ISSUE 22

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In this issue...

Foreword

Welcome to another packed and informative edition of Fifty Four Degrees.

While I have declined the use of Generative AI to draft this introduction, it is hard to escape the increasing presence of Artificial Intelligence and other technologies in our everyday lives.

We are not yet (and hopefully will never be) at the stage where the machines have taken over and we are at best redundant from our roles in society, and at (apocalyptical) worst under their control and command. We are, though, using technologies in ever-evolving ways.

Across Lancaster University Management School, many of our researchers conduct work with technology at its heart, and this edition is built around a selection of those projects and expertise.

João Baptista is looking at how AI is already affecting leadership and management within organisations. It is fascinating to see how his work shows the evolution beyond the straightforward – keeping notes from a meeting, summarising a report – to more complex, creative and strategic applications.

João's work suggests the need to clearly shape how we use AI from the start, and that is something that can be seen in the work being carried out by Martin Spring and James Faulconbridge on the Technology in Professional Services (TiPS) project.

James and Martin are part of a team working with law and accountancy firms on how they adopt technology into their businesses. This goes beyond just AI – though that is inevitably becoming more common – and examines the processes that are needed for adoption to be successful.

On a similar note, David Knights and his colleague Guy Huber from Oxford Brookes University, have explored how AI may be affecting our emotions and behaviours. The prospects of machines and technology having emotions themselves is a long way from fruition, yet their research shows that AI is already changing how we think and act – something that has deep repercussions as it becomes more ingrained in our lives.

Natural disasters are a part of life in countries such as Indonesia, so the efforts of Konstantinos Zografos and his colleagues on the RESPOND-OR project using programmes and algorithms to develop more effective response operations has the potential for great impact.

While most of us use technology every day, how many of us will be exploring ***The Backrooms?*** Sophie James and James Cronin's work takes us into a realm where tourism is exploring strange new worlds online. I have no real desire to go to these places myself – and am not quite sure what to make of the creepypasta phenomenon – but they exist, and a growing number of us enjoy, if that is the right word, these imagined worlds.

It was not so long ago that hybrid working was an imagined world – now it is common in many countries and professions. Niki Panteli and her colleagues from Canberra look at how technologies can be used to help remote and hybrid employees stay engaged with the companies they work for. It is something business and management schools like ours need to consider, as well as many other companies.

The same may not be true right now for asteroid mining, but Craig Jones takes us on a journey into space with this fascinating topic. You may think it sounds like science fiction – but as we have seen with AI, the future is always closer than you think.

Professor Claire Leitch
Executive Dean
Lancaster University Management School

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AI'S WORKPLACE TRANSFORMATION

Is AI an aid to better decision-making, or is it dislodging humans from management? ***Professor João Baptista*** outlines his work with businesses to discover how they are using the new technology, and how it affects their actions and processes.

The jury is out on the role and effects of Artificial Intelligence in the workplace and in management.

Many people worry about AI numbing and deskilling workers, narrowing creativity and innovation, and a wide range of unintended risks. Others focus on AI's potential in liberating workers from tedious tasks, augmenting their abilities and capabilities, and leveraging human thought and digital assets at scale for more powerful and insightful business decisions.

This dichotomy exists because AI is still mostly an unknown variable and does not fit into established management theories and frameworks. Although it masquerades as a plain and innocuous aid to human work, the reality is that agentic AI has the potential to operate and function independently or in collaboration with humans, and lead to the end of several analytical and managerial functions. We are not there yet though.

In my work with Professor Malar Hirudayaraj, at the Rochester Institute of Technology; and Dr Bonnie Cheuk, at AstraZeneca, we have been following the adoption of AI at a global pharmaceutical company, studying their approach in involving the workforce in the process of learning about and integrating AI in their day-to-day work.

ADOPTING AI

Our research is part of an upskilling initiative to encourage employees to engage with a new internally developed and company-specific version of Gen AI, which we refer to as "GPT". The organisation collected data in multiple stages through surveys and employee journal entries to capture concerns and to understand the support required to better integrate these technologies into everyday work.

We found that the tasks delegated to GPT at this stage ranged from simple and repetitive to more complex, strategic and creative functions. All were in a supporting role to human work at this stage. We categorised these tasks by the level of cognitive effort and strategic thinking required into three distinct levels: low, moderate, and high cognitive complexity.

These range from routine tasks that were mostly administrative to higher complexity tasks requiring creativity and strategic thinking, planning and innovation.

LEVEL 1

At this level, workers used GPT for the summarisation of meetings and reports, organising content, and formatting and improving presentations. These were mainly routine and administrative tasks.

The nature of interaction between Humans and GPT was transactional – inputting simple requests and receiving quick outputs. The tasks were repetitive, not requiring deep engagement, creativity, or strategic thought. GPT enhanced efficiency by taking on low-value activities, which are typically time and labour intensive.

Employees told us:

"I needed to summarise more than 1000 comments from Zoom chat during a live interactive workshop. I used prompts on GPT and got this done within a minute."

"Summarising a large report took me some time, I tried GPT and quickly summarised the key points and made the report more succinct."

LEVEL 2

At this level, the digital agent supported tasks that required more contextual understanding and a degree of analysis or creativity. Here, employees used GPT as a tool for four purposes:

1. To write and assist with professional communication such as drafting reports, formal emails, or improving language and structure.
2. For data synthesis and analysis of large datasets, identifying themes, and extracting actionable insights.
3. To support meetings in taking notes, summarising discussions, and creating follow-up items or action plans.
4. For idea generation, brainstorming and developing meeting agendas.

The nature of interaction between humans and digital agents is more collaborative. AI assists with the first steps, and the user refines or evaluates the output.

Employees told us:

"I was writing a response to a letter that needed to have succinct and accurate arguments – I used GPT to check what I was writing and make it read better."

"I used GPT to help me brainstorm a difficult conversation with a team member who was radio silent for weeks. GPT helped with suggestions on how to begin the conversation, and ways I might influence this team member to communicate, and identified some approaches to avoid."

"I was setting up a programme management team so asked GPT for help with suggesting roles and responsibilities. I used the suggestions as a thought-starter and was a very useful shortcut."

LEVEL 3

Here, GPT supported employees with four types of tasks:

1. Strategic planning and decision-making.
2. Problem-solving and risk assessment.
3. Collaborative and strategic communication.
4. Creative and innovative work.

These tasks required significant cognitive effort from the user and often involved complex decision-making processes. GPT's role was more as a collaborator in strategic thinking, helping shape ideas and decisions that go beyond routine or creative work. GPT provided insights, generated strategic suggestions, and helped navigate complex scenarios.

Users demonstrated judgement and engagement in decision-making as they evaluated, prioritised, and applied GPT's insights to broader business or strategic contexts. GPT not only augmented users' abilities but also changed the nature of their role within the organisation structures and workflows.

Employees told us:

"I was preparing a roadmap for the next few years. I imported the business scorecard into GPT and asked for opportunities for improvements and development. It suggested several ideas, some of which we hadn't previously thought of. AI is helping us shape our long-term strategy."

"During a workshop, AI helped us outline our vision, problem statement, and operational model. It gave us a great starting point for strategic planning."

"GPT contributes to problem-solving by generating multiple scenarios and solutions."

"We were brainstorming ideas for a product design workshop, and AI helped us generate a focused agenda and questions. This allowed us to spend more time thinking about the big picture and less time on the logistics."

KEY INSIGHTS FOR MANAGEMENT

Our study shows employees use AI to support decision-making but also in higher-level thinking, as a strategic partner and to amplify human creativity. This means AI is already aiding and operating in cognitive managerial work. The future of work requires a synergetic and harmonious relationship between human creativity and AI's capacity to support and amplify that creativity.

However, the level of control and authority over final decisions by humans can become blurred and this can undermine efforts to retain AI as a complement, rather than a replacement for human judgment. This raises important considerations around trust, control and the balance between human oversight and AI autonomy.

AI is embedded and enveloped within the human and social layers of organising. It is important to recognise that AI is not in the realm of traditional IT, and it does not follow typical processes of design and development. This means that we as users are constantly shaping its features through our use of the tool and other ongoing digital interactions.

A key characteristic of AI is that it responds to user needs and leverages user data. From this perspective, it is user and employee centric. This means that we are not passive onlookers, and this is true also for us as researchers when reporting our insights and proposing visions for future use and adoption. It is within our power to shape and inform our joint evolution between humans and AI.

RECOMMENDATIONS

We recommend that organisations approach AI adoption from the ground up and engage openly with employees on learning about use cases and their effects in real time and in a dynamic way. This means decommissioning established IT frameworks and rollout plans, and allowing experimentation and organic learning instead.

Further, we recommend constructing visions and scenarios collectively with the workforce that inform and shape the development and embedding of AI. The key areas that should be engaged in this process are HR, Innovation, and Risk and Security.

HR needs to evolve from using AI to manage internal processes, to supporting AI rollout across all business functions. Innovation should become a top priority for senior management, supporting the organisation to absorb, redesign and recapacitate the workforce in a more dynamic and responsive mode. Thirdly, the Risk and Security function needs to be involved in creating spaces for emergent new forms of organising that challenge established risk frameworks but that are essential for the long-term evolution and survival of the organisation.

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BE CONSCIOUS OF AI'S EVOLUTION

Artificial Intelligence may not yet be achieving consciousness, but we should pay attention to its impact on our identities. ***Professor David Knights*** and ***Dr Guy Hube***r look at the role AI is already playing in how we think and act, and whether it may be affecting our emotions and feelings even if it cannot – yet – have them itself.

Artificial Intelligence (AI) programmes are "***more and more pervasive in our day-to-day lives... turning into an integral, seamless***" aspect of living. Indeed, over a short period of time, AI has become a daily news item and, regardless of our intentions, it is now impossible to avoid interacting with, or "speaking to" AI, if only because of its displacement of human-to-human interaction in everyday activities.

From corporate customer relations to social media communications, as well as a diverse range of other commercial and domestic use, we cannot be other than deeply affected by AI. Social scientists see it as '***affecting our very existence***', yet we remain largely unaware of the hidden algorithms doing the heavy legwork on social platforms.

FRAMING ETHICS

Our research focuses on conversations with specialists working within the field of AI. We wanted to interrogate them regarding their own thinking and values. For example, we ask AI programmers what ethical considerations they deem most important and why?

As you might expect, their responses reflect dominant discourses and assumptions emerging from their training, together with beliefs, norms and values derived from life experience. These frame what is deemed important for producing what they see as the technically rational content of AI.

What is then hidden or obscured are those other lesser cognitive elements of experience: norms and values that become embedded in the data and algorithms that form the basis of AI with little awareness of how they are deployed to render AI proficient in its multiple uses.

Some of these have recently been brought to the attention of programmers through an examination of the ethical implications of AI such as its gender, racial and other ideological discriminatory tendencies, its neglect of security and privacy matters, lack of transparency and thus accountability, the dangers of too heavy a human reliance on systems leading to a paucity of creative and critical thinking, job displacements and unemployment, and even apocalyptic fears of computers taking over the world.

UNEXPECTED CHANGES

While these fears are 'real', they vary in their plausibility for most people. There is more of a consensus regarding the need for regulation. What is neglected, however, is a concern with how AI might transform us as individuals into subjects who secure our sense of meaning, identity and reality through engaging with the services that it facilitates.

AI may not have consciousness, but it exercises power in ways that affect our subjectivity because we freely identify with – and participate in – the pursuits enabled by its presence. In this sense, AI is not some great conspiracy designed to control the world and all its inhabitants but more like a force, ***neither necessarily good nor bad***, that may ***lead us down a cul-de-sac of collective self-discipline of totalising proportions***.

Take, for example, the performance guidelines for, and monitoring of, delivery drivers that have been described by a UK ***all-party parliamentary group*** (APPG) as affecting negatively the mental and physical wellbeing of workers as "they experience the extreme pressure of constant, real-time micro-management and automated assessment". Or worries that a Stanford economist has about the "Turing trap", wherein the automation of human activities using brute computational force could leave wealth and power in fewer and fewer hands. ***Erik Brynjolfsson*** writes "With that concentration comes the peril of being trapped in an equilibrium in which those without power have no way to improve their outcomes".

More recently, ***Jeremy Howard***, an Artificial Intelligence researcher, introduced ChatGPT to his seven-year-old daughter and – after she asked several questions – concluded that it could become a new kind of personal tutor, teaching her maths, science, English and other important lessons, though he warned her not to believe everything it told her.

A TRANSFORMATIVE EFFECT

These examples clearly demonstrate the way AI transforms the sense we have of ourselves (our identities), in terms of both our economic and social existence. They indicate how there is a relation of power between AI and users in which the voice of one (AI) exercises authority over the subjectivities of those with whom it interacts.

Research by ***Taina Bucher*** suggests that because of how AI continually represents our preferences or past ways of behaving, we are beginning to see ourselves through the 'eyes' of the algorithm.

However, since AI is unable to embody feelings, emotions and a sense of what it is to be human, it remains constrained within a cerebral logic and rationality. While this can capture our concerns to behave rationally in decision-making and physical operations, it is bereft of the soul, affective energy and passion.

This is clear from asking ChatGPT the question: Can AI be embodied? While claiming it could, on elaboration, the focus was restricted to the physical body and its relationship to external objects.

As well as physicality, embodiment involves the emotions, feelings and spontaneity that allow us a diverse range of expressions including humour, sentiment and empathy that may not be reducible to linear sequences of instructions constructed by an algorithm.

Of course, AI reinforces our existing identities insofar as its algorithms are based on data drawn from our past behaviour. In this sense, it affects our emotions, feelings and affective energy even though it cannot itself reproduce them.

While there is no question that AI can advance our civilisation for the benefit of us all, and that there is no possibility of reversing its continuing development, we do have to restrain its potential for harm.

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THE TECH ADOPTION CHALLENGE

If you want to bring in new technologies – including Artificial Intelligence – to improve your business, planning is needed. Based on their experiences working with firms on the Technology in Professional Services (TiPS) project, *Professors James Faulconbridge* and *Martin Spring* advise companies on how they can make tech adoption more successful.

When your business brings in new technologies and Artificial Intelligence (AI), there are sure to be challenges. Adoption is hard, and there are important areas to consider when taking on any tech.

Through the ***Technology in Professional Services (TiPS) project***, we work with around 30 small and mid-tier law and accountancy firms who have been thinking about using AI for some time, but who had not yet turned intention into action.

We are helping businesses respond to the well-recognised challenge of technology adoption. With some, we work to train them on the basics of AI application using technology they already have. With others, we bring cohorts of companies together, allowing them to learn from mentors and network over a period of eight-10 months. We also have a group of three firms that are advanced adopters. We are helping them to super-charge their use of technology.

Across the firms, we have encountered certain challenges on a regular basis. We have come to see them not as problems, but rather opportunities to do things in a different way to ensure a greater chance of success.

Adoption can be smoothed by recognising the obstacles ahead of time and addressing the issues head-on. If you acknowledge a challenge, you can tackle it.

While our work has been with law and accountancy firms, many of our lessons will also be actionable at a wide range of professional services and other companies.

Here we present some of the challenges everyone will need to address at some point in their technology adoption journey.

BUSINESS CONTEXT

Assessing the state of your business, and where you stand in terms of need, capability and capacity is a first step.

Different technologies bring different benefits. Understanding the kind of project you are engaging with, what kind of benefit you might gain, and who will benefit, is essential.

You might think it is all about the return on investment by saving time and cutting costs. But there are other reasons for adoption. It might be about improving work-life balance for staff by reducing workload; making sure your firm is up to date enough to attract young talent; or providing access to services for underserved communities. There are many ways you can gain value.

Getting started does not mean planning a project for 10 years. There will always be uncertainty – you cannot know everything, and if you want to wait until you do, you will never actually do anything. But you do need a coherent idea that guides your project.

USE CASES

One way of refining your idea for a project is to think about use cases.

Does your business need AI or another technology? If so, where will you use it – and how? Demonstrating a definite use case for technology rather than talking in generalities and hypotheticals is a major challenge. You need concrete examples of positive application if you are going to invest time, money and resources.

Think about what you need the technology for in the first place. Where could it benefit your business? Where could it save time and resources?

You also need to think carefully about what kind of project is most appropriate. What capability and capacity do you have when it comes to tech adoption? An all-pervasive project might be attractive and deliver big changes and benefits, but they are more complex, riskier and perhaps not suitable for those who have never run a tech adoption programme before.

It may be best to start with something small, such as saving time on expense claims. You can then learn and build from that initial experience.

LEADERSHIP

Recognising how decisions are made; who is in charge; and who can agree the kind of changes that might be needed to adopt technology is a crucial starting point.

The success of a new tech project will be determined in part by getting the right decisions from the right people at the right time.

Senior managers and, in professional services, partners, generally expect to have a big influence on decision-making. But often the adoption of technology requires an integrated approach, with coordinated decisions that bring multiple different groups into the process.

One part of this story involves recognising the changing role of the people running technology in your business. They have to be involved in the big conversations. Firms must think about how they can reach the point where the chief technology officer or equivalent has the relationships with partners and key influencers that ensure decisions about technology are informed by insights from inside and outside the top team. Those managing a firm's technology stack need a presence and the ear of management to help the board make the right decisions. That is a big cultural shift in professional services, but a key ingredient for success. And do not stop there...

A TEAM ENDEAVOUR

Ensuring technology adoption is informed by an understanding of the needs and ideas of everyone is crucial. Involve both tech and non-tech people. Listen to what staff at all levels are saying about the opportunities that technology provides for their work.

It is not just those in senior roles who need to be persuaded. You need buy-in from everyone impacted. So, include users of the tech from the start by listening to their needs and by showing how tech projects are designed to deal with their frustrations and allow them to exploit new opportunities.

People need to see what is in it for them if you are going to ask them to change the way they work to adopt new technology. It is vital that the case is made using rationales that talk to the motivations and interests of those being asked to change. You need to understand what motivates them, show them why they would want to adopt the technology, demonstrate how it solves problems and creates opportunities for them.

It is unrealistic to expect to convince everyone – but you want the majority on side and, crucially, you need to convince the people that everyone else listens to. Or at least ensure the key influencers are willing to not stand in the way of the tech adoption project.

MAKE IT STICK

The interesting question for all the firms we work with is how they make change stick. If you have addressed the kinds of issues outlined here, then this is more likely.

Within TiPS, the companies we work with are evaluating the success of their tech adoption projects and seeing how they can ensure it is successful in the long term.

They are seeing that adoption is ongoing. You do not finish a project, and that is it. Job done. Using new technology requires future adoption activity, because technology or your company's needs will change.

One project might lead to another and there will be new challenges. There are lessons to be learned from where you are applying technology now and how you might apply it elsewhere.

THE BIGGER PICTURE

Technology adoption projects also require firms to navigate the world of technology companies and digital ecosystems. You need to know how the market works, how other companies are adopting technologies, how to learn about the latest developments, and how to be a savvy buyer.

You are not on your own. All firms find the market for digital technologies challenging to navigate. We found that firms benefit from involvement in networks and associations where they can share problems.

We know that professional bodies are thinking about these issues as much as you are. Special interest groups and networks make the transitions more straightforward and stop people going off on the wrong path.

Likewise, regulators are considering which guidelines and rules need to be put in place. These regulations will shape what you need to do – and may mean that any adoption now needs to be adapted further down the road.

None of the challenges we have highlighted are insurmountable, but all need to be considered for your technology adoption to succeed.

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Technology in Professional Services (TiPS) is an Economic and Social Research Council (ESRC) and Innovate UK-funded project involving Lancaster University Management School, Oxford Brookes University and Hyperscale Group Ltd. The programme aims to help professional service sectors develop and use digital technologies.

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A New Era of Cyber Dark Tourism

The internet has opened up opportunities for users to explore previously unimaginable horizons. *Dr Sophie James* and *Professor James Cronin* take a trip into the dark side of the web and discover a realm where people take tourism to strange new worlds.

Dark tourism, the practice of venturing to places characterised by death, disaster, and destruction, has long captivated those drawn to confronting the shadowed depths of human history.

With greater participation on social media platforms, expanded means for novel content creation, and the growth of internet-savvy '***meme cultures***', new forms of dark tourism that diverge from factually grounded locations requiring travel have emerged. By enabling entry to fabricated and performative spaces that lack tangible connections to real places or history, digital phenomena transform dark curiosity into a realm of simulation and hearsay, misinformation, conspiracy, myth-making, and collective imagination.

CREEPY STORIES TO COLLABORATIVE NIGHTMARES

Unlike '***virtual dark tourism***', which uses technology to interact with and learn about real-world locations tied to historical tragedy from afar (for example, ***Auschwitz-Birkenau's online virtual reality tour***, or the ***online collection*** of stories and photographs digitalised from the 9/11 Memorial Museum), the cyber-cultural variant we are interested in relates to online spaces dedicated to 'touring' the unsettling, surreal content of unsubstantiated legends that exist solely in the digital realm.

Platforms such as Reddit's ***r/nosleep*** or 4chan's ***/x/*** (a forum for paranormal discussions) and the growing universe of ***creepypasta*** (creepy stories copied and pasted from around the internet) curate spaces for cyber dark tourists to consume, speculate upon, and perpetuate unsettling narratives devoid of historical or factual grounding.

Through discussion board posts, memes, vlogs, fan art, reader responses and other user-generated content, participants share personal accounts, supposed witness statements, and cryptic tales that foster a sense of discovery and wonder, where each interaction deepens the mystery. Members thrive on collaboration and creativity, inviting participants to contribute their own twisted narratives or decode hidden clues.

In doing so, they curate an immersive participatory experience that feels both personal and collective, as they navigate an ever-evolving, dreamlike labyrinth of the unknown.

THE BACKROOMS

The Backrooms is a cursed location that originated in 2019 on 4chan's /x/ board and has evolved into a vibrant community on Reddit's ***r/backrooms***. Described as an infinite, eerie maze of yellow rooms with flickering fluorescent lights and aging carpets, ***The Backrooms*** tap into existential dread and isolation; their mysterious spatiality – having no basis in real history or geography – is both unsettlingly familiar and eerily alien, creating a sense of uncanny dissonance.

Digital environments dedicated to the legend of these purgatory-like spaces encourage members to not only consume but also contribute to the myth by sharing their own stories and theories about the meaning, location, and function of the fluorescent-lit maze.

The participatory nature of ***The Backrooms*** mirrors the concept of 'hyperdiegesis' as described by the media scholar Matt Hills. For Hills, the reason for the popularity of certain fictionalised or unreal events is that they allow fans to imagine a vast and detailed world that extends beyond whatever immediate narrative (or diegesis) they are first presented with. Cyber dark tourists grow and evolve ***The Backrooms*** as they explore them, making their mythos more cohesive and compelling through collaborative world-building. The longer they remain within this virtual labyrinth, the more invested and convinced they become of the sensationalised content – regardless of its truth value.

MAINSTREAM APPEAL

The Backrooms, once consigned to the localised myths of web forums, has rapidly become a cultural touchstone finding its way into mainstream media. Its chilling portrayal of isolation was featured in the 2024 season of ***American Horror Story,*** in an episode titled ***Backrooms***, where it served as a metaphor for the terror of being trapped in endless, empty spaces. More recently, Netflix released a haunting teaser titled ***The Backrooms (Found Footage)*** to promote the second season of ***Squid Game***.

This shift from obscure online folklore to mainstream horror reflects the growing influence of cyber-driven content on modern storytelling. ***The Backrooms*** is now firmly integrated into the fabric of contemporary horror.

REALITY OR ILLUSION?

In a world where physical tourism locations are increasingly mapped, photographed, rationalised, and commercialised, the internet offers a digital abyss for sensation-seekers to immerse themselves, explore with abandonment, and navigate the boundaries between belief and scepticism.

Unreal and fictive spaces like ***The Backrooms*** represent a cyber-mediated destination for the dark tourist jaded by the commodification of offline venues. This is somewhere untethered to history or reality, where the uncanny still thrives and existential anxieties can be explored earnestly. These spaces are not just for passive consumption; they are environments that invite participation and introspection.

Ultimately, the rise of dark cyber-mediated tourism represents a significant shift in how we experience dark spaces and their relationships with human stories. As internet platforms provide a space for collaborative myth-making and world-building, they encourage detachment and self-exploration, providing an escape from the pressures of everyday life while engaging with the 'unknown'.

Nevertheless, while they allow tourists to explore aspects of fear and anxiety, they also raise questions about the ethics of curating these feelings for entertainment. While traditional dark tourism challenges us to contextualise, ethically make sense of, and ultimately sympathise with historic sites of real suffering, cyber dark tourism risks joining the long list of activities which trivialise human fear.

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SUPPORTING NATURAL DISASTER RESPONSE

Natural disasters affect tens of millions of people worldwide every year. Between 2000 and 2019, 1.23 million people lost their lives to such events. But response operations in their aftermath can be difficult to manage in order to help as many people in as fast, fair, and efficient a way as possible. *Distinguished Professor Konstantinos Zografos* explains his work on the RESPOND-OR project, aiming to improve emergency response operations by developing mathematical models that reflect the decision-making context and requirements in Indonesia.

With a population of 277.5 million, Indonesia is the fourth most populous country in the world. It sits on the Ring of Fire, a 25,000-mile chain of volcano and earthquake zones that encircles the Pacific Ocean.

As a result, its more than 17,000 islands are prone to volcanic eruptions and earthquakes, as well as experiencing flooding, tsunamis, mudslides, wildfires and more.

Indonesia deals with ***between 2,000 and 5,000 natural disasters every year***. There is a natural disaster somewhere in the country at almost all times, from minor to major. For every ***tsunami that draws the world's attention and sympathy***, or ***volcano that creates dramatic images online***, there are many other events that garner little notice outside the country.

Indonesia's population are among the ***4.2 billion people worldwide*** who felt the effects of natural disasters in one way or another in the 20 years from 2000 to 2019.

Dealing with the aftermath of these events is an immense task involving national and regional response organisations, NGOs, and volunteers. The logistics are mammoth, with numerous complicating factors.

MAKING A DIFFERENCE

The ***Sendai Framework for Disaster Risk Reduction 2015-2030*** identifies the enhancement of disaster preparedness for effective response as a key priority risk-reduction area.

However, the available mathematical models and solution methodologies fall short of capturing the breadth and complexity of the real-world challenges concerning disaster preparedness and response problems.

The available approaches are mostly based on generic assumptions that tend to oversimplify the decision-making needs of disaster management agencies. This problem is more pronounced in developing countries such as Indonesia, and this is where our work comes in.

MODELLING DISASTER RESPONSE

The strategic vision of our RESilient Emergency Preparedness for Natural Disaster Response through OR ***(RESPOND-OR) and RESPOND-OR X projects*** was to develop and implement mathematical models and solution algorithms that underpin the development of Decision Support Systems (DSS) for large scale disaster preparedness and response. Our research was focused on disaster response operations in both Indonesia and Sudan – a country affected by flooding and drought – but we will focus here on the former.

The models and algorithms developed for Indonesia within the framework of RESPOND-OR are motivated by the emergency preparedness and response decision-making needs and context of Indonesia.

Our team here in the ***Centre for Transport and Logistics (CENTRAL)*** at Lancaster have collaborated with academic institutions, public organisations and NGOs in Indonesia to develop solutions that work for their specific geographic, social and economic situations. You cannot take in a ready-made generic model and transfer it. You have to develop something specific to their situations.

Also, there can be a scarcity of resources. How organisations use efficiently the resources they have is of the utmost importance. This is coupled with the fact that when a natural disaster occurs, it generates high demand for resources like trucks to evacuate people and livestock.

Only by working closely with the end-user organisations can we understand all the specificities and complexities and optimise the use of these resources.

We developed mathematical models and algorithms to help disaster response management organisations to optimise two key disaster response management decisions: assisted evacuation; and disaster response personnel routing and scheduling.

ASSISTED EVACUATION

Besides the loss of human lives, another major impact of natural disasters with significant socio-economic impact is population displacement. In 2020, ***around 30.7 million people were displaced due to natural disasters***.

There are two types of evacuation: i) self-evacuation; and ii) assisted evacuation. Assisted evacuation involves people who need assistance to leave disaster zones. They might not have the transport means, so this must be provided.

Our models are motivated by disaster management practice in Indonesia and consider time, fairness, and the risk of the assisted evacuation operations. They help determine the number of vehicles needed, where people should be evacuated to, and which routes should be used to evacuate them.

We optimise evacuation decisions from impacted areas to shelters while considering the risk associated with different parts of the underlying road network.

DISASTER RESPONSE DEPLOYMENT

When you have a disaster, you have to dispatch specialists to assist the people who have been evacuated. Imagine a situation where a village or part of a village has been evacuated. You need to set-up temporary shelter facilities; you must provide medical assistance.

For all of this, you need personnel – whether government employees or from NGOs – and you need to schedule them, working out the optimum way to visit the different locations they are needed.

When you provide these services, not all of the specialists can arrive at the same time. For instance, before medics provide their services, somebody else has to set up the tent as a temporary clinic. So, the problem of achieving optimum scheduling of the resources available becomes more complex.

Once in place, people working in disaster-hit areas generally experience two types of problem.

Firstly, fatigue. The workload is huge, but emergency response workers also have lots of psychological pressure. Therefore, they need a break, and you have to take this into account when planning.

The second issue is that the specialists come from different locations. You have to collect them and take them to the disaster site. That is another complex mathematical problem to be resolved.

PRACTICAL APPLICATION

We can build programmes to help with this, but developing the models by themselves is not enough. You can develop models and use them to produce some results, but we wanted to develop a tool that people without modelling expertise can use easily.

The DSS we developed in collaboration with the University of Indonesia has a user-friendly interface. The people who need to make the decisions can enter the required information in a structured and easy to understand way.

We also use information regarding the risk associated with the underlying road network. When you make the decisions to evacuate people, and to schedule disaster response personnel to reach the disaster-impacted areas, you have to consider risk. You want to schedule these movements in a way to minimise the risks to those being transported.

With our system, you can visualise this information. You can see it on the map, and you can also see the trade-offs between the different objectives. The feedback we have received in Indonesia is positive.

Natural disaster response will always be a complex undertaking, but through RESPOND-OR and RESPOND-OR-X we hope we can provide the tools to make it more effective, equitable and fast – helping people when they need it most.

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He is the Principal Investigator on the EPSCR UKRI Global Challenges Research Fund-funded RESilient Emergency Preparedness for Natural Disaster Response through OR ***(RESPOND-OR) project***. Lancaster University members of the team were Professor Juliana Sutanto, Dr Ahmed Kheiri, Dr Aleksandr Pirogov and Dr Istenc Tarhan. Professor Zografos, Professor Sutanto (now at Monash University, Australia) and Dr Raja Fatricia participated in RESPOND-OR-X.

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A Hybrid Approach to Success

How do you keep workers engaged with your business if they have a hybrid working pattern? ***Professor Niki Panteli***, ***Associate Professor Blooma John*** and ***Dr Zeena Alsamarra'I*** examine how workplaces have been transformed through hybrid working, and how digital technologies and a caring, inclusive environment can regenerate employee engagement.

There is no doubt that the way we work and our preferences in terms of how we work have been changing. According to the Office of National Statistics, ***more than a quarter of working adults in the UK (28%) were hybrid working in the autumn of 2024***. Similarly, ***Gallup*** reported that over half of US remote-enabled employees prefer and expect to work in a hybrid mode, a trend that is expected to grow.

Despite these trends, the majority of organisational leaders do not know how to ***master hybrid working***. As organisations adapt and transform into hybrid work practices, they need to ensure that communication, collaboration, and overall engagement of both remote and in-person employees is maintained and supported.

In a project funded by the British Academy of Management - Australian and New Zealand Academy of Management (BAM/ANZAM) collaborative initiative, we sought to explore influencing factors in a knowledge-based organisation that contribute towards developing and supporting employee engagement in hybrid work.

Employee engagement is a motivational concept and is seen as important for increasing employee performance and productivity. Most work in the area looks at employees working on a permanent full-time basis in a collocated setting, and little explores hybrid work.

COMPANY ANALYSIS

To fill in some of those gaps, our study focused on the Australian division of a multinational high-tech organisation with more than 2,000 employees, where they used an algorithmic management tool for supporting employee experience in hybrid work.

Following the Covid-19 pandemic, hybrid work became the predominant form of work within the company, preferred by both employees and the organisation.

Soon after, they implemented Microsoft Viva as an integration platform of existing tools, powered by Microsoft 365 and integrated into Microsoft Teams to provide a unified work environment. Viva was adopted to enhance employee learning, team connection, communication, collaboration, productivity, wellbeing, and the overall engagement of employees regardless of their work arrangement.

With its AI capabilities, Viva can support employees and leaders with insights and nudges related to various aspects of the employee experience, making it a suitable tool for our study.

We spoke with employees and managers across the business and with various levels of seniority, all within the Australia/New Zealand region.

What we found was that managers were actively putting effort in to foster employee engagement in hybrid work. We found three factors enabling this: Digital Workplace Transformation, Caring Workplace and Inclusive Leadership.

DIGITAL WORKPLACE TRANSFORMATION

Not long after the official launch of the hybrid work policy, Microsoft Viva was introduced. This is an employee experience management platform. The platform is promoted by Microsoft as helping to create an engaged and productive workforce using work analytics. It provides insights on employees' behaviour online, encouraging employees to stay connected to improve their learning by taking online training courses.

Some participants described Viva as a personal assistant that reminds them to take a break after working online for a long time or to have focus time away from meetings.

Employees can see their own work analytics, for example how long they have been online, when was the last time they had a break, or when they connected with a colleague. This helps them become aware of their work habits and to take corrective action if needed. Managers can see their team's work analytics, warning of employee burnout: e.g. '60% of your team is working after hours for more than an hour a week'. This gives them the opportunity to introduce intervention strategies and check if the team needs additional resources.

CARING WORK ENVIRONMENT

The use of analytics alone was not sufficient to develop the needed employee engagement in the hybrid workplace. Another theme that emerged was evidence of a caring, human-centred work environment.

Employees talked about being given a choice to attend either in-person or online meetings, rather than being told they had to attend in-person.

As part of developing a caring environment, new practices emerged that enable employees to remain connected with the organisation and to feel that they are valued when they choose to work remotely. For example, someone talked about being sent chocolates out of the blue, a signal that 'we have not been forgotten'.

INCLUSIVE LEADERSHIP

The third emerging theme is the practice of inclusive leadership. Participants reported having more frequent one-to-one meetings than in the pre-pandemic period, more meetings just to check on each other, and how they are coping with workload, contributing to a more humanised and empathetic leadership style.

Leaders were also seen as modelling desired behaviours – not sending emails or having their Teams on before 9am, for instance, and there was an overall feeling that everyone tried to be kinder to others. Such forms of inclusive leadership reinforce the caring culture that has been associated with hybrid work in this organisation.

BETTER INSIGHTS

Our study demonstrates that with the increasing use of analytics in hybrid work, there are renewed possibilities for leaders to develop insights about employees' experiences that can be used to develop personalised engagement practices and interventions in a timely and targeted manner.

Engagement can be achieved in non-traditional work settings such as hybrid work, and leaders should adapt their behaviour and practices within the hybrid work setting to take account of the challenges employees may experience in this form of work arrangement. These practices appear to be more inclusive, humanised and empathetic.

We show that algorithmic management tools, such as Viva, and work analytics go beyond the provision of metrics on employee performance. They provide opportunities for adopting a human-centric leadership approach, one that encompasses attention to learning and development, wellbeing, and work-life balance. Individuals who lead in hybrid work settings need the skills and knowledge to deal with the challenges that employees are experiencing, so they can develop appropriate responses.

Ultimately, organisational leaders need to pay close attention to the data generated by algorithmic management tools. They should employ work analytics for the design and implementation of initiatives that consider the changing nature of work while ensuring the provision of individualised resources and the support required in the hybrid workplace.

This article is based around work on ***Reconfiguring digital embeddedness in hybrid work: The case of employee experience management platforms***, published in ***Information Systems Journal***; and ***Enhancing employee experience in the era of hybrid work: the case of Microsoft viva,*** published in ***IEEE Software***, both authored by Dr Blooma John, Dr Zeena Alsamarra'I, and Professor Niki Panteli.

This work was supported by the British Academy of Management (BAM)-Australian and New Zealand Academy of Management (ANZAM) Collaborative Research Award (2021-262-BAM-ANZAM).

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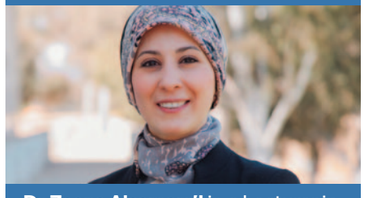

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Asteroids: The Future of Mining?

It may sound like the stuff of science fiction, but businesses and governments take the potential for asteroid mining seriously. *Dr Craig Jones* blasts into space to explore the situation today – and to see how close we are to theory becoming reality.

You have to go back to 1898 for the first mention of asteroid mining. It comes in Garrett P. Serviss's science fiction work ***Edison's Conquest of Mars***.

Science fiction may be where it remains for many of us, but in the intervening 127 years, much thought has gone into the subject.

From a science fiction trope, it became more prominent in science and military writings, particularly during the Cold War.

With the launch of Sputnik in 1957, the threat of nuclear war, and how to avoid it, discussions turned to creating space bases.

In 1963, Dandridge Cole was the first to estimate the potential worth of an asteroid, using spectroscopy. That method allows you to work out if it is an M-Class asteroid (metal-based), or C-Class (carbon-based). Among Cole's proposals was that you could hollow out an asteroid, mine its materials, then use the hollowed-out object as a base.

This was – and still is – theoretical, but the contemporary manifestation of asteroid mining is much closer than you might think – if still not as close as its proponents might like us to believe.

A NEW FRONTIER

Asteroid mining as a private sector endeavour started in 2012 when the first two asteroid mining companies announced themselves – ***Deep Space Industries*** and ***Planetary Resources***.

Both were bought out in 2018, but they have done the most in terms of shifting contemporary discourse around what asteroid mining is and what it can supposedly be used for.

The focus has been largely twofold – on finding water and on mining platinum group elements, shiny metals that can be brought back to Earth and used for multiple purposes.

Deep Space Industries' website had a whole page dedicated to discussing water. Their plans were to scan and show what percentage of each asteroid's surface was water and use that to rationalise their targeting.

You need water to live, and it would be very expensive to take it there from Earth. Astronauts would also get sick of drinking their own recycled fluids.

Another part of the argument is this water could be potentially used for off-Earth agriculture. They have been testing this on the International Space Station, to see how it would work, and there has been discussion around what would be needed to set up agriculture on the Moon if we were to have a lunar base.

A lot of this is discussed as in-situ resource utilisation, the idea being that the resources are already there, so you utilise them rather than taking everything with you.

There are questions of expense, the amount of fuel it would take, the rocket space needed – you want to pack as much stuff onto a rocket or a payload as possible to make the operation viable, so anything already there is a big saving.

You can also break water down into oxygen and hydrogen for fuel and life support systems.

The second material group the firms look for are construction group elements, so you can use an additive manufacturing process, like 3D printing, using these different construction metals from the asteroid.

The third group is volatiles, fun little gases. One potential use is as fertiliser, because you can use nitrogen and hydrogen in ammonia.

The fourth material grouping is that of platinum group elements and rare earth metals. This is the main material group that is often discussed as being brought back to Earth. They are often used in things like LCD TVs, but also a lot of sustainable technologies.

A SUSTAINABLE ARGUMENT?

One of the key arguments made by advocates of asteroid mining is that it can help create a sustainable future. Bringing those materials back can resource sustainable technologies.

The sustainability dimension is incredibly important right now. Not so much in terms of what these companies promise mining operations will do, but, as with many speculative technologies, rather it is important to understand what they are doing with their narrative in terms of moving responsibility away from the present moment to future generations.

By saying that we will one day be able to bring in more resources to Earth, and that we do not need to worry about exhausting those we have, they are kicking the can down the road.

We have things we can be doing now rather than trying to pin our hopes to these speculative dreams. People say space will make us infinitely sustainable, but we could – should – stop making loads of emissions now rather than hoping something better will come along in the future.

CLOSER THAN YOU THINK?

If this all still sounds like science fiction, then bear in mind governments are taking it seriously – and there are geopolitical factors at play even today.

There are important questions to ask around regulation and governance – ethical behaviour in outer space.

In 2015, the Obama administration in the US went forward with the US SPACE Act, essentially permitting asteroid mining within the US context. Luxembourg legalised asteroid mining in their context. There has been draft legislation in India, and both Russia and China have said they will join the scramble for extraterrestrial resources.

A key part of debate has been whether asteroid mining is compliant with the Outer Space Treaty of 1967, which states that outer space is the common heritage of all mankind and that no-one can make a sovereign claim to it.

But in 1967, there was no private enterprise involved in outer space, so the argument is the act only applies to nation states. The counterargument is that anything done in space is regulated, and is ultimately the responsibility of the country from where a mission is launched, or where the company launching it is based.

In a globalised context, that becomes harder. Does the responsibility lie with country a craft is launched from? The country the company is registered with? Or the country the spacecraft is registered with?

You have private corporations lobbying governments. Many will argue that it should remain unregulated, because otherwise it will kill off innovation. But will it? Or will they just work within the framework?

While asteroid mining is being driven by private companies, it has also started to become a geopolitical flashpoint – if not around asteroids themselves, then around lunar mining.

Different countries want to create lunar bases and scientific camps. This is led to the ***Artemis programme*** in America, the announcement that we are going back to the moon. China, Russia, Japan, India, and others want to be there as well.

Attached to that are the Artemis Accords, principles for a 'safe, peaceful and prosperous future in space'. The US, UK, Canada, Japan and India are among those signed up.

In parallel, you have the ***International Lunar Research Station***, an agreement between Russia, China, Pakistan, and others.

There are already dividing lines in space – between countries, and between the public and private sectors. Everyone has their ideas and ideals for what will happen next.

OR FURTHER AWAY?

But maybe we are not so close to asteroid mining after all.

There is a joke in the space sector that everything is always 10 years away. If you ask in 10 years, it is another 10 years.

There have been various promises of when asteroid mining will become a reality since 2012: first for 2020, then 2025. Now it is 2035.

There have been test launches, and companies are talking about testing satellites which would serve as prospecting units. This does not just test the overall technology, it creates spin-offs, different ways of commercialising operations through patents on equipment that can be used in other areas.

Then you have a company testing a mini refinery, which would be sent to a near-Earth object, pick the minerals it wants, excavate them, and fire itself back to Earth. If that works, that would be a major step.

But to my mind, the more realistic scenario is that people go back to the moon first. They probably are there for 50-100 years, then they look at asteroids. It is still some time away.

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Moving Away from Pollution

If where you live is polluted, would you want to move away? What if you could not afford to? *Dr Aurelie Slechten* outlines research that shows how economic inequalities mean it is often only the rich who have the money necessary to move from polluted neighbourhoods into clean ones.

Air pollution, particularly exposure to particulate matter (PM2.5) and nitrogen dioxide (NO2), poses a significant threat to public health and imposes substantial economic costs.

In 2016, exposure to particulate matter caused 4.1 million premature deaths globally. In the UK alone, the financial burden on the NHS and social care due to PM2.5 and NO2 was ***estimated at £42.88 million in 2017***, rising to £157 million when accounting for emerging evidence of other diseases.

These numbers highlight the pervasive impact of air pollution, particularly on vulnerable communities.

AN UNEVEN BURDEN

Environmental injustice occurs when certain populations - often low-income or minority communities - are disproportionately exposed to environmental hazards. The concept emerged in the 1980s in the United States, closely tied to grassroots movements against environmental racism.

In 2020, the tragic case of ***Ella Adoo-Kissi-Debrah***, a nine-year-old who died from asthma aggravated by air pollution in London, brought the health impacts of environmental injustice into sharp focus in the United Kingdom. The case highlights the urgent need for stricter environmental laws and more comprehensive policies to protect vulnerable populations.

The issue of disparities in exposure to pollution has spawned interest across multiple fields, including law, sociology, public policy, geosciences, and economics. Early work mostly focused on understanding the extent of environmental injustice and providing quantitative evidence of the uneven burden of pollution that falls on communities of colour or low-income households.

Quantifying pollution gaps across different pollutants and population groups is important for policymakers to allocate limited resources efficiently when working toward equity-related goals. While this is a critical first step, identifying the underlying mechanisms leading to these pollution disparities is essential for developing effective solutions.

One such mechanism is residential mobility, i.e. the movement of people from one home to another. ***Our study*** reveals how household income influences where people choose to live and the quality of their environment, painting a concerning picture of environmental inequality in the United States.

BEYOND SIMPLE CHOICES

We often hear about the voting with your feet phenomenon – the idea that people choose to live in areas that best match their preferences and needs, including environmental quality.

But this is not just about personal preferences. If clean air is an attribute everybody wants, this will drive up the price of clean neighbourhoods. What happens then, when clean air becomes a luxury only some can afford?

Our study reveals a self-reinforcing cycle that helps explain why environmental inequalities persist in America. When wealthier residents consistently choose cleaner areas, it leaves lower-income households concentrated in more polluted regions. This pattern does not just happen by chance – it is driven by the economic reality that cleaner environments often come with higher housing costs.

This dynamic creates what we as economists call a 'sorting effect', where households naturally separate themselves based on their ability to pay for environmental quality. It is similar to how people might sort themselves based on school quality or crime rates, but with one crucial difference: while you can choose to invest in private education or security systems, you cannot easily escape poor air quality in your neighbourhood.

TRACKING MOVEMENT AND INCOME

Using detailed IRS migration data from 2010 to 2014, we analysed how Americans moved between counties – local administrative divisions in US states. This unique dataset captured information from nearly 98% of all tax filers, making it the most comprehensive view of population movements within the United States ever studied in this context.

What makes our study particularly interesting is that we did not just look at where people moved – but also at how much money they made compared to those who stayed behind. We looked at two key measures of environmental quality:

- PM2.5 concentrations: tiny air pollution particles, less than 2.5 micrometres in diameter, that can penetrate deep into the lungs and bloodstream, posing serious health risks
- The number of facilities reporting to the EPA's Toxic Release Inventory (essentially, a count of major polluting industries in an area)

The findings were stark: people with higher incomes were more likely to move to areas with cleaner air.

For example, counties with six micrograms of PM2.5 per cubic meter attracted, on average, 3% more movers than those with eight micrograms. Additionally, movers to less polluted areas had incomes 7% higher than those relocating to more polluted regions. This is concerning, as s***everal studies have shown*** that a 1 μg/m³ increase in PM2.5 is associated with a 0.6%–1.2% increase in all-cause mortality.

It is a modern-day tale of environmental privilege – the ability to buy your way to cleaner air.

COMPLEX DECISION-MAKING

Residential choices depend on more than just environmental quality. Understanding migration patterns and their relationship with environmental quality requires careful consideration of numerous factors that influence where people choose to live.

Job opportunities play a crucial role – people might accept lower environmental quality if it means better employment prospects. Local amenities such as parks, schools, and shopping areas also factor in. Demographics of potential destinations matter too, as people often prefer to live in communities like their own. And of course, the costs of moving itself – both financial and personal – can significantly impact choices.

Even after considering all these factors, the relationship between income and environmental quality held strong.

IMPLICATIONS FOR ENVIRONMENTAL JUSTICE

Our findings challenge traditional approaches to tackling pollution and how we think about environmental justice. While stricter regulations and clean-up initiatives are essential, they may not address the root causes of environmental inequality. Wealthier residents can 'escape' polluted areas, leaving lower-income families behind and further entrenching disparities.

The results of our related study published in 2021 add another layer to the issue: polluting companies in poorer areas tend to invest less in pollution prevention, exacerbating environmental harm in poorer communities. This creates a vicious cycle, where pollution drives wealthier residents away, further concentrating poverty and pollution.

BREAKING THE CYCLE

Addressing environmental inequality requires a multi-dimensional approach.

Environmental policies must be coordinated with social policies that address income inequality and housing affordability. For example, when the US Environmental Protection Agency designates an area as having poor air quality, it triggers various clean-up requirements.

However, if wealthier residents simply move away before improvements take effect, it could further concentrate poverty in polluted areas. Efforts to clean up polluted areas should be paired with measures ensuring equitable access to these improved environments.

The stark reality is that in many places income determines access to clean air. As the case of Ella Adoo-Kissi-Debrah reminds us, the right to breathe clean air should not depend on economic privilege. Tackling these issues is critical for creating a more just and sustainable future.

Dr Aurelie Slechten is a Senior Lecturer in the Department of Economics. Her main research interests revolve around Environmental Economics, Applied Microeconomics, and Market Design.

The paper ***Tiebout Sorting and Toxic Releases*** by Dr Aurelie Slechten, Professor Dakshina De Silva, and Dr Anita Schiller, of Lancaster University Management School; and Dr Leonard Wolk, of Vrije Universiteit Amsterdam, is published in ***Environmental and Resource Economics.***

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The Hidden Mental Toll of Your Morning Cuppa

You might feel the impact of a rise or fall of the cost of coffee beans when you tot up the expense of a visit to your local coffee shop. But while you may grumble about a small price increase, there are others who suffer much more because of market fluctuations. ***Dr Saurabh Singhal*** shows how the mental health and wellbeing of farmers thousands of miles away is affected by events far beyond their control.

Have you ever considered the journey that coffee takes from the farm to your cup? Behind every sip of your favourite brew - at home, in a café, or from a takeaway - lies the toil of coffee farmers facing unique challenges.

Farmers in developing countries face myriad risks that threaten their livelihoods and security. These include extreme weather events, pests and plant diseases, which can devastate crops and reduce yields.

Then there is the unpredictable nature of coffee prices.

Farmers on small holdings across the world are affected by international markets that determine how much money they will receive for their products. Prices are famously unpredictable, swinging up and down due to weather, market demand, and the global economy.

This adds another layer of worry and uncertainty – casting a shadow over their professional and family lives. Farmers cannot easily change how much coffee they produce based on price changes, and the price instability means they cannot be sure about their income at harvest time. The resulting stress can lead to depressive symptoms and a feeling you have lost control – helplessness, hopelessness.

Our research shows how these volatile prices affect the mental health of farmers in Vietnam, which has accelerated over the last three decades from accounting for just 1.2 per cent of world output in 1989, to become the second largest coffee producer in the world, after Brazil.

BEYOND THEIR CONTROL

Looking at the picture from the point-of-view of coffee farmers shows how few things they can control.

The coffee tree takes about three years to bear fruit and lasts around 50 years. There is little the farmer can do to change the output. They know, for example, they have 100 trees, and from experience approximately how many beans they will get. But they do not know the price they will receive. The farmer will be asking 'how much will I get per pound of coffee beans? How much income will I have?' They cannot control the price – their hands are tied by factors beyond their land, their harvest, and their work.

Some of these farmers may be just about keeping their heads above water. If there is even a small drop in income for one or two months, that could be all it takes to push them under.

But poor or not, the fact there is income uncertainty – that you do not know how much money you will have in your pocket one day from now or one month from now – creates a lot of stress and tension. You do not know how to plan; you cannot budget.

As a coffee drinker, you might see the price of your cup of coffee go down or – far more likely – up. But does this feed back to the farmer? If you pay 10p more per cup, are they seeing the same benefit? Simply put, no.

There are a lot of steps between what we pay and what the farmer gets. The money the farmer receives is a small fraction of what we pay in the coffee shop.

It is not just one farmer or one village increasing or decreasing their supply that influences the price they get; it is a whole bigger market sometimes thousands of miles from their homes. For example, if there is a drought in Brazil, that can lead to global coffee prices shooting up, transmitting down to the small farmers in Vietnam.

HEALTH IMPLICATIONS

These uncontrollable factors can cause health problems for the farmers.

We used data from a long-running survey covering rural farming households in 12 provinces of Vietnam. In the survey, respondents are asked how often they experience sadness, hopelessness, a lack of concentration and poor sleep etc. To investigate the effect of coffee price volatility on these factors, we merged the household survey data with the monthly international coffee prices published by the ***International Coffee Organization***.

We found clear evidence that exposure to increased price volatility leads to greater incidence of depressive symptoms among the farmers. They also have poorer health, lower levels of happiness, increased cognitive load and alcohol consumption, and reduced social capital, all reducing overall well-being.

In addition to the depressive symptoms, we found that farmers' reported levels of happiness and life satisfaction are negatively affected. They are more likely to say they have problems in remembering things, which points to the fact that if you are constantly stressed about money, you have little mental bandwidth for other things.

The farmers also report poorer physical health. They have more body aches – which medical research shows is more likely when you are stressed, as your threshold for enduring physical pain goes down.

We asked the farmers how many days of work they lost due to these depressive symptoms. These are days when they are not able to do their usual activities, whether it is work or household chores, etc. The number of those days increases by 0.6 days per week. The farmers cannot process or concentrate on what they need to do. They need to lie down. That has a cost – in terms of both health and economics.

There is a direct relationship between poverty and mental health. That probably seems obvious. What we are showing is that it is not just poverty that matters in these low-income settings, it is also income uncertainty. This adds another feature affecting mental health.

While we have looked at Vietnamese coffee farmers, these effects could be applied elsewhere. From similar workers in Global South nations in industries affected by people living far away, to those on zero-hours contracts here in the UK, and for whom there is no certainty from one week to the next over how many hours they will work.

THERE ARE OPTIONS

We have identified several long-term actions for government to help the farmers.

For example, they could work with farmers to show them how they might take out long-term fixed-price contracts with buyers – essentially selling their output before harvest. These agreements would mean the farmers know how much money they will receive. But for this to happen, the farmers need a certain level of financial literacy, which is where the government could come in with education programmes.

There are also certain organisations, such as Fairtrade or Rainforest Alliance, who guarantee farmers a minimum price. They compute this based on the cost of production etc. and guarantee the farmer will receive it even if the international price goes below that level. If the price is above that level, then the farmer gets a premium. Additionally, farmers receive funds to invest in projects that improve quality of life for them and their communities. Using data from Costa Rica, ***recent research*** found Fairtrade certification increases farmers' income.

Both these solutions provide added security. The farmers know at least some stable income will be coming in.

As consumers, we can play a role by purchasing these certified coffees.

Equally important are programmes that prioritise mental health support within farming communities, providing resources for coping with stress and building resilience for farmers who are having a tough time.

The main thing is that action is needed, and leaving farmers in this perpetual state of stress and ill-health is unsustainable.

Dr Saurabh Singhal is a Senior Lecturer in the Department of Economics. His research interests include the political economy of development, human capital development issues, and experimental economics.

The article ***Commodity price volatility and the psychological wellbeing of farmers***, by Dr Saurabh Singhal and Dr Finn Tarp, of the University of Copenhagen, is published in the ***American Journal of Agricultural Economics***.

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A NATIONAL RESET ON WORKFORCE HEALTH

With almost three million people out of the UK workforce due to ill health, what can be done to address the problem? The Work Foundation's *Asli Atay* presents research showing the importance of preventing these workers leaving jobs in the first place and making the workplace more accessible for them.

The UK is facing a health crisis – and its impact is rippling through the labour market. With more than nine million people out of the workforce and 2.8 million citing ill health as the primary reason, the Government's ambitious target of an 80% employment rate feels increasingly out of reach. Achieving it would mean bringing approximately two million more people into work – a task that is impossible without a radical change in approach.

For too long, policy efforts have focused on getting people back into work rather than preventing them from leaving in the first place. This reactive mindset has created a cycle of poor health and economic inactivity. We need a national reset on workforce health, one that prioritises prevention and equips employers to take meaningful, proactive steps.

BAD WORK AND HEALTH

The UK is the only G7 country with a smaller workforce now than before the pandemic. This is no coincidence. It reflects decades of neglecting the complex relationship between health and employment.

Policymakers have traditionally centred on the negative impact of unemployment on health. While being out of work undeniably harms wellbeing, poor-quality work can be just as damaging. Bad jobs with inflexible schedules, high stress, and low autonomy do not just make people miserable; they make them ill. Addressing workforce health demands a comprehensive approach that tackles both unemployment and poor job quality.

At ***the Work Foundation***, we sought to understand what drives people out of the labour market due to ill health and how they can be better supported. ***Our research***, involving longitudinal data from the Understanding Society dataset and insights from more than1,000 senior business leaders, paints a clear picture of the challenges and opportunities in creating healthier workplaces.

Our analysis revealed that nearly one in ten employees who experienced a health issue between 2017 and 2019 had exited the workforce by 2021. Alarmingly, almost half of these exits occurred within the first year of illness, highlighting the importance of timely interventions.

Certain groups are disproportionately at risk. Unsurprisingly, workers with three or more health conditions are 5.6 times more likely to leave the workforce than those with no health conditions.

Mental health is a particularly acute concern. Employees with poor mental health are nearly twice as likely to leave work after falling ill compared to their peers with good mental health. With mental health now a leading reason for workforce exits, the status quo is unsustainable.

MOVING BEYOND AWARENESS

Employers are aware of the problem, but awareness alone is not enough. Our research reveals a significant gap between recognising the issue and taking action. While 64% of senior leaders acknowledge that poor employee health affects organisational performance, fewer than half offer flexible working arrangements – a proven strategy for retaining employees with health conditions.

This gap is troubling, especially when flexibility and autonomy can make the difference between retaining talent and losing it. Workers with no flexibility are four times more likely to leave their jobs. Similarly, those with little control over their tasks, hours, or workload are 3.7 times more likely to exit.

These are actionable insights, yet many employers are trapped in a reactive mode, addressing problems only when they arise instead of preventing them.

A HEALTHIER WORKFORCE

It is time for a national reset on workforce health. This means moving from downstream, reactive measures to upstream, preventative ones. The Government must lead the way with bold reforms:

Improve job quality: Enact the long-awaited ***Employment Rights Bill*** to ensure secure, flexible working from day one. Enhance paid leave entitlements to reflect the realities of longer working lives, and update the Health and Safety at Work Act to account for modern challenges like mental health and chronic illness.

Integrate occupational health with public health: Establish a UK-wide network of workforce health hubs. These hubs should provide accessible support to small and medium-sized enterprises (SMEs), which often lack the resources to tackle workforce health issues independently.

Enhance Statutory Sick Pay (SSP): Increase SSP to provide a meaningful safety net for employees. This includes abolishing the income threshold and waiting period, as proposed in the Employment Rights Bill, and raising SSP to 60% of wages or the Real Living Wage, prorated by hours worked, whichever is higher.

Employers must also step up. It is no longer acceptable to view workforce health as someone else's problem or as a burden too big to bear. Healthier workplaces are an investment, not an expense. By adopting flexible working policies, redesigning jobs for greater autonomy, and prioritising mental health, businesses can protect their bottom line and contribute to a healthier society.

The alternative is stark. Continued economic inactivity and growing inequality risk undermining the Government's ambitious vision to grow the labour market and improve working conditions. Without action, those people who need help the most will be left further behind, exacerbating existing social and economic divides.

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The report ***Stemming the tide: Healthier jobs to tackle economic inactivity***, is authored by Asli Atay, Rebecca Florisson, George D. Williams, and Alice Martin, of the Work Foundation; and Professor Stavroula Leka, of Lancaster University Management School.

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What does having a social impact mean for business?

Businesses are increasingly interested in understanding their contribution to societal well-being. *Beatriz Bonilla Berrocal* outlines how having a positive impact and being socially responsible have shifted from being an option to becoming a key driver for companies.

Corporate responsibility has an influence on the sustainable development of companies worldwide. The phenomenon is caused by its impact on increasing the value of companies, related to a greater awareness of not focusing efforts exclusively on achieving good financial results.

Impact, specifically social impact, relates directly to sustainable development objectives and is increasingly reflected in business management practices. The concepts align corporate mission, values and activity with the growing sensitivity to social and environmental issues.

Sustainability is a priority on the global development agenda, and both public and private companies are an integral part of that agenda. More and more companies are strategically assuming the role of sustainability and corporate responsibility, not merely from an ethical perspective, but actively referring to their competitiveness and productivity. Each initiative and project leaves a footprint that directly or indirectly affects the community in which a company operates.

COMMITMENT AND SOCIAL RESPONSIBILITY

Currently, the significance of the social aspect often takes precedence over the economic and environmental aspects in those companies that take a sustainability approach seriously. This is not surprising, as actions in this area often return benefits, such as talent retention, increased resilience, and improved reputation, which translate into greater loyalty from customers and employees, creating trust among stakeholders and, consequently, a better market position. This all adds more value to the business.

Companies around the world have adopted measures to achieve significant progress in generating positive societal impacts. In recent years, the role of businesses as generators of value in society has been increasingly recognised, internalising the vision of becoming fundamental pillars of a country's development.

CORPORATE PURPOSE

A social purpose can play a central role in business operations. Companies that

incorporate social impact at the core of their strategy are more competitive and better positioned to create value for all their stakeholders.

For the past few years, a transformation has been taking place, an evolution of business models towards sustainable principles, where more attention is paid to generating meaningful changes that focus on solving societal problems and meeting the current market demand.

Corporate social responsibility thus becomes synonymous with productivity, generating value concerning social and environmental concerns, encouraging the commitment of human talent, building a better reputation, and creating new models of innovation.

SOCIAL INITIATIVES

We can classify some of the initiatives companies undertake regarding the social aspect, internally and externally, into eight main categories:

1 Fair and dignified working conditions, ensuring fair wages, adequate rest periods, safe working conditions, and compliance with labour laws.

2 Diversity and equity in employment, promoting diversity within the company and ensuring equal opportunities and career advancement without gender or racial discrimination.

3 Environmental responsibility, through the commitment to minimise impact on the environment, as well as respecting the life and dignity of living beings in their surroundings.

4 Contribution to social justice, through the adoption of measures that ensure activities do not contribute to the creation or promotion of injustices.

5 Donations for sustainability causes, financially contributing to projects related to sustainability.

6 Recycling, through the implementation of policies, such as the reuse of products at different stages of production, thus reducing waste.

7 Solidarity activities, through the organisation of activities that raise funds for community projects.

8 Promotion of renewable energies, through the adoption of energy sources that reduce greenhouse gas emissions.

EVALUATING IMPACT

In seeking to generate an impact, it is imperative for companies to establish indicators of success. This measurement becomes essential to evaluate how a company contributes to the well-being of society.

Although there is no single framework, there are several common methodologies adopted to measure it, including:

A Theory of change: Acting as a roadmap to analyse the causal relationship between a company's activities and its social impact, helping to define the objectives and determining the necessary strategies and actions to reach them.

B Social Return on Investment (SROI): Based on the idea of assigning a monetary value to the social impact generated and inspired by the economic indicator of Return on Investment, but incorporating the concept of social value, allowing for a tangible quantification of the social benefits resulting from business actions, and facilitating the evaluation of their impact.

C IRIS (Impact Reporting and Investment Standards): A catalogue of metrics designed to measure social, environmental, and financial value. Providing a set of standardised indicators that companies can use to assess their impact by collecting relevant data and reporting on their performance in terms of ESG (Environmental, Social, and Governance) criteria, contributing to greater transparency.

SOCIAL INVESTMENT OR STRATEGIC PHILANTHROPY

It is important to emphasise the role of investments in these initiatives. In many businesses, social investments focused on external groups predominate, which can be referred to as the shift from charity to social investment. Some companies argue that philanthropy should be strategic because by using the company's own skills and expertise, the greatest possible economic and social value is generated.

There are different forms of corporate social investment depending on the context, including:

1 Creating internal programmes within the company.

2 Creating organisations outside the company, such as foundations, corporations, or associations that support existing NGOs.

3 Participating in social programmes led by the sector to which they belong.

4 Participating in government programmes.

The landscape is diverse regarding social investments by companies. Although social investment is recognised, strategic philanthropy holds a special place in fostering collaborative initiatives. Through the integration of social management strategies with business strategies, companies manage to generate social value and economic value with their social interventions, increasing the likelihood of the intervention's survival, and providing an experience and logistics that are difficult to obtain otherwise.

A social initiative integrated within the business has different characteristics from social investments detached from the business, and it has a high potential impact due to the possible synergy between the economic and the social realms.

BUSINESS CHALLENGES

In an increasingly globalised and complex world, companies face a series of challenges that go beyond economic profitability. Climate change, social inequality, and food insecurity, among others, must be addressed to be sustainable in the long term.

As a result, a great diversity of business initiatives are emerging as solutions to meet various needs. Each has an impact on workers, suppliers, customers, competitors, the local community, and specific sectors of society.

More and more companies are investing in being socially responsible and maintaining sustainable development. This shift could reflect a growing ethical business commitment but also emerges as a solid strategy in response to economic instability, seeking business sustainability alternatives. Despite this, the promotion of corporate social impact is a fundamental pillar for sustainable development and the well-being of society.

The adoption of corporate social responsibility practices has a significant potential for benefiting businesses while generating a positive impact on society, the environment, and employees. By committing to actions ranging from production efficiency and equal employment opportunities to environmental preservation and waste reuse, organisations can significantly and tangibly contribute to the well-being of the communities where they operate and to society in general.

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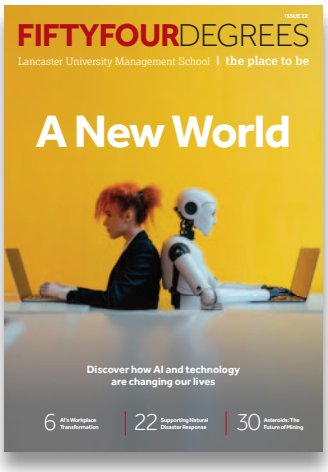

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