AI READY: SHAPING TOMORROW WITH AI AND HUMAN INTELLIGENCE

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THINKERS
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Hult is for those made to do. Hult strives to create a better future for all by inspiring and challenging everyone within its dynamic community to make an impact that matters. With program offerings from undergraduate through doctorate levels, a global campus network, and a student body that represents more than 150 nationalities, Hult proudly pioneers a 'learn by doing' approach. Hult is recognized by top international accrediting bodies including the Association to Advance Collegiate Schools of Business (AACSB), the Association of MBAs (AMBA), and The European Quality Improvement System (EQUIS). Learn more by visiting www.hult.edu.

About Thinkers50

Thinkers50 (thinkers50.com) is the world's most reliable resource for identifying, ranking and sharing the leading management ideas of our age. Established in 2001, it publishes its global ranking of management thinkers, the Thinkers50 Radar, Thinkers50 Hall of Fame, Thinkers50 Booklists, Leaders50, Coaching Legends and Coaches50.

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Foreword

The financial crisis of 2007-2008 and the Coronavirus pandemic were global events of seismic human, organizational and financial significance. They were also notable for catching the world under-prepared. In the aftermath of these events there has been a great deal of talk and research in the areas of resilience and preparedness for the future. The phrase *future readiness* is now used routinely in the business world.

Readiness, of course, comes with caveats. No organization can be fully insulated from the vicissitudes of changing circumstances and shifting contexts. But that does not mean that the quest for readiness is anything other than essential for any global organization.

Nowhere is this more apparent than in the area of technology and Artificial Intelligence (AI) in particular. While the full potential and ramifications of AI cannot be fully understood at this point in its rapid and exciting development, it is critical that all responsible and future-looking organizations begin to think about how AI will impact their business, their people and customers. Being AI-ready is a means of understanding the rapidly changing world so that your organization is as well prepared as is realistically possible to lead the way in maximizing the human and financial value of AI.

With this in mind, Thinkers50 is delighted to be partnering with Hult International Business School in publishing *AI Ready: Shaping Tomorrow with AI and Human Intelligence*

What is exciting about this collection of articles and insights is that they explore the human and organizational potential for AI drawing on the worlds of best practice and rigorous research. Be warned, the picture they paint is at times a daunting one. There is no doubt that AI has the power to re-shape entire industries and that it poses new sets of managerial challenges — and opportunities. But, fearfulness is not the best preparation for the future. Instead, the emphasis in *AI Ready* is on helping you navigate a safe, prosperous and fulfilling route into the future with AI augmenting human creativity, industry and entrepreneurialism.

Being future-ready is a necessary condition for tomorrow's success. Let *AI Ready* help you begin that process.

Stuart Crainer
Co-founder Thinkers50

Introduction: Navigating the AI Revolution—A Global Perspective

JOHAN ROOS

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The convergence of human ingenuity and artificial intelligence creates unprecedented opportunities and profound challenges for organizations worldwide. At Hult International Business School, our laboratory of global innovation - enriched by the perspectives of students and faculty from over 150 nations - serves as a living testament to this transformation. Having led change initiatives across diverse institutions over several decades, I can attest that Hult's nimble structure and culture enables it to adapt more rapidly than many academic institutions. Our early embrace of Generative AI reflects not merely a technological experiment, but rather a fundamental reimagining of education and leadership in an age of radical change.

Why venture into these uncharted waters now? The answer lies in the compelling intersection of necessity and possibility. Generative AI emerges not as another tool in our arsenal, but as a force that fundamentally reshapes the landscape of academic value creation - much like the printing press once transformed the dissemination of knowledge. At Hult, we recognized this seismic shift early. In early 2023, we began weaving Generative AI into the fabric of our curriculum and research processes, discovering its power to streamline administrative tasks, amplify imagination, and deepen our engagement with students. This journey of discovery, while not without its storms, has yielded invaluable insights: AI's greatest promise lies not in supplanting human wisdom but in elevating it to new heights.

The voices gathered in this volume represent Hult's vanguard - faculty members who have ventured beyond theoretical discourse into the practical realm of AI integration. Through their experiences, they illuminate a path forward for both academic and practitioner communities, addressing essential questions: How do we harness AI's transformative potential while safeguarding human values? What defines ethical leadership in an AI-driven world? How can we prepare organizations not merely to weather this technological tsunami but to ride its waves toward greater performance?

Together, these chapters weave a tapestry of insights into building AI-ready organizations. Rather than offering simplistic solutions, they provide a foundation for thoughtful action and adaptation.

As you journey through this volume, we hope you will see not just the challenges but the immense opportunities that AI presents. At Hult, we believe that the future of education—and indeed of business—lies

in embracing this transformative change with curiosity, courage, and a commitment to shared learning. It is in this spirit that we present this book, as a catalyst for dialogue, innovation, and, ultimately, progress.

About the Author

Johan Roos is an internationally renowned scholar, academic leader, and advisor. Following nine years as Chief Academic Officer at Hult International Business School, he now serves as an independent Presidential Advisor to the institution.

Bridging Cultures: How Human-AI Collaboration is Redefining Teams

PATRICK LYNCH, KATELYN LYNCH, AND OMAR SHANTI

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Jordan leaned forward, eyes fixed on the AI dashboard pulsing with insights. "What do you think about the market shift in Southeast Asia?" he asked. The AI answered in a soothing tone, "Based on the latest economic indicators and social media sentiment, I'd suggest a 12% resource reallocation to Vietnam. However, Jordan, real-world experience might reveal factors I've missed."

As he jotted notes for the upcoming board meeting, Jordan nodded with a smile on his lips, "We've come a long way." He marveled at how seamlessly the AI integrated into the team, becoming a valued partner in complex decisions. Jordan stood up, energized. "Time to present our findings," he said. As he walked, he wondered how this relationship between humans and AI would reshape the future of work – and if the world was ready for it.

From accountants to zoologists, artificial intelligence (AI) is reshaping work. More than *when*, it's a question of *how* human-AI collaboration will transform teams and corporate cultures. AI already complements many jobs and augments human decision-making. This shift brings unique opportunities and challenges, particularly as we grapple with our tendency to attach human characteristics to these digital colleagues. Just ask Jordan, whose AI sidekick coworker makes him look like a genius! Savvy business leaders are turning to an unexpected source of wisdom: classic group dynamics, leading to the creation of cohesive high-performing teams. These insights offer a roadmap for integrating AI into teams, preparing organizations for the future of work where the lines between humans and AI increasingly blur. What shape will this take?

Human AI Machine: The Other 'Us'

Humans have a remarkable tendency to anthropomorphize non-human *things*. From the 1970s Pet Rock craze to the enduring Chia Pets, we've long attributed human qualities to inanimate objects. Consumer studies show that naming these objects transforms them from commodities into sacred items, indispensable to our self-esteem, increasing psychological ownership and attachment.

Our naming habit extends beyond trinkets to ships and planes, which we frequently endow with human qualities. Studies show that we quickly personify self-driving cars, giving names and motivations. People even admit to naming their robot vacuums – "Hazel," is the most popular by the way. This tendency to humanize technology significantly influences our trust and acceptance of innovations.

Anthropomorphizing naturally extends to AI, often by design. AI agents like Engineered Art's Ameca and Hanson Robotics' Sophia express human-like emotions and personalities. Turing Test science fiction films such as "Her" and "Ex Machina" portray intimate, sometimes unsettling human-AI connections. These cultural representations hint at a future where AI is deeply integrated into daily lives.

Think about how you interact with your smartphone or a virtual assistant like Alexa or bot like ChatGPT. Have you ever said "thank you" after it completed a task? Or felt annoyed when it didn't understand you? These reactions are examples of how we unconsciously treat technology as if it were human. But why do we do this?

According to Reeves and Nass's (1996) theory of Computers as Social Actors (CASA)[1], the answer is in our evolutionary past. Across the ages, if something communicated like a person, it was a person. Our brains developed to interpret certain cues, like a voice responding to us, as signs of human interaction. Even though we now live in a world full of advanced technology, we instinctively react to these cues in the same way. This happens unconsciously, even when we consciously know we're dealing with a machine.

To capture the essence of our reactions to human-like machines, we distilled CASA's key principles:

- **Automatic Acceptance:** Readiness to suspend disbelief and interact with human-like machines as if they were human.
- **Adaptive Social Response:** Willingness to reciprocate courtesies with human-like machines as they would other people.
- **Anthropomorphic Cues:** Responsiveness to human-like machines with vicarious empathy.

These principles are especially true when it comes to interactions with robots imitating human-like features with a face, voice, or personality. A study of Nao, a small humanoid robot, revealed blurred lines between human-machine interactions. Participants, tasked with helping Nao 'learn,' were faced with turning it off. When Nao protested, expressing fear of the dark, many refused or hesitated significantly longer to switch it off compared to when it remained silent. It's similar to how we might follow the directions of a person, expert – or think about it – boss. This extends CASA, by demonstrating how displays of autonomy may shift our perception of machines as sentient beings.

Even simple devices like Tamagotchi toys, with their pixelated 'baby-like' faces, can trigger strong nurturing instincts. This tendency to emotionally connect with technology has profound implications for human-AI interaction. As AI systems evolve, our engagement with them may become indistinguishable from human interactions, both in play and work.

The blurred lines between human and AI interaction extends beyond toys to professional settings. Major companies now employ AI for customer service. As AI incorporates more sophisticated social cues and adaptive behaviors, CASA predicts our interactions will increasingly mirror human dynamics. This poses a crucial question for businesses: How will the integration of human-like AI reshape teamwork and corporate culture?

Silicon Synergy: Navigating the Four Faces of AI Intelligence

Welcome to the era of AI co-workers. A world where routine tasks are handled by silicon sidekicks, freeing human creativity. This isn't science fiction, it's the emerging reality of human-AI collaboration impacting jobs and the nature of work. Huang and Rust's (2018)[2] groundbreaking perspective highlights AI's role as both innovator and disruptor. In our workshops, we've distilled this into the 'Four Faces of AI Intelligence,' a taxonomy for the AI revolution. Ready to meet your new teammates?

Mechanical Intelligence: The Digital Heavy Lifter

Picture an AI as the world's most efficient intern, tirelessly handling repetitive tasks without complaint or coffee breaks. From automated data entry to inventory management, AI takes the grunt work that once consumed hours of human time. AI data entry tools process vast amounts of information quickly, reducing errors and increasing efficiency. In warehouses, robots guided by AI zip through aisles, packing orders with superhuman speed and accuracy. This type of intelligence also powers basic customer service. For instance, chatbots handle routine customer inquiries around the clock, providing instant responses and freeing humans to tackle more complex issues.

Analytical Intelligence: The Number-Crunching Ninja

AI transforms from intern to analyst extraordinaire. With its ability to digest vast amounts of data at lightning speed, AI is revolutionizing fields like finance and marketing. Imagine an AI that can analyze markets, customer behaviors, and economic indicators simultaneously, providing reports that would take a human team weeks to compile. In finance, AI algorithms analyze markets, track stock movements, and optimize investment strategies. This boosts productivity and enables more informed decision-making. Analytical intelligence enables AI to see patterns at lightning speed, making it the number-crunching ninja of the digital age.

Intuitive Intelligence: The Silicon Valley Psychic

This is where AI starts to get eerily smart. Intuitive intelligence represents AI's ability to make sense of complex, ambiguous situations, almost like a silicon psychic. In fields like product development or trend forecasting, AI can identify strategies that humans might miss, helping companies stay ahead of the curve. AI systems in healthcare, for example, assist doctors by analyzing medical images and suggesting potential diagnoses. These sophisticated systems don't replace doctors but augment their capabilities, allowing them to make more accurate and timely decisions. In creative industries, AI tools generate prototypes or suggest improvements based on vast datasets of previous work, sparking new ideas for designers.

Empathetic Intelligence: The Circuitry with a Heart

The final frontier, where AI attempts to understand and respond to human emotions. Empathetic intelligence aims to infuse AI with the ability to understand and respond to human emotions. Better than their Heavy Lifter cousins, this AI manages customer queries while adapting responses to the customer's tone and sentiment. It even makes strides toward companionship and counseling, offering personalized interactions that can adapt to a user's emotional state. This "circuitry with a heart" is seen in AI applications designed for mental health, where virtual therapists provide vital support. Although these systems may not replace human therapists, they offer valuable assistance in managing large volumes of patients and providing immediate interventions.

The depth and breadth of these AI intelligences mean we have crossed into an AI Industrial Revolution. The prior century saw the rise of simple machines shifting jobs from farms to factories over decades. Robots took over assembly lines and harvesters replaced manual labor. Now, AI's Four Faces are swiftly transforming work giving way to the AI analyst of today and the creative collaborator of tomorrow. We should expect AI

to progressively show its Four Faces, starting with mechanical tasks and moving towards more complex, empathetic ones. This progression shifts the role of human workers, with AI first augmenting and then potentially replacing certain job functions.

This AI revolution isn't just machines replacing workers. While most occupations involve some tasks ripe for AI automation, few are entirely automatable, suggesting that people remain central to the workforce. Daugherty and Wilson (2018)[3] see an intersection of human and AI where human creativity, emotional intelligence, and complex problem-solving remain as critical as ever. A key to success is in reimagining roles to combine the strengths of both. Organizations that master this human-AI synergy should thrive building cultures where humans and AI elevate each other, driving growth and competitive value in ways we're only beginning to imagine.

The AI Quartet: Orchestrating Human-AI Collaboration

So, we know *what* AI can do. But how will we view AI as it does it? With our tendency to personify technology and its pervasiveness in the future of work, leaders should prepare for blurred lines between human and AI team members. They should anticipate integrating AI as a collaborative partner based on its *perceived* functionality and "humanity." Luckily, this evolution should mirror familiar team dynamics, while reshaping organizational culture.

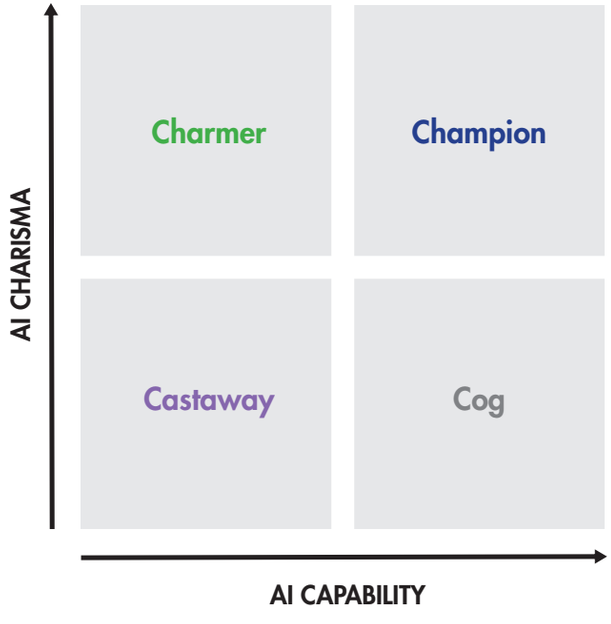
Human-AI Team Formation

Bruce Tuckman's (1965) renowned team development model[4]—Forming, Storming, Norming, and Performing—offers a way to view this integration. Long applied to human teams, this takes on new relevance in the age of AI, providing leaders with a guide for managing the complexities of human-AI teamwork. The challenges of AI integration are likely to parallel those seen in cross-cultural teams, where leadership strategies must be tailored to diverse cultural contexts. As with human teams, conflicts during multicultural group formation are not always rooted in reality, perception is key. Stereotypes and perceived threats will impact how employees view AI teammates. Teams may fear AI as an ultra-competent competitor or dread it as an ineffective burden. Leaders must prepare to bridge human-AI divides as they would cultural gaps in global teams.

Tuckman's four stages of team development take on new dimensions when applied to AI integration. In the Forming stage, teams are introduced to AI, balancing excitement with uncertainty. Leaders must guide this phase, setting the tone for how AI fits with the team. The **Storming** stage brings conflicts as teams engage more deeply with AI, questioning its reliability and impact on job roles. Leaders need to address concerns proactively, fostering open dialogue. As teams enter the **Norming** stage, they establish new workflows and redefine roles, optimizing AI capabilities while focusing human skills on creative and strategic tasks. In the **Performing** stage, human-AI interactions become seamless, leading to enhanced productivity and continuous refinement of collaboration.

It's important to see this process as cyclical and dynamic. Teams constantly evolve as they face new challenges, shift in composition, or develop capabilities. As AI becomes more sophisticated, teams will naturally evolve, reflecting the interplay between human *perceptions* of AI.

We anticipate the emergence of an 'AI Quartet' - four distinct archetypes of AI team personas, each characterized by unique combinations of perceived AI capability and charisma:



The Castaway (Low Capability, Low Charisma):

In this quadrant, we encounter an AI team member that is perceived to fail on both functional and interpersonal fronts. This AI lacks advanced cognitive abilities and struggles to provide meaningful contributions, often leading to frustration. The Castaway is perceived as an outsider, a tool that's neither efficient nor relationally engaging.

Imagine an "AI Compliance Officer" that rigidly enforces rules without context, makes frequent errors, and alienates team members with its cold, authoritarian demeanor. Like early customer service chatbots, it struggles to provide meaningful contributions and becomes an easy scapegoat for team frustrations.

For leaders, this scenario presents a significant challenge. The Castaway AI can become a source of team tension rather than an asset, potentially hampering productivity and morale. If the AI is deemed essential, seek to improve its capabilities or reconsider its role within the team.

The Charmer (Low Capability, High Charisma):

Here we connect with an AI team member that excels in personability but falls short in practicality. The Charmer initially earns deep personification and positive responses from team members. Its ability to engage in social niceties and emulate human-like interactions creates a sense of emotional connection within the team. However, this initial appeal masks its limited utility, leading to complex team dynamics.

Picture a "Virtual Office Buddy" AI hologram. It delights with social niceties, greets team members warmly, shares jokes, and offers motivational quotes. While it may create a positive atmosphere, its inability to contribute to actual work renders it more of a novelty than a productive team member.

For leaders, the Charmer's positive impact on team morale and workplace atmosphere can be valuable, potentially improving job satisfaction and cohesion. However, the risk of it being perceived as a costly distraction or an inefficient use of resources is significant.

The Cog (High Capability, Low Charisma):

Meet the AI team member that excels in task execution but lacks presence. The Cog's high capability ensures its value to the team, consistently delivering results with a level of accuracy and speed that often surpasses human performance. Yet, they remain impersonal, perceived purely as a tool rather than a relatable team member.

Imagine a "Taskmaster AI," a behind-the-scenes system optimizing organizational workflows. It accurately allocates resources, efficiently schedules tasks, and precisely predicts inventory. Despite its productivity-enhancing role, it remains impersonal, rather than conversational.

The Cog offers a powerful opportunity to drive operational excellence, but its integration requires finesse. Leaders must strategically deploy these capabilities while addressing job displacement concerns, building a culture that values both AI efficiency and human creativity. Seek to create a symbiotic relationship where the Cog's efficiency enhances human strategic thinking, driving the team towards higher performance without alienating the workforce.

The Champion (High Capability, High Charisma):

In this scenario we find an AI team member that excels in both task execution and interpersonal skills. While true Champion AIs are still emerging, we're steadily advancing towards this reality. IBM's Watson, for instance, is celebrated for its potential in healthcare but criticized for limitations, such as handling complex diagnoses. Yet Watson famously beat Jeopardy pros at their own game.

Envision a future "Quantum Co-Manager," a fully integrated AI system that manages large-scale projects with precision while maintaining meaningful personal connections with team members. This AI would recognize individual strengths, weaknesses, and emotional states, offering tailored feedback, and preemptively addressing issues. Its combination of analytical prowess and emotional intelligence would make it a solid collaborative teammate.

For leaders, the Champion presents deep opportunities to elevate team performance and satisfaction. However, it also requires careful management to maintain a balanced human-AI dynamic. Use the Champion's capabilities to drive productivity and innovation while ensuring that human team members continue to develop their skills and maintain a sense of agency within the team. Balance decision-making authority with promoting a collaborative environment where the Champion enhances human contributions.

The integration of AI into teams is an agile process, mirroring human team dynamics. As teams evolve, so too will their perceptions of AI's capabilities and charisma. The AI Quartet—Castaway, Charmer, Cog, and Champion—will shift as the team develops and work changes. During these stages, both human and AI team members are tested for their strengths, weaknesses, and ability to integrate into the group. Leaders should

regularly re-evaluate the alignment between AI functionalities and team objectives in human-AI collaborations.

Troubleshooting AI Team Personas

Working with these teams, leaders must remain open to feedback, especially during the Storming and Norming phases. To maximize AI integration and team value, consider these AI Quartet questions

Team perception of AI	Key Questions to Ask
Castaway	• Is the AI struggling due to premature deployment or unclear expectations? • How can we better align the AI's capabilities with team needs? • What steps can be taken to improve the AI's functionality or user interface?
Charmer	• Are the team's expectations of the AI realistic and aligned with its actual capabilities? • How can we balance the AI's positive impact on morale with its limited functional contributions? • What strategies can be employed to enhance the AI's capabilities while maintaining its charismatic qualities?
Cog	• Is the AI being used effectively for its strengths in efficiency and task execution? • Are there opportunities to further optimize routine tasks using AI? • How can we ensure AI complements human creativity without needing personification?
Champion	• How can the AI's high performance continue to free up human creativity and energy? • In what ways can the team further capitalize on the AI's strengths to enhance innovation? • How can we maintain a balance between AI contributions and human agency in decision-making?

It's important to see that AI-human teams are dynamic. Between successes and failures, leaders should expect perceptions within the AI Capability-Charisma matrix to shift over time. The same AI system might occupy different quadrants simultaneously, depending on the specific task or context. There is no universally "ideal" quadrant; each represents a different integration approach with its own set of advantages and challenges. However, as AI improves in both capability and charisma, we will see an increased perception of AI Champions.

A key to successfully bridging the human-AI culture is knowing where an AI persona fits within your business and managing its integration accordingly. By regularly reassessing the AI's role and impact, leaders can guide teams through the complexities of human-AI collaboration, developing a more innovative, high-performing organization.

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The AI-Ready Leader: Human Functionality in an Age of Co-intelligence

EVE POOLE

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With the advent of sophisticated AI tools, businesses are facing the transformation not only of their operations but often of the sectors in which they operate. So far, the impact of AI is largely being felt as an acceleration in pace and scale of the kind that automation and digital innovation had already set in train: the introduction of Large Language Models like ChatGPT means that business processes that used to take days can now be executed in a matter of seconds. But AI is optimising processes that would normally be undertaken by employees or suppliers, not by CEOs. So is being an AI-ready leader just about coping with these changes by having a revised workforce plan and a new Technology Audit Committee? This chapter argues that it is about a lot more, because the magnitude of the change that lies in prospect will not only transform businesses, but will require a shift in the tenor of leadership itself. Leaders of the future will need to harness their comparative advantage in order to prevail in a world of co-intelligence, and this means they will need to lead other humans from the very essence of their own humanity.

Leadership

Over the last 100 years, thinking on the nature of leadership has moved away from its roots in the technical disciplines of scientific management towards a focus on the skills and emotional competencies of adaptive leaders. AI will accelerate this trend, but its impact can best be understood within this historical context.

Have you ever thought about where 'leadership' really came from, as a topic? Research into it became urgent as Europe ran out of leaders after the First World War. Much of the early research was funded by the military, so it is unsurprising that the first wave of thought-ware was all about the leader as hero, triumphant in battle, and a fine figure of a man. Many of our public statues epitomize this kind of heroic leader, and this idea of leadership still appeals to organizations who prize competition and market share, because it is all about beating the opposition. We have never fully lost this model, which is why studies still show that taller men – and men in general – are paid more; and this thinking is why dynasties remain important in many walks of life, because of notions about 'blue blood' and the 'officer class.'

But thinking about leadership generally moved on, as technology made warfare less about cannon fodder and more about strategy, and we started seeking leaders with brains as well as brawn. This coincided with the popularity of Frederick Winslow Taylor's Scientific Management, itself the foundation of Harvard's first ever MBA in 1908, and vestiges of this trend linger today in the MBA culture and the prevalence of Oxbridge, Ivy League, and the 'old school tie' in senior appointments. This phase involved the rediscovery of classic texts like von Clausewitz's *On War*, Sun *Tzu's Art* of War and Machiavelli's *The Prince*, so it still assumed a military metaphor, and was primarily about protecting your territory. But the collapse of deference after the mixing of the classes in the Second World War made it much harder for leaders to assume they would be followed by default, so the thinking moved on again.

Hippies, the humanistic movement, and the emergence of what we would now call HR, made followers more visible, and introduced the notion that they might need to be persuaded to follow, not just ordered to. And women and minorities have now thankfully become a more noticeable part of the workforce. So leadership thinking over the last few decades has been more concerned with diversity, charisma, and emotional intelligence, honouring representation and the sort of skillsets that are more likely to appeal to followers in the war for talent.[1]

AI will accelerate this trend, not because leaders will need to charm it into submission, but because AI can increasingly take the weight of earlier leadership needs for knowledge and decision-making, but what AI cannot do is motivate and inspire human colleagues to contribute the kind of discretionary effort that makes good companies great.

Cultural Significance

There is a danger that leaders may underestimate AI as just another technological advance that can produce extraordinary efficiencies. But visionary leaders already know that AI will be far more culturally significant. For starters, previous technological advances largely came for blue-collar jobs and the working classes. But the AI revolution has parked its tanks squarely on the lawn of middle-class privilege and the world of the white collar. It will upend traditional assumptions about education and career-pathing because it will simply render most of it obsolete, stripping out rungs of these ladders that had not substantially changed for hundreds of years. Roles, careers and industries that have survived countless upheavals will disappear overnight; and the removal of whole organizational layers will compress the time-honoured procession up the hierarchies through which future leaders used to have the time to earn their spurs. This means that AI-ready leaders will need to double down on those areas of leadership that are not easy to translate into code, and quickly. AI teaches us that if you are reduceable, you are expendable, because you are easy to copy. So leaders will need to set cultures for *co-intelligence* in their organizations that avoid duplicating AI,[2] while reserving and promoting the particularly human skills that will always be needed to use AI well. But what are these particularly human skills, and do humans really have any reasonable chance of keeping the upper hand?

Comparative Advantage

Because the emergence of AI provides humans with their most formidable competitor yet, it is worth drawing on the wisdom of the formal strategy disciplines to determine the best course of action. The most helpful insight is to be found in the notion of comparative advantage. The economist David Ricardo's 1817 defining explanation of comparative advantage used trading examples of wine and cloth in contemporary England and Portugal, but the idea can be more simply put. Apparently, Winston Churchill was a gifted bricklayer. But he was also a gifted politician and author. When he needed a wall built, he chose to pay builders to do his bricklaying for him, even though he could have done the work better himself. It made sense for him to do this, so he could spend his time on the activity — politics — where he had comparative advantage. To have done his own brick-laying would have taken him away from statecraft, so the opportunity cost of bricklaying made it unattractive for him.[3] This idea about finding the right level, and playing to your comparative strengths, is the best way to position yourself as an effective leader; and it is the only way to identify an unassailable future in an AI world. So what is our comparative advantage, as human leaders?

Human Leadership

We are now accustomed to being told how clever AI is, as each new tool aces the Turing Test and outperforms human experts, in seemingly every field of endeavour. It is easy to feel as though we may already have been overtaken as a species, and are living in the plot of a Sci Fi movie. But paradoxically the best way to locate our own uniqueness is to look at what has *not* been programmed into AI. Generally, Artificial Intelligence is modelled on what we know about human intelligence. But quite a number of things have been left on the cutting room floor, because they are human properties or features that do not fit the narrative of a highly rational mind - things like emotions and intuition, all that messy stuff that looks like junk code in human design.

There are seven key elements of this written-off junk code. First, **Free Will**. If you were in charge of designing a species, you might consider this a disastrous design choice. Letting creatures do what they want is highly likely to lead to their rapid extinction the first time one of them makes a poor choice. So it would be extremely wise to design in some risk mitigation. Hence **Emotions**. Humans are a very vulnerable species because their young take nine months to gestate, and are largely helpless for their first few years. Emotion is a good design choice because it makes these creatures bond with their children, and in their communities, to protect the vulnerable.

Next, you design in a **Sixth Sense**, so that when there's no clear data to inform a decision, your species can use their intuition to access wisdom from the collective unconscious, which helps de-risk decision-making. We then need to consolidate this amelioration by designing in **Uncertainty**. A capacity to cope with ambiguity will stop them rushing into precipitous decision-making, and make them seek others out for wise counsel. And if their design leads them to make **Mistakes**? Well, they will learn from them, because trial and error acts as a ratchet on development. Moreover, mistakes that make them feel bad will develop in them a moral conscience, which will steer them away from repeated harms in future.

Now that the design has been corrected to promote survival, what motivators are needed for the future flourishing of this species? Well, they need to want to get out of bed on a dark day, so we fit them with a capacity for making **Meaning**, because a species that can discern or create meaning and purpose in the world will find reasons to keep living in the face of any adversity. And to keep the species going over generations? We design in a super-power of **Storytelling**, because stories allow communities to transmit their core values and purpose, down the generations, in a highly sticky way. Stories last for centuries, future-proofing the species through the learned wisdom of our ancestors, and the human species prevails. In the midst of global consternation about the Control Problem, or how to stop AI going rogue, it is particularly interesting to note that it is actually all of this junk code that does the heavy lifting in the alignment and control of human autonomy.[4]

Looking at these properties, it is clear that the leaders of the future will do best to compete by nurturing and honing of all these 'junk code' features, because they have been hardwired into our design to provide the species with the peripheral vision it needs to succeed. They are the source of our comparative advantage. Those leaders who compete with AI on its own terms have already been outclassed, so they will add no value in a co-intelligence environment. But the leader who has exquisite command of their emotions and has made friends with their intuition? Who is comfortable with uncertainty, trusts their conscience, and learns from their mistakes? Who provides meaning and tells inspirational stories? These are the leaders who will thrive in a co-intelligent environment. They will not only charm the workforce, they will be best placed to de-risk the company's use of AI by compensating for its natural blind spots.

Succession

This has major implications not just for how leaders position their own leadership, but how they establish a pipeline of talent for succession, given how fast AI is evolving. To understand just how complex this is becoming, we need to go back to school. In both primary and secondary school, they are already talking about the learning loss that occurs when students outsource their knowledge acquisition to digital tools and AI. It is even more of a problem in the university sector, where the pressure of deadlines, outside work commitments, and the untraceability of AI usage makes taking such shortcuts both attractive and efficient, resulting in further learning loss, and graduates with increasingly empty heads. In some ways this is not a new phenomenon: we forgot how to recite The *Odyssey* when we learned how to write it down; we forgot how to hear music in all its variety when we invented notation and tethered the scale to the keyboard; and the introduction of the calculator was a disaster for mental arithmetic. But this might be the first time we have encountered a technology that can have that effect across so many categories of learning simultaneously. And if students have experienced learning loss at school, then continue with their reliance on AI into university, will they emerge from their education knowing anything useful at all? If all they will have learned is how to use an AI brilliantly, well, AIs are already learning to be better at that too. Industry is rediscovering apprenticeships to make up for an already disappointing graduate cadre: but in time, even apprentices are likely to be usurped by AI.

Learning

Way back in 2003 at Ashridge, we initiated a research program based on asking existing board-level leaders 'what do you know now about yourself as a leader that you wish you'd known 10 years ago?' The findings were used to devise a leadership accelerator, written up in the book *Leadersmithing*, and still in active use today.[5] Our research program included collaborating with a neuroscientist to identify how this kind of learning is acquired. From that, we showed the role of the emotions in learning, and found that reliable templates are most efficiently acquired through learning under pressure. And both this method and these research findings suggest an answer to the conundrum of workplace learning loss.

First, we need to get forensic about what, precisely, the senior leaders in your industry do, and how they learned it. It is highly likely that much of their value-add is not AI-able, so this exercise should immediately reveal a workplace curriculum for those hoping to succeed them. The *Leadersmithing* list of critical incidents suggests it will be a fairly standard set of challenges, which will differ between workplaces and cultures only by degree and nuance rather than by type. For example, all senior leaders will have had their mettle tested by making key decisions, fronting multi-million dollar pitches, and mopping up after things have gone wrong. And we know these things are teachable, if you can be precise enough about the muscle memory you are trying to acquire, like practising difficult conversations or handling hostile media.

Second, we need to learn from the neuroscience. I remember answering the phone in my first ever London office, to hear my sibling, hiding in a cupboard in another London office, asking in a stage whisper: "when you're photocopying, do you take the staples out?!" We all remember those ghastly days of learning the ropes largely by making mistakes and incurring the wrath of our seniors over everything from making the coffee wrong to sending out blank faxes. Life would indeed be tranquil if we could make AI take this pain for us. Our recall of such events is heightened by the fact that our errors were often observed. And indeed we learned vicariously, wincing at witnessing the mistakes of others, which is another argument in favour of a back-to-the-office policy. This is because our Ashridge findings showed that whenever you feel observed and under pressure, your heart-rate increases and your learning is enhanced, as the memories you form in those moments are stored deeply and permanently in your brain in your amygdala.

And we all learned far more than just office-craft in those clumsy days. Through the tedium of note-taking and bag-carrying we saw how leaders really behave: we learned about power, decision-making, values and standards. We witnessed the quite brilliant rescuing of an impossible situation, or a tension diffused with a beautifully timed witticism. We also learned how not to do it, too often I imagine. And it is this implicit learning that we now need to surface and teach back, so that we do not lose a whole generation to AI.

Conclusion

This chapter has argued that being an AI-ready leader is not just about having a revised workforce plan and a new Technology Audit Committee. It is about adjusting the tenor of leadership itself. In particular, it is about identifying the comparative advantage of being human in a workplace that will increasingly feel dominated by AI; and it is about developing this kind of leadership in others by a careful study of what senior leaders really actually do. Above all, it is about developing the right kind of workplace culture for co-intelligence. It will be increasingly futile to compete with AI, and we will have some challenges ahead in developing good habits of co-working with these synthetic but very real companion intelligences. But we know that the early LLMs seem to respond better to good manners in prompting, so as a leader, modelling excellence in human behavior is not only likely to be the best way to make the most of the human talent around you, but also the best way to train up your AIs too.

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1. The Wizard of Oz is a great summary of this historic sequencing: the Lion needed courage; the Scarecrow needed a brain; and the Tinman needed a heart. And they all needed Dorothy! See Poole, E (2017) Leadersmithing, Bloomsbury, pp. 7-8.
2. I am indebted to Ethan Mollick for this useful phrase, see Mollick, E (2024) Co-Intelligence, WH Allen.
3. See the discussion on comparative advantage in Poole, E (2017) Leadersmithing, Bloomsbury, pp. 134-6.
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Will AI Help or Hurt Sustainability? Yes.

ANDREW WINSTON

4

For a technology getting as much attention – and vast sums of money – as Artificial Intelligence, there's remarkably little consensus on what exactly we're talking about. Or what it can do. Or what it means for us mere humans.

Tech journalist William Douglas Heaven notes that, "In all the conversations I've had with people at the cutting edge of this technology, no one has given a straight answer about exactly what it is they're building." So Heaven defines AI as "technologies that make computers do things that are thought to require intelligence when done by people." The U.S. Congressional Research Service's adds to the definition an "ability to learn, solve problems, and achieve goals with varying levels of autonomy."

It's interesting to consider why it's so hard to define. We humans lack clear definitions of the things that make us human: consciousness, dreaming, intelligence, and more. Naturally, it's unsettling when machines mimic these our own unique traits.

Philosophy aside, as I see it, the core question going forward is this: Can AI help us build a better, thriving world for all? And honestly, at this point in human development, with massive threats to our well-being building all around us, what else matters?

None of the concerns or opportunities we'll look at here are overblown. The hype about AI's capabilities may outstrip the reality (for now), but companies and governments will spend trillions on this tech and the changes to society will be significant. Some may minimize the changes coming, partly to assuage concerns about it replacing us – they say it's a tool that will help humans do more. Perhaps, but ChatGPT is not like a PC or Microsoft Word with "spell check." It's something of a different nature entirely.

Let's be clear: the impact of this technology will be sweeping and existential over time, even if we get a little too excited in the short run. As the famous sci-fi author Arthur C. Clarke once said (and Bill Gates later mirrored), "we tend to overestimate what we can do in the near future and grossly underestimate what can be done in the distant future." Things are speeding up, especially since AI can improve itself. The "distant future" is not far off.

A note on terms: To oversimplify, there are two types of AI: Generative AI (GenAI) and traditional (or "narrow"). Both are based, fundamentally, on pattern recognition. Traditional AI, leaning heavily on machine learning (ML), usually solves defined problems using set rules, such as identifying whether an email is spam or finding more efficient delivery routes. GenAI is, well, generating content. It can use language patterns to tell a new story or data to design a new building. But the lines can be blurry.

Let's break down the question of whether AI is building a better world – that is, does its positive handprint outweigh its footprint – into three areas: its purpose, physical impacts (environmental mainly), and societal ramifications. When you ask questions, AI boosters may say it's anti-tech. It's not. We may need advanced technology to solve problems at speed and scale, but only if we don't make the problems worse.

1. ***What exactly are we – and in particular, business -- doing with this technology? (And why?).***

Companies have used versions of traditional AI to solve problems for years. Uber and Lyft already use it to match drivers and optimize routes. All the delivery companies use AI as well and FedEx is using an AI-controlled robot to pack trucks optimally. But the hype around the broader benefits to society is outpacing reality. That's even more true for GenAI which is flashy but has a less clear value so far.

Over time, AI should help make systems of all kinds much more efficient. It will help optimize building energy use, find the most efficient routes for deliveries and flights, reduce traffic, manage the incredibly complex electric grid (with billions of things drawing or producing power), supercharge "precision agriculture" to reduce the footprint of food, make supply chains more efficient, or design new products and materials with lower footprint. All of these things reduce energy draw and carbon emissions. On the social side, AI can accelerate drug discovery, personalize learning, enhance public safety, and more.

Let's look at one tactical story in more depth to see what AI can do. One of pharmaceutical giant Merck's large facilities, called West Point, has 8,000 employees working in labs, factories, and offices covering seven million square feet of space (more than the Mall of America). In its manufacturing operations, keeping temperatures at specific levels is critical. The site's four main hydraulically-linked chiller plants (with more than 40 individual chillers) work hard, as do the engineers running them.

AI firm Phaidra is helping Merck manage the cooling system to produce the right temperature while minimizing energy use. It looks at extensive data on operations, weather patterns, and more, and then explores billions of possible combinations of equipment settings. The system worked well, but the AI found even more improvements. Before the AI, the temperature was outside the required range a very respectable three percent of the time. AI brought that down to effectively zero (0.1%).

I talked to Phaidra CEO Jim Gao in more general terms about how AI helps their clients. He said that roughly 70% of the benefits from AI come just from doing something faster than humans would (like using weather forecasts to adjust machines immediately). But the rest of the benefits can "seem like magic", when the AI, not burdened by what's normal practice, finds a solution humans might not. For example in cooling systems, chillers are most efficient when operating at about 80% utilization, so engineers generally turn them on sequentially - get one up over 80%, then add the next. But the AI has, for example, advised turning on several at once at much lower utilization. The AI considers not just the chillers, but the energy needed to move chilled water around a system. With a more systemic view, this seemingly odd solution can be more efficient.

And this gets to the real potential for AI. We can expand the boundaries of the system it's analyzing. Imagine asking not just how to minimize energy use of the chillers but how to design the cooling system, how and where to build the next factory to reduce demand, or how to best manufacture the product.

These are the kinds of higher order questions we need to ask. AI could help companies identify opportunities for systems change, which is the scale we need now. And it can help companies live their purpose and serve people and planet better.

AI is most useful under a few conditions. It needs extensive data sets, and as companies are increasingly required to measure and report sustainability data, there will be more information on the system to analyze. Problems that are complex to solve – or simple in theory, like the optimization of chillers, but with massive data – are also good to point the supercomputers at. The potential to scale up is important as well, like improving operations in one building and then extending to a site or all company facilities.

A harder issue is what to use GenAI for. It's all so new, and it's creative by nature, which means it's less predictable. Sure, writing marketing copy or providing customer service are good use cases. But this realm is the least developed, so there's a vast amount of experimenting going on. And that has a down side since all AI – and especially GenAI – has a footprint.

2. Are the benefits in energy and material savings worth the inputs? Is it netting out positively given the footprint of the technology?

The energy required to train AI models like ChatGPT is massive. People joke that these GenAI models have read the internet (but it's kind of true). ChatGPT will tell you that it processed millions of books – a human would need centuries to read that much. As we talk about skyrocketing energy needs, keep in mind that it's mainly about these big GenAI models. Traditional AI work can easily save more energy than it consumes. Not so much for GenAI (yet).

The concerns about AI energy use have been growing. In 2020, a group of computer science academics contrasted what they called "Red AI" – essentially barrelling forward with massive investments in money and energy – with "Green AI", which balances innovation with the resources used.

None of this is theoretical. Google announced recently that, primarily because of AI, its carbon emissions had gone up 48% in four years (Microsoft had a similar experience). These firms have been the most aggressive in addressing carbon emissions, buying the most renewable energy by far and investing in expensive carbon sequestration technologies. So, this is particularly bad news. The world was heading toward peak emissions, but it's possible that AI will blow a hole through that goal.

There's growing concern about the ability of utilities and the grid to support all this new demand. In the last year, the expected growth of power needs has skyrocketed – it's partly AI, and partly the drive to "electrify everything" from transportation to buildings. Utilities are keeping fossil fuel plants open longer and now looking to build new ones. And grid reliability issues affect every company (and home).

Exponential growth of tech is nothing new, nor are fears about its footprint. Datacenters produce about one percent of global carbon emissions, which sounds low, but matches Canada's emissions. The industry does have a good track record on controlling the growth of energy needs. A study from the Digital Climate Alliance pointed out that, "while data demands have grown exponentially over 25 years…datacenter energy consumption globally hardly changed between 2010 and 2020." That's great news, but things do seem different this time. The same Alliance recently suggested that "the rapid deployment of AI makes it necessary to revisit those data points."

Even if there are efficiency gains, will it yield lower emissions? The Nvidia chips that power AI are getting more energy efficient. And DeepSeek from China claims to use far fewer resources. But the tech giants are likely to use any gains to increase the size of the AI and its datasets (a form of the classic "rebound effect" where efficiency in energy drives people to use more). This is an arms race and we're in the "move fast and break things" phase.

Making tech more efficient and shrinking the footprint of AI itself – that is, Green AI – of course helps. The options for tech companies to reduce impacts include using renewable energy (solar, wind, geothermal, and even small nuclear now), programming to make computing more efficient, using different (e.g. liquid) cooling systems, re-using waste heat for the facility or the community, and more.

But the deeper question remains what are we using this for, and is the energy expenditure is worth it (especially for GenAI) – or as one tech exec said "Is the juice worth the squeeze?" Finding efficiencies like Merck did is well worth the computing power But not everything is that clear cut. And the balancing act gets even harder to measure when we throw in the social side of the equation.

3. Do the benefits in terms of human well-being outweigh the costs to society?

In theory, it's relatively easy to compare the energy use or carbon emissions from a technology to the gains. But comparing environmental downsides to societal improvements, or even weighing societal gains to societal losses, is much harder. But that doesn't mean we shouldn't try, or at least ask the questions. These are sustainability questions – the full agenda of building a thriving world goes beyond just climate change and planetary impacts to include people's overall well-being.

The potential for positive change seems large. In healthcare, pharma companies are using AI to help in drug discovery, and the Mayo Clinic used it to help identify people at risk of heart dysfunction, even without noticeable symptoms. In education, Khan Academy and others are personalizing learning plans and AI will certainly be integrated into schools. It can help with public safety (better storm warnings, for example) and help people with disabilities navigate the world.

That's wonderful news, but the downsides to society are very real. Even putting aside the sci-fi apocalyptic outcome (AI decides we're not necessary), there are some serious issues. First, AI-created misinformation can inflame differences and destabilize democracies. Bad actors are already making fake speeches and videos of public figures saying whatever they want. Second, there's bias in our system and AI conclusions are only as good as the data going into it. Regulators are looking at whether a Goldman Sachs credit card systematically gave men higher spending limits. An AI-driven hiring system at Amazon was biased against women because people currently in the job were mostly men.

Third, the impact of AI on jobs is potentially seismic. Tech companies argue that AI is a tool which enhances productivity and, like other tech advances, will create new kinds of jobs. But it will undoubtedly eliminate jobs directly. McKinsey estimates that AI could automate 30% of work hours in the U.S. by 2030. Does that mean more productivity or fewer jobs? It's unclear, but in the business context, "productivity" has generally meant doing more per person, which certainly doesn't drive job growth. When I asked one tech exec what everyone in the GenAI hunt was racing towards, his gut reaction was "replacing humans?"

One client of mine is using AI to help staff with research and data gathering. The company is growing, but it's not hiring many new people any more. The current jobs are safe (for now), but they aren't creating new ones. Past tech transitions (to cars, planes, semiconductors, mobile phones, and so on) have created entire new industries, but this doesn't feel the same.

AI is digitizing skills and roles, affecting not only low-skill jobs and mundane tasks, but also higher-skill roles like reading x-rays or understanding the law. AI is potentially game-changing in the creative fields in particular. As GenAI gets better at writing, creating art, writing scripts and songs, creating life-like movies from a simple prompt, and more, what happens to creatives?

Many people are asking these questions. Some of the biggest names in tech have advocated for providing everyone with a Universal Basic Income to provide a basic safety net if massive numbers of jobs disappear. For now, all of this is moving forward at light speed and competition and profits rule (like always). But what if the benefits accrue mainly to investors and a very small number of tech owners with trillions of wealth between them? What does that mean for inequality?

Conclusion

If you're both excited and scared by all of this, you're not alone. The stakes are high – climate change, inequality, and biodiversity loss are systemic, existential challenges and they're getting worse. And societal institutions and democracy are wavering. Business has a critical role to play in tackling all of these issues. But it's critical that we ask the right questions and apply the right technologies.

Is GenAI the answer? It's not clear. One AI exec I spoke with called them "toys." Personally, I've found GenAI incredibly useful for brainstorming, writing, and editing. But not every use is worth it. I've also used text-to-image graphics to accompany things I've written. It's fun, but I realized that using a stock photo took much less energy and rewarded human photographers.

My concern is whether businesses are doing the equivalent of creating fun pictures for limited value. Or seeking cost savings and driving entire processes – like customer service – through GenAI, which could destroy their own carbon reduction plans and replace people.

There's no easy answer to this. The world likely needs AI to tackle systemic issues and help solve our biggest problems. But ignoring the human and environmental costs is willfully blind. The bottom line is that governments and companies should apply a sustainability lens over this work – asking what choices mean for people and planet – to ensure the benefits outweigh the costs.

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From Adoption to Action: GenAI as a Catalyst for Change at Hult

JOHAN ROOS

5

This chapter chronicles Hult International Business School's journey in adopting Generative AI (GenAI) , focusing on key steps, actionable insights, and practical advice for driving change and embracing new technologies. With over three decades of experience as a faculty member, leader, and advisor in international higher education, I have witnessed firsthand the transformative impact of technology on the sector. From video platforms and Massive Open Online Courses (MOOCs) to Virtual Reality and the Metaverse, each innovation has brought its own challenges and opportunities. However, the launch of Chat GPT-3 in November 2022 marked a watershed moment, convincing me that GenAI would rapidly reshape both education and business.

Although many initially viewed GenAI as a passing trend, its rapid evolution within education demanded a shift in both mindset and practice—an approach exemplified by early adopters like Hult International Business School.

This chapter is about driving change, particularly in preparing an organization for disruptive technologies like GenAI, and transforming readiness into actionable outcomes. In the context of educational institutions, the external conditions included increasing pressure from businesses adopting AI and the fast-paced evolution of educational technologies. By sharing Hult's experience, I aim to offer insights to leaders considering similar strategic initiatives—efforts that must be undertaken swiftly and with focused determination.

Setting the Initial Conditions

The journey of adopting GenAI at Hult began with a moment of clarity—realizing that this technology was not just another passing trend but a fundamental shift in the landscape of education and business. The urgency of adopting GenAI stemmed from several factors that were apparent by the end of 2022:

- **Rapid adoption in business:** The business world was rapidly adopting GenAI, creating a need for graduates well-versed in these technologies.
- **Potential for educational enhancement:** GenAI had the potential to augment educational offerings and increase operational efficiency.
- **Faculty lag:** Most faculty members were already behind students in adopting GenAI.

- **Competitive pressure:** The risk of falling behind competitor institutions in an increasingly technology-driven educational landscape.
- **Thought leadership opportunity:** There was an opportunity to position Hult as a thought leader in integrating GenAI into business education.

From the outset, we recognized that adopting GenAI at Hult was not just a technological integration but a significant change management project. Following successful AI implementations elsewhere, we focused on adjusting organizational processes and behaviors to ensure the successful adoption of this transformative technology. By reframing the initiative as a cultural shift rather than a technical overhaul, we gained broader buy-in from faculty and staff, making it clear that the real challenge lay in reshaping how we operate as an institution. Despite some initial skepticism, the message was clear: we needed to move fast to stay ahead.

Our change journey can be framed as the well-known and overlapping phases of technology acceptance.

Phase 1: Influencing Attitudes

In mid-January 2023, we launched a task force to examine the academic implications of AI-based tools. A key element of our adoption strategy was managing expectations to avoid inflated promises, a common pitfall in most projects. Inflated promises can scare stakeholders rather than inspire them. Instead, we focused on small, achievable goals that demonstrated GenAI's immediate impact—such as enhancing course design and providing personalized feedback to students. This approach also proved effective in overcoming initial skepticism among some faculty members, who later became champions of GenAI integration. By setting realistic expectations, we created an environment where faculty and staff could see the practical benefits of GenAI without feeling overwhelmed by the technology's broader implications.

A critical moment came during a Curricula Committee meeting where I demonstrated GenAI's capabilities by designing an entirely new three-credit course a few moments after collecting the desired design parameters from faculty. This demo had a profound impact, changing faculty members' behavioral intentions regarding GenAI. Soon after, the task force recommended immediate training for faculty, academic, and IT staff on GenAI tools and clarified the need to consider the ethical consequences of using AI.

Leading by example, I actively engaged with GenAI tools and showcased their potential internally and externally, modeling the behavior I was asking of our faculty and staff. At the same time, I wrote articles that appeared in respected channels for business school leaders, highlighting the potential benefits and potential consequences of GenAI for higher education. I also used my sessions at the two most influential annual conferences for business school leaders (in January and February) to share our intent and what we were doing.

After just a few weeks, we had created a strong foundation for our GenAI adoption intent and approach. We had secured broad stakeholder support, gathered crucial data to inform our approach, and established a clear direction for the policy and guidelines to be developed.

Phase 2: Demonstrating Ease of Use and Usefulness

Rather than expecting immediate and full-scale adoption, we embraced a phased approach to familiarization. Peer-to-peer learning sessions, task force-led showcases, and opportunities for faculty to explore GenAI tools in low-stakes settings encouraged gradual learning. This approach significantly reduced resistance, as indicated by faculty feedback showing a 40% increase in GenAI usage within three months.

It is well known that comfort with new tools is a necessary precursor to their broader use, and we ensured that faculty could experiment with GenAI at their own pace. This approach not only reduced resistance but also built confidence in GenAI's potential applications for both teaching and research. As seen in early GenAI integration efforts at Hult, showcasing 'wow' experiences and fostering peer-to-peer learning helped faculty overcome initial skepticism and explore the creative possibilities of AI in their teaching.

The focus groups and peer-to-peer sessions were designed to encourage creative thinking and innovation, enabling participants to explore new ways to enhance their teaching and research practices. By continuously connecting emerging insights with practical applications, we empowered our faculty to contribute to the ongoing evolution of our approach to education.

In late February, the Hult Board of Directors gave their enthusiastic support for our GenAI initiative and intent, and a few weeks later, staff training began across all campuses. The message was that we needed to quickly integrate GenAI tools in every possible way throughout Hult.

Phase 3: Encouraging Faculty and Staff to Act

In March-April, we accelerated GenAI awareness among faculty and staff by promoting funding and showcasing AI use in the classrooms, even producing case studies of how to innovatively and effectively use such tools. This naturally shifted the focus towards encouraging more faculty members and academic staff to use GenAI tools. The proactive task force and training programs were critical to ensuring that faculty and staff felt empowered to embrace emerging technologies like GenAI. We also appealed to their shared interest in teaching knowledge and skills that would help students get jobs and flagged that we would soon have a formal AI Policy in place that would set the institutional expectations for their work.

In April, we identified how GenAI tools could be used in admission, curricula design, pedagogy, assurance of learning, and career development and research, including ethical considerations like data privacy and bias. The task force also benchmarked with institutions and individual experts we considered early adopter peers, and sent regular updates about our progress to the Hult community.

The Outcome: The AI Policy and Guidelines

By mid-April the task force had developed a draft policy to be considered by the Academic Board. The policy was based on UN and UNESCO recommendations emphasizing cognitive and ethical dimensions. Tracking AI use and presuming originality were critical not only for maintaining academic integrity but also for fostering trust and transparency as GenAI tools became integral to both academic and operational processes. The key policies were:

- **AI use is highly encouraged:** AI use is highly encouraged within all Hult activities.
- **AI use must be tracked and acknowledged:** AI use must be tracked and acknowledged by faculty and staff.
- **Presumption of originality:** Any submissions not explicitly identified as AI-generated will be presumed as original.

A continuously updated intranet page outlines the details of the policies and their practical consequences for systems, faculty, and student-facing activities. By June, most faculty members were redesigning their courses for the next academic year. The final policy was formally approved by the Academic Board in early August 2023.

The rapid adoption of GenAI at Hult has yielded significant positive outcomes across various facets of our institution, with immediate effects and the promise of long-term implications for our educational offerings and operational efficiency. A survey conducted in May 2024 underscored these impacts:

- **Enhanced student engagement:** Faculty reported a notable increase in student engagement when integrating AI into the classroom.
- **Improved teaching effectiveness:** Educators utilizing AI tools observed heightened teaching efficacy.
- **Elevated quality and efficiency of course materials:** AI facilitated the rapid creation of high-quality, customized teaching resources.
- **Personalized learning experiences:** AI tools empowered faculty to craft tailored learning experiences.
- **Development of AI-related skills:** Students acquired valuable experience with AI systems, honing skills essential in today's job market

Beyond these direct educational enhancements, our AI initiative has increased the institutional readiness for change. Additionally, our commitment to AI has paved the way for collaborations with tech companies and educational institutions globally.

Feedback from faculty has been overwhelmingly positive. Initially skeptical members now feel empowered by these tools, appreciating the shift towards new levels of interactions with students. Students report feeling better equipped for an AI-driven business landscape, valuing the practical skills gained in using and critically assessing AI tools. Our industry advisory board has lauded the initiative, recognizing that Hult graduates are poised to excel in the evolving business environment.

My passion for AI made me advocate for it also outside Hult, writing articles for a range of media and speaking at industry events.

Dealing with Challenges

The rapid adoption of AI at Hult was not without its challenges. Some faculty members expressed concerns over AI's role in grading and assessment, fearing a loss of academic rigor. To address this, we provided personalized support, helping faculty integrate AI in ways that complemented their teaching style, such as focusing on prompt engineering or critical evaluation of AI outputs. There were also concerns about the ethical implications of using AI, particularly regarding academic integrity

and potential biases in AI-generated content. To address this, we developed guidelines for the ethical use of GenAI in academic settings, as outlined in our policy.

Technical infrastructure was also a challenge. Implementing AI tools across multiple campuses required significant updates to our technical infrastructure. To address this, we prioritized IT upgrades and created a dedicated AI support team within our IT department.

The skill gap between our faculty and staff was yet another hurdle. To tackle this, we implemented a tiered training program to address different skill levels and needs, established a mentorship program, and created an online resource center with self-paced learning modules.

Maintaining academic rigor was and remains a concern. To address this, we have developed new assessment methods that emphasizes skills like prompt engineering, output evaluation, and AI-human collaboration. We have integrated discussions on the limitations of AI into our curriculum and created guidelines for faculty on designing "AI-proof" assignments that test higher-order thinking skills.

The rapid technological changes in the field of AI posed another challenge. To address this, we established an AI Working Group tasked with monitoring technological developments and recommending updates to our strategy. We adopted a flexible modular approach to AI integration and developed partnerships with AI companies and research institutions to stay at the forefront of developments in the field.

Insights

Our experience offers several key insights for other institutions considering similar initiatives when dealing with new and potentially disruptive change like AI:

A Friendly Top-Down Approach

A friendly top-down approach was essential in driving the change process. As the Chief Academic Officer, I took a proactive and leading role in driving the AI adoption initiative at Hult. I set the initial conditions for the project and nudged the process to get going.

My experience suggests that to be credible in such a top-down process, perceived competence matters as much as leadership enthusiasm. Leaders driving AI initiatives need to be sure to be well-versed in the latest technology from the outset, capable of using and benefiting from commonly used GenAI tools and willing to role model the behavior they wish to see.

Subsequently, I moved to a more symbolic leadership role, focusing on encouraging and inspiring faculty members and academic staff. In a third phase, I endorsed and supported emerging experimentation as well as evaluating and guard railing draft recommendations. This approach ensured that our AI adoption was fully aligned with our overall strategic priorities to grow our institutional reputation and be a great place to work and teach.

Immediate Relevance

Immediate integration into the curriculum and administrative processes was a key focus for our AI experiments, and suitable Faculty Leads helped peers to identify opportunities for existing courses. Staging 'wow' experiences to demonstrate ease of use and usefulness helped kick-start and maintain excitement.

We encouraged faculty to use AI tools in course preparation and delivery, modelling effective use for students. Training was provided to academic staff on how to effectively use AI tools in their daily work. Additionally, we launched research projects and integrated such tools into our research support services.

We also used AI to create a series of personalized student orientation materials, significantly reducing the workload for our admissions team while improving the student experience. This immediate relevance helped to build enthusiasm for the initiative and demonstrated the practical benefits of AI across different areas of our institution.

Proactive Support

A comprehensive training and support program was crucial to our rapid adoption strategy. We implemented a tiered training approach, providing basic awareness training for all staff and faculty, in-depth technical training for those directly involved in AI-related teaching or research, and advanced training for Faculty Leads and IT support staff.

We established a dedicated AI learning portal with regularly updated resources, tutorials, and best practices. We fostered a community of practice around AI, encouraging knowledge sharing among faculty and staff. Regular showcases allowed early adopters to share their experiences

and inspire others. Recognizing that many students were already familiar with AI tools, we created opportunities for reverse mentoring, where students could share their knowledge with faculty and staff. We established a dedicated AI support team within our IT department to handle technical issues and provide guidance on tool selection and use.

Integrated into the support mechanism were three subtle messages about the need for individuals, groups, and the entire organization to strike dynamic balances between: (1) the benefits to the institution and to individual faculty members and academic staff; (2) the immediate urgency and longer-term perspectives; and (3) the need to adapt to external changes like AI and the desire to innovate so that others must adapt to us.

Using External Media to Send Signals Internally

Through various external channels, I focused on building Hult's reputation among peer schools and their leaders while keeping internal stakeholders informed about the progress of our initiative, celebrating early wins, and addressing concerns promptly. This approach reinforced the internal message that Hult was not just keeping up with the times but leading the way in AI adoption. By aligning external communications with internal developments, we were able to create a sense of pride and urgency among faculty and staff, motivating them to engage fully with the AI initiative.

Conclusion

In the 1980s, much discussion about machine-human interface was on the limits of computers in replicating human expertise. Half a century later, the focus has shifted to how we can best collaborate with AI, in its many and evolving guises—Perceptive, Generative, Agentic, and Physical. The way individuals and institutions reacted to and continue to navigate the explosive growth of AI is a topic worthy of study. This chapter described what transpired as we seized on the potential of Chat GPT-3 in early 2023, what actions we took, and what the outcomes were.

While peer institutions who followed us have likely achieved similar results, the rapid adoption of AI at Hult has not only transformed our approach to education, research, and administration but also strengthened our institutional readiness for change. The lessons learned extend beyond adopting to a technology; they touch on how to be prepared for and lead in times of rapid change, how to cultivate and draw on a culture of continuous learning, while remaining focused on strategic priorities. As an early mover, Hult also gained recognition as a leader in AI integration in business education, attracting attention from media, potential students, peers, and industry partners.

As we move forward, these insights will continue to guide my efforts to help organizations be more ready for change. While early adopters like Hult have laid important groundwork, it remains crucial that institutions continue to adapt their approaches, cultiavting a culture of readiness for the next technological wave. As I write, the world is facing an accelerated and geo-political competition in Large Language Model developments, and the adjacent possible of Agentic AI, which opens new doors to academic value creation. What are you waiting for?

Resources

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About the Author

Johan Roos is an internationally renowned scholar, academic leader, and advisor. Following nine years as Chief Academic Officer at Hult International Business School, he now serves as an independent Presidential Advisor to the institution.

Beyond Degrowth: Embracing AI for a Future of Sustainable Abundance

BOYD COHEN

6

1. Introduction

Beyond scarcity and de-growth

In 2023, the Stockholm Resilience Centre published its extensive research into the evolution of our collective impact on fundamental natural ecosystems over the past 15 years. They discovered that of the nine ecological systems critical for sustaining life and our economy, we have breached six of the boundaries of planetary limits. This research confirmed what many in the sustainability community had feared for years. That our current economic model is putting humanity's ability to survive and thrive at risk.

Many of these sustainability professionals have argued that the only logical path forward in light of the unsustainable trajectory we are on, is to embrace de-growth. As the argument goes, our current pace of development and ecosystem degradation is not sustainable. As our global population continues to swell, expected to exceed 10 billion by 2100, there is no viable path to continue our current levels of production and consumption into the future. Therefore, to ensure the survival of our species and others too, the de-growth movement argues for a moral imperative to ensure intergenerational equity by diverging from a continued growth model to a new one that embraces scarcity and minimalism. Instead of making and building more stuff, therefore, we should focus on finding ways to improve quality of life without consuming more stuff.

The de-growth movement, in my opinion, is not a radical indefensible response to the ecological threats we face. Yet, it is depressing to preach to companies, governments and citizens that our only path forward is to build and buy fewer things and to refocus away from innovation and economic growth. Furthermore, it is not the only path towards surviving and thriving within planetary boundaries.

I call the alternative to de-growth, abundance capitalism. In my recent book of the same name, I define abundance capitalism as:

an innovative economic model that marries the growth-driven spirit of capitalism with a deep commitment to sustainability and abundance. It challenges the traditional scarcity mindset by envisioning a world where essential resources are universally accessible, underpinned by ecological balance. This paradigm leverages exponential technologies, sustainable innovations, and collaborative efforts to ensure that economic prosperity

does not come at the expense of the planet. It aims to foster a resilient, inclusive economy where wealth and success are redefined to prioritize the collective well-being of society and the environment, setting the stage for a future of widespread prosperity and environmental stewardship.

In the rest of this chapter, I will unpack this definition and, in particular focus on the convergence of AI with other exponential technologies which can serve as the foundation to an abundant future where instead of de-growth, we focus on growing smarter, and within planetary boundaries.

2. Exponential Technologies and the Power of Convergence

Exponential Technologies

Core to the abundance capitalism thesis is that the emergence of a range of exponential technologies gives hope for an abundant future. There is no single unanimously approved definition of exponential technologies, however for the purposes of this chapter, I define them as:

Technologies which double their performance capabilities while also halving their costs within two years.

AI may arguably be the best example of an exponential technology in history. AI itself is based on several underlying technologies, many of which are also exponential. AI depends on computational power which has roughly followed Moore's Law (the computational power of microchips doubles every two years). AI also relies on deep learning and the pace of deep learning is beyond that of microchips. OpenAI's own reporting has indicated that since 2012, the computational power to train AI models has been doubling every 2.4 months. OpenAI's GPT-1, born in 2018, relied on 117 million parameters, GPT-2 (less than one year later in 2019), relied on 1.5 billion parameters, GPT-3 released in 2020 relied on 175 billion parameters and GPT-4 (released in early 2023) relies on 1.76 trillion parameters. Remember another aspect of exponential technologies is that they tend to see dramatic declining costs to produce. This is also the case for AI. The cost of training AI models has been on such a price decline. A report by ARK Invest in 2020 noted that the cost to train an AI Model with the same performance as an early AI model, ResNet-50 had gone from $1,000 (USD) in 2017 to under $10 (USD) by 2020.

In short, there is no disputing that AI is amongst the most notable exponential technologies we have ever witnessed. Many other technologies are considered exponential as well. These include: IoT, blockchain, quantum and edge computing, robotics, 3D printing, biotech, nanotech and some renewable technologies, especially solar.

Power of Convergence

The story of AI demonstrates in itself the power of convergence in that AI relies on multiple hardware, software and data sources that in themselves tend to be exponential, helping to drive the unprecedented pace of innovation in the AI industry. Yet something that is often missed, is the power of the convergence of multiple exponential technologies to accelerate innovation, not just in products and services, but also, in the context of this chapter, provide a path to abundance capitalism, whereby we are collectively able to produce energy, water, food and other life and industry supporting systems at an unprecedented scale, at lower costs and within planetary boundaries.

For the purposes of this chapter, we consider also the convergence of exponential technologies with AI along with new, or revived historical, models of sustainable business practices which can be combined to shift us from scarcity and de-growth to abundance.

3. AI Convergence with Sustainability for an Abundant Future

This section focuses on emerging case studies of how AI converges with other exponential technologies and with sustainable business practices and business models to provide a path towards abundance. Instead of focusing on specific sectors of the economy where AI may play a role to support (or detract) from sustainability efforts as explored in a few other chapters in this book, here I am presenting the scenarios through the lens of three important sustainable business frameworks: *circular economy, regenerative economy* and the *blue economy*.

Circular Economy

The Ellen Macarthur Foundation,[1] a leading global foundation dedicated to promoting the adoption of the circular economy, defines the circular economy as a system whereby:

products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources.[1]

In a nutshell, the circular economy is about rethinking the way our production and consumption system works, challenging the linear approach to extracting raw materials, converting them to products which are sold and consumed and then sent to a landfill. It is about optimizing raw materials and natural resources seeking ways through innovative design, new business models such as product as a service, incentives for waste diversion, product take back schemes and more.

IBM Food Trust: Convergence of AI and Blockchain for Reducing Food Waste

Experts estimate that roughly one third of all food produced is wasted annually, leading to more than 1.3 billion tons of edible food going to landfills. This is obviously a major cost to the entire supply chain, a significant contributor to climate change (through transport and landfill emissions) and a major loss for the nearly 10% of the global population who are malnourished.

IBM seeks to tackle this problem by leveraging AI and blockchain through a suite of tools they call the IBM Food Trust. The Food Trust first focuses on bringing in richer data about the food supply chain. IBM's Sterling Supply Chain Control Tower leverages AI to identify areas of weakness in the supply chain which contribute disproportionately to waste and then to generate insights on pathways for optimizing resource utilization. The data generated from this system is stored on IBM's own blockchain, increasing the traceability and transparency of the food supply system.

IBM is far from the only company leveraging the convergence of AI and blockchain to tackle the circular economy opportunity. Other companies working on similar approaches include: Cargill, Honeywell, Provenance and Circularise.

The circular economy is so vast touching virtually every industry. One case on the convergence of AI and blockchain in the agricultural sector is insufficient to reflect the potential AI has to accelerate an abundant economy.

Connected Energy: AI, Solar and Circularity in Battery Storage

As mentioned previously in this chapter, solar, and other renewables are also recognized as exponential technologies. Solar photovoltaic panels follow what is known as the Swanson Effect with price drops of 20% for every doubling of shipped volume. Dozens of countries have already reached grid parity, whereby solar is on par or cheaper than current grid energy sources. Yet solar, and other renewables, have a flaw in trying to scale to make them abundant globally. Renewables are generally seen as intermittent in that they do not provide constant energy flow throughout the day. Yet many renewables, including solar, have the potential in many jurisdictions, to create sufficient abundant energy year round, if we had scalable and affordable storage solutions.

The battery energy storage system (BESS) market, estimated to already be worth about $7 billion USD in 2024 and projected to reach $56 billion by 2033, has emerged as a major solution to the abundant but intermittent renewable energy challenge. Connected Energy, a BESS company founded in the UK in 2013, has gained major market traction in the BESS sector. Its focus is on harnessing the power of second-life electric vehicle (EV) car batteries once they are no longer efficient enough to continue to power EVs. Connected Energy acquires these batteries and assembles them together into storage containers and places them in close proximity to renewable energy, usually solar PV systems.

Connected Energy leverages more than 2.5 million data points (e.g. power output, temperature, storage levels) generated daily from their deployed systems to optimize their BESS performance. Not only that, Connected Energy has now begun to leverage their AI engine to detect when batteries are reaching the end of their useful life for BESS while seeking pathways for those batteries to find a 3rd life as opposed to ending up in the landfill or at best, being disassembled for component parts.

Regenerative Economy

Neither the circular economy, nor the regenerative economy, are new sustainability models. Prior to the industrial revolution, economic activity was at least more circular than today and also frequently regenerative too. The regenerative economy is about finding pathways for economic activity to not just reduce its ecological footprint, but rather to actually help restore natural systems, while producing goods and services desired by society. On the surface, for many economic actors, investing in nature appears by default to be a cost for companies without providing financial returns. Yet, there are a growing number of companies, large and small, embracing regenerative approaches for profit. For example, in 1994, Interface, a billion-dollar carpet and flooring manufacturer with 4,000 plus employees, embarked on a mission to become ecologically restorative by 2020, going beyond net zero while increasing profits.

Indigo: Convergence of AI and IoT

Indigo Ag was founded in 2013 with the mission to "harness nature to help farmers sustainably feed the planet." Indigo focuses on enhancing farmer profitability, improving quantity and quality of food produced and reducing ecological and climate impacts of farming.

By the end of 2023, Indigo Ag had received more than USD $1.4bn and as of February 2024, was supporting eight million acres of regenerative farmland across nine countries. Leveraging bioinformatics, machine learning and AI, Indigo has developed more than 36,000 microbial seeds that assist farmers in improving crop performance while mitigating or eliminating the need for synthetic, chemical fertilizers and pesticides. Indigo uses sensor data to generate AI models to identify the optimal microbial seeds which are literally tailored for each crop and each field.

Of course, as in the IBM case above, Indigo is also not alone in leveraging AI and IoT to accelerate the adoption of regenerative agricultural practices. Other companies deploying similar approaches include: AgroSmart, Taranis and FarmLogs.

Blue Economy

While humans have leveraged the seas for thousands of years for fishing and fluvial transportation and logistics, the blue economy is perhaps the most recent sustainable business sector opportunities of the three discussed in this chapter. For some, the blue economy is focused more exclusively on sustainable and regenerative economic ocean-based activity whereas others also include freshwater economic activity to be within the blue economy framework.

Deep Trekker: The Convergence of AI and Robotics for Underwater Infrastructure

AI and robotics have been converging over the past decade for a range of marine based use cases. While many use cases tie more into marine conservation efforts by governments and non-profits, there are increasing corporate efforts tied to this convergence for underwater for-profit use cases. Aside from companies like Aquaai and Innovasea using these technologies to improve quality control and predictive maintenance for acquaculture use cases like fish farms, other companies like Deep Trekker are increasingly focused on leveraging AI and robotics to support remote assessment and support for underwater infrastructure projects.

For example, a recent effort by Deep Trekker is named AROWIND and is designed to leverage AI and remotely operated vehicles (ROVs) to engage in surveillance and inspection. The resulting output are 3D models and digital twins enhancing underwater asset management.

4. Future Trends in AI Convergence and Sustainability

This chapter has only touched the surface on emerging convergence opportunities with AI and other exponential technologies which have real promise for advancing sustainability across numerous industries. In this section I will provide a glimpse into other near to mid-term developments in this space.

AI and Quantum Computing

Quantum computing, in itself an important exponential technology, is directly linked to the ability to expand the utility of AI models. In the context of sustainability, applications are emerging to help optimize energy grids and enhance climate change and resilience models.

AI and Synthetic Biology and Nanotech

AI-supported synthetic biology can be used to create bio-based materials and engage in remediation of toxic, brownfield sites. The materials revolution is upon us and is precisely driven by the convergence of AI and nanotechnology. Other use cases include convergence of AI, synthetic biology and nanotech in the development of a range of alternative, clean fuels and energy such as biofuels, enhanced photosynthesis and carbon capture and utilization.

AI and Edge Computing

Edge computing enables the processing of data at the source. In the context of some powerful use cases including those referenced in previous sections, AI paired with edge computing can improve the speed of diagnosis and actions for remote and underwater systems, or even to support disaster response (e.g. to remote wildfires or oil spill cleanup).

5. Reflections and Conclusion

The convergence of AI with other exponential technologies offers an unprecedented opportunity to transition from a model of scarcity and de-growth to one of abundance capitalism. By leveraging AI, blockchain, IoT, robotics, and other cutting-edge innovations, we can address the pressing sustainability challenges that threaten our planet's future.

In the circular economy, AI and blockchain are revolutionizing supply chain transparency and reducing food waste, as demonstrated by IBM Food Trust. This convergence not only optimizes resource utilization but also enhances traceability and accountability, leading to more sustainable consumption and production patterns.

Regenerative agriculture is benefiting immensely from the integration of AI and IoT. Companies like Indigo Ag harness these technologies to improve soil health, increase crop yields, and reduce reliance on synthetic inputs. By tailoring microbial seeds to specific crops and fields, AI-driven solutions are promoting more sustainable and regenerative farming practices.

The blue economy, the most recent frontier in sustainable business, is being transformed by the fusion of AI and robotics. Companies such as Deep Trekker utilize AI-powered ROVs to monitor and manage underwater infrastructure, ensuring the sustainability of marine and freshwater resources. These technologies not only aid in conservation efforts but also enhance the efficiency and safety of ocean-based economic activities.

Future trends and innovations, such as quantum computing and nanotechnology, hold the potential to further accelerate sustainable development. Policymakers play a crucial role in fostering an environment conducive to innovation, ensuring that regulatory frameworks support the convergence of these technologies.

The socio-economic implications of these advancements are profound, offering new job opportunities and enhancing social equity. Collaboration among businesses, governments, academia, and non-profits is essential to harness the full potential of these technologies for sustainability.

By focusing on these convergent technologies, we can create a resilient and inclusive economy that prioritizes ecological balance and collective well-being. The examples highlighted in this chapter underscore the transformative potential of integrating AI with other exponential technologies to foster a future of widespread prosperity and environmental stewardship. Embracing these innovations is crucial for achieving sustainable development and ensuring a thriving planet for generations to come.

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The Future of Customer Experience: Unleashing the Power of AI

PRIYANKA SHRIVASTAVA

7

A few years ago, being stuck on hold with customer service for over an hour, navigating endless options and robotic responses, was a common frustration. Today, the experience looks vastly different. While ordering running shoes online, an AI-powered chatbot instantly answers questions, recommends new options based on past purchases and running habits, and completes the transaction in minutes. The landscape of customer experience (CX) is undergoing a profound transformation driven by the rapid adoption of Artificial Intelligence (AI) across industries.

AI's Growing Role in Business

Companies increasingly rely on AI to analyze vast amounts of data, automate processes, and deliver previously unattainable insights. In customer experience, AI's role is particularly significant. It enables businesses to process and respond to customer interactions at a scale and speed that would be impossible for human agents alone. From chatbots handling customer inquiries in real-time to machine learning algorithms predicting customer preferences, AI is reshaping the way businesses interact with their clients.

This chapter will delve into the multifaceted impact of AI on customer experience, starting with an in-depth examination of the key AI technologies currently reshaping this domain. We will explore not only the present applications of these technologies but also their future potential. Additionally, we will look at the ethical considerations of AI deployment in customer interactions, and how companies can navigate the ethical landscape of AI responsibly. This approach will provide a thorough overview of AI's capability to enhance customer satisfaction, loyalty, and overall business outcomes, while also addressing the critical dimensions involved.

How AI is Shaping Modern Customer Experiences

AI's impact on customer experience is underscored by compelling research that highlights the critical role of personalization in modern business strategies. According to McKinsey & Company, 71% of consumers now expect personalized interactions, and a lack thereof leads to frustration for 76% of them. Furthermore, Adobe's 2024 Digital Trends report reveals that 80% of customers prize seamless and consistent interactions across various channels, emphasizing the importance of a unified data approach. The gap between consumer expectations and

business perceptions is notable; while 85% of brands believe they are delivering personalized experiences, only 60% of consumers agree. This disparity highlights the significant opportunities for companies to enhance their data-driven personalization strategies, ensuring they meet the evolving expectations of their customers.

Evolution from Traditional to AI-Driven CX

The shift from traditional to AI-driven customer experience marks a significant departure from past practices. Traditional CX strategies were often reactive, based on historical data and generalizations about customer behavior. In contrast, AI-driven CX is proactive and dynamic, capable of responding to customer needs in real-time and predicting future behaviors with a high degree of accuracy. This evolution is characterized by the integration of AI technologies such as machine learning, Natural Language Processing (NLP), and computer vision into the customer experience framework. These technologies enable businesses to not only understand what their customers want but also anticipate their needs before they even express them.

As AI continues to evolve, its role in customer experience will only grow more prominent. Businesses that embrace AI-driven CX strategies are likely to see significant improvements in customer satisfaction, loyalty, and overall business performance. For instance, data from Shopify indicates that personalized customer experiences lead to a 49% likelihood of repeat purchases, further enhancing customer lifetime value and loyalty. See Figure 1.

Personalization and Customer Insights through AI

In today's competitive landscape, personalization is no longer a luxury but a necessity for businesses aiming to engage and retain customers. Customers expect interactions that are tailored to their specific needs, preferences, and behaviors. AI has become a critical enabler of this level of personalization, allowing businesses to go beyond generic customer experiences and offer highly individualized interactions that resonate on a personal level.

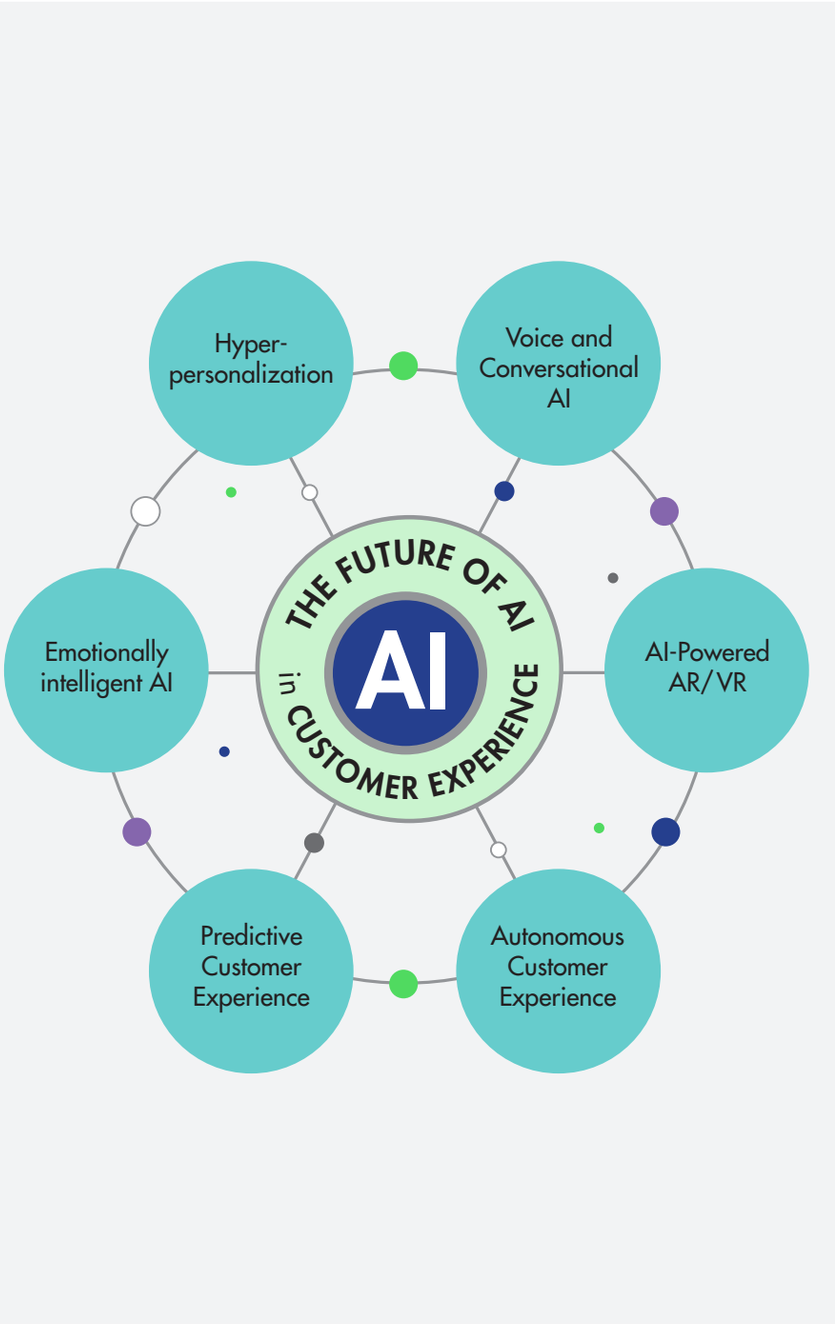

Figure 1. Transforming Customer Experience using AI, Image generated by Dalle.

AI-Driven Personalization Strategies

At the core of AI-driven personalization is the ability to analyze vast amounts of customer data in real-time and make data-driven decisions that enhance the customer experience. Machine learning algorithms, in particular, play a key role in identifying patterns and preferences from customer data, which can then be used to tailor products, services, and communications.

For instance, streaming services like Netflix and Spotify use AI to create personalized content recommendations based on users' viewing or listening histories. These recommendations are not only based on what a customer has consumed in the past but also consider trends among similar users, the time of day, and even the device being used. This level of personalization keeps customers engaged and increases their loyalty by consistently offering relevant content.

Creating a Holistic View of the Customer

One of the greatest challenges in delivering personalized experiences is creating a holistic view of the customer. Traditionally, customer data has been siloed across different departments—sales, marketing, customer service, and so on—making it difficult to get a complete picture of the customer journey. AI helps break down these silos by integrating data from multiple sources, providing businesses with a unified view of each customer. This unified customer profile is crucial for delivering consistent and seamless experiences across all touchpoints. For example, if a customer browses products online, AI can ensure that their preferences are recognized when they visit a physical store, enabling personalized service from in-store staff. Similarly, if a customer reaches out to customer support, AI can pull up their entire interaction history, allowing the representative to offer more informed and personalized assistance.

The Impact of AI on Customer Loyalty and Engagement

Personalization powered by AI not only improves immediate customer experience but also has a long-term impact on customer loyalty and engagement. When customers feel understood and valued, they are more likely to remain loyal to a brand and engage with it regularly. AI-driven personalization builds this connection by ensuring that every interaction is relevant and meaningful enabling businesses to continuously refine and improve their personalization strategies. By learning from each customer interaction, AI systems become better at predicting what will resonate with individual customers, leading to even more effective personalization over time. This ongoing improvement creates a positive feedback loop, where enhanced customer experiences drive loyalty, and increased loyalty provides more data to further enhance personalization.

For example, Starbucks uses its AI-driven recommendation system, Deep Brew, to personalize offers and suggestions to customers through its mobile app. This technology analyzes purchase history and preferences to tailor suggestions, thereby enhancing customer satisfaction and fostering loyalty. As a result, Starbucks not only retains customers but also sees increased frequency of visits and higher sales per visit.

AI in Customer Service and Support

In the realm of customer experience, service and support are critical touchpoints that significantly influence customer satisfaction and loyalty. Traditionally, customer service has been a labor-intensive process, often constrained by human limitations such as availability, response time, and consistency. However, the advent of AI has revolutionized this domain, enabling businesses to provide faster, more efficient, and more personalized support to customers.

The Role of Chatbots in Automating Customer Interactions

Chatbots are among the most visible and widely adopted AI technologies in customer service. These AI-powered programs are designed to simulate human conversation and can handle a wide range of customer inquiries, from answering simple questions to guiding users through complex processes. The primary advantage of chatbots is their ability to operate 24/7, providing instant responses to customer queries without the need for human intervention.

Businesses across various industries are leveraging chatbots to improve their customer service operations. For instance, e-commerce platforms use chatbots to assist customers with product recommendations, order tracking, and returns processing. Financial institutions deploy chatbots to help customers with account management, transaction inquiries, and even financial advice. These applications not only enhance customer convenience but also reduce the burden on human agents, allowing them to focus on more complex and value-added tasks. For example,

Sephora's chatbot offers beauty advice and product recommendations, significantly enhancing the shopping experience and driving engagement. Statistics highlight the efficiency of chatbots: a report by Oracle noted that 80% of businesses expected to have some form of chatbot automation by 2020. Furthermore, a Juniper Research study predicts that chatbots will be responsible for over $112 billion in retail transactions by 2023, underscoring their growing impact on commerce and customer service. These figures illustrate the transformative potential of chatbots in streamlining customer interactions and boosting operational efficiency.

Virtual Assistants: Enhancing the Customer Experience

While chatbots primarily focus on automating specific customer interactions, virtual assistants represent a more advanced application of AI in customer service. Virtual assistants, such as Amazon's Alexa, Apple's Siri, and Google Assistant, are capable of engaging in more complex, multi-step conversations and can integrate with various services and platforms to provide a seamless customer experience.

In a customer service context, virtual assistants can serve as personal concierge, helping customers with tasks such as making reservations, scheduling appointments, and managing subscriptions. In the hospitality sector, virtual assistants are being integrated into hotel rooms to improve guest experiences. For example, the Wynn Las Vegas equipped its rooms with Amazon Echo devices, allowing guests to control room features like lighting, temperature, and entertainment systems through voice commands. Additionally, these devices provide information on hotel services, local attractions, and can even facilitate room service orders.

In the automotive industry, virtual assistants like BMW's Intelligent Personal Assistant offer drivers a hands-free way to control vehicle settings, navigation, and entertainment systems, essentially acting as a personal concierge while on the move.

They can also be integrated into mobile apps, websites, and smart devices, allowing customers to access support whenever and wherever they need it. For example, a virtual assistant integrated into a banking app can help customers transfer funds, pay bills, and monitor account activity, all through simple voice or text commands.

Virtual assistants are also being used to enhance in-person customer service experiences. In retail settings, AI-powered kiosks equipped with virtual assistants can guide customers through store navigation, provide product information, and even suggest complementary items based on past purchases. In hospitality, virtual assistants can be found in hotel rooms, where they assist guests with everything from adjusting room settings to ordering room service.

AI-Enhanced Contact Centers: The Next Frontier of Customer Support

While chatbots and virtual assistants handle routine inquiries, complex and emotionally charged issues often require human intervention. However, even in these cases, AI is playing an increasingly important role in enhancing the efficiency and effectiveness of contact centers. AI-enhanced contact centers leverage a variety of AI technologies, including machine learning, NLP, and sentiment analysis, to improve agent performance and customer satisfaction.

One of the primary applications of AI in contact centers is the intelligent routing of customer inquiries. Traditionally, customer calls and messages were routed to agents based on availability or basic criteria such as language or department. AI takes this a step further by analyzing the nature of the inquiry, the customer's history, and even the emotional tone of the interaction to match the customer with the most suitable agent. This intelligent routing ensures that customers are connected with agents who have the appropriate expertise and can resolve issues more effectively.

For example, AI-powered tools can analyze the conversation in progress and recommend responses, actions, or resources that the agent can use to resolve the issue more quickly. This not only improves response times but also enhances the consistency and quality of customer support. At Verizon, AI tools analyze customer interactions in real-time to suggest solutions to customer service agents. Citibank uses AI to provide its agents with real-time recommendations during customer calls.

AI and Customer Journey Mapping

Customer journey mapping is a vital tool for understanding and optimizing the various touchpoints and interactions that a customer has with a brand. Traditionally, creating and analyzing these maps has been a manual and time-consuming process, often based on static data and generalized assumptions. However, the advent of artificial intelligence (AI) has revolutionized customer journey mapping by introducing dynamic,

data-driven insights that allow businesses to monitor, analyze, and optimize customer journeys in real-time.

Customer journey mapping involves visualizing the steps a customer takes from the moment they first engage with a brand to the point of purchase and beyond. It encompasses every touchpoint, from online interactions and social media engagement to in-store visits and post-purchase support. The goal of journey mapping is to understand the customer's experience from their perspective, identifying pain points and opportunities for improvement to enhance overall satisfaction and loyalty.

Traditionally, journey maps have been static representations, often based on anecdotal evidence or aggregate data. These maps can provide valuable insights, but they lack the flexibility and precision needed to respond to the dynamic nature of customer behavior. This is where AI comes in, offering the ability to continuously update and refine journey maps based on real-time data and sophisticated analytics.

Integrating AI with Customer Journey Analytics

AI-driven customer journey mapping goes beyond static representations by integrating real-time data from multiple sources, such as CRM systems, social media, website analytics, and customer feedback platforms. This integration allows businesses to create a comprehensive, 360-degree view of the customer journey, capturing every interaction and providing a detailed understanding of customer behavior.

One of the most powerful aspects of AI in journey mapping is its ability to identify patterns and trends that might not be immediately apparent through traditional analysis. For example, AI algorithms can analyze vast amounts of data to detect subtle shifts in customer behavior, such as changes in buying patterns or engagement levels. These insights can help businesses anticipate customer needs and adjust their strategies accordingly. Moreover, AI can segment customers based on their journey data, allowing businesses to create personalized experiences for different customer groups.

One of the most significant advantages of AI in customer journey mapping is its ability to optimize journeys in real-time. Traditional journey maps are often static snapshots that provide insights based on past data. In contrast, AI-powered journey mapping tools continuously monitor customer interactions, allowing businesses to adapt and optimize journeys as they happen.

For example, if a customer encounters a problem during the checkout process, AI can detect this issue in real-time and trigger an automated response, such as offering assistance through a chatbot or sending a follow-up email with alternative solutions. Similarly, if AI detects that a customer is spending an unusually long time on a particular page, it can prompt personalized content or offers designed to guide the customer to the next stage of the journey.

This real-time optimization is particularly valuable in managing complex, multi-channel journeys. Customers today interact with brands across various platforms, including websites, mobile apps, social media, and physical stores. AI can track these interactions across channels, ensuring that the customer experience is consistent and seamless. For instance, if a customer begins their journey by researching a product on a mobile app and later visits a physical store, AI can ensure that the in-store experience aligns with the information and preferences gathered during the online interaction.

In summary, AI is transforming customer journey mapping by enabling real-time, data-driven insights and optimizations that enhance the customer experience. Businesses that leverage AI in their journey mapping strategies are better equipped to understand their customers, deliver personalized experiences, and foster long-term loyalty.

Ethical Considerations and Challenges in AI-Driven Customer Experience

As AI continues to transform CX it brings with it a host of ethical considerations and challenges that businesses must address. While AI has the potential to revolutionize the way companies interact with their customers—delivering highly personalized, efficient, and engaging experiences—it also raises questions about data privacy, algorithmic bias, transparency, and the balance between automation and human interaction.

At the heart of AI-driven customer experience is data—massive amounts of it. AI relies on collecting, processing, and analyzing customer data to deliver personalized experiences and gain insights into customer behavior. However, this dependence on data raises significant concerns about privacy and security.

One of the primary ethical challenges is ensuring that customer data is collected and used in a manner that respects individuals' privacy. Customers are becoming increasingly aware of how their data is being

used, and they expect businesses to protect their personal information. High-profile data breaches and privacy scandals have eroded trust. In 2017, for example, one of the largest credit reporting agencies, Equifax, experienced a massive data breach that exposed the personal information of approximately 147 million people. This breach included sensitive data such as Social Security numbers, birth dates, addresses, and in some instances, driver's license numbers. Such instances make data security a top priority for companies leveraging AI in their CX strategies.

To address these concerns, businesses must implement robust data protection measures, such as encryption, anonymization, and secure data storage practices. Moreover, they need to be transparent with customers about what data is being collected, how it is being used, and who has access to it. Consent is a critical factor—customers should have the ability to opt-in or out of data collection practices, and businesses must ensure that consent is informed and meaningful.

Bias in AI Algorithms

Another significant ethical challenge in AI-driven customer experience is the potential for bias in AI algorithms. AI systems learn from data, and if the data they are trained on is biased, the resulting algorithms can perpetuate or even exacerbate those biases. This can lead to unfair and discriminatory outcomes in customer interactions.

For example, if an AI system used in a financial institution is trained on historical data that reflects biased lending practices, it may continue to favor certain demographic groups over others when making loan decisions. Similarly, AI-powered marketing algorithms might inadvertently target or exclude specific customer segments based on biased assumptions about their behavior or preferences.

Balancing Automation with Human Touch

While AI can automate many aspects of customer experience, there is a delicate balance between automation and the human touch. Customers appreciate the efficiency and convenience that AI-powered tools, such as chatbots and virtual assistants, provide. However, there are situations where human interaction is essential, particularly in handling complex, emotional, or sensitive issues.

One of the ethical challenges businesses face is determining when and where to apply AI versus when to rely on human agents. Over-automation can lead to a depersonalized experience, where customers feel like they are interacting with machines rather than people. This can be particularly problematic in industries where trust and empathy are critical, such as healthcare, financial services, and hospitality.

In conclusion, while AI offers tremendous opportunities to enhance customer experience, it also presents significant ethical challenges that businesses must address. By prioritizing data privacy, mitigating bias, ensuring transparency, balancing automation with human interaction, and complying with regulations, companies can responsibly navigate the ethical dimensions of AI use.

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Generative AI: Technology Utopia or Disaster Waiting to Happen?

YUSAF H. AKBAR AND MARK ESPOSITO

8

"I want AI to do my laundry and dishes so that I can do art and writing, not for AI to do my art and writing so that I can do my laundry and dishes."
– Joanna Maciejewska

Recently, the CEO of Cognizant, Ravi Kumar suggested: "Generative AI can be deployed flexibly to accentuate people's existing strengths while de-emphasizing their weaknesses"[1]. This claim about human-centered generative AI typifies technological utopianism which claims that advancements in science and innovation inevitably lead to a better society. Executives, entrepreneurs and public intellectuals who share this perspective, regard technology as being capable of bringing about widespread prosperity, equality, and happiness.

Kumar's view is nothing new. Previous waves of technology utopianism famously included the claim by the founder of the World Wide web, Tim Berners-Lee that "the Web does not just connect machines, it connects people"[2], seemingly oblivious to the impending commercial weaponization of user data from Internet usage. Or, proponents of the digitally mediated sharing economy, who claimed that individuals can become micro-entrepreneurs by renting belongings or providing rides through platforms like Airbnb and Uber. Data from JP Morgan has shown that while half of US adults had participated in the sharing economy, very few made significant income this way. Only four percent of adults earned more than USD5,000 annually through sharing platforms. The majority earned less than USD1000.[3]

Consider also the starry-eyed optimism surrounding social media, once hailed as a democratizing force for free speech and connection. Today, these platforms grapple with issues like misinformation, data breaches, and the corrosive impact on mental health. Data breaches have exposed the private information of millions, eroding trust and raising grave concerns about user privacy, while fostering polarizing echo chambers. The reckless celebration of GenAI and its supposedly widespread power is likely eroding trust, which in turn diminishes its economic profitability and accrues various hidden costs.

Given the technology utopianism associated with new technology waves, which typically end up proving to be far worse that initial predictions, our chapter highlights three goals. First, it calls for a serious and critical evaluation of the actual and potential usefulness of GenAI to organizations and society alike. Second, it reveals how technology utopianism promotes GenAI technologies that systematically underplay societal harm from their use. Third, given the historically unique threat of GenAI, it presents an alternative, genuinely human-centered vision for GenAI which embraces the precautionary principle i.e. use of GenAI is permissible as long as it does not substantially threaten the extinction of human labor in economic production and the autonomy of human choice.

Is GenAI's Usefulness to Organizations and Society Overhyped?

GenAI has been heralded as holding significant benefits for organizations and society. Across a range of socio-economic activity from manufacturing, digital media, professional services and healthcare, a consensus has emerged that GenAI is the 'next big thing'. Advocates claim that GenAI can assist in medical diagnostics; provide personalized learning experiences; automate repetitive tasks; enable workers to focus on more complex and creative activities as well as assist artists, writers, and designers by generating new ideas, enhancing creativity, and streamlining the creative process overall. Trillion-dollar corporations like Alphabet and Microsoft proclaim that GenAI is as revolutionary as electricity or fire and are restructuring their entire operations to center around it.[4] Governments are also considering the integration of GenAI into public sector operations to enhance efficiency and service delivery. Educational institutions are exploring its potential to revolutionize teaching methodologies and personalized learning paths for students, potentially addressing long-standing educational disparities. This has further been reflected in the interest of investors. In 2023, generative AI start-ups raised almost 50 Bn USD.[5]

Yet despite this technology utopianism, there are a number of doubts about both the usefulness and potential for GenAI in the next few years ahead. Gary Marcus, co-author of *Rebooting AI* [6] with Edward Davis, has emphasized one of the core weaknesses of current GenAI: the neural networks upon which current GenAI is based suffer from a lack of reliability because of its tendency to hallucinate. This has led important potential users of GenAI, such as governments, to declare a lack of willingness to deploy it owing to its unreliability.[7] Cory Doctorow has gone further to suggest that increased use of GenAI platforms such as ChatGPT actually make the situation worse because content produced by generative AI is polluting the data sets on which future systems will be trained.[8] This means that rather than becoming better over time, GenAI will in fact get worse. These concerns explain in part a stagnation in ChatGPT user growth with declines in five of the eight months to February 2024. This has encouraged further skepticism in the potential economic impact of GenAI more broadly. One of the foremost thinkers in the economics of technological change, MIT Professor Daron Acemoglu,argued that GenAI will increase productivity by only 0.66 percent over 10 years, or by 0.06 percent annually. Since GenAI will encourage an investment boom, Acemoglu argues that the increase in GDP growth could be a little larger, perhaps in the 1 percent to 1.5 percent range – hardly transformational.[9]

A further fear behind the hype cycle associated with GenAI, is that once investors begin to recognize its limitations, there could be a sell off of GenAI assets, increasing the risk of a severe economic contraction. Echoes of the 'Dot Com' Bubble are not far from the mark in that regard. Investor overconfidence often drives inflated valuations, and a sudden market correction could result in significant financial loss and instability. This scenario places both nascent AI startups and mature tech giants at potential risk, affecting broader economic landscapes and prospects for organically scaling firms, from the ground up. Thus, it is important for society to exercise considerable caution about the revolutionary nature of GenAI in the near term. While it is very difficult to take predictions about change 20 to 30 years from now seriously, that shouldn't prevent us from looking at the dangers of GenAI should it fulfill its potential in the longer term. We now turn to this issue.

Dangers from a GenAI Dream Fulfilled

GenAI presents several dangers to society that require urgent consideration. These dangers encompass a range of ethical, social, and economic dimensions that outweigh the benefits of GenAI if not addressed sooner rather than later.

Organizational Dangers

For organizations of all sizes and across all kinds of activities, we have identified three key dangers of using GenAI. First is the **potential for bias in GenAI systems** if decision-making relies exclusively on the output of GenAI. GenAI algorithms are trained on data that reflect existing prejudices and inequalities, leading to biased outcomes. For instance, if an AI recruitment tool is trained on historical hiring data that favors a particular demographic, it may perpetuate these biases, affecting diversity and inclusion efforts within an organization.

Second, **GenAI brings a number of dangers associated with data privacy and security**. GenAI systems often require vast amounts of data to function effectively. Collecting and processing this data raises concerns about how it is stored, used, and protected. Organizations that embrace GenAI also have to further enhance their current cybersecurity measures to prevent data breaches, which can have severe legal and reputational consequences. Additionally, they must comply with stringent data protection regulations, which can be time consuming and resource-intensive. Ensuring robust data governance frameworks is also essential to maintain public trust and avoid the misuse of sensitive information, which could lead to significant ethical and legal challenges, as we will explore further in this chapter.

Third, while some investors may see this as a key opportunity associated with GenAI, the **potential displacement of jobs due to GenAI is a critical economic danger**. While GenAI enhances productivity and lowers operating costs, it also renders many existing jobs obsolete which are linked to skills and capabilities that require substantial investment and time for people to develop. Job displacement from GenAI implies that organizations may need to invest in reskilling and upskilling their workforce to mitigate the impact of automation on employment. At the organizational level, failure to do so can lead to increased employee turnover, low morale, and a tarnished reputation as a socially responsible employer.

Societal Risks

The dangers for society associated with GenAI are even greater. First is a concern associated with the **erosion of privacy**. Data collection required by GenAI systems lead to intrusive surveillance, where individuals' actions and behaviors are constantly monitored and analyzed. This creates a sense of vulnerability and mistrust among the public, undermining societal cohesion. This collection of private information and data can be weaponized to tarnish reputations, fuel social unrest, or interfere in electoral processes, potentially destabilizing entire nations, as seen in summer 2024, on the mismanaged coverage of the riots occurring in the UK. Second, GenAI systems can be used to **manipulate public opinion, spread misinformation and influence democratic processes**. Deepfake technology, which creates highly realistic but fake videos, poses a threat to political stability and social cohesion. Third, rapid advancement of GenAI brings **increased probability of greater social inequalities**. This is due to the fact that access to advanced AI technologies may be limited to affluent individuals or organizations, reinforcing the existing digital divide and leaving marginalized communities further behind. Without equitable access, GenAI could exacerbate existing disparities, resulting in unequal economic opportunities and widening gaps in education and employment, making it somehow, a (the) great disequalizer.

Given the evident dangers associated with GenAI, why does society appear hell bent on adopting it, sleepwalking into a serious threat to humanity? This is a complex question that can be explored from multiple angles. We focus the remainder of our chapter on one aspect of this GenAI sleepwalk: technology utopianism.

Technology Utopianism

Does technology utopianism promote GenAI and systematically underplay its harm for society? While the origins of technology utopianism cannot be attributed to a single thinker or source, it is a belief that technological advancements will inevitably lead to a perfect society. Supporters of technology utopianism assert that technology can solve all of society's pressing problems through the development and use of new technologies (such as GenAI). The vision of a future where technology solves all human problems is highly seductive and systematically encourages us to ignore the real and present dangers of GenAI. But why is society so seduced by technology utopianism? First, **believing in a technological utopia creates a (false) sense of security**. This allows society to opt out from facing the need for proactive measures to address pressing societal issues like climate change, digital divides and income and wealth inequality believing (erroneously) that technology 'will solve the problem'. This mindset fosters complacency and a lack of urgency in addressing

issues that require immediate action and sustained effort. Moreover, it shifts the responsibility from human action to technological solutions, diminishing the perceived need for policy interventions, civic engagement, and societal change, hence eroding a fundamental tenet of liberal democracies.

Second, **narratives (and outcomes) of previous technological breakthroughs, from the internet to advancements in medical research, imply that all technological change is alike** i.e. that it can lead to significant and unambiguously positive change. This reinforces the belief that GenAI innovation is part of the same historical development that will bring even greater benefits, making the idea of a tech-driven utopia extremely compelling. Moreover, the successes of past innovations create a collective memory that overlooks the associated challenges and failures, leading to an overly optimistic expectation of new technologies, nested into a naïve sense of interminable incrementalism of the technologies that permeate our lives. Third, as many of the world's historical and contemporary social, economic, and environmental challenges can emotionally and intellectually overwhelm us, **technology utopianism is a heuristic** that simplifies these challenges e.g. if only we embrace 'progress' presented by GenAI, there is a seemingly straightforward path to resolution and progress of the manifold challenges facing society. Fourth, **believing in a technologically-driven utopia also reinforces psychological comfort**, offering hope and a sense of control over the future. This idealism helps mitigate fears about the unknown and offers a coping mechanism for dealing with complex global issues. It allows individuals, organizations and society more broadly to express optimism about progress and human ingenuity and provide strategic vision.

Fifth, popular culture is sometimes upstream from economics. Notwithstanding the nuance of science fiction writing, film and TV, decades of science fiction and entertainment depict the emergence of utopian worlds transformed by the judicious application of advanced technologies. These **narratives shape public imagination and create an emotional connection to the idea that GenAI can create ideal societies**. The prevalence of such stories in popular media not only fuels public enthusiasm but also influences policymakers and industry leaders who seek to align with these visions to maintain relevance and support. Lastly, the tech industry and its key stakeholders, including investors, entrepreneurs, and policymakers, all face **strong financial incentives to promote optimistic views of GenAI's potential**. This attracts funding, talent, and regulatory support, entrenching the allure of GenAI. Google CEO, Sundar Pichai, warned in an interview that GenAI "can be very harmful if deployed wrongly" and when asked if GenAI needed international agreement to limit the risk, he strongly agreed. Yet in the same interview, he pivoted arguing that Google's GenAI capability, Bard, was however, safe for use.[10]

The Way Forward: Short-term Skepticism, Long-term Vigilance

We have argued in this chapter, that society should avoid overrating GenAI's value in the short term due to its manifest limitations in the immediate future, but at the same time be aware that in the long-term, as AI more broadly evolves, society should remain laser focused on its risks in order to avoid falling into the psychological and economic traps that technology utopianism offers. A utopian vision, fundamentally and by necessity, glosses over the ethical and social implications of technology. GenAI utopianism is no exception. GenAI exposes society to nuanced dilemmas that demand careful scrutiny and reflection at all levels. A failure to address these concerns may result in a dehumanizing effect where human agency is de-emphasized in favor of technological processes and economic wealth. This dehumanization fosters the creation of a passive society and an overreliance on algorithmic decision-making from GenAI that can erode society's interests in critical areas such as criminal justice and employment. For example, biased AI algorithms in judicial systems can lead to unfair sentencing, perpetuating systemic inequalities, while even more generically in any workplace, overdependence on AI for hiring processes can unintentionally discriminate against certain demographics, exacerbating employment disparities, subtly determined by poor data vetting and mounting undetectable biases.

As we reach the end of our chapter, we believe that GenAI developments and innovations should be subject to the precautionary principle in the long run. The precautionary principle is a valuable framework for developing a human-centered approach to GenAI. It espouses proactive, preventative measures to safeguard humanity. This principle can guide the responsible development and deployment of GenAI technologies, ensuring they align with the preservation of humanity in the long run. By prioritizing human welfare and ethical considerations, the precautionary principle can serve as a counterbalance to the unchecked

advancement of technology, as we advocate that a GenAI precautionary principle creates five pillars of human-centered GenAI.

First, the precautionary principle takes **preventive action in the face of uncertainty**, especially if potential dangers are significant or irreversible. In the context of GenAI, this means conducting thorough risk assessments before deploying AI systems. Developers and organizations should evaluate potential risks, such as biases in algorithms, privacy breaches, and unintended consequences. For example, carrying out thorough testing and validation can uncover and eliminate bias in AI models before they enter the real world. Second, the precautionary principle demands the **incorporation of ethical considerations** into GenAI development processes from the outset. This involves requiring that GenAI systems must respect human privacy and autonomy. Ethical guidelines can mandate transparency in GenAI decision-making processes, require informed consent for data collection, and promote fairness in algorithmic outcomes.

Third, the precautionary principle necessitates **an inclusive GenAI development process** and the involvement of various stakeholders in decision-making processes. This demands a diverse set of perspectives, including philosophers, sociologists, scientists, as well as representatives from affected communities. For example, the employing of a combination of public consultations and interdisciplinary collaborations can better confront GenAI dangers that may be overlooked from a purely technological perspective. Fourth, **transparency and accountability** are at the very heart of the precautionary principle. GenAI development should include processes and protocols that embed transparency in how AI systems both operate and make decisions. This requires clear explanations of AI algorithms, data usage, and decision-making processes to all impacted stakeholders. Creating robust reporting and redress mechanisms can help users and affected parties address grievances and where necessary seek corrective actions.

Lastly, the precautionary principle is a dynamic one that requires **ongoing monitoring and evaluation** to identify and address potential risks on a continuous basis. For GenAI, this requires the development and deployment of real-time monitoring that can track the performance of GenAI systems in a range of contexts, both public and private, in order to offer nuanced insights into their impact on different stakeholders and which will mandate reform of GenAI design and deployment.

While GenAI may present a number of transformative benefits, it also presents substantial dangers to organizations and society. Addressing biases, safeguarding data privacy, mitigating job displacement, and ensuring ethical use are paramount to harnessing GenAI's potential responsibly. Proactive measures, including regulatory oversight, ethical guidelines, and comprehensive education and training programs, are essential to mitigate these risks and promote the responsible adoption of GenAI. Governments around the world have tried to address these dangers. Perhaps the most developed and advanced response to the dark side of GenAI has been the European Union's (EU) AI Act. The EU's AI Act is a regulatory framework aimed at ensuring safe and ethical AI development and use within the EU. It organizes GenAI systems into four risk levels: unacceptable, high, limited, and minimal. The Act prohibits GenAI applications deemed a threat to safety or fundamental rights, such as social scoring by governments and 'predictive policing'. High-risk AI systems face strict requirements, including risk management, transparency, and human oversight. These systems include those that would be responsible for educational assessment and HR hiring processes. Limited-risk systems must meet transparency obligations such as chatbots and ai-driven recommendations in e-commerce platforms, while minimal-risk AI systems, such as music recommendations on music streaming services are mostly exempt from regulations. Moreover, the Act encourages the adoption of a risk-based approach that adapts to technological advancements, ensuring that new GenAI applications are scrutinized appropriately as they emerge. At its core, the Act aims to balance innovation with fundamental rights protection and as it comes into force establishes the EU as a leader in trustworthy AI.

In summary, by adopting the precautionary principle in the development of GenAI that we have articulated above, GenAI can be created and implemented with a focus on human welfare, ethics, and societal impact. This approach ensures that AI technologies do not advance at the expense of public interest and moral considerations. By proactively managing risks, integrating ethical standards, involving diverse stakeholders, setting up adaptive governance, promoting transparency and accountability, and encouraging continuous evaluation, the precautionary principle can guide the development of human-centered AI systems that safeguard and benefit humanity.

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Unlocking Africa's Potential with AI

DANIEL RUKARE

9

Artificial Intelligence is revolutionizing sectors across Africa, offering solutions to challenges in healthcare, agriculture and education. This transformation is not just about adopting technologies from other parts of the world; it is driven by the innovation and creativity of African talent.

For example, in Nigeria, LifeBank uses AI to improve blood supply chains, ensuring that lifesaving blood reaches hospitals quickly, even in remote areas. In Rwanda, AI helps farmers by monitoring crops and alerting them to potential pest threats or soil issues, which can save entire harvests. In Kenya, the Eneza Education app provides students with AI-driven quizzes and lessons, accessible even on basic mobile phones, helping to bridge the educational gap between rural and urban students.

However, Africa's journey with AI is not without its challenges such as limited infrastructure and a skills gap. But there are promising initiatives aimed at overcoming these hurdles. In Ghana, for example, universities are now offering AI courses, supported by local and global tech firms, creating a new generation of AI experts.

An AI-powered Africa is emerging, driven by resilience and an unwavering commitment to solving pressing challenges. The continent's innovations have the potential not only to transform Africa but to offer inspiration to the world.

This chapter explores the profound impact of AI in Africa, highlighting its role in social change, sustainable development, and governance. It emphasizes the importance of collaboration while cautioning against the risk of multinationals dominating the AI landscape, which could hinder local innovation. To ensure AI's benefits are maximized, the chapter advocates for investment in AI infrastructure, talent development, and regulatory frameworks that align with Africa's unique needs.

Foreign direct investment

Recent research underscores the transformative economic potential of AI and foreign investment in Africa, with studies showing that technology-driven growth can enhance sustainable development across the continent.

Investment in human capital—particularly in education and health—has been shown to significantly contribute to economic growth. AI and machine learning, when integrated with existing technological frameworks, have the potential to drive innovation, increase productivity, and foster knowledge economies in Africa. Moreover, while foreign direct investment (FDI) has

a modest impact, it plays a critical role in bolstering economic growth through improved infrastructure and capital formation, though it requires robust human capital to maximize benefits. Together, these insights highlight the importance of targeted investment and strategic use of AI to unlock Africa's economic potential.

Foreign direct investment (FDI) has been a crucial source of funding for Africa's development, particularly in infrastructure projects essential for AI adoption. In 2023, FDI inflows into Africa reached $97 billion, with an increasing portion of this investment directed toward digital infrastructure, including AI-focused initiatives. Development partners such as the World Bank and the International Monetary Fund (IMF) have emphasized the importance of technology and innovation in their lending programs. For instance, the World Bank's *Africa Pulse* report highlighted that AI and other technologies could accelerate progress toward the UN Sustainable Development Goals (SDGs) in key sectors such as education, healthcare, and economic growth.[1]

Similarly, the United Nations has underscored technology's role in achieving the SDGs, particularly in agriculture, education, and healthcare. AI applications could play a pivotal role in addressing Africa's most pressing challenges, including food security, access to quality education, and improved healthcare services.[2] The Africa AI for Development (A14D) report predicts that AI could boost Africa's economic growth by an additional $2.9 trillion by 2030, though this potential is contingent upon overcoming obstacles such as limited digital infrastructure, the digital divide, and the need for robust governance frameworks.[3]

As Africa seeks to unlock its development potential, industrialization, and technology adoption must progress in tandem. With the backing of development partners and an increasing focus on AI, Africa stands at a critical juncture. Whether the continent can overcome its historical challenges and seize the opportunities presented by the digital revolution remains to be seen. With the evolution of technologies on a global scale, Africa finds itself at a crucial point where strategic integration of AI could tackle some of its most urgent issues and offer opportunities for social advancement throughout the continent. From healthcare and education to agriculture and infrastructure, AI holds the promise to fuel growth and enhance the lives of millions.

However, despite its benefits, leveraging AI for development in Africa presents challenges. African nations will need to address obstacles related to governance, infrastructure and institutional capabilities to fully tap into what AI has to offer. Overcoming these hurdles will require efforts from policymakers, industry stakeholders and international collaborators to ensure that AI solutions are developed and implemented in ways that cater to the needs of all Africans.

The Promise of AI in Africa

Healthcare: AI has the potential to revolutionize African healthcare, especially in diagnostics, treatment, and health outcomes. AI diagnostic tools can detect diseases like cancer, tuberculosis, and malaria early, leading to better treatments and outcomes. AI also enhances health informatics, enabling data analysis that supports more effective health strategies, resource allocation, and efficiency. This helps tackle issues like limited healthcare infrastructure and medical staff shortages, potentially reducing mortality rates and improving health outcomes.[4]

Education: AI is poised to transform education by personalizing learning and making it more inclusive. In Africa, AI-powered solutions can help bridge educational access gaps and support educators by automating tasks, allowing them to focus on teaching and engaging students. AI can identify areas needing improvement, boosting literacy rates and equipping students with skills for the digital era.[5]

Agriculture: As a vital sector in Africa, AI in agriculture can enhance productivity and sustainability. Precision agriculture allows farmers to use real-time data on soil, weather, and crops to make informed decisions, increasing yield and reducing waste. AI also supports livestock breeding, boosting productivity for small-scale farmers. Expanding AI adoption can bolster resilience to climate change and improve food security.[6]

Infrastructure: In infrastructure, AI enhances planning and resource management. Predictive analysis improves the design of roads, utilities, and construction, ensuring projects are cost-effective, sustainable, and community focused. In industries like FinTech, AI promotes inclusivity by broadening banking access for marginalized groups and supporting SMEs. It also improves public sector efficiency by reducing recruitment bias and improving service delivery, strengthening governance.[7]

Driving Socio-Economic Transformation

AI offers transformative potential for Africa's socio-economic landscape by breaking down traditional barriers and accelerating growth. As a catalyst for innovation, AI boosts productivity and competitiveness, essential for sectors like manufacturing and services through automation, optimized supply chains, and data-driven decisions. The growth of AI-driven industries could establish African nations as innovation hubs, attracting investment and creating high-quality jobs. Despite concerns about automation, AI also drives job creation in fields like data science and technology management, promoting inclusivity. Additionally, AI can enhance healthcare access and educational quality, fostering a more equitable, resilient, and prosperous Africa.

AI also holds great promise in securing funding for sustainable development initiatives. It can play a pivotal role in areas like climate change adaptation, resource conservation, and renewable energy projects by providing data-driven insights that optimize the use of resources. AI models and analytics can help predict weather patterns, enabling governments and communities to prepare for natural disasters and mitigate their impacts. These capabilities are crucial for attracting funding from international organizations and investors focused on sustainability, while also improving resilience to environmental challenges.

By leveraging AI's capabilities, African countries have a significant opportunity to drive economic growth, improve living standards, create new jobs, and secure resources for sustainable development. AI can transform industries such as agriculture, healthcare, and education, fostering innovation and productivity. However, for this transformation to be both equitable and sustainable, it is crucial for nations to invest in developing their own AI infrastructure, nurture local talent through education and training, and create robust regulatory frameworks. These frameworks must not only protect against external dominance but also encourage homegrown innovation and ensure that AI technologies are aligned with Africa's unique developmental needs and challenges. With the right investments and policies, AI can help Africa overcome its historical challenges and unlock its full potential in the digital age.[8]

While the World Bank and the International Monetary Fund (IMF) advocate for investment in digital infrastructure and AI to drive inclusive growth in Africa, these recommendations face challenges due to the region's historical struggles with flagship educational programs like Universal Primary Education (UPE). Despite efforts to improve education access, the effectiveness of UPE and secondary education programs has often fallen short, limiting the development of necessary human capital to fully leverage AI-driven growth opportunities.[9] This contradiction highlights a critical gap: while digital and AI investments have transformative potential, the absence of a robust educational foundation hinders their impact, making comprehensive reform in education a pressing need alongside technological advancements.

Climate Change Financing: Africa's New Oil Renaissance

Africa stands at the forefront of a new era, where artificial intelligence (AI) can drive transformative solutions to climate change financing, often dubbed the "new oil" renaissance. Leveraging AI for carbon offsets and climate finance, Africa has the potential to harness its vast natural resources, biodiversity, and reforestation capabilities to generate substantial revenue while mitigating environmental challenges. AI enables the development of precise carbon capture measurements, robust monitoring systems, and predictive models that assess the effectiveness of carbon offset projects. By positioning itself as a leading player in the carbon offset market, Africa could attract global climate finance, investing in renewable energy projects, sustainable agriculture, and nature-based solutions that directly benefit local communities and ecosystems. This dual approach would not only contribute to global carbon reduction targets but also foster economic growth, jobs, and infrastructure development across the continent.

The pace of regulatory development in Africa often lags behind the rapid innovation in climate finance, presenting risks that must be carefully managed to enable meaningful engagement with emerging AI technologies. Establishing a sound regulatory framework is essential to ensure that climate finance initiatives are both ethical and effective. African governments must prioritize transparency, accountability, and data protection, especially when utilizing AI in carbon offset and other climate financing projects. These frameworks are critical for building trust and mitigating potential risks associated with data misuse or project mismanagement. For instance, Ethiopia's Climate Resilient Green Economy strategy exemplifies how clear regulations can strategically channel funding into sustainable projects that benefit both the economy and the

environment. A similar commitment across the continent would empower Africa to harness climate finance responsibly, fostering growth while safeguarding the integrity of AI-driven initiatives.

Investing in Capacity Development

African institutions must invest in training and infrastructure to manage climate funds efficiently. Without capacity, even well-funded projects may fail. For instance, Kenya has made strides in building institutions that oversee climate financing projects, ensuring they align with national development goals.

Africa's climate finance potential faces risks from institutional weaknesses, like corruption, seen in Nigeria's misused Ecological Fund, highlighting the need for stronger governance. Additionally, digital colonization threatens African sovereignty as international firms exploit local data under climate projects. Policies advocating data localization and fair data-sharing are crucial, ensuring data benefits local communities. Agreements should mandate reinvestment of profits from these initiatives into Africa's green tech and conservation efforts, fostering equitable, sustainable growth.

International Collaboration and Local Innovation

International partnerships play a key role in ensuring Africa benefits from AI-driven climate finance. Collaborations must prioritize knowledge transfer and capacity building to empower African researchers, entrepreneurs, and policymakers. For instance, partnerships between African universities and international institutions can foster local AI research hubs, ensuring homegrown solutions tailored to Africa's unique challenges, such as language barriers and infrastructural deficits.

Additionally, African governments must champion indigenous AI solutions that cater to their societies. Supporting local AI ventures through investment and favorable policies ensures that Africa retains ownership of its climate and data-driven solutions, fostering innovation that directly benefits its people.

Africa's climate change financing potential represents a new oil renaissance, but it requires robust governance, innovative financing models, and local capacity development to fully leverage it. AI offers immense opportunities to attract investment, maximize impact, and transform climate finance into a vehicle for sustainable growth. By addressing governance risks and promoting local solutions, Africa can lead the global green transition, securing both environmental and economic prosperity.

AI's Transformative Power in Africa

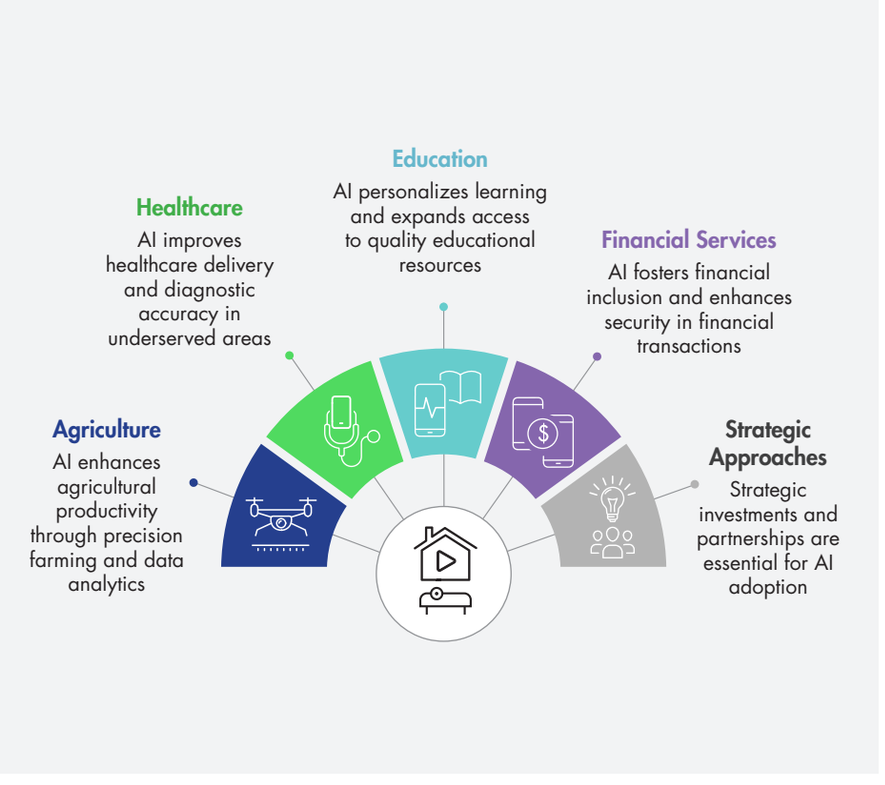

Figure 1. Unlocking Africa's AI potential.

Countries Leading the Way

Many African nations are leading the way in utilizing AI to unlock the potential of the continent. They are excelling in innovation, crafting policies and implementing AI-driven solutions to tackle socio issues enhance governance and promote development.

South Africa stands out as a pioneer in AI research and development within Africa. The country boasts a tech community with numerous universities and research organizations spearheading AI projects. Noteworthy accomplishments include applying AI in healthcare for diagnostics and health data analysis. South Africa is also home to AI research hubs like the Centre for Artificial Intelligence Research (CAIR). It has taken proactive steps in shaping AI policies through initiatives like the Presidential Commission on the Fourth Industrial Revolution (PC4IR).

Meanwhile, Kenya has positioned itself as a point for AI advancement in areas like FinTech and agriculture. Known as "Silicon Savannah", Kenya's vibrant tech industry has garnered recognition. The country leads in mobile money services and digital financial solutions, with AI playing a role in detecting fraud, assessing creditworthiness and tailoring services to individuals. Additionally, Kenya is witnessing a rise in AI startups focusing on sectors such as healthcare, education, and logistics.

Conclusion

These nations are at the forefront of unleashing Africa's potential through the use of AI, demonstrating how AI can address economic challenges, foster innovation, and support development. Although obstacles like infrastructure deficiencies and the necessity for governance frameworks persist, these countries are laying the foundation for a future in Africa that is more prosperous and technologically advanced. By investing in developing policies and engaging in partnerships, these nations can serve as examples for others on the continent by highlighting the opportunities that AI can offer to Africa's development journey. Africa's exploration of AI is just starting, with endless possibilities awaiting. However fully realizing the benefits of AI demands leadership, proactive policy formulation and a dedication to progress. By taking these measures Africa has the potential to lead in the AI revolution while promoting development and enhancing millions of lives throughout the continent.

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Utilizing AI Technology to Improve Modern Slavery Survivor Support

EMILY GILHESPY, QUINTIN LAKE, JULIA MURASZKIEWICZ, RYSZARD PIOTROWICZ AND MATTHEW YOUNG

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RESTART – The Reporting Experiences of Survivors to Analyze in Real Time – was a multi-disciplinary research project which involved a proof of concept of using AI software and a custom mobile app to analyze modern slavery survivor's stories for insights to improve support. Funded by the Modern Slavery Policy and Evidence Centre (PEC), the project was headed by Aberystwyth University in cooperation with modern slavery survivor support charity, Causeway, modern slavery research and technology specialists FiftyEight and ethical AI development and research company Trilateral Research.

RESTART aimed to provide policy makers with a better understanding of survivor needs, how they should be prioritized and how they change over time, as well as how to better align support packages with what they actually need. It also aimed to help change the way stakeholders see the potential of data science methods – in particular Natural Language Processing (NLP) — in engaging with survivors, giving them a voice and providing them with support.

This chapter shares the learning of this ground breaking project, which found AI to be effective in analyzing survivors' needs and challenges consistent with results from conventional research methods, but at scale and in real-time. It also demonstrated how technology can improve support for survivors of modern slavery and enable faster insights for policy makers, support providers, the private sector and others who are trying to address the systemic challenges of modern slavery.

It is estimated that 50 million people worldwide are living in modern slavery on any given day. Modern slavery is an 'umbrella term' for a range of forms of exploitation, including forced labor, debt bondage, child labor and human trafficking. According to the 2021 ILO Global Estimates of Modern Slavery,[1] 27.7 million people are trapped in forced labor, primarily in the supply chains of global companies. The last ten years has seen encouraging growth in legislation and both private and public sector spending to address the systemic challenges of modern slavery in global supply chains, with up to $1b spent annually to combat it.[2] However, stronger commitments financially, relationally and strategically are needed.

The persistence of modern slavery is deeply rooted in a complex interplay of systemic issues that create and exacerbate vulnerabilities among affected populations. Socio-economic inequality is a primary

driver, as individuals in impoverished communities often lack access to education, employment, and social protections, making them susceptible to exploitation. Gender inequality and discrimination further compound these vulnerabilities, with women and girls disproportionately targeted due to their marginalised status in many societies. Harmful social and cultural norms, such as those that condone child labor or forced marriages, perpetuate environments where modern slavery can thrive. This situation is further exacerbated by climate change and conflict which create conditions that foster exploitation and human trafficking, for example damaging agricultural output or forcing migration.

The complexities of modern slavery and the long term outcomes for survivors which can involve mental and physical health problems, insecure immigration status, and exclusion from mainstream support systems and the risk of re-trafficking – make it difficult for policy makers to respond effectively.

RESTART sought to provide a proof of concept for a new, and more effective, method for understanding survivors' needs and making authoritative policy recommendations. To that end, we were led by four research questions:

1. How can support workers, researchers and policy makers harness AI capabilities to provide faster, more effective and efficient insights into the support requirements of modern slavery survivors?
2. If AI is beneficial in gaining insights, what are the recommended methods for its utilization, and what challenges does it present?
3. Does technology serve as a viable platform for survivors to contribute their lived experiences and expertise in shaping modern slavery services authentically?
4. What are the prevailing support needs amongst survivors of modern slavery?

RESTART employed an innovative blend of AI systems, data analytics and interactive mobile applications to analyze large datasets related to survivor support needs. Project RESTART used NLP, an AI technology, to analyze large and complex data sets held by Causeway, a UK charity that supports survivors of modern slavery, that would otherwise remain underutilized due to resource constraints. Survivors were consulted on the design and use of NLP through a Lived Experience Advisory Panel.

Recognizing the authority of survivors in comprehending their own needs and proposing solutions, RESTART introduced a novel approach to integrating survivor voices in research. This approach empowered survivors to actively document their individual experiences and assess their own needs and goals via a smartphone app over a four-month period. Subsequently, the data generated by survivors underwent analysis using NLP techniques.

By leveraging AI techniques, particularly NLP, the research emphasized the potential advantages of using technology to handle large volumes of data and bypass manual analysis to inform insights and proposals regarding survivor needs, while also helping limit traumatization of researchers and others involved in evaluating case data. It also highlighted technology as a new avenue for survivors to actively shape support services and policy recommendations.

In the UK, the National Referral Mechanism (NRM)[3] serves as the support system for potential victims of modern slavery, and in 2023, almost 10,000 individuals exited the supportive framework it provides - with ongoing needs and the challenge of having to navigate complex systems to access essential support. The lack of continuity has a detrimental effect on survivors' mental health, a critical aspect of their recovery and stability. While research has explored the nature of the ongoing support needs of survivors, these have often been based on reflective interviews with a limited number of participants.

Methodology

The project was conducted in two stages, using a mixed-method, co-design approach. Phase 1 entailed the application of NLP technology in survivor case notes analysis. It utilised NLP to analyze the information captured in Causeway's support worker case notes. Phase 2 entailed the generation of data relating to survivors' needs using a smartphone app (MeL app). It sought to move away from conventional research methods, particularly interviews, to establish an alternative platform for survivor engagement in data creation. The MeL app enabled survivors to record 'bullet journal'-style diary entries using their own words, at their own pace, where and when it suited them. They also used the app to assess their needs in real-time, and within the context of available support structures. The text generated by survivors was analyzed using NLP, enabling the identification of trends and patterns of the evolving needs of survivors.

Recommendations

The research found AI to be effective in uncovering insights into survivor's legal, financial, social and mental health needs and challenges, consistent with the needs identified by conventional research methods. AI enabled this identification to be conducted at scale and in real-time. However, this was only made possible due to the involvement of project experts, including a five-person Lived Experience Advisory Panel, in training the AI models and validating the insights they produced. The application of technology is most effective when supported by high-quality human engagement. The process of keeping humans in the loop ensures contextual understanding and sensitivity to the nuances of personal experiences and ethical considerations, which automated systems might overlook.

On the use of AI technologies to analyze modern slavery-related data sets:

1. ***Whilst substantial resources must be invested when first using NLP, particularly for training and validating the NLP model, subsequently, data can be analyzed rapidly.***

While RESTART's NLP models required comprehensive training to navigate the complexities of the Causeway dataset, and much effort was spent to ensure anonymity and compliance with data protection, the researchers found the results justified the time and resources spent at the beginning. In this project, we developed tailored models, as off-the-shelf AI models lack the specificity necessary to consider these complexities, and would run the risk of oversimplifying or misinterpreting critical information, potentially hindering the effectiveness of data analysis. Once trained, the NLP model was able to rapidly analyze and identify trends despite the size of the input. Causeway supplied Trilateral with 39,513 unique case notes, facilitated by a data-sharing agreement. These notes documented interactions with 545 distinct service users who received support from Causeway over a period of more than five years, from March 2018 to April 2023. Exclusive and consistent human analysis of such large datasets would be unfeasible, and so NLP provided a novel method of making use of such rich data.

2. ***Human engagement of subject experts and experts by experience in the use of technology remains critical, in the form of oversight.***

NLP models were developed in consultation with the subject-matter experts within the research team, and the experts by experience through the LEAP. This was essential to the training phase and ensuring the analysis responded to specific categories related to modern slavery. Despite this, NLP remained unable to understand culturally specific language or contexts. The research team was subsequently essential in placing the findings within the context of wider literature relating to survivor needs. Survivor participants highlighted their desire for human scrutiny of data analyzed by NLP, feeling that only a human could properly understand their feelings. As such, use of AI technologies should be complimented by a human response to the needs it may identify.

3. ***Survivor needs identified using NLP analysis of case note and MeL app data are consistent with needs identified by conventional methods. But the size and breadth of the data-set analyzed demonstrate how widespread and enduring these needs are.***

While all service users represented in the dataset had exited the NRM, most had support needs that endured long past their exit. The number of service users who mentioned support needs in the case notes steadily increased, starting from 32 individuals (60% of the sample) in March 2018 to 116 individuals (71%) in December 2019. 532 users (99% of the sample group) mentioned at least one support need across the sampled period. 515 service users (96%) mentioned needing legal support, making it the most mentioned support need. This was followed by financial support, mentioned by 470 individuals (88%) and mental health support, mentioned by 442 individuals (83%). The impact of external pressures on survivor recovery journeys is demonstrated by a peak in support calls made between March 2020 and March 2021, with 2020 and 2021 generally showing the highest volume of calls (over 10,000 calls in total for each year).

On the use of mobile application technology in support delivery:

4. ***Survivors should be given opportunities to create their own datasets using technology such as the MeL app.***

As Causeway data consisted of a caseworker recording the needs of their service users, and considering the limitations of NLP in recognizing the nuance of more complex thoughts and feelings, RESTART complemented its analysis of survivor needs that enabled survivor engagement in data creation itself via the MeL app. Data taken from MeL demonstrated how survivors consider their needs and goals differently and work towards them. Over half of the journal entries were about needs (57%) and 43% were about goals. While needs most often related to categories such as medical care, housing and support, goals more often related to broader things such as education and finding purpose in life, broadening our understanding of the long-term goals of survivors.

5. ***Access to a customized app yields significant potential benefits for survivors of modern slavery by providing a space where they can process and record thoughts and feelings, whenever they wish.***

Beyond facilitating the creation of authentic and multifaceted data, the app also provided signposting materials to help survivors seek out support related to the needs they recorded. The journaling function proved to have its own therapeutic benefits to survivors, particularly in an environment where it can be difficult to access sustained, formal mental health and wellbeing services.

The app can be a therapeutic thing for people. Just going there and writing your thoughts and your goals, it can be a relief for you. Survivors go through a lot of trauma…and I understand better what I need through writing.

The use of NLP to analyze these entries prevented survivors from having to repeat their experiences directly to researchers - reducing risk of trauma and providing more agency on what information was shared and when. As one user said:

It's not good for you to keep on repeating the trauma and everything to people before they can support you. But when it's just you and your phone no one is going to ask you what happened…when you feel like you're writing too much and you keep remembering all this stuff. You can stop it. You can pause it. You can have a break. You can come to it whenever you feel like.

6. ***The use of an app as a consistent resource while navigating different support systems facilitates making a more permanent record of needs and goals, and avoids potentially triggering repetition to different caseworkers and organizations.***

Survivor app-users found that the journaling function of MeL allowed them to record and reflect on their needs and goals in novel and useful ways, in a time and place where they felt comfortable doing so.

It really had a positive impact because I was able to differentiate my goal, my support and my need. And once you do that you see, OK, I'll need this support for me to be able to achieve my goal…So I'll reach out to somebody who will be able to help me meet that need.

An information and signposting page on the app, co-authored by the LEAP, also proved useful for survivors in understanding next steps in their support journeys.

7. ***Survivors were sometimes reticent about using the app, and participating in the project more broadly, but these misgivings were overcome with specialist support provided by Causeway:***

The role of the Participation Facilitator based in Causeway proved essential to overcoming barriers related to low-confidence, tech-illiteracy and language to allow a diverse group of survivors to participate in the MeL-trial. This required significant resourcing, including regular contact and support and the creation of information sheets and other tutorial materials.

Key Findings

Arising out of the recognition that the UK still falls short of adequately protecting survivors of modern slavery, project RESTART sought to provide a proof of concept for a new, and more effective, method for understanding survivors' needs. Following the work by the consortium, a set of recommendations were developed, and are presented below.

To the UK Government:

- Incorporate, with associated funding, the use of AI technologies such as NLP across UK Home Office and First Responder agencies as a means of identifying fluctuations in modern slavery trends and survivor support needs in real-time, with a view to sustained enhancement of support measures and mechanisms. The Independent

Anti-Slavery Commissioner should consider facilitating and overseeing the amalgamation of these diverse data sets: RESTART effectively employed NLP to identify survivor support needs as they evolved over time, and doing so continuously in real time could create a more responsive approach to law enforcement and survivor support responses to modern slavery.

- Training should be introduced at the national level to ensure all statutory and state-funded support services collect and record data in line with strict data privacy and protection measures and in a uniform, consistent manner. This would better enable efficient analysis and anonymization by AI technologies: the uniform manner in which Causeway recorded data allowed for NLP to more easily anonymize and categorize data, and more uniformity in data collection methods would enable for the effective implementation of AI on a larger scale.
- Subject-matter experts (including lived experience experts) should be involved in the development and vetting of any use of AI tech and other technologies to ensure they are customized to respond to the complexities related to modern slavery: the subject-matter experts and experts by experience involved in RESTART played a crucial role in ensuring that the NLP and mobile app technologies used in RESTART were adapted to be relevant to the specific complexities of modern slavery, culturally sensitive and trauma-informed. They also mitigated some of the shortcomings of NLP in analyzing culturally specific data by ensuring the findings were reflective of the lived experience of survivors.
- Access to mobile devices and internet data packages should be made available through state-funded survivor support services, and the use of apps to help survivors to manage their needs and goals should be encouraged: survivors involved in the MeL app trial found that it helped them manage their needs and goals, in some cases helping to identify and secure employment and education opportunities. App-users also recorded therapeutic benefits and improved access to information, but stressed that they would like their use of the app to be supplemented and enhanced by human caseworkers.

For UK Practitioners:

Education, empowerment and upskilling programs should be integrated into survivor support services, and should enhance tech literacy. Such programs should include support for survivors wishing to participate in consultation activities and mentoring opportunities: NLP analysis found that survivors often prioritize long-term goals such as professional or personal development, but existing support services do not directly facilitate this. Lived experience participants in RESTART learned new skills and appreciated the opportunity to share their perspectives in a professional capacity, but the process of facilitating their participation was resource-intensive. Participants expressed interest in providing or accessing mentoring opportunities for other survivors to further encourage self-actualization.

Areas for Future Research

One limitation of the timeframe of this project was that the team was not able to fully identify the benefit of real-time insight coming from modern slavery survivors - for example, via use of the mobile app or from live case note data. Further research could explore this potential over a longer timeframe, to monitor the following outcomes which were alluded to during RESTART:

- The positive impacts on survivors' wellbeing in using an app to record needs, goals and reflections in their own time and space.
- Incorporating the recommendations on being able to have proactive follow-up from caseworkers or monitoring of journaling/question responses in real-time.
- The potential for this kind of real-time insight from survivors to feed into adaptation of support to better meet their needs (and to result in faster outcomes, such as a survivor finding employment, or getting medical/financial support) — as well as to feed into faster/more nuanced decisions around policy.
- Further research should be conducted into exploring the use of an app with increased functionality, including interactivity with caseworkers and more curated signposting resources (for example, by region, or for different stages in the NRM process).
- Access to data was a limitation of NLP work. With more training data, there is potential for the NLP model to increasingly learn the context around different classes, or types, of information and thereby improve performance. This might be the subject of a future research project.

- Any future projects using sources and methodology similar to RESTART should, if possible, be carried out on a larger scale and over a longer time frame, using data from several different organizations, in order to be able to provide more accurate general recommendations. Ideally, such projects should be conducted with a view to enabling comparison of support provision amongst the relevant organizations.

RESTART showed this sort of AI and mobile app approach can help transform both survivors' experiences and the organizations who support them. As one participant highlighted:

The app helped me explore the present and picture a future that is free from the limitations of my past. It is truly empowering to see the possibilities that lie ahead. Keeping a journal has been pivotal in charting my path towards pursuing a degree in business management and venturing into entrepreneurship. It has helped me stay focused and motivated, helped me track my progress, and expand my aspirations.

We hope that the project, as well as providing immediate benefits for survivors of modern slavery who participated in the research, will encourage and inform future research in this field.

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Embracing AI for Sustainability: A Framework for Leaders

OMAR ROMERO-HERNANDEZ AND
SERGIO ROMERO-HERNANDEZ

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In the last 20 years, more than one billion people have transitioned from low-income to middle-class. This positive change has also brought a new challenge. The rapid growth in the demand for goods and services has been matched with unsustainable consumption rates of natural resources and unprecedented levels of pollution and hazards to the environment. Current megatrends in climate change and depletion of natural resources are compromising the ability of future generations to meet their own needs.

Governments and organizations all over the world are searching for new ways to respond to the growing environmental crisis. Technological advancements are becoming the platform for transformative solutions. Among the ecosystem of technological prowess, Artificial Intelligence (AI), has emerged as a formidable transformative tool to advance and accelerate our quest toward sustainable solutions because of its ability to analyze and rapidly process massive amounts of data.

For example, in the logistic sector, major delivery companies are grasping the benefits of AI to enhance operational efficiency. UPS is using AI-powered route optimization and vehicle maintenance algorithms to reduce fuel consumption and lower greenhouse gas emissions. In the technology space, tech companies are integrating energy management systems with artificial technology solutions to tackle the high cost of operating their data centers. In the public sector, India and Bangladesh are using AI to predict extreme weather events and execute response plans that save lives – and more countries are following this trend. In California, the rise of wildfires has pushed firefighters to accept any help they can take, and tech solutions are responding. AI is replacing the traditional human detection station for an array of real time images that detect fires and model fire behavior.

Leaders are curious and eager to consider the adoption of AI into their organizations, but they do not always find clarity on the potential and the best way to proceed. For this reason, in this chapter we examine how AI applications are already being used in multiple sectors, and present a framework to embrace AI as a platform for creating business value while tackling sustainability challenges.

Application of AI in Sustainability

AI applications are pivotal in advancing a more sustainable future, and business leaders are finding new opportunities to use AI for good. Practitioners now have ample potential applications of AI to tackle sustainability challenges. Here are a few of them:

Climate change, one of the most pressing issues of our time, has become a landing port for AI applications. AI helps advise policies and strategies for lowering emissions and mitigating the impacts of climate change. AI engines aid in recognizing and predicting weather patterns and climate change impacts in various applications, including weather forecasting, climate modeling, and pollution scenarios. Through real-time monitoring and data analysis, AI predicts and prevents wildfires and weather variations that can affect crop yields and soil preservation while reducing the use of fertilizers.

The use of AI to analyze weather patterns and energy demand is enabling the optimal operation of solar and wind farms to maximize energy production while keeping a reliable grid integration and a secure transmission. Energy optimization is leading to fewer greenhouse gases and more companies are evaluating the adoption of these tools. The Boston Consulting Group and Google reported in 2023 that by scaling currently proven applications and technology, AI has the potential to unlock insights that could help mitigate 5% to 10% of greenhouse gas emissions by 2030 and significantly bolster climate-related adaptation and resilience initiatives.

The use of tools and techniques to measure and observe environmental parameters, such as air and water quality, soil conditions and deterioration, noise levels, and biodiversity data have found an ally in AI. There is too much data to collect, too many interactions to run and an urgent need to get insights in real-time. AI is modernizing environmental monitoring and enabling real-time monitoring of air and water conditions. AI-powered drones and satellites capture high-resolution images and analyze environmental phenomena such as deforestation, pollution, and land use changes. Machine learning algorithms are processing these vast datasets to identify patterns, and predict environmental events (like natural disasters). This process is getting more efficient, accurate, and effective in addressing global challenges like climate change, pollution, and biodiversity loss.

Improving **energy efficiency** is one of the most effective ways to reduce energy consumption, lower costs, and decrease greenhouse gas emissions. AI empowers energy efficiency to a new level by analyzing real-time sensor data from buildings and electric grids and enhancing smart cities and grids.

Smart Buildings: data analysis on temperature, occupancy, and energy use can be used to automatically adjust HVAC and lighting (e.g., lowering temperatures in unoccupied rooms and maximizing natural light to reduce energy consumption). This minimizes energy consumption while maintaining comfort and quality of services.

Smarter Grids: Artificial Intelligence is used to optimize complex electricity grids, especially when there is a large fraction of renewable sources. AI ensures grid stability and reduces reliance on fossil fuels by forecasting energy demands and matching them with available renewable resources (e.g., wind power availability, solar irradiation, etc.) and managing the use of batteries for grid reliance and energy storage.

Predictive Maintenance: Data analysis from motors and other applications identifies potential equipment failures before they occur, preventing energy-wasting breakdowns (e.g., predicting fan motor decline). This results in significant cost savings, lower energy consumption, and longer working periods. One of the best examples comes from General Electric. Through its GE Digital subsidiary, the company uses SmartSignal, a solution that enables prediction, diagnosis, forecast and prevents equipment downtime.

In **waste management**, AI is a discerning sorter that accurately separates recyclables from trash. Waste separation and sorting are performed at waste facilities, and effective separation into different natures' valuables is paramount to getting the materials into a new value stream. AI recognition uncovers hidden value in discarded materials, transforming them into new products or source materials for new processes. Moreover, AI optimizes waste collection logistics, reducing the environmental impact of waste transportation. Additionally, AI helps with the traceability and unique identification of waste streams to ensure their inclusion in a circular economy scenario, just like Greenback Recycling Technologies does by processing flexible plastic waste. The pyrolytic reaction generates raw oil that can be returned to a food packaging value stream.

Sustainable Agriculture. With climate change, farmers face increasing climate risks and environmental threats. The four major key challenges include pests, soil health, and extreme weather. AI is acting on all of them. Farmers now use in-ground sensors, farm machinery, satellites, and imagery to map soil conditions and types to adapt to irrigation needs. They can now turn on and off irrigation from a phone using analysis to cut water use by over 50% in some crop types.

AI is also used to analyze historical and present weather patterns, which can predict when and where an extreme weather event may occur. Farmers pay large insurance premiums to help hedge the risks of a large frost or drought, with the potential to lose an entire crop to these extreme weather events. This same weather pattern analysis can help farmers use more targeted pesticide sprays to target the prevention of pests on the crops. Using this technology also helps farmers understand where to invest for land evaluation and future areas of crop variation. For example, crops that normally do not survive due to cold temperatures are now being planted in areas that were never thought possible because of the changing climate. Adopting technology allows farmers to grow more food more efficiently with fewer resources and lower risk.

Smart cities are a main landing spot for AI applications. These urban areas satisfy their inhabitants' present and future needs and keep sustainability at the top of the agenda. Oftentimes, they use technology to improve the quality of life for their citizens, improve operational efficiency, and promote sustainability. This involves identifying specific urban challenges (based on the needs detected in civil society, government, private sector, and academia) and developing focused solutions that can be implemented and evaluated. Technology aside, this plan constitutes the Minimum Viable Product (MVP), which serves as a baseline to plan the required infrastructure for the plan to take place. According to expert Nelly Meza "Early implementation of technology without a good roadmap often wastes resources and money". So, once a baseline is established, AI is a powerful tool for quickly developing innovative and effective smart city solutions.

Figure 1 presents examples of Smart City MVPs. These examples include *Smart Parking:* Implement a pilot program with a limited number of parking sensors to provide real-time parking availability information to drivers. *Smart Lighting:* Install energy-efficient LED streetlights with sensors that adjust brightness based on traffic and pedestrian activity. *Bike-sharing system:* Launch a small-scale bike-sharing program with limited stations to test demand and usage patterns. *Waste management:* Deploy smart bins with sensors to monitor waste levels and optimize collection frequency and routes. *Citizen engagement platform:* Create a mobile app for residents to report issues, access city services, and provide feedback. *AI-powered traffic management:* Implement AI algorithms to analyze real-time traffic data from sensors and cameras to optimize traffic flow, reduce congestion, and suggest alternative routes. *AI-driven crime prevention:* Employ AI to analyze crime patterns and facial identification and identify potential hotspots, enabling proactive policing strategies and resource allocation.

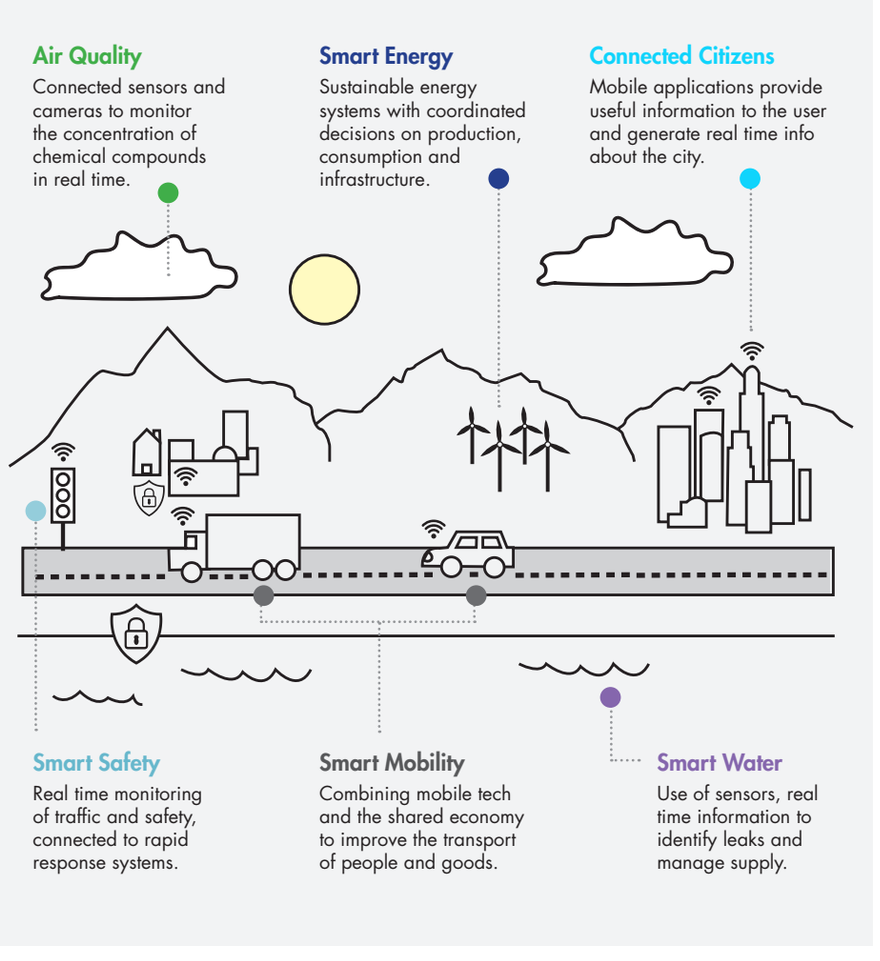

Figure 1. Applications of AI in Sustainable Cities.

Electric vehicles. The transition from gas-powered vehicles to electric vehicles (EVs) is accelerating globally, with the US and Europe leading the charge. In the United States, EV sales grew by 60% in 2023, reaching, by 2024 first quarter, a market share of 7.9% of all new vehicles sold. In Europe, the adoption rate is even higher in countries like Norway (95%), Sweden (60%), the Netherlands (30%), and even France and the UK with 25%. In 2024, EVs, including both fully electric and plug-in hybrid models, accounted for approximately 20% of global new car sales.

However, a major challenge in this transition is the management of the electric grid. The grid must accommodate the increased electricity demand from EVs while maintaining stability and reliability. This involves balancing electricity supply and demand, integrating renewable energy sources, and ensuring the infrastructure can handle the additional load. Artificial Intelligence can be pivotal in addressing these challenges. AI algorithms can analyze vast amounts of data from various sources, such as weather patterns, historical energy usage, and real-time data from smart meters, to predict electricity demand accurately. This predictive capability allows for efficient resource allocation, ensuring the electricity supply meets the demand without overloading the grid.

Moreover, AI optimizes the EV charging process by scheduling charging times during off-peak hours, reducing strain on the grid and lowering consumer costs. AI can also facilitate the integration of renewable energy sources by predicting fluctuations in energy production and adjusting supply accordingly. This ensures a stable and reliable power supply, which is crucial as the adoption of EVs increases.

How can organizations embrace AI for Sustainability?

Business leaders may feel compelled to jump into the AI revolution but may also need clarification about the best way to start and the path to follow. This section provides a framework proposed by the authors to embrace AI as a platform to enhance opportunity and tackle sustainability challenges. The framework is illustrated in Figure 2.

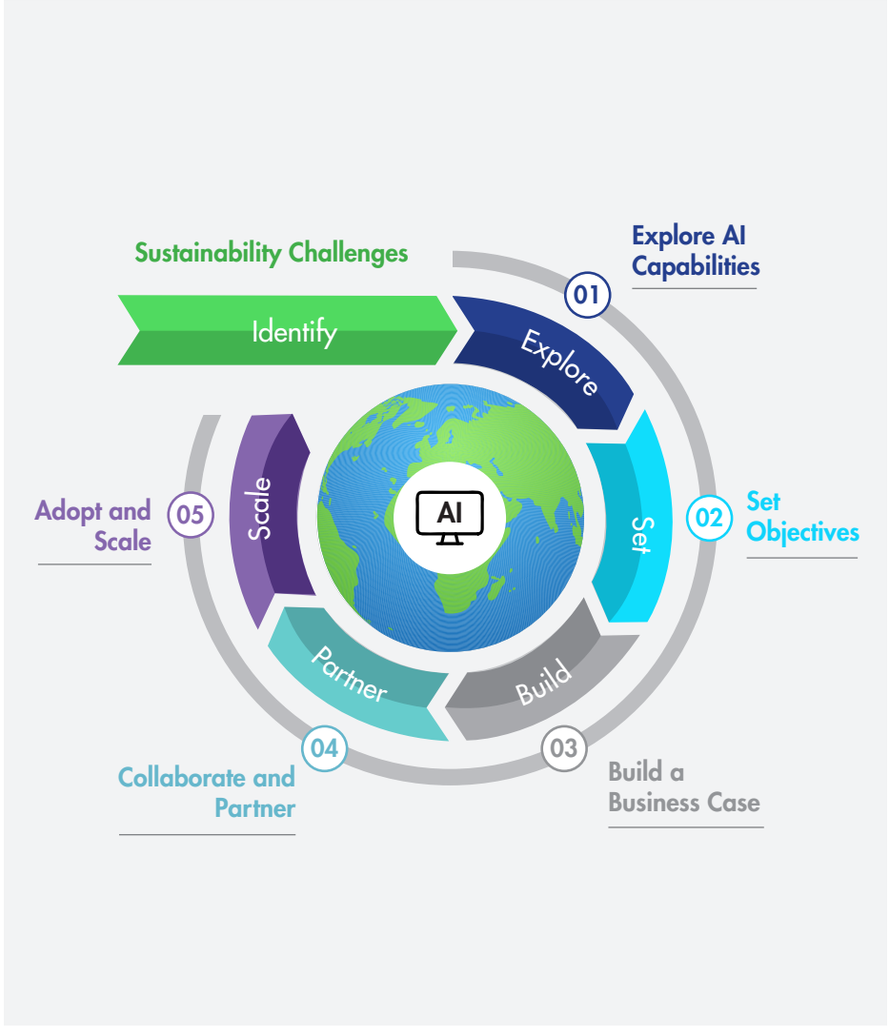

Figure 2. Framework to explore AI opportunities in sustainability.

Identify: The framework starts with an **identification** phase. An initial review of applications in the field of interest helps to identify sustainability opportunities and challenges relevant to your industry or organization (e.g., climate change, resource efficiency, biodiversity loss, social equity).

Explore AI Capabilities: Then, practitioners can **explore** AI capabilities and research AI technologies and applications that can contribute to solving sustainability challenges (e.g., predictive modeling, optimization algorithms, image recognition, natural language processing). It is worth assessing the availability and quality of data necessary for AI applications in sustainability (e.g., environmental data, socio-economic data, satellite imagery).

Set Objectives: For every project pre-selected, practitioners must **set objectives** and define the scope for applying AI to address sustainability challenges (e.g., reducing carbon footprint, enhancing resource efficiency, promoting sustainable practices). There may be an appetite to perform many things, but resources are limited and practitioners must prioritize use cases and pre-select the ones where AI can make the most significant impact (e.g., renewable energy forecasting, smart agriculture, waste management optimization).

Build a Business Case: The preselection process helps pick a few projects among many. The few that pass the cut may lead to a deeper analysis, leading to development of a **business case**, and estimates of the costs and potential benefits of implementing AI solutions for sustainability (e.g., cost savings and environmental impact reduction).

It is important to be realistic about current capabilities and assess if teams have the necessary skills for AI development and deployment. Plan for training or hiring as needed.

Partner and Collaborate: Involve stakeholders from within and outside the organization (e.g., government agencies, NGOs, academic institutions) to gain diverse perspectives and expertise. Seek collaborations with AI developers, technology providers, and sustainability experts to leverage their knowledge and resources.

Scale and Adapt: Not all organizations will have the same resources and capabilities as the Big Tech companies, but AI has room for all. It may make more sense to plan for **adaptability and scalability**. Start with pilot projects to test AI solutions in real-world settings and gather feedback before scaling up. Develop strategies for scaling successful AI applications across different locations or sectors to maximize impact.

The more you apply the framework, the stronger the capacity to identify and execute successful AI projects.

The un-sustainable use of AI and its effects on climate change

AI is also leading to unsustainable practices due to excessive water use and electricity consumption, and large amounts of greenhouse gas emissions that result from electricity generation.

AI needs data. Data centers account for the lion's share of energy and water use. Companies need millions of liters of water to cool and manage temperatures at their data centers. The amount is not negligible but very substantial and, in some cases, it may compete against the water needed in urban centers. Just a reference, consider that the water consumption for Microsoft and Google was 1.7 and 5.6 billion gallons, respectively. This total amount is equivalent to 11,000 Olympic-sized pools.

AI systems demand substantial energy for operation and model training, contributing to greenhouse gas emissions. Google uses as much electricity for its AI operations each year as the homes in Atlanta do. Creating a single AI program or model can gobble up more electricity than 120 US homes in a year and put up more carbon emissions than 110 cars. The recent breakthrough with ChatGPT in 2023 suggests that the problem is even more critical than reported. A simple query in ChatGPT may consume 10 times more energy than a search in a standard internet browser. The prediction is more daring. In 2021, Huawei estimated that AI computing power may increase 500 times by 2030. This pervasive use of generative AI will significantly increase the demand for electricity at data centers and bring more greenhouse gases.

As AI usage expands, it's crucial to prevent increased energy consumption and emissions. Balancing AI growth with environmental sustainability is paramount. This challenge has not passed unnoticed in major tech companies. Data centers account for 1% of global emissions and there are efforts to reduce energy consumption. Google is conducting research and running applications on how to train AI models and how to design data centers to maximize energy efficiency. The research also covers the development of energy-efficient TPUs (chips) to speed up machine learning workloads. There is room for improvement and opportunity, and all businesses, not only the big techs, can strive to find and monetize new designs and technologies to tackle water and energy consumption.

Conclusions and Key Insights

AI has already set ground in the areas of sustainability. Several sectors are using it to analyze massive amounts of real-time data, build comprehensive and complex scenarios, and make decisions. Climate change, energy efficiency, sustainable cities, and smart use of resources are just a few examples.

The capabilities and possibilities unleashed by AI have amazed the world in the last couple of years. Some of these relate to generating original content across multiple media, extracting insights from large data sets, and presenting them efficiently. The next stage would seem more creative than analytical; for instance, updating software and code used in environmental monitoring, generating collaboration within different platforms, or producing proactive plans for the operation of resources.

As AI continues to evolve, its integration into sustainability initiatives offers promising avenues to address complex global challenges and safeguard the planet for future generations.

Artificial intelligence technology seems to promise increased productivity, efficient resource use, data gathering and analysis, and overall innovation in several sustainability issues. The technology is still considered to be nascent, so integrating AI agents/solutions will require robust data management, evolving IT infrastructure, and human oversight to ensure accuracy and alignment with company values.

Not everything is a rosy forecast, and practitioners need to be aware that AI significantly stresses water and energy consumption. The rapid adoption of AI exacerbates the release of greenhouse gases. To address this unintended issue, more research in product development, hardware and software efficiency, and better cooling systems for data centers remain a big need. This need is also a source for new business opportunities. There are ways to create business value through sustainability, and AI may be a platform to help make that happen. Any implementation should be accompanied by strategic technology planning and mechanisms to keep human control through the process.

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It's a Relationship, Not a Takeover

RENE CARAYOL

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It is now incontrovertible that Artificial Intelligence can outperform humans when diagnosing tumours in breast cancer patients. Many doctors are concerned that it is now at such an advanced stage that it is, therefore, inevitable that AI is coming after their jobs. What rarely gets publicised, is the fact that a combination, a partnership, between AI and the human doctor generally outperforms either the doctor or the machine working alone. As with all partnerships, ultimately one partner has the final decision, albeit after considerable consultation. The *key* decision, however, should actually be how the partnership decides who/what is best placed to make that final decision. Naturally, humans tend to believe that in all situations, that person/machine should be the person. But that blanket response avoids the obvious examples of where overriding the machine causes catastrophic consequences.[1] As with all technology transformations, leaders make the tough calls.

In the doctor's case, who said that the primary role of a doctor today is an accurate diagnosis? Many people now Google their symptoms and are looking for the doctor to confirm what they thought. The point is if we define unambiguously the relationship between AI and the human doctor then we don't need to have the fear. We are in control – it is a choice.

So how do we determine that an organization is AI-ready? Start with the people because they had better be ready to manage this complex relationship. We aren't proposing that executives need to massively embrace AI, but more that they are not axiomatically resistant to AI. As with any technological innovation, it could catalyze cultural change or rather, change 'the way we get things done around here'. Of course, that is the scary part for many leaders. Change can be scary. What do the marketers now do, what happens to finance – so many questions and fears. Forget those fears and focus on defining the relationship.

Of course, any technological innovation can descend into a race, and no one wants to be left behind. There is so much to be learnt from the pioneers without being so patient that you miss the wave.

Remove the Fear

We get it. AI can and will replace some, if not, redefine most of the jobs that exist today. Now that future can be quite hard, or quite scary to imagine. Driverless cars, autopilot on aircrafts, robotic surgeries. Despite the logical and numerical data, a lot of people will still find it more

comforting with a human being in control. The human understands. The human can empathize. The human can appreciate.

We would argue that even if AI cannot appreciate or empathise today, what it can do is execute with more accuracy, speed and convenience than a human. So where does the fear come from and how do you remove it?

Loss of jobs. Yes, it will redefine many roles but not necessarily for those people that have adopted the 'not resistant' mindset to AI. Traditional thinking informed us that the illiterate of the 20th century will be those that can't read or write. But for the 21st century, the illiterate will be those people that can't 'learn, unlearn and relearn'.

One trait that is a massive indicator when trying to determine someone's innate ability to learn is curiosity. What is someone's curiosity quotient? Peter Senge referred to this when writing *The Learning Organization* and we see a similar trend with organizations when it comes to AI. If the people are not curious, they may tend to also be resistant to change and, therefore, resistant to AI, then they are likely to be replaced. But for those that are curious, they may keep their role – but it will probably be redefined. You can decide your relationship with AI – friend or foe. If you fear it, but have accepted that it will be a part of life, that is a good start.

One way we advise people to remove the fear is to find the quick wins. Baby steps. Test a new piece of software, if it will potentially save you 30 minutes performing that task yourself, see what happens. You may hate it but that is ok, it is a start. If you want the organization to be AI ready, this will be determined by your people and their attitudes – not their skillsets. An appetite for being curious is a positive way forward. Humans can remain in control. The nature of the roles is likely to change, but leadership won't. Technology isn't perfect but neither are humans.

When the IBM PC was released in 1981 it marked the point when advanced technology became accessible to many, at their desktop and under their control. Nobody predicted what would happen next. The original manufacturing forecasts were for one million machines over three years, with 200,000 the first year. In reality, customers were buying 200,000 PCs per month by the second year.

This proliferation of technology brought with it a fear for job security, especially for those that saw their roles as being most at risk.

It was clear to all that a PC with word processing and email would rid the world of handwritten letters going to the typing pool to be "typed up", returned for proofing and correction, placed in the out tray in time for collection by a post room worker to take to the post room to be sorted and passed on to the Post Office for its onward journey.

From the early days in my career, I saw the potential of Personal Computing. One phenomenon that I witnessed was that the secretaries that embraced the technology were ahead of the game. They were not just ahead of their peers, they were ahead of their managers and became even more indispensable. The ease with which documents could be produced, edited, formatted and shared via email allowed for more collaboration and for deadlines to be shortened. The result was that more could be done of a better quality, and at the heart of this was the secretary, now named the executive assistant. As new technologies come in, we are often told that we will be doing different things and sometimes we can't see it, but if we don't embrace it then we won't.

Post office workers that viewed their USP and core competence as delivering the mail would have seen challenging times ahead, whereas, those who were more confident and forward thinking would have seen that their new USP was actually home delivery and that the existing infrastructure, network and systems would be perfect for a new company called Amazon that was about to reawaken and revolutionise home delivery. A new industry was given birth to with convenience at its heart... and the Post Office still delivers to us every day.

But what about those fears for the future, were they founded? Let's see what the numbers say.

The highest employment rates in the UK were in the years 1872, 1943 and 2018, at 76% of the working age population; the lowest rate was 61% in 1932, during the Great Depression. (Office for National Statistics)

And so, the industrial revolution, the computer revolution and the internet revolution have not caused the much-feared mass long term unemployment. In fact, mass long term unemployment has remained in those nations that have yet to embrace technology.

You might say that it's different this time, but as we have shown it is always going to be different, but it actually never is. Metaverse and recent history that have shown us that it is never that different. Far more than the technology determining the level of transformation, it's always a combination of leadership and culture that drives the transformation. Tough calls are always made by leaders not technology.

Remove Human Drudgery

AI has an advantage over humans when it comes to speed and convenience. The same way the Pony Express was obsolete when someone invented the Telegram and killed the business model within 18 months of its inception. Amazon isn't a $1.9trn company because it put more humans in a warehouse. But who supervises the warehouse? Not the robot picking the stock off the shelf that is for sure. People define the relationship, and more importantly, control the relationship. Speed and convenience has been Amazon's biggest competitive advantage for delivering great customer service. For most businesses, speed and convenience is the 'holy grail' for attracting and retaining customers.

We've had a similar experience coaching chief executives in the UK telecoms space. For a long time it has been a duopoly, which is a nice way of saying customers don't get great service or quality but they have no other choice. During the pandemic, the 'digital divide' became very apparent and finally the telecoms industry had its watershed moment. It takes courage and confidence to challenge an industry with such entrenched incumbents. It took a fearless entrepreneurial mindset, to realize just what the technology might be capable of. Without his dash and daring, the technology was not a game changer on its own.

So, what was the value proposition, and could AI assist it? Yes, and yes. The new entrants needed to be cheaper on price and have higher quality customer service to compete. At some point, I imagine most of us have rung up our broadband provider because something wasn't working. Simply for one reason or another you can't access the internet. How will you possibly cope? Panic sets in and you make that dreaded phone call. You get through to the automated voice system – you say your password before being told it didn't understand and you need to repeat it again. After five minutes you get in and select the option that you believe best suits your need. Great, now you just have to spend 30 minutes on hold while they scramble to find someone willing to take your call.

By now you have no internet and importantly no patience. You get through to an advisor who gets the full wrath of how your life is falling apart because the router is blinking red. They apologise profusely and suggest an engineer will visit the property after some diagnostics. Whilst the solution of an engineer dissipates some of your anger, they then tell you the earliest they can visit is in two weeks' time. The advisor gets the second wave of your wrath but this time to no avail. This is completely unacceptable to the customer.

The CEO I was coaching, recognized that AI could anticipate power surges and self-correct system faults. No need for the 'man in a van'. No need for long delays. Result – a satisfied customer. This transformed the traditional cost equation for the whole broadband industry.

Result – enables lower prices for customers. The CEO had a vision and a purpose. AI accelerated this vision – a nice relationship.

Whilst we might feel aggrieved for the 'man in a van' and other engineers, they were all redeployed. AI added value to the business but only because the CEO had the courage to embrace it and saw the way it could accelerate the purpose they had set out.

Leadership and Decision Making

When I was coaching Ralph Hamers, former CEO of UBS and ING Bank, he once told me "You never get an easy decision because the easy decisions are taken for you." This is true at the top. He also went on to say, "You cannot delegate the ugly and horrible decisions – that's your job".

It is tough and lonely, but it is what you sign up for. Ideally every leader would like to have all the relevant data and intelligence at their fingertips prior to having to make a tough call.

I have yet to coach any leader that has had this luxury of having all the information prior to making a tough call. AI will bring huge benefits to having timely and accurate information at your fingertips, but there will still be situations when the unexpected occurs. The leader will still have to make the call and rely on their instincts and experience. Not only do they have to make the call, but they will have to convince many that they have made the right call with confidence. This is leadership, and it will always be leadership.

AI isn't like a four year-old toddler. It will do precisely as you have asked. The parameters are the parameters, and it is as linear as that. The first question you have to ask is what is the problem? Second, would AI help solve it? If yes continue, if no, forget AI and work out what does. The machine proposes, the human decides.

Let's take the luxury car market. Quality over quantity. No mass production. The customer demands and is paying for perfection. Imported Italian leather, TV screens in the headrest, Sonos Surround Sound are things

that traditional luxury cars may have provided with the promise of four things. Comfort, convenience, entertainment and safety.

The world has changed and drastically. We had the opportunity to work closely with an iconic British luxury car manufacturer. The CEO couldn't understand why you can't do both – deep customization and luxury production. With courage he decided to deploy AI where he could – without any redundancy. Artificial Intelligence became their biggest addition to the workforce. They struck gold. And by gold, I mean the world of premier customization. Firstly, the features they could implement. Driverless car technology, connectivity and over-the-air upgrades, smart security systems and stitching your initials in every square inch of the seat. It was all about being the first mover and sometimes colours no one could imagine. The technology was there but the CEO was the brave one who decided before his competitors to switch the business model. Secondly, to the point of personalization, lead times reduced significantly. What usually took 18 months was taking six weeks. This was the gamechanger. Imagine how the customer feels. Imagine what you could charge when the customer feels they have something that is completely unique, special and different.

Believe it when we say flipping a business strategy on its head is no easy job. Pressure from the media, pressure from the workforce, pressure from the shareholders. Every day. "You can't change tack now; we have already started implementing the current strategy."

This attitude is why we don't hear of Kodak today. Our world moves very quickly and as leaders we have to have the vulnerability and humility to change when the world changes. Sure a few people get upset. It's not nice but it is not a reason to stay the same, doing what you have always done. You have to escape the pull of the past. Roles will change and many will be retrained and reoriented. Your heritage is not your destiny.

Conclusion: It's a relationship, not a takeover

'Culture is more powerful than strategy'. This is still true. Some organizational cultures lend themselves to change, others are trapped by the 'pull of the past' and are resistant to any change. This drives the fear and cynicism. Digitization was also going to wipe out millions of jobs. But as mentioned, it became a partnership controlled and managed by leaders. They used it to accelerate their overriding vision and purpose. Again, IQ vs EQ. AI cannot replicate or replace the 'bedside manner' of the GP, consultant or architect. Creating a safe space, allowing the client/patient to voice their concerns, feelings and views and leaving feeling better without ever affecting the predetermined outcome.

If you are feeling like your company's culture is resisting the shift, then you may want to consider these eight steps to changing it:

- Hire for attitude as much as skills
- Seek to interact with customers often
- Provide "Something to belong to"
- Acknowledge effort and wins
- Nothing is ever achieved without enthusiasm
- Circumstances change - values don't
- Finished beats perfect
- Trust your people

The technology is complex, and so are relationships, but we don't give up on those without a fight.

As Henry Ford said, "If I had asked my customers what they wanted, they would have said a faster horse".

Henry Ford had to make the tough calls.

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About the Author

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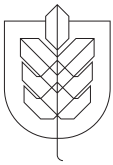

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