen Business School, Denmark, [11]University of Glasgow, UK, [12]WU Vienna University of Economics, Austria, [13]University of York, UK, [14]Alliance Manchester Business School, The University of Manchester, UK, [15]Queen's University Belfast, UK, [16]Hebrew University of Jerusalem, Israel, [17]UNC Greensboro, USA, and [18]University of Warwick, UK
Corresponding author email: s.ren@qub.ac.uk

Reimagine the Relational Realm of Workplaces in the Generative Artificial Intelligence Era

Shuang Ren, Riikka M. Sarala, Paul Hibbert

The advent of generative artificial intelligence (GAI) has sparked both enthusiasm and anxiety as different stakeholders grapple with the potential to reshape the business and management landscape. This dynamic discourse extends beyond GAI itself to encompass closely related innovations that have existed for some time, for example, machine learning, thereby creating a collective anticipation of opportunities and dilemmas surrounding the transformative or disruptive capacities of these emerging technologies. Recently, ChatGPT's ability to access information from the web in real time marks a significant advancement with profound implications for businesses. This feature is argued to enhance the model's capacity to provide up-to-date, contextually relevant information, enabling more dynamic customer interactions. For businesses, this could mean improvements in areas like market analysis, trend tracking, customer service and real-time data-driven problem-solving. However, this also raises concerns about the accuracy and reliability of the information sourced, given the dynamic and sometimes unverified nature of web content. Additionally, real-time web access might complicate data privacy and security, as the boundaries of GAI interactions extend into the vast and diverse Internet landscape. These factors necessitate a careful and responsible approach to evaluating and using advanced GAI capabilities in business and management contexts.

GAI is attracting much interest both in the academic and business practitioner literature. A quick search in Google Scholar, using the search terms 'generative artificial intelligence' and 'business' or 'management', yields approximately 1740 results. Within this extensive repository, scholars delve into diverse facets, exploring GAI's potential applications across various business and management functions, contemplating its implications for management educators and scrutinizing specific technological applications. Learned societies such as the British Academy of Management have also joined forces in leading the discussion on AI and digitalization in business and management academe. Meanwhile, practitioners and consultants alike (e.g. McKinsey & Company, PWC, World Economic Forum) have produced dedicated discussions, reports and forums to offer insights into the multifaceted impacts and considerations surrounding the

Table 1. Examples of GAI adoption in business organizations

Organization	Adoption context
Zalando [online platform for fashion and lifestyle]	• The use of GAI improves consumer experience in the e-commerce platform. • Based on prompts provided by a consumer, the chatbot powered by OpenAI's ChatGPT technology helps the consumer to navigate products by acting as a virtual fashion assistant.
Instacart [e-commerce application]	• Integrating ChatGPT technology into the grocery delivery application enhances the app's search functionality, allowing it to interact with users through conversational responses under the 'Ask Instacart' feature. • The application enables users to explore food-related inquiries, including healthy meal options, recipe suggestions and ingredients. It can also create shopping lists from specific recipe ingredients, significantly simplifying meal planning for users.
Salesforce [cloud-based customer relationship software provider]	• The company uses a new ChatGPT application, Einstein, on its Slack platform. • The application utilizes ChatGPT to provide writing support, generate summaries of conversations and offer research functionalities for organizations utilizing Slack.
DHL [logistics provider]	• DHL uses GAI, particularly through AI-driven computer vision, in various aspects of its logistics operations. • GAI helps to automate processes like inventory and parcel counting, enhance the speed and accuracy of supply chains, monitor logistics assets, simplify defect detection and alert maintenance teams about potential issues. • In human resources management, GAI facilitates identifying potential hazards and monitoring employee health, such as detecting fatigue or ensuring compliance with protective gear, to build a more efficient, safe and sustainable workplace.
Coca-Cola [beverage company]	• Coca-Cola integrates AI into different aspects of its operations, from product innovation and advertising to customer engagement and community building. • In product design, the company introduced its first AI-created limited-edition flavour, Y3000 Zero Sugar, under the Coca-Cola Creations platform. • In advertising, the firm teamed up with OpenAI and Bain & Company to utilize ChatGPT and DALL-E platforms for crafting personalized ad copy, images and messaging showcasing the company's strategy.
Nestlé and Mondelez [confectionary]	• The company employed OpenAI's DALL-E 2 for an advertising campaign in India, featuring Bollywood superstar Shah Rukh Khan. • This approach reportedly resulted in saving up to 10 to 20 times compared to traditional advertising methods.
Heinz [food processing company]	• Heinz utilized OpenAI's DALL-E 2 for a marketing campaign, creating ketchup-themed images that showcased Heinz's distinctive branding elements, such as its iconic bottle shape and logo. • The campaign, a sequel to one where people drew ketchup images, demonstrated Heinz's strong brand association with ketchup, even in AI-generated content.
Air India [airline]	• ChatGPT was integrated as part of the shift to algorithm-driven software to replace traditional paper-based methods and to enhance revenue. • The software predicts passenger behaviour, such as travel destinations and spending willingness, enabling more effective pricing strategies compared to the previous fixed-rate system for seat blocks.
Duolingo [language learning application]	• Duolingo Max utilizes GPT-4 to enhance language learning with GAI features that enable users to interact with the Duo chatbot for detailed explanations and clarifications on language queries. • Another feature of Duolingo Max offers practice with simulated characters and scenarios, providing a realistic conversational experience to improve language skills.
Mastercard [financial services]	• ChatGPT was integrated into the customer service chatbot to enhance handling diverse consumer needs such as account details, balance inquiries and transaction histories. • In addition, the chatbot utilizes machine learning to offer personalized recommendations based on consumer behaviour analysis.

integration of GAI in contemporary business and management practices. Table 1 illustrates some current applications of GAI as documented in the practitioner literature.

In an attempt to capture the new opportunities and challenges brought about by this technology and to hopefully find a way forward to guide research and practice, management journals have been swift to

embrace the trend, introducing special issues on GAI. These issues aim to promote intellectual debate, for instance in relation to specific business disciplines (e.g. Benbya, Pachidi and Jarvenpaa, 2021) or organizational possibilities and pitfalls (Chalmers *et al.*, 2023). However, amidst these commendable efforts that reflect a broad spectrum of perspectives, a critical examination of the burgeoning hype around GAI reveals a significant gap. Despite the proliferation of discussions from scholars, practitioners and the general public, the prevailing discourse is often speculative, lacking a robust theoretical foundation. This deficiency points to the challenges to existing theories in terms of their efficacy in explaining the unique demands created by GAI and indicates an urgent need for refining prior theories or even redeveloping new theories. There is a pressing need to move beyond the current wave of hype and explore the theoretical underpinnings of GAI and the dynamics of its potential impact, to ensure a more nuanced and informed discussion that can guide future research and application in this rapidly evolving area.

In this direction, the *British Journal of Management* (BJM) invited prominent scholars who serve as editors in leading business and management journals to weigh in and contribute with their diverse theoretical knowledge to this symposium paper on the emerging GAI phenomenon. This collaborative effort aims to advance the theorization of business and management research in relation to the intricacies associated with the impact of GAI by engaging in intensive discussions on how theoretical attempts can be made to make sense of the myths and truths around GAI.

The quest for theory, either seeking or refining, is a long-standing tradition in business and management research (e.g. Colquitt and Zapata-Phelan, 2007). While the seven pieces below place different elements under the spotlight of theoretical scrutiny, one common thread is the need to reconceptualize the relational realm of workplaces. The introduction of GAI in the workplace refines the norm of working together as a person-to-person group to working in a human–GAI group, with the latter illustrating three novel conceptual contributions in comparison to traditional understandings of the dynamics in the workplace.

Insight 1: The workings and outcomes in the GAI-laden workplace are dynamic and emergent rather than given

In the realm of the GAI-laden workplace, it is imperative to shift our perspective from a deterministic outlook to one that manages emergence. Quattrone, Zilber and Meyer encapsulate the emergent nature of GAI-related phenomena by pointing out that 'the future is not out there'. Rather than attempting to predict the future, they advocate the making of the future through creativity and reflection. Equally, they posit that GAI should be viewed as a construction whose functions and effects are not predetermined but shaped by people's decisions and utilization. The etymological lens they bring encourages a rethinking of the impacts of GAI ontologically. The recognition of our inability to know what the future is points to a relational approach to creating it, centred upon relations between the current and future generations in specific ways, and between people within generations, objects and locations more broadly. Relationality thus establishes the context for sense-making, where the workings and outcomes unfold as emergent phenomena, in the GAI-laden workplace.

Insight 2: Relational social activities in the phenomenon of the GAI-laden workplace should be recognized, with a stronger emphasis on 'context matters'

MacKenzie, Decker and Lubinski illuminate the importance of contextual understanding when examining the impact of GAI on the workplace, advocating an approach where 'context matters'. The context they propose is an expansive concept that can encompass the analysis of past imaginaries of existing technologies, an examination of technologies currently in question along with other technologies, as well as the incorporation of institutional forces over time (e.g. economic, political systems). In essence, the call to recognize that 'context matters' should serve as a guiding principle to move beyond idiosyncratic, isolated examinations of GAI and place it within the intricacies of contextual relationships that contribute to its emergence and future development.

Insight 3: The emergence of new knowledge and unknown problem-solving locates within the human–GAI group, disrupting conventional forms of teamwork

Brown, Ellis and Gore ask a critical question of how we should redefine 'team' if GAI integrates into our daily work. As the conventional definitions of team comprise individuals, the extent to which AI can be considered as a team member becomes pivotal. As much as GAI technologies may seem human-like (including robotic 'human'), GAI does not yet possess feelings, desires, intentions and responsibility in the same way as human beings. In the context of a human–GAI team, Davison and Ravishankar provide their first-hand experience of using GAI in their research, specifically for tasks such as literature review, transcribing and analysing data. They caution against the mere reliance on GAI in generating original research. Nonetheless, they conclude by highlighting the potential of leveraging effective 'prompts' to maximize the capabilities of GAI, leaving readers with valuable food for thought.

Munzio and Faulconbridge take the concept of human–GAI relationships forward by focusing on the producer–consumer relationships that shape professionalism. They highlight a range of new research questions in which the human–GAI group will challenge established constructs both theoretically and empirically. In addition, Islam and Greenwood contribute to debates about the nature (or absence) of responsibility in the use of GAI as human–GAI interactions unfold. They take a relational perspective to knowledge production in which the use of GAI-based large language models challenges the production of knowledge and the nature of accountability. These issues are perhaps more profound as the interactions between humans and GAI can be either coordinated or uncoordinated.

Conclusion

In sum, BJM is committed to fostering a deeper understanding and stimulating debate around GAI and its profound impact on business and management studies. The diverse contributions in this symposium collection do not seek to offer definitive solutions; instead, they serve as an invaluable starting point on a journey of exploration and discovery in the field. The insights offered here extend beyond the conventional boundaries, challenging and enriching existing management theories with fresh perspectives stimulated by the phenomenon of GAI. These discussions are pivotal in developing, extending, adapting and evolving theoretical frameworks to remain relevant in a business landscape that could become GAI-driven. The discussions also extend to the ethical and societal considerations of GAI in management, emphasizing responsible and sustainable business and management practices. By bridging theory and practice, BJM aims to provide managers and practitioners with insights and tools to navigate the complexities of integrating GAI into their strategies and operations, where appropriate, in a sustainable and responsible manner. In essence, with this symposium, BJM aims to contribute to a collective body of knowledge that not only seeks to understand and explain GAI but also to shape the future of GAI in work, employment, business, governance and society towards sustainable and responsible directions.

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The 'Art' in the Artificial: Making Sense of Generative Artificial Intelligence in Research and Beyond

Paolo Quattrone, Tammar Zilber, Renate Meyer

The etymology of words is often a source of insights to not only make sense of their meaning, but also speculate and imagine meanings that are not so obvious and thereby see the phenomena signalled by these words in new and surprising ways. The etymology of 'artificial' and 'intelligence' does not disappoint. 'Artificial' comes from 'art' and *-fex* 'maker', from *facere* 'to do, make'. 'Intelligence' comes from *inter* 'between' and *legere* 'choose, pick out, read' but also 'collect, gather'. There is enough in these etymologies to offer a few speculations and imagine the contours of generative artificial intelligence (GAI) and its possible futures.

The first of these is inspired by the craft of making and relates to the very function and use of AI. Most of the current fascinations with AI emphasize the predictive capacity of the various tools increasingly available and at easy disposal. Indeed, marketers know well in advance when we will need the next toothbrush, fuel our cars, buy new clothes, and so forth. The list is long. This feature of AI enchants us when, for instance, one thinks of a product and, invariably, an advertisement related to that product appears on our social media page. This quasi-magical predictive ability captures collective imaginations and draws upon very well-ingrained forms of knowledge production which presuppose that data techniques are there to represent the world, paradoxically, even when it is not there, as is the case with predictions. The issue is that the future is not out there; we do not know what future generations want from us and still, we are increasingly called to respond to their demands. Despite the availability of huge amounts of data points and intelligence, the future, even if proximal and mundane – as our examples above, always holds surprises. This means that AI may be useful not to predict the future, but to actually imagine and make it, as the *-fex* in 'artificial' reveals. This is the art in the 'artificial' and points to the possibility of conceiving AI as a compositional art, which helps us to create images of the future, sparks imagination and creativity and, hopefully, offers a space for speculation and reflection.

The word intelligence is our second cue, which stresses how 'inter' means to be and explore what is 'in between'. As entrepreneurs are in between different ventures and explore what is not yet there (Hjorth and Holt, 2022), AI may be useful to probe grey areas between statuses

and courses of action. It can be used to create scenarios, to make sure that the very same set of data produces alternative options that leave space for juggling among different decision-making criteria without reducing decisions about complex states of affairs to single criteria, most likely, value rather than values. This is how, for instance, one could wisely refrain from both apocalyptic and salvific scenarios that characterize the debate about AI. On the one hand, AI is seen as one of the worst possible menaces to humankind. It will take control of our minds and direct our habits, making us entirely dependent. Very likely, as the Luddites were proven wrong (but not completely) when looking at the first and second Industrial Revolutions, the pessimist views will prove wrong, but not completely, as it is clear that AI has agency (Latour, 1987) in informing our judgement and it does so through various forms of multimodal affects, that is, relying on our vast repertoire of senses, all mobilized by new forms of technology (e.g. think of smartwatches and how they influence our training habits). On the other hand, AI – similar to the first enterprise resource planning (ERP) systems – is seen as a panacea for many of our problems, diseases and grand challenges, from poverty to climate change, at least until one realizes that SAP does not stand for 'Solves All Problems' (Quattrone and Hopper, 2006). These dystopian and utopian attitudes will soon be debunked and leave room for more balanced views, which will acknowledge that AI is both a means to address wicked problems and a wicked problem itself, and, again, realize that wisdom is always to be found in the middle, the very same middle in between views. In this case, a more balanced in-between view is to realize that AI itself is a construction. Like all resources (Feldman and Worline, 2006) and technologies (Orlikowski, 2000), their function and effect are not pre-given but will be determined by our use thereof. For example, AI will be productive of 'facts' but of those that are reminiscent of the fact that facts are 'made', and that there is nothing less factual than a fact for, as the Romans knew so well (from *factum*, i.e. made), a fact is always constructed, and AI will be making them in huge quantities. This will be good to speculate, to foster imagination by having a huge amount of them available, but also potentially bad, as those who will own the ability to establish them as facts will magnify Foucault's adage that knowledge is power.

The third cue stands in the root *leg-*, which originates so many words that characterize our contemporary world, both academic and not, including *legere* (to read, but also to pick and choose), *legare* (to knot) and indeed a religion. As much as medieval classifying techniques used *inventories* of data to *invent* new solutions to old problems by recombining such data in novel forms, by choosing and picking data depending on the purpose of the calculation, to imagine the future and reimagine the past (Carruthers, 1998), AI will use even bigger inventories of data to generate inventions until we finally realize that to explore 'what is not' and could become is much more fruitful in imagining the future and the unprecedented than to define 'what is' (Quattrone, 2017). Only then will AI be truly generative. As was the case with Steve Ballmer, then CEO of Microsoft, when presented with the first iPhone. He exclaimed 'who would want to pay five hundred dollars for a phone?'. He had not realized that to comprehend the power and complexities of technologies, it is better to think in terms of what they are not, rather than what they are. The cell phone is not a phone so much as it is a camera, a TV or cinema, a newspaper, a journal/calendar. Google begins a search with X, a negative, and then by creating correlations defines what Z could be (a phone may be a cinema) and what it could become (a meeting place). This move from the negative to the potential, from what is not to what can be, is the core of AI. AI can facilitate this exploration into what is not obvious and help us avoid taking things for granted. So, predicting how AI will develop and affect our lives is bound to fail as there are so many ways this can go and many unintended consequences. At this stage, it may be more fruitful not to predict the future but to explore how we try to make sense of the unknowable future in the present and which potential pathways we thereby open and which we close. Exploring the framing contests around AI, the actors involved and the various interests they attempt to serve may tell us more about ourselves than about AI – about our collective fantasies, fears and hopes that shape our present and future.

This brings us to whether and to what extent AI can inform human thinking and actions. That technologies influence our behaviour is now taken for granted, but given that this influence is not deterministic, and technologies have affordances that go beyond the intentions of the designers, what counts as agency and where to find it is possibly a black box that GAI can contribute to reopen. Since the invention of the printing press, and the debate between Roland Barthes and Michael Foucault, the notion of authorship has been questioned (Barthes, 1994; Foucault, 1980), along with authors' authority and accountability. This is even truer now, when algorithms of various kinds already take decisions seemingly autonomously, from high-frequency trading in finance to digital twins in construction, and now also being able to write meaningful sentences that potentially disrupt not only research but also the outlets where these texts are typically published, that is, academic journals (Conroy, 2023). We are moving from a non-human 'decision-maker', be it a self-driving car or a rover autonomously exploring Mars, to non-human 'makers' *tout court*, with the difference that they have no responsibility and no accountability. And yet they influence the world and affect our personal, social and work lives. This has policy and theoretical implications.

In policy terms, as much as the legal form of the corporation emerged to limit and regulate individual greed (Meyer, Leixnering and Veldman, 2022), we may witness the emergence of a new fictitious persona, this time even more virtual than the corporation, with no factories and employees, while still producing and distributing value through, and to, them, respectively. Designing anticipatory governance is even more intricate than with corporations, as these non-human 'makers' are even more dispersed and ephemeral, not to say slippery.

Theoretically, we may be at the edge of a revolution as important as the emergence of organization theory in the twentieth century. It was Herbert Simon (1969) who foresaw the need for a science of the artificial, that is, a science the object of which was the organization of the production of artefacts of various kinds, of the need for making sense of the relationship between means and ends when new forms of bounded rationality informed decision-making. We would not be surprised if a 'New Science of the Artificial', this time related to the study of AI rationality, emerged in the twenty-first century. For sure, there will be a need to govern AI and study how the governance and organization of AI intertwine with human rationality, possibly changing the contours of both.

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Contested Imaginaries Through Time: Putting Generative Artificial Intelligence in Context

Niall G. MacKenzie, Stephanie Decker, Christina Lubinski

Recently, generative artificial intelligence (GAI) has been subject to breathless treatments by academics and commentators alike, with claims of impending ubiquity (or doom, depending on your perspective) and life as we know it being upended, with millions of jobs destroyed (Eglash *et al.*, 2020). Historians will, of course, point out that this is nothing new. Technological innovation and adoption have a long and generally well-researched history (Chandler, 2006; Scranton, 2018) and the same is true for resistance to these innovations (Juma, 2016; Mokyr, 1990; Thompson, 1963) and moral panics (Orben, 2020). What, if anything, does history have to tell us about GAI from a theoretical perspective other than 'it's not new…'?

Good historical practice requires a dialogue between past and present (Wadhwani and Decker, 2017). Thus, if we want to understand GAI we should understand the character of its development and the context in which it occurred and occurs. GAI's history was/is underpinned by progression in several other areas including mathematics, information technology and telecommunications, warfare, mining and computing science (amongst many more) (Buchanan, 2006; Chalmers, MacKenzie, and Carter, 2021; Haenlein and Kaplan, 2019). This means that despite GAI's rapid recent progress, it is still the result of iterative developments across various other sectors which enable(d) and facilitate(d) it. Consistent within this is the imagined futures (Beckert, 2016) pushed by technologists, entrepreneurs, policymakers and futurists about what it could mean for society.

The value of historical thinking with regard to new technologies like GAI can be illustrated by considering the social imaginaries (Taylor, 2004) that have been generated as part of the experience of previous technologies and their development and adoption. When a technology emerges, there may be a fanfare about how it will change our lives for the better, and/or concerns about how it will disrupt settled societal arrangements (Budhwar, 2023). Ubiquity-posited technologies like GAI are then often subject to competing claims – promises of imagined new futures where existing ways of doing things are improved, better alternatives averred and economic and societal benefits promised, but are also often accompanied by challenges and concerns regarding job destruction, societal upheaval and the threat of machines taking over. As a consequence, the imaginaries compete with each other and are generative in and of themselves in that they create spaces of possibility that frame experiments of adoption (Wadhwani and Viebig,

2021). We can analyse past imaginaries of existing technologies to better understand what the emergence of new technologies and the auguries posited with them tell us about how societies adopt and adapt to the changes they bring. However, it is only in a post-hoc fashion that we can understand the efficacy of such claims. For example, recent work by business historians has considered how we understand posited past futures of entrepreneurs across a range of technological and non-technological transformations (Lubinski *et al.*, 2023), illustrating the value that historical work brings to theorizing societal change brought about by such actions.

The imaginaries, good and bad, associated with technologies like GAI play an important role in their legitimation and adoption, as well as their opposition. Given the contested nature of such societally important technologies, it is therefore important to also recognize and consider the context in which new technologies such as GAI emerge in terms of the promises associated with them, the societal effect they have and how they unfold in order to provide appropriate theories and conceptual lenses to better understand them. When exploring the integration of new technologies in context, historical analysis of both the technology in question and other technologies illustrates nuances and insights to inform deeper theory to understand what a technology like GAI can mean to society. The different imaginaries associated with GAI possess clear parallels with what has come in the past.

The Luddite riots of the nineteenth century, whereby agricultural workers sought to destroy machinery that was replacing their labour (Mokyr, 1990; Thompson, 1963), are probably the most famous negative societal response to the introduction of new technology, giving rise to the term 'Luddite' that is still commonly used today to describe someone opposed to technology. Contrastingly, the playwright Oscar Wilde posited in his 1900 essay 'The soul of man under socialism' that 'All unintellectual labour, all monotonous, dull labour, all labour that deals with dreadful things, and involves unpleasant conditions, must be done by machinery' (Wilde, 1891/2007). More recently, Lawrence Katz, a labour economist at Harvard, repeated Wilde's suggestion by predicting that 'information technology and robots will eliminate traditional jobs and make possible a new artisanal economy' (Thompson, 2015). Both Wilde's and Katz's comments tilt at the imaginary of the benefits that technology and automation can bring in freeing up people's time to focus on more creative and rewarding work and pursuits, whilst the Luddites were expressing serious misgivings about the imaginary that their jobs, livelihoods and way of life were under serious threat from mechanization.

Good and bad imaginaries are a necessary part of the development of all new technologies but are only really understood post hoc and within context. As Mary O'Sullivan recently pointed out, based on her analysis of the emergence of steam engine use in Cornish copper mines in the eighteenth century, technology itself does not bring the general societal rewards suggested if the economic system in which it is developed remains controlled by small groups of powerful individuals (O'Sullivan, 2023). Similar concerns have been made about GAI with its principal proponents comprising a few global multinationals, as well as state-controlled interests such as the military, racing for dominance in the technology (Piper, 2023). The economic and political systems in which GAI is being developed are important to understand in relation to the imaginaries and promises being made concerning its value and warnings of its threats, particularly in light of the history of societally important technological shifts.

As scholars, we face ongoing challenges to explain new, ubiquity-focused technologies and the accompanying imaginaries (which often constitute noise, albeit with kernels of truth/accuracy hidden therein). In this sense, when we seek to theorize about GAI and its potential impact on business and management (and vice versa), it is important to recognize that historical analysis does not foretell the future, but rather provides a critical understanding of how new innovations impact and are impacted by the societies they take place in. Interrogating the contested imaginaries through the incorporation of historical thinking in our conceptualization of new technologies such as GAI will provide a deeper understanding of their impact, which in turn will allow us to better harness them for the greater good.

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Generative Artificial Intelligence in Organizational Teams: Challenges and Future Directions Within and Beyond Management

Olivia Brown, David A. Ellis, Julie Gore

Digital technologies continue to permeate across society, not least the way in which they allow individuals and teams to collaborate (Barley, Bechky and Milikhen, 2017). For instance, innovations in communication have led to a shift towards virtual working and the proliferation of globally distributed corporate teams (see Gilson *et al.*, 2015). As the volume and variety of data types that can be linked together has also accelerated, we have witnessed the emergence of large language models (LLMs), with the introduction of ChatGPT bringing them to the attention of a much wider audience. Broadly referred to as a form of generative artificial intelligence (GAI), ChatGPT allows individuals (or teams) to ask questions and quickly be provided with detailed, actionable, conversational responses. Sometimes referred to as virtual agents as part of customer service and information retrieval systems, these conversational responses can effectively become virtual team members.

The view of technology as a means with which to facilitate effective teamwork in organizations has now shifted towards questions of whether, and under what circumstances, we can consider this GAI as a 'team member' (Malone, 2018). Conceptualizing GAI in this manner suggests a trend away from viewing technology as a supportive tool that is adjunct to human decision-making (see Robert, 2019 for a discussion of this in healthcare) to, instead, having a direct and intrinsic role within the decision-making and task-execution processes in teams (O'Neill *et al.*, 2022). New questions are therefore being raised as to whether AI team members improve the performance of a team, and would organizations trust them? And if so, how much? To what degree are AI team members merely adjunct to, or replacements for real team members when it comes to decision-making? When a hybrid AI team completes a task, who takes responsibility for successes and failures? How can or should managers or leaders quantify accountability? Addressing these early questions dictates that it may soon be necessary to reframe and readdress the way in which teams are studied from theoretical, practical and ethical perspectives.

From a **theoretical** perspective, across the many definitions of teams that have been developed within the management literature, one constant is that they are generally understood to comprise 'two or more individuals' (Kozlowski and Bell, 2003; Kozlowski and Ilgen, 2006; Salas *et al.*, 1992). If we are indeed approaching the point at which AI will 'become an increasingly valuable team member' (Salmon *et al.*, 2023, p. 371), we will need to reconsider our definitions of what constitutes a team (i.e. is one human individual sufficient when paired with an AI member). In turn, we then need to assess how theoretical frameworks and constructs that facilitate teamwork operate within the context of AI–human teams. For instance, in Ilgen *et al.*'s (2005) widely adopted input–mediator–output–input (IMOI) model of teamwork, the input element has typically focused on the composition of the team (i.e. individual characteristics), alongside the structure of the team and the environment in which they are operating (see also Mathieu *et al.*, 2008). As GAI is incorporated into organizational structure and design, it is pertinent to consider where (and indeed whether) it ought to be placed within this framework. Should GAI be considered part of the team composition as an input factor or is it best accounted for in the technological capabilities of the wider organizational context? The answer to this question will have important implications both for research designs and for the way in which the academic community relays findings to practitioners. Time will tell, and the answers to

these questions will require further systematic thought, however, this may perhaps then warrant the start of a 'necessary scientific revolution', the like of which Kuhn advocated (Kuhn, 1962).

Alongside situating GAI's place within our theoretical framing, we must also consider how established team constructs operate within this new frontier of teaming. For example, interpersonal trust is a key component in the performance of highly functioning teams, especially in instances where there is a high level of task interdependence between team members (De Jong, Dirks and Gillespie, 2016). Research has shown that communication behaviours (e.g. style, openness, responsiveness; see Henttonen and Bloqvist, 2005) influence the development of trust in virtual teams, thus it begs the question that, in a wholly virtual interaction, how do we conceptualize and explore the development of interpersonal trust in AI–human teams? Is it possible that individuals will develop trust in AI in the same manner that they would their human team members, and how might this then impact organizational performance and transform our understanding of what it means to interpersonally relate to technology?

These questions, amongst others, are documented in a growing body of literature (see O'Neill *et al.*, 2022; Salmon *et al.*, 2023; Seeber *et al.*, 2020), however, at present, empirical research on GAI within the management literature remains limited (Dwivedi *et al.*, 2023). It is now pertinent for management scholars to begin addressing these questions empirically, as we face rapidly evolving and potentially disruptive changes to the world of work, not seen since the beginning of the digital age. For example, lab-based experiments could manipulate AI team members by changing their 'personality' or adding/removing them from teams. This could be further understood in terms of effects in different contexts (where an AI team member is given a greater or reduced physical presence, e.g. via a robot, or tasks, creative vs procedural). Observational research and interview studies will also be valuable in providing an initial understanding of the perceptions of GAI, alongside insights into how GAI is being incorporated into working structures and organizational teams at present and where managers and employees perceive it might be incorporated in the future.

Alongside definitional issues and the need to re-examine how teamwork constructs operate within human–GAI teams, there are **practical considerations** posed by the introduction of GAI at work. As researchers, we are already facing a poignant challenge in connecting the myriad of ways individuals can interact with networked technologies with their offline behaviours (Brown *et al.*, 2022; Smith *et al.*, 2023). At present, efforts to capture the interplay between actions taken online and actions taken in the real world have largely failed to understand the nuanced behavioural and psychological mechanisms that might link the two (see Smith *et al.*, 2023). For instance, while digital technologies such as Microsoft Teams, Slack and Zoom are now widespread across organizations, scholars have noted that our understanding of how teams engage with these technologies and how they might improve, or hamper, team effectiveness remains limited when compared to the individual and organizational level impacts (Larson and DeChurch, 2020). The introduction of GAI may only serve to widen this gap in understanding, as the line between technologically driven and human-driven behaviour becomes increasingly blurred (see Dwivedi *et al.*, 2023). To overcome this, management scholars must carefully consider the methods that will be required to study GAI in teams and be open to utilizing innovative practices from other disciplines (e.g. human factors, computer science, psychology). This will allow for the triangulation of findings from experimental and observational studies with data derived directly from the digital services that sit at the centre of modern working life.

Finally, at the forefront of our exploration of GAI in work teams, ethical considerations must be addressed. Indeed, there has been much conjecture about the perils of AI in organizational psychology and human resource management amongst both scholars and practitioners (CIPD, 2021, 2022a, 2022b, 2022c). Practitioner-centred outlets and public discourse are filled with a focus on risk mitigation, the implications for recruitment practices, legal and cross-country considerations, unwanted employee monitoring software and a somewhat Luddite philosophy surrounding the dark side of AI (Cheatham, Javanmardian and Samandari, 2019; Giermindl *et al.*, 2022; McLean *et al.*, 2023). Despite this, it remains plausible that in the coming years, ChatGPT will become an everyday reality at work, such that it is used as frequently as virtual meeting platforms and email. While, for some, the prospect of a team that is readily supported by GAI might be a welcome addition, the potential of such a reality could also be perceived as a dystopian nightmare, with any number of ethical challenges (see Mozur, 2018). This equally applies to how we study any effects on people and organizations. In considering the ethical implications of GAI in teams, it is, of course, important to outline the recognized potential for societal benefits. For instance, many challenges whereby teams become unable to make decisions due to increased cognitive load, especially in atypical, high-reliability organizations, could be mitigated with the use of AI (Brown, Power and Conchie, 2020, 2021). For example, an artificial agent with no cognitive limitations could remind a team that some solutions will bring risks that members have failed to consider (Steyvers and Kumar, 2023).

On the other hand, ChatGPT and similar systems have been predominantly trained on English text, and such systems build in existing societal biases that are then further magnified (Dwivedi *et al.*, 2023; Weinberger, 2019). Furthermore, whereas traditional software is developed by humans, whereby computer code provides explicit step-by-step instructions, ChatGPT is built on a neural network that was trained using billions of words. Therefore, while there is some understanding about how such systems work at a technical level, there are also many gaps in existing knowledge which will not be filled overnight, generating issues relating to the transparency of these systems (Dwivedi *et al.*, 2023; Robert, 2019). While there are no easy answers to the current (and yet-to-come) ethical concerns that accompany the study of AI in teams, there are uncontroversial processes by which we can perpetually operate and self-reflect. Our developing ability to make comprehensive assessments of digital, hybrid and traditional teams' performance carries with it heavy questions about how this power will be used and who will be using it. We must therefore consider how organizations (and indeed we, as researchers) might incorporate these tools into teamwork *and* research processes thoughtfully, but humanely. Introducing interdisciplinary ethics committees that include a wider range of stakeholders (e.g. members of the public, technology developers) offers a potential solution here, and will help to engender responsible and innovative research into GAI within management studies.

Encompassing all the above, management scholars will need to become increasingly comfortable when engaging with other disciplines, the public and policymakers, all of whom have unique perspectives (Kindon, Pain and Kesby, 2007), as part of an interdisciplinary endeavour to address the methodological and theoretical challenges that lie ahead. This involves accepting that while the study of GAI in teams for management scholars is certainly not staring into the abyss, our current theories, methods, expertise and ethical explorations remain far from conclusive.

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Professionalism in the Age of Artificial Intelligence: Theoretical Implications

Daniel Muzio, James Faulconbridge

There has been a lot of journalistic, practitioner and academic attention on the topic of artificial intelligence (AI) and the professions. Some authors (Armour and Sako, 2020; Faulconbridge, Sarwar and Spring, 2023; Goto, 2021; Pemer and Werr, 2023; Spring, Faulconbridge and Sarwar, 2022) have focused on how professional services firms introduce and use increasingly sophisticated technological solutions. Others (Leicht and Fennell, 2023; Sako, Qian and Attolini, 2022) have focused on the impact of AI on professional labour markets. Indeed, the consensus seems to be that unlike previous technological revolutions, this current one will concern primarily professional and knowledge workers. However, given the prospect of wide-ranging change, surprisingly little attention has been paid to how AI may affect our theoretical understanding of professionalism as a distinct work organization principle. This is unfortunate, since the new AI revolution is likely to challenge some deeply held assumptions and understandings which underpin the sociology of the professions as a distinct body of knowledge (Abbott, 1988; Johnson, 1972; Larson, 1977; Muzio, Kirkpatrick and Aluack, 2019). In this contribution, we focus on this issue and reflect on how AI might affect the way we understand professionalism.

Professionalism as a work organization principle

One of the central tenets of the sociology of the professions is that professionalism is a specific work organization principle, which is analytically distinct from alternatives such as bureaucracy and entrepreneurship (Freidson, 1970). Specifically, professionalism places in the services producers (i.e. the professionals) a high degree of control over the definition, performance and evaluation of their work, including the terms and conditions under which such work is performed. As such, professionalism is defined by high levels of autonomy and discretion. This is so even in situations such as the case of large professional bureaucracies (Freidson, 1970; Mintzberg, 1979), where the professionals do not own the means of production. This situation has been described as an example of 'occupational dominance' (Freidson, 1970) associated with the professions and reflects the existence of significant knowledge asymmetries separating producers and consumers of services (Johnson, 1972).

Specifically, professionalism tends to emerge in its most complete collegial form in situations where we have a body of knowledgeable, resourceful, politically organized and socially cohesive producers and a body of fragmented, isolated and less knowledgeable consumers. In these situations, consumers will not be able to define their needs or how these should be met, nor will they be able to easily challenge the advice they receive. This is typical of the relationship between a doctor and their patients, or a lawyer and their clients. Of course, there have always been exceptions to this model. For instance, in situations where clients (i.e. large multinationals) are more powerful and resourceful than their professional advisors, they may be able to capture them and deploy them as 'hired guns' to advance their interests (Coffee, 2006; Muzio *et al.*, 2016). Yet, even in such contexts, professionals have usually enjoyed higher levels of autonomy and technical discretion compared to that afforded to other occupations and types of workers (Freidson, 2001).

The trajectory and effects of change

Recent developments in AI and related technologies threaten to undermine professionalism as a distinct work organization principle by redressing existing knowledge and information asymmetries to the consumers' advantage, even when these are individual 'retail' consumers. Table 1 charts three key stages in the development of AI systems in the professions. Whilst not exhaustive in its analysis of the technologies or stages of change, it charts a trajectory over the past 20 years or so that has seen technologies progressively encroach on the work of professionals. From a position where technology enabled professional work, for example through decision-support systems or computer-aided design, we have progressed to a position where technology can complete aspects of professional work. In Table 2 we have deliberately sought to avoid speculation about what AI might be able to do in the future, but

Table 2. Key AI eras in the professions and implications for theories of professionalism, professional organization and professions

Era	Exemplary technology	Underlying algorithmic infrastructure	Impact on professional work	Implications for the sociology of the professions
Early 2000s	Decision and process support systems	Conditional constructs and Boolean logics (if/then/else) generating flow diagrams. Static calculative algorithms (calculating/modelling based on data inputs). Algorithms that followed programmed sequences, often designed/set by professionals, in a linear and predictable manner.	Some basic professional tasks to be handled by non-professionals (e.g. paralegals in legal service centres). Some tasks completed more quickly by professionals (e.g. computer-aided design, CAD in architecture and engineering firms).	*Knowledge asymmetry*: professional dominance as design and use of systems continues to rely on professionals. Professionals control new technological infrastructure and use it to facilitate their work or automate lower-skilled tasks so as to focus on more bespoke expert advisory work. *Implication* – knowledge asymmetries remain. *Professional autonomy*: professionals retain control by designing technologies that codify their knowledge into conditional constructs and algorithms and deliver predictable outputs/ends. Technologies used by para-professionals are directed and controlled by professionals. *Implication* – professional autonomy maintained. *Professional organization(s)*: conversion of manual support roles (e.g. law librarian, drafting assistant) into technology-enabled roles (e.g. paralegal, CAD technician). Emergence of outsource/back-office service centres (e.g. legal claims centres in insurance, CAD service centres, often in low-cost locations such as India). *Implication* – tasks hived off to support roles and organizations that sit alongside and support professional organizations.
Mid/late 2010s	Process automation systems	Machine learning (supervised and unsupervised). Natural language processing. Data and predictive analytics.	Key diagnosis tasks automated and completed by algorithms (e.g. document review/discovery in law, medical scan review). Algorithms interpret data to identify relevant patterns of concern but do not advise on how to respond. New sources of data generated that inform professional decision-making and create opportunities for new client offerings (e.g. 100% audit reviews in accounting, computational design in architecture).	*Knowledge asymmetry*: professional dominance partially disrupted by ability of non-professionals to design machine learning algorithms and make some low-level judgements using technology. Clients remain reliant on professionals for advice about how to respond to the insights generated by technology. *Implication* – changes to knowledge asymmetries affect relationships between professions and other occupations and less so between professions and their clients. *Professional autonomy*: professionals lose some control over the means of their work as this is automated via machine learning algorithms. Professionals retain control over ends as they decide how to respond to outputs from algorithms. *Implication* – task-level analysis needed as autonomy compromised in some areas, but change may reinforce and augment autonomy in other areas *Organization(s)*: technologists who develop, manage and operate these new machine learning solutions provide a new role that is crucial to professional work and disrupts hierarchies (e.g. technologists without professional training taking senior partner/principal-type roles).

Table 2. (Continued)

Era	Exemplary technology	Underlying algorithmic infrastructure	Impact on professional work	Implications for the sociology of the professions
				Professional organizations which were historically asset-light organizations required to invest more significantly in technology. Growing need for management control to ensure effective use of technologies (e.g. standard operating protocols). *Implication* – greater interdependence between professions and other occupations/organizations, leading to dissolving of some boundaries within organizations and challenges to collegial model of professionalism.
Early/mid 2020s	Advisory systems	Large language models and neural networks allowing generative artificial intelligence. Unsupervised, automated machine learning.	Systems able to provide recommendations and answers to questions (e.g. legal chatbots that advise on parking fine disputes or offer tax advice). Ability to pose questions in natural language and get narrative responses (e.g. ChatPGT-style large language models that allow a legal precedent database to be queried).	*Knowledge asymmetry*: clients increasingly able to self-service, using technologies developed by a professional service firm (e.g. chatbots). Professionals turned to for verification of technology-generated diagnosis and proposed treatment route. *Implication* – reduced scope of knowledge asymmetries, but greater emphasis on the asymmetries that emerge from the relational expertise of professionals. *Professional autonomy*: professionals lose control of certain tasks as technologies and those who design and operate them provide judgement and interpretation previously reserved for professionals. Means of delivering professional advice reconfigured by technologies and their outputs. Professionals retain control over verification of interpretations by technologies (e.g. to identify and prevent actions based on what ChatGPT's creators refer to as 'hallucinations') and continue to control the more creative, contextualized and synthetic work that delivers the most effective forms of advice/treatment. *Implication* – professional autonomy relationally constructed in conjunction with technology, autonomy in how technology used. *Organization(s)*: technology-enabled next-generation professional service firms rely increasingly on investment in technology and data creation/management assets. The technologists who manage and operate these become part of the service offering to clients and at the centre of organizational hierarchies. New organizations emerge that are 'born technologically enabled' and are not dominated by and configured to prioritize professional autonomy and collegiality. *Implication* – the defining features of professional organizations (asset light, professional dominated, collegial control) come under pressure.

as recent developments such as ChatGPT have shown, significant advances are inevitable, and the trajectory of change documented in Table 2 is almost certain to continue and even accelerate.

The most common development is likely to be change involving technological solutions that routinize and commodify professional expertise (Hansen, Nohria and Tierney, 1999), thus transferring value from individual professionals to organizational systems which are predominantly operated by non-professionals. In more extreme scenarios, consumers may be increasingly able to use technological solutions directly to cater for their own needs, thus bypassing the professions entirely. Alternatively, clients may use technology to conduct preliminary research before instructing their advisors, or to double-check their advice (Muzio, Kirkpatrick and Aluack, 2019; Nichols, 2017). Importantly, as Table 1 notes, in all scenarios there are changes to professional autonomy, organization and knowledge asymmetries, the key things that define professionalism and the professions as distinct from other occupations and modes of work. This suggests that AI may require us to update existing theories and concepts within the sociology of the professions.

Avoiding deterministic thinking

Of course, Table 2 obscures as much as it reveals in relation to the trajectory of change. The capabilities of technologies are only a small part of the story of change. Other considerations, including the regulatory action of governments and international organizations and crucially the actions of professionals themselves, influence if, when and how technologies are adopted. These actions, in turn, reflect ethical and political concerns in relation to the challenges and opportunities of generative AI (GAI). Bias in algorithms, data security issues, intellectual property rights or inaccuracies that have become most apparent through ChatGPT's 'hallucinations' all might prevent a teleological process of adoption. Moreover, professionals are well known to be active institutional agents who respond to external challenges to their autonomy, discretion and working conditions through defensive actions intended to protect interests and the exclusive access to resources that result from knowledge asymmetries (Scott, 2008; Suddaby and Viale, 2011). This has manifested itself in how professionals have resisted the adoption of technologies (Chen and Reay, 2020; Pachidi *et al.*, 2021) or actively appropriated them in ways that serve their interests (Faulconbridge, Sarwar and Spring, 2023; Nelson and Irwin, 2014).

We should also end with a note of caution because not only have predictions of the technological demise of professionalism been around for a long time (e.g. Burris, 1993; Haug, 1972; Susskind, 2000), but there are also further considerations at play beyond the technical, ethical and political barriers to change noted above. At the heart of professional work is the reconciliation of uncertainty, contextual nuance and ambiguity in a situation where there are a multitude of potential responses to a problem. As a result, many have noted the essential challenge of using technology to replicate the ability of human professionals to operate in liminal zones in which judgement matters. Likewise, the reassurance gained by a client from a trusting human relationship, whether it be with an accountant, doctor, lawyer or other professional (Fleming, 2019; Pettersen, 2019), is something that technology seems unlikely to replace. Finally, there are also issues of legal liability and the question of who would ultimately be responsible in cases of professional mistake or misconduct.

Nonetheless, the trajectory illustrated by Table 2 shows a number of technologically inspired changes which are underway and which will potentially challenge how we think about professionalism, professional organizations and professions. As Pakarinen and Huising (2023) suggest, this means recognizing the 'relational' characteristics of professional work and expertise and how this brings together a multitude of actors and objects, including AI technologies, to diagnose problems and develop treatment. This should be at the heart of attempts to theorize professionalism as a distinct organizational principle in the AI age.

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Relational Knowledge and Epistemic Accountability in the Wake of Generative Artificial Intelligence

Gazi Islam, Michelle Greenwood

The founding of the scholarly *Journal of the Royal Society of London*, described by the historian Biagioli (as cited in Strathern, 2017), illustrates how scientific production rests on paradoxes and precarious relationships at a distance. Biagioli describes how the Royal Society became the locus of a plethora of scholarly correspondence from distant geographies, which it acknowledged in its title as 'giving some accompt (account)… of the ingenious in many parts of the world' (Royal Society London, 1865, cover). In contrast to its sparsely attended, gentlemanly, in-person meetings, the broadening of the transactions through correspondence produced a publicly available, globalized scholarly record, but also led to a problem regarding the credibility of the interlocuters. The Society's solution was to develop an 'epistolary etiquette', by which the value of contributions could be assessed without direct personal relationships. The current system of scholarly peer review and journal publication descends from this system of partial connections and evaluation at a distance (Strathern, 2017).

The case of the Royal Society journal is interesting because it lays bare the relational infrastructure that undergirded the production of scholarship. Both collegial (because it required ongoing scholarly interaction and etiquette) and impersonal (because it required judgement at a distance between strangers), scholarly production involved a balancing act between proximity and distance, a system of partial relations that was itself emblematic of emerging modern conceptions of civil society (Strathern, 2020). Beyond flashes of creative insight or financial patronage – although both were present – it was this relational infrastructure that allowed the emergence of modern scholarship within newly forming national civil societies.

We do not argue that such epistolary conventions are the only (or best) way to produce scholarly advancement, but these are the structures we have inherited, and are being quickly called into question by the emergence of recent technologies. One of these – not the only one – is generative artificial intelligence (GAI), or its recent incarnation in large language models (LLMs) like ChatGPT. LLMs promise to intervene in the scholarly process at virtually every point of knowledge production, from writing text and simulating data to 'peer' reviewing and editing. It is likely that the mix of human creation and mechanical supplement already woven into scholarly publishing will shift considerably. With what results?

Taking a relational perspective to knowledge production allows us to imagine how scholarly knowledge may be shaped by LLMs. Specifically, drawing on Strathern's (2000, 2004, 2020) work around relations and knowledge practices, we argue that networks of relationships (and the actors thereby constituted) change both the production of knowledge and the nature of its accountability. The embeddedness of LLMs in these networks could be a radically reshaped research landscape, with unpredictable consequences for what counts as knowledge in our field.

Production of research

Strathern's (2020) relational perspective begins with the idea that actors, and their knowledge products, do not pre-exist relations, but are formed out of relational

configurations and stabilized by 'objectifications' through which they come to produce knowledge – and themselves as scholars. Drawing upon fieldwork around gift exchange in Melanesia, Strathern undercuts individualist notions of giver and receiver and illustrates how relations of exchange shape agency in non-essentialist forms. Applied to academic knowledge production, relational perspectives recast scholarship from a collection of individual contributions to a network of relational exchanges from which science, and scientists, emerge.

To illustrate, Munro (2005) describes how the convention of authorship involves an objectification whereby the collective work going into knowledge production is obscured by focusing on a specific author who takes credit for the work. This fixing of authorship reduces complexity and ensures a form of auditability, where the author is 'responsible' for and thus motivated to ensure the work's validity. Such actors do not have to be human – entities like research institutes, universities or corporate R&D units, or technologies such as Editorial Manager, PDF format or pre-registration depositaries, are similarly stabilized through and stabilizing of relations. For that matter, so are journals such as that of the Royal Society, and more recently, the tens of thousands of academic research journals concentrated in large publishing enterprises, the few hundred in the field of management and the few dozen or so at the centre of intense scholarly competition. These forms express and institutionalize the relational networks by which knowledge products and producers are formed, and by which credibility is attributed. Theories, data and scientists are produced from such networks.

This introduction of LLMs into the communicative networks of management research may upend the vast ecosystem from which ideas are recognized, processed and exchanged. For example, at the most obvious level of direct text production, LLMs draw on vast and unspecified data sources to produce text, in forms much less transparent than the conventional reading and citation practices of researchers. Information produced from these models may originate from academic and non-academic sources in an indiscriminate manner, cutting across scholarly networks and non-scholarly sources in ways that are deeply opaque, creating knowledge that is not traceable to its sources and possibly without source. Notwithstanding, the identifiability of sources may or may not matter, depending on dimensions such as genre, readership and context. As noted by Foucault (1984), the legitimization of text through authorship does not affect all discourses in a universal or constant manner. Interestingly, texts came to have authors in the modern era as a signal of individualism and private property and in response to the need for an authorizing voice who would take responsibility (Coekebergh and Gunkel, 2023; Foucault, 1984). Even so, there were early predictions of the death of the author (Barthes, 1977) and that the 'author function will disappear' (Foucault, 1984, p. 119), opening up questions about the viability of regimes of scholarly ownership and accountability still in practice in journals today.

Beyond direct text production, however, LLMs intervene at the levels of researcher thought processes and analytical and rhetorical style. Regarding idea formulation and researcher analytical process, as researchers adapt to interact with LLMs, they may adopt a 'prompting' style to maximize LLM performance, changing how they think about research questions so that their thoughts become 'legible' to the LLM. Stylistically, relatively homogenized academic conventions may become even more so as the output from LLMs becomes a default argumentation structure across different topic domains.

At the level of editorial process, editors looking for reviewers may draw on LLMs and thus expand or restrict reviewer networks to create new knowledge networks, affecting diversification. Furthermore, if reviews themselves are increasingly written with the aid of LLMs, then a homogenization and standardization of evaluative practices could result. The outcome of papers being written with, and also evaluated by, LLMs poses a real question of whether scholarly publication could increasingly become an inwardly folded meta-reflection of algorithms on their own outputs.

Epistemic accountability

The above effects on processes of academic production have implications for the accountability of research. This is obviously the case for the editorial processes described above, where the judgement of academic work is directly influenced by LLMs. However, it also applies at the level of academic thought and writing, to the extent that these result from networks with increasingly opaque and digitally distributed technologies, raising questions as to who or what has authored/authorized the text.

This blurring of accountability is not remedied by simply reporting which aspects of research use LLMs, because the programs themselves act as 'black boxes' that summarize an incredibly large number of inputs which are algorithmically recombined in ways that no one – not even their programmers – can explain. Such models are trained on data flows that are not themselves easily trackable, and then create (or at least extrapolate) new data in iteration with other non-human and human actors, often through distributed labour processes that are also opaque (e.g. Pasquale, 2015). Although invisible work runs throughout academia in the form of unrecognized lab assistants, graduate students and collegial networks, the speed, scale and globalization of this vast network of indeterminate and indeterminable labour makes current models seem transparent by

comparison. It is unreasonable to expect fair attribution for work in such models, given such opacity and iteration.

The problem, however, is not only one of accountability and distributive justice; from a relational perspective, it also translates into an epistemic injustice and a problem for knowledge creation and evaluation. From that perspective, participants in a knowledge community have a 'right to know what is going on in the very organization of knowledge production' (Strathern, 2004, p. 71). Epistemic accountability is compromised when knowledge is socially and technologically generated by a network of human–technology interactions that are deeply opaque and unknowable (Amoore, 2020, p. 6). As such, we cannot rely on conventional attributions of authority and responsibility (Coekebergh and Gunkel, 2023). Understanding AI technologies as 'implicated in new regimes of verification, new forms of identifying a wrong or of truth telling in the world' and, thus, embedded with political arrangements and value propositions about the world (Amoore, 2020, p. 6), the task of determining responsible practice becomes one of ethical reflection and democratic discussion (Coekebergh and Gunkel, 2023; Greenwood and Wolfram Cox, 2023).

To conclude, a relational approach would reconfigure ethical questions around exchanges and relational configurations, and the subject positions that these make possible. How such approaches change the relevant issues may be illustrated by Foucault's (1984, p. 119) reimagining of inquiry as to 'what is an author?':

> We would no longer hear the questions that have been rehashed for so long: Who really spoke? … Instead, there would be other questions, like these: What are the modes of existence of this discourse? Where has it been used, how can it circulate, and who can appropriate it for himself? What are the places in it where there is room for possible subjects? Who can assume these various subject functions?

Conclusion

Above, we give only a broad-brush treatment of our concerns around GAI and scholarship, points that should be theoretically and empirically fleshed out in much greater detail than is possible here. Nevertheless, our central point is straightforward: knowledge communities are built around structures of relations, and these relations constitute both the knowledge they produce and the social forms they take. It is unreasonable to expect a technology that claims to automate these relational processes to leave the rest of knowledge and its social structure intact. As the Royal Society example illustrates, scholarship has never perfected its relational balancing act between personal familiarity and trust at a distance; its partial connections reflect imperfections and internal tensions within modern democracies. Yet reconfiguring this science-social system should be done with care, and on a precautionary principle, lest the forms that replace it erase its modest gains. Before consigning scholarship to proprietary and opaque computer models, we suggest looking carefully into the hidden connections we may be unravelling in the process.

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Generative Artificial Intelligence and Theorizing

Robert M. Davison, M. N. Ravishankar

Theorizing is a messy business. It involves multiple sources of evidence and multiple possible explanations. The sources of data may include interviews, observations, literature, documents and diaries. They may be coded in multiple (human) languages and in multiple registers from the formal to the informal, from the technical to the mundane. While there are clear guidelines for how researchers can approach theorizing (Gioia, Corley and Hamilton, 2013; Hassan, Lowry and Mathiassen, 2022; Martinsons, Davison and Ou, 2015; Weick, 1989), in practice, theorizing is an idiosyncratic activity that reflects the style, personality, values and culture of the theorizer. Thus, the most convincing theoretical explanation may be one that is more parsimonious,

interesting, counterintuitive and/or provocative. Crafting that convincing theoretical explanation requires adherence to multiple standards (parsimony, interestingness, etc.), each of which competes with the others for attention.

Generative artificial intelligence (GAI) programs like ChatGPT have several useful attributes that might assist researchers as they theorize. For instance, GAI programs may be able to synthesize some of the literature or other documents. Such syntheses can be invaluable as they often require considerable time. But synthesizing the literature is not simply a mechanical task with a precise end state: the synthesis. It is also a way of understanding how prior research has been conceived, or not conceived. When reading a series of research papers, the perspicacious researcher will, in addition to synthesizing, note both the prominent and the absent trends or patterns. For instance, the researcher may recall a study or method or theory from some years previously in a different field or discipline that could usefully be compared with or inform this literature. Naturally, the human brain is somewhat selective: the researcher is unlikely to have read the entirety of the literature across multiple disciplines, and so this comparison is limited by the researcher's own reading. Can the GAI program help here, perhaps suggesting the relevance of a study in a very different discipline? To give two real examples, when writing a paper (Liu *et al.*, 2023) about the role of Chief Digital Officers in digital transformation, one of us employed punctuated equilibrium theory (PET), a theory first proposed in evolutionary biology (Eldredge and Gould, 1972) and occasionally encountered in the management and information systems literatures (Gersick, 1991; Wong and Davison, 2018). In our discussion, we found that we needed to examine more closely the way PET had been applied in recent business research, and then to draw parallels between the focus on digital transformation with the evolutionary biology sources. The literature in the latter area is huge: perhaps GAI could have helped identify salient sources, in effect working as a research assistant? No doubt GAI could also synthesize those sources and even render their technical jargon into a form that an information science researcher could more readily comprehend. But what will this type of non-active participation in the research process cause researchers to lose? As it turned out, in these examples we were not assisted by GAI. We simply Googled the relevant terms and quickly enough found exactly the paper that we needed to support and develop our arguments (see Liu *et al.*, 2023). Similarly, when writing papers on the role of framing in IT-enabled sourcing, the other author could have benefitted immensely from GAI's ability to synthesize the huge corpus of scholarship on framing in the social psychology literature (Ravishankar, 2015; Sandeep and Ravishankar, 2016). However, we had to do the dejargonizing work ourselves, a process that admittedly took some time but was intellectually stimulating. Indeed, these examples neatly encapsulate many of the things that we appreciate about research, and we would be loath to relinquish them to GAI.

A second example where GAI may help out concerns data transcription. As researchers, we often collect data through interviews. Traditionally, we transcribe the interviews to text and where necessary translate them into the language that we wish to code them in, often English. GAI programs can certainly be used for interview transcription and translation. The GAI software can certainly speed up the initial process but the error rate of the software is non-trivial, that is, careful manual checking of the transcription/translation is needed. For instance, we recently used GAI to transcribe and then translate interviews from Chinese to English. As part of our preparation, we needed to inform the software that the source material was in Chinese (Mandarin), so that the Chinese language module would be applied. However, the audio text included English words embedded in it, that is, the interviewees spoke both Chinese and English in their interview responses. This is technically referred to as code mixing, and is quite common among second-language users, that is, they use their first language for much of their communication but mix in words from second languages on an ad hoc basis, often because the second-language word expresses an idea or concept more succinctly than would the corresponding first-language word. Such code mixing exists in both spoken and written communication. The GAI transcription software accurately recognized and transcribed the Chinese words, but was unable to deal with the English words because it was not expecting them, so it rendered them by converting them phonetically. For instance, the abbreviation EDI (electronic data interchange) was rendered in Chinese characters not as the correct translation of EDI (電子數據交換) but as characters that approximated the sound of the letters E D I (一點愛). However, these inserted characters (which actually mean 'a little love') were totally inappropriate in the context and made no sense at all. Perhaps in the future, GAI programs could be instructed to look out for words in specific languages and so transcribe or translate appropriately.

When it comes to the analysis of data, that is, the identification of themes and patterns, and the generation of theoretical arguments, our earlier comments about parsimony, interestingness, counterintuitiveness and provocativeness come to the fore. Although the efficiency of human analytical capacity may not be superior to GAI, given GAI's potential to analyse vast quantities of data quickly, to compare that data with past literature, and presumably to generate many possible options, we suggest that the effectiveness of human intuition is superior because of our ability to identify an interesting or provocative or counterintuitive angle

that is worth exploring. Quite what is interesting or provocative or counterintuitive is hard to pin down, as it depends to a large extent on the subjective assessment of the researcher who is going to create an argument to justify that interesting, provocative or counterintuitive theoretical explanation. This human capability goes beyond creating new content using patterns in data, and it is central to theorizing: the researcher(s) need to draw on their innate imagination and creativity to craft that theoretical explanation. Could a GAI program be trained to identify potentially interesting, provocative or counterintuitive positions, and then to craft the supporting arguments? The answer must be yes, but how convincing they would be is moot. They might help the researcher to identify promising new lines of thought, or might stimulate further intellectual engagement, with the GAI program acting as an agent provocateur. A final point, which slightly contradicts our arguments so far, is worth making. Fears are being expressed about how the limits of GAI are really the inability of users to ask the system the 'right' questions. If GAI intuition and reasoning powers appear unable to produce sophisticated theorizing, could it be that the issue is less about GAI capability and more about scholars' relatively limited experience and knowledge around employing the 'prompts'? This line of thought opens the intriguing possibility that GAI is far more potent than we realize, and that it may indeed produce academically sound, rigorous, novel and elegant theorizing of significant value.

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Olivia (Liv) Brown is an Assistant Professor in Organisational Behaviour at the University of Bath, School of Management, UK. Liv's research sits at the intersection of psychology and behavioural science, aiming to understand how intra- and inter- group processes influence individual and group behaviour in online and offline settings.

Robert Davison is a Professor of Information Systems at the City University of Hong Kong. His research focuses on the use and misuse of information systems, especially with respect to problem solving, guanxi formation and knowledge management, in Chinese organisations. He is particularly known for his scholarship in the domain of action research. As a researcher, Robert seeks to promote both an inclusive and an indigenous perspective to research. Home Page: http://www.is.cityu.edu.hk/staff/isrobert.

Stephanie Decker is Deputy Dean and Professor of Strategy at Birmingham Business School. Her work focuses on historical approaches in Organisation Studies and Strategy, and she has published in journals such as *Academy of Management Review*, *Human Relations* and the *Journal of Management Studies*. She is joint Editor-in-Chief of *Business History* and Co-Vice Chair for Research & Publications at the British Academy of Management.

David A. Ellis is a Professor of Behavioural Science at the University of Bath, School of Management, UK and a Visiting Fellow in Psychology at the University of Lincoln, UK. David's research considers how data and ubiquitous digital technologies are changing the way we conduct research and the way we live. Research projects have included experiments in labs, large scale surveys, focus groups and the use of smartphones to collect data 'in the wild'.

James Faulconbridge is a professor at Lancaster University Management School. His research focuses on the professions and professional service firms. James has been involved in several large projects funded by the UK's

EPSRC and ESRC and has published widely in academic journals including *Journal of Management Studies*, *Organization Studies*, and *Work, Employment & Society*.

Julie Gore is a Professor of Organisational Psychology, Birkbeck, University of London, UK and a Visiting Professor at the University of Bath, UK. A chartered psychologist and expert in behavioural sciences, Professor Gore is the Editor of the *Journal of Occupational and Organizational Psychology* and a longstanding board member for the *British Journal of Management*.

Michelle Greenwood is Professor at Monash University, Australia. Michelle's research is in critical business ethics, which she has developed conceptually and qualitatively in the areas of ethics and HRM/employment, critical approaches to stakeholder theory and corporate social responsibility, organisational visuals, and technological mediations. Michelle has published 50+ articles, book chapters and books. She has an ongoing interest in the politics and ethics of academic publishing. Michelle currently serves as Co-Editor-in-Chief of the *Journal of Business Ethics*.

Gazi Islam is Professor of People, Organisations and Society at Grenoble Ecole de Management, and member of the research laboratory IREGE (Research Institute for Management and Economics) at the University of Savoie Mont-Blanc. He is Co-Editor-in-Chief of *Journal of Business Ethics*. His research interests revolve around business ethics and the contemporary meanings of work, including the relations between identity, power and the production of group and organisational cultures.

Christina Lubinski is a professor at the Department of Business Humanities and Law at Copenhagen Business School and joint Editor-in-Chief of *Business History*. Her research focuses on historical approaches to entrepreneurship and international business. She is principal investigator of the research project 'Rethinking Entrepreneurship in Society' funded by the Carlsberg Foundation, which explores entrepreneurialism as an ideology and its impact on society.

Niall G. MacKenzie is Professor of Entrepreneurship and Business History at the Adam Smith Business School, University of Glasgow where he also leads the Entrepreneurship, Development and Political Economy cluster. He currently serves as Co-Editor-in-Chief of *Business History* and has published widely on business history, entrepreneurship, innovation and regional development.

Renate Meyer is Professor at WU Vienna and Copenhagen Business School. She holds visiting positions at Oxford University and University of Alberta. She is a former Editor of *Organization Studies*. Renate's current research interests include the translation of novel ideas into new cultural contexts and their impact in society, institutional renewal, multimodality, collective action as well as governance governance gaps related to wicked problems.

Daniel Muzio is a Professor of Management at the University of York. He is a General Editor of the *Journal of Management Studies* and a founding editor for the *Journal of Professions and Organisation*.

Paolo Quattrone is Professor of Accounting, Governance and Society at the Alliance Manchester Business School, where he also leads the Centre for the Analysis of Investment Risk, and Associate Fellow at Saïd Business School at the University of Oxford. He is interested in how the visible and the invisible, absences, no-things, ambiguity, mystery and the unknowable affect decision making, organising, data visualisations, and governance. He is the 5th recipient of the EIASM Interdisciplinary Leader Award and Co-Editor-in-Chief of *Organization Studies*.

M. N. Ravishankar is Professor of Technology & Globalisation, and Dean, of Queen's Business School, Queen's University Belfast. Ravi's research engagements span strategic coordination of technology sourcing, management of digital social innovations, and social entrepreneurship. He has been consistently ranked amongst the top 20 global scholars based on research publications in the Association for Information Systems' basket of world-leading scholarly journals. He is a Senior Editor at *Information Systems Journal*.

Tammar B. Zilber is Professor of Organisation Theory at the Hebrew University Business School, Jerusalem, Israel (TZilber@huji.ac.il), and the Copenhagen Business School, Denmark. She is interested in how ways of organising are grounded within broadly shared beliefs and understandings and reflected in words, materials,

structures, and practices. She uses ethnographic and qualitative methods to connect macro-level cultural ideas and understandings with micro-level thought and action by people in organisations and organisational fields.

Shuang Ren (PhD, University of Melbourne) is Professor of Management, Director of Diversity, Equity, Inclusion and Belonging at Queen's Business School, Queen's University of Belfast, UK. Her research is at the intersection of sustainability, human resource management and leadership vis-à-vis the evolving digitalisation landscape. She has published on these topics in leading journals such as *Journal of Applied Psychology*, *Journal of Management*, *Personnel Psychology*, *Human Relations*, *Human Resource Management*, *Human Resource Management Journal*, *Journal of Management Studies*, etc. She is a Co-Editor-in-Chief of the *British Journal of Management*.

Riikka M. Sarala is Professor of International Business at University of North Carolina at Greensboro, USA. Her research focuses on the socio-cultural dynamics of knowledge and innovation management, particularly in mergers and acquisitions and multinational corporations. She is a Co-Editor-in-Chief of the *British Journal of Management* and a member of the *British Academy of Management*.

Paul Hibbert is Professor of Management and Organisation, and Head of Organisation and Work, at Warwick Business School. He researches reflexive practice and processes of organizing and learning, to develop insights for managers and leaders. He is a Fellow of the Higher Education Academy, the Chartered Management Institute, the British Academy of Management, and the Academy of Social Sciences. He is a Co-Editor-in-Chief of the *British Journal of Management*.