ASIAN
Management Insights

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25 YEARS AND BEYOND

Reimagining Education
Keeping the human in the loop

Contents

06

We still look at adult or continuous education very transactionally, and tend to look for a return on investment in the short term. Instead, we need to recast it as a continuous process not unlike going to the gym to stay healthy.

– Sanjay Sarma, CEO, President, and Dean of the Asia School of Business

26

As curricula evolve, teachers need to learn new skills and even unlearn outdated ones to serve as mentors and facilitators in the classroom.

– Havovi Joshi, Editor-in-Chief, Asian Management Insights

34

68

84

Learning and reskilling to stay ahead amidst disruption

Reforming adult and continuing education has become a key issue in an era defined by relentless change borne of constant technological advancements. The traditional education paradigm where instructors transfer knowledge to students—often likened to a pen writing on a blank page—is deemed insufficient to meet the needs of the 21st century. As curricula evolve, teachers need to learn new skills and even unlearn outdated ones to serve as mentors and facilitators in the classroom.

Throw in a form of artificial intelligence (AI) that is capable of doing tasks autonomously rather than as a human-operated tool, also referred to as agentic AI, and you have job transformations that lead to what Sanjay Sarma, CEO, President, and Dean of the Asia School of Business, Kuala Lumpur, Malaysia, calls "personal obsolescence". In this issue's At The Helm feature, the former Massachusetts Institute of Technology (MIT) Vice President for Open Learning advocates formalising 'quaternary' education—the lifelong, white-collar follow-up to primary, secondary and tertiary education—to cope with changing job skill demands. In an era where AI is increasingly agentic, Sarma urges human learning to reclaim agency and become AI-proof.

Incorporating the human experience into AI learning systems could deliver Sarma's vision. Whereas one-size-fits-all teaching moves too fast for slower learners while leaving faster learners bored and unchallenged,

Reinforcement Learning (RL) can be leveraged to help both instructors and learners. Pradeep Varakantham and Sidney Tio show how RL-based solutions can reduce teachers' cognitive load while delivering to students a data-driven and personalised learning experience.

While AI has immense potential to do good, AI systems can be programmed to prioritise profit or efficiency at the expense of human agency and fairness. An understanding of behavioural psychology is useful in working out how AI influences human decision-making, says Seema Chokshi. More importantly, organisations can then design AI systems that uplift, rather than undermine, human beings.

Singapore's SkillsFuture movement celebrates its 10th anniversary this year. As a national movement promoting lifelong learning and skills mastery, it has become the region's gold standard in bridging skills gaps in the market. SkillsFuture Singapore Chief Skills Officer Gog Soon Joo explains how the country drives its efforts to upskill and reskill, while Shoeb Kagda details how Singapore's Southeast Asian neighbours are doing the same to capitalise on their youthful workforce.

Skills for the green economy are covered in SkillsFuture's range of courses, but there is already a widening green skills gap in the market, says Panchali Guha. Unless green skills are properly defined and taught, the lack of trained workers will put net zero goals at risk. Above all else, policy frameworks for green skills

development must be put in place to set the wheels in motion.

Transition finance might be a valuable form of green expertise, given that current green financing practices directing capital away from carbon-intensive brown sectors could be hindering the achievement of green targets. Hao Liang, Yongheng Sun, and Tianhao Yao champion the merits of transition finance, which would fund brown industries' efforts to address the dual challenge of reducing carbon emissions while maintaining economic growth.

The manufacturing of commercial vehicles is a brown industry, and it is a prominent one in India, the world's largest manufacturer of buses and the third largest of trucks. Many foreign automobile companies have tried and failed to gain a footing in the market since it was opened up in 2002, earning it the nickname the 'graveyard' of global automotive players. Debjit Roy and Shubham list seven steps to achieve success in a market where plenty have failed.

Those companies would benefit from the skilled implementation of a clever strategy. While leaders may know the right things to be done, Robin Speculand spells out how organisations can do them right. More than just a good plan, successful implementation requires disciplined leadership that motivates staff to take the right actions.

In India, Infosys' learning experience platform Wingspan delivered much-desired digital skills that made the company an employer of choice. Perhaps more importantly, it demonstrated to its

clients its ability to walk the digital transformation talk. Adam Tatarynowicz, Wee-Kiat Lim, and Mahima Rao-Kachroo chronicle the creation and growth of Wingspan within and beyond Infosys in this issue's Case in Point.

Social mobility offers the opportunity to secure a better life, but it can lead to a hypercompetitive environment and burnout. High levels of social mobility can also feed the 'meritocracy myth': success is the reward for those who hustle, and the lack thereof is the fruit of the less diligent. Jacinth Tan proposes not only a more inclusive form of social mobility that redefines success beyond wealth and status, but also the strengthening of social safety nets.

Finally, as we celebrate International Women's Day 2025, we acknowledge Sharon Wong's accomplishments. The founder of premium baby and mother product retailer Motherswork shares how a self-professed "hobby" turned into a multinational operation, why her staff stayed with her for more than 20 years, and her take on "having it all".

And this issue of *Asian Management Insight*—centred on relearning and reskilling—arrives at the perfect moment as we celebrate Singapore Management University's 25th anniversary, marking both our achievements and our exciting future ahead!
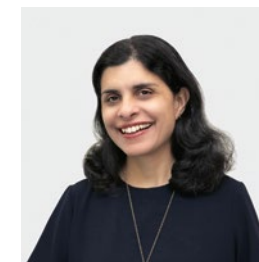
DR HAVOVI JOSHI
Editor-in-Chief
Asian Management Insights
havovijoshi@smu.edu.sg

LEARNING
HUMAN VERSUS MACHINE

Outdated education paradigms must be revamped to reclaim the all-important human quality: agency.

Sanjay Sarma, CEO, President, and Dean of the Asia School of Business, Kuala Lumpur, Malaysia and the Fred Fort Flowers (1941) and Daniel Fort Flowers (1941) Professor in Mechanical Engineering at the Massachusetts Institute of Technology (MIT), shares insights on the artificial intelligence (AI)-agency revolution and how the human brain works.

As someone who has been highly influential in the education arena, and who helped establish the Singapore University of Technology and Design, and then served as the first Director of Digital Learning at MIT and later as MIT's Vice President for Open Learning, what are your insights on existing education systems, specifically those associated with continuing education?

Education systems today are based on a somewhat outdated construct. Previously, you acquired a skill and diligently practised it throughout your life. For instance, if you learned cobbler skills, the technology remained largely unchanged over time. But we are in a different era now. Initially, it only affected some sectors of industry, such as technology. For example, the way you design a semiconductor chip now is very different from how it was done 30 years ago. But it did not affect, say, accounting much because the only things that changed in accounting were new regulations and new apps.

However, over the last 15 years, we have arrived at a point where job transformations have become life-changing. We need to consider the concept of "personal obsolescence"—a somewhat chilling term. And unfortunately, the education systems of today are not prepared for that rate of change. They are still designed for the 'one and done' model, in which your secondary or tertiary education prepares you for life. We have no real formal structures for continuing education—in fact, the term "continuing education" has a vocational whiff like retraining someone to use a new machine tool or repair a new kind of air-conditioner. But if you had to learn, say, AI, where would you go? You may just have to go browse YouTube. And how do you certify yourself? How do you prove yourself? There is nothing there. To me, this is an existential moment of our times that is desperately important to address, because AI is leading to a rethinking of work, the workforce, and workers. It won't necessarily show up as layoffs but as deferred hires to begin with, and then if we don't respond rapidly enough, as job losses. To stave that off, we need to take on a formal approach to quaternary education: the lifelong, white-collar follow-up to primary, secondary and tertiary education.

While AI is changing how we work, addressing global issues such as climate change and geopolitics will also place unprecedented demands on the agility of the labour market. Consider the fact that the efforts to keep global temperatures increases below 1.5ºC are

faltering and climate mitigation and adaptation are becoming increasingly urgent. A raft of new technologies, such as smart grids and direct carbon capture, will need to be developed, deployed and operated. This means new skills will have to be learned urgently and on a massive scale. Continuous education is thus probably one of the most important fronts for human development and sustenance.

What recent developments in education and technology do you find troubling?

Human beings are uniquely adaptable compared to other mammals. We have an 18-year period of mental and physical growth from infancy to adolescence. In fact, the prefrontal cortex grows all the way through early adulthood (compare that to a zebra calf, which can run a few hours after birth). Our adaptability comes from this growth period, and mental nurturing is what we call parenting. This is the natural origin of the human capability–and indeed need–for learning. Over the centuries, we have formalised our education system based on historical precedent. But our systems today are 'path-dependent'–they are not necessarily what we would have designed if we had known how the brain worked. Compare medicine in the 19th century to medicine today! Unfortunately, this historically evolved system is not necessarily ideal–particularly for our urgent new needs.

The sudden acceleration of the capabilities of AI has shocked many of us. What is even more unsettling

is the quest to make AI agentic: in other words, capable of doing tasks autonomously rather than as a tool that a human uses like ChatGPT. The irony is that human learning has been gradually shorn of agency at the very time we are trying to make AI agentic. Human learning needs to return agency to the learner–as many of us have been pleading for decades. Project-based learning, experiential learning, flipped classrooms and other trends are small steps in this direction. But many of our learning practices are based on a key misunderstanding of human learning: that the teacher wields a pen, and the learner's brain is a sheet of paper. Rather, the learner is actually building a model of the topic, and the teacher should see themselves as a facilitator and a nourisher. That is a central component of agency in learning. And trying out what you learn is a second component of agency. Without agency, practical mastery is difficult, especially at the scale we are now going to need. But old practices and dogmas are difficult to shake off.

Technology can help in several respects. Online education is an obvious approach, but that is only one piece of the puzzle and not the solution. In fact, the failure of pure online unfolded when folks tried to treat it like the exclusive panacea, which it is not. It is merely a tool. What I have argued for is flipped classrooms, where lessons that would have typically been taught in the classroom are instead delivered through online, and classroom time is dedicated to application, exploration and

coaching as students take on tasks– an agentic approach in which a flipped classroom meets something called deliberate practice. Teachers in this model are nurturers, nourishers and coaches.

AI gives us tremendous new possibilities. It is like that garage wall behind my parents' home where I learned to play tennis; it was my greatest tennis partner. In the same way, AI becomes this coach–a mentor that can do a lot and then grade your work. Augmented reality is another tool that offers extraordinary possibilities. But none of this will work if we don't change the underlying system with sincerity and commitment. In fact, I fear that they will be used in a gimmicky and ultimately ineffective way. The hold of existing systems is too strong to swim counter-current. However, the good news for adult education is that because we have little in place right now, we have an opportunity to build something right anew. System change is generally difficult, and innovation is often best at the periphery. But overall system change will require all parties to pitch in: the government, to change regulations and offer incentives; teachers, to embrace new practices; companies to accept this for adult education; and for younger learners and parents, to buy into this departure from the practices they grew up with. Starting with adult education gives us a self-contained blank slate clear of legacy.

I also find it ironic that educational systems and practices in many countries in Southeast Asia have largely remained unchanged

> **The irony is that human learning has been gradually shorn of agency at the very time we are trying to make AI agentic. Human learning needs to return agency to the learner.**

since these nations gained independence from former colonial powers. There is a sort of over-reliance on colonial constructs that are no longer valid, and a loyalty to systems that the erstwhile powers are themselves trying to shake off.

How can adults and retirees be enabled to continue learning to improve their lives?

We still look at adult or continuous education very transactionally, and tend to look for a return on investment in the short term. Instead, we need to recast it as a continuous process not unlike going to the gym to stay healthy. Think of a company that decides that it needs its people to be healthy and installs a gym on the premises, assuring its employees that they do not have to take time off if they went to the gym for, say, three hours a week. Societies need to do the same thing with continuous education. In fact, at the Asia School of Business, we are pivoting around something called Agile Continuous Education, or ACE. We are saying it is like a gym inside a company, but for learning. For this to be successful, you need to allocate time, budget, physical and mental space, and recognition to get your people up to speed. So, the next time there is a crisis from a disruptive technology, you will be better prepared, rather than being a deer in the headlights, which is what many of us are right now with AI.

Many countries have started doing some things right in this area. Singapore, for instance, introduced the SkillsFuture Credit scheme in 2015 to encourage its citizens to deepen their skills or reskill in new areas outside of their current field. Credits are offered which can be used on top of existing course fee subsidies to pay for a wide range of approved skills-related courses. Malaysia has something similar with HRD Corp. But this

is not enough; the entire infrastructure needs to come together for things to click. It is an entire arch that needs to be constructed–you can't just build a semi-arch. And this is the challenge we're trapped in for education.

As MIT's first Vice President for Open Learning (2012–2021), you spearheaded transformative learning initiatives such as edX and OpenCourseWare. Looking back, are you satisfied with the results?

I was satisfied with open learning results. But I had an instinct, which by and large I still believe is right, which is that online by itself is a glass half empty. For someone who is parched with no water, a glass half empty still contains water. But the full glass, the other half, involves the flipped classroom component I described earlier. I authored a book, *Grasp: The Science Transforming How We Learn*, which cautioned against betting entirely on online. At MIT, we made an equal effort to encourage experiential learning. This came easily to my colleagues because it is a central motto of MIT: learning by doing. We also extended this to the outside world. For example, we worked with refugees from Syria in Jordan: we offered them online courses backed up with in-person coaching and hackathons, followed by internships. In fact that's where Agile Continuous Learning was born.

But if I had a regret, it is that the online message dominated, and our in-person message did not necessarily stick. Online appears so glamorous with all these high-profile courses. Numbers are easy to count, and we tend to count only what we can count easily. That's sort of a failure in our society as a whole–we value that which we can count simplistically and not that which is important but uncountable. Hence my

regret is that we didn't double down on the half-empty part of the glass. This time around, I am emphasising it even more.

With Open Learning, we did make a lot of inroads into the science and practice of learning. We funded a lot of research on the neuroscience of learning, and it is still going well, but my regret is that it was the sizzle and not the steak that got the attention.

Do you believe that AI- and automation-enabled learning environments make it harder for novices to achieve mastery in fields requiring deep experience and deliberate practice, such as medicine? To what extent is this a matter of adapting our thinking around learning versus balancing trade-offs like expertise, convenience, and cost? How should higher education institutions address these challenges?

It depends on how AI is deployed in any situation. I use AI extensively and am on various AI beta programs because I want to "stare into the abyss", so to speak. Furthermore, I do research in AI and augmented reality. My view is that AI can be an enormous help. But I also believe that we, the professional class, have a lazy tendency to look for pat answers, not nuanced ones. We would prefer to hit a button and assume it's going to work in all circumstances. While I think AI can work in many circumstances, it will not necessarily work the same way each time.

Let me give you an example. I can say for sure that using Waze and Google Maps has hurt my sense of direction. When I compare my current state—I live in Kuala Lumpur today and take Grab everywhere I go—to the time I lived in various parts of Europe and had to walk a lot to get around, my sense of direction has become abysmal. So there's no doubt that technology can stop you from learning and lead us to take all these for granted.

On the other hand, I'm helping out a family member with a health situation; it is nothing serious, just something that requires lifestyle changes. I have been using AI, and I have to say that I could not have found a better coach. I use a combination of ChatGPT, Perplexity, and Claude. I am always second-guessing AI in case it hallucinates, but I learned more in a month than the patient did in six months under the tutelage of a doctor.

So when you ask AI, take the answers it gives you and then go to the primary source; the results can be exceptional. It is like playing tennis against a wall. The only difference is that a wall is passive whereas AI adds information when the ball comes back to you. You can ask for a flat stroke or a topspin. Done right, AI can be absolutely exceptional. But my great fear is that we will keep looking for pat answers and end up doing damage by giving students tools like Waze or Google Maps, which reinforce lazy learning methods. Learning flourishes where learners face something called "desirable difficulties".

AI is at an early stage of incredible acceleration. The DeepSeek bombshell is a reminder of the unstoppable and reverberating progress in this cauldron of innovation. We should not think of banning its use by students. Instead, professors have to figure out how to use it. They must think like epistemologists, questioning and understanding the nature of knowledge. One thing though: exams may have to move back to the classroom because the outcome of this interaction among the professor, the student and the AI needs to be measured for the student in isolation.

The more agency, choice, and decision-making a job entails, and a human is educated to take it on, the more likely the job is AI-proof for the time being.

What are your thoughts on the growing trend towards vocationalism in higher education?

I have strong views about this. For me, this separation of the vocational and the theoretical has parallels to the class structure in our societies. You may find it interesting that MIT was originally dismissed as a vocational school when it was established just before the American Civil War. Its founding seal features a smith with a hammer on one side and a scholar reading a book on the other side. The motto under the seal reads '*mens et manus*', meaning 'mind and hand'. I would argue that to some extent, class warfare is mind *versus* hand, that is, people who work using their minds versus the people who work with their hands. But bridging the two is essential, because it does not matter how much you learn theoretically if you cannot implement it. My view is that there is a bit of a false dichotomy embedded in the question of vocational learning.

It is reminiscent of classifying people at an early stage based on a false understanding of 'IQ' (which has been discredited in recent times). I do believe that the cobbler's son can appreciate ancient philosophy from Confucius as much as an accountant's son can learn to program or master the artisanal craft of *batik*. We need to bridge these two views.

This class distinction is going to be one of our key issues with the AI-agency revolution that is coming, because those holding white-collared jobs who don't want to get their hands dirty live in one world and the blue collars live in another world. But AI and AI-robotics will attack both these worlds, so both demographics will have to work together eventually. I don't mean it as waging a war against the machines, but there is a need to invent a future where we take advantage of these tools—and each other.

What advice would you give to students today, both youth and adult, especially in Asia?

My advice is actually hard to follow, but it is what it is. It is about the race to obtaining agency as humans face off against machines. My view is that if you are doing a job that can be replaced, it will be replaced. In fact, the more agency, choice, and decision-making a job entails, and a human is educated to take it on, the more likely the job is AI-proof for the time being. Much of this has to do with the ability to conceive of something that isn't in the data set that AI has scoured; we need to move outside the box that AI is occupying. Sound familiar? We have boxed ourselves squarely inside a trap of our own making, and the escape route is through education. And this involves agency, and enough of a rebellious spirit within ourselves to say things that are controversial or outside the norm. I would say that a world of agency and creativity is where we need to be, rather than a world that seems comfortable for now until the wildfires reach our doorstep. Or the seas, for that matter. ◼

12

VANTAGE
POINT

by Pradeep Varakantham
and Sidney Tio

ASIAN MANAGEMENT INSIGHTS
MARCH 2025

13

Reimagining Education

Keeping the Human in the Loop

How educators can work with generative artificial intelligence models to improve learning.

Artificial intelligence (AI) helps break the mould of one-size-fits-all education by creating personalised learning paths that adapt to each student's pace and style.

By combining human expertise with AI capabilities, educators can create learning experiences that are both structured and flexible, thus getting the best of both worlds.

While promising, AI used in educational contexts must carefully navigate privacy concerns, ensure fairness across all student groups, and support appropriate learning progression.

Education has traditionally operated under a model where a teacher follows a fixed curriculum, either in a classroom or through standardised video lessons on a learning management platform. While this approach effectively standardises education for large groups, it faces significant limitations. Central to this model is the concept of a 'one-size-fits-all' curriculum, which assumes that all students will progress at the same pace and follow a uniform learning path. While this structure may work for some, it often neglects the diverse needs, prior knowledge, and learning speeds of individual learners.

In this article, I explore how AI is reshaping education by combining human expertise with adaptive learning systems. I begin by examining the limitations of traditional classroom models, where fixed timelines and standardised curricula often fail to meet individual student needs. Next, I delve into how different AI approaches—from supervised learning to reinforcement learning with generative models—can create more personalised and effective learning experiences. Finally, I address the practical challenges of implementing AI in education, including data privacy, fairness concerns, and the crucial role of human oversight in maintaining educational quality. Throughout, I emphasise that the goal is not to replace teachers but to enhance their capabilities and create more responsive learning environments that work for every student.

TRADITIONAL CLASSROOMS: STATIC IN A FLUID AGE

In the traditional classroom model, time is a fixed variable, while learning is flexible—students must master a set of skills within a predetermined time frame, regardless of their starting point or learning speed. This structure leaves faster learners unchallenged and slower learners unsupported. Teachers, despite their best efforts, have limited capacity to tailor their instruction to the unique needs of every student. Consequently, students who require additional support may fall behind, while those ready for more advanced material remain unengaged.

The rigidity of traditional curricula further compounds this issue. Curricula designed by experts, though informed by educational research, are often slow to adapt to new developments in knowledge and skills. This problem is particularly acute in fast-evolving fields like technology, where the knowledge taught may become obsolete within a few years. Revising curricula requires substantial time and effort from educators, administrators, and policymakers. As a result, students may be learning outdated material that fails to meet the demands of modern industries.

Another challenge of traditional education models is their reliance on standardised assessments. Examinations and tests provide a snapshot of student performance at a particular moment, but they

rarely capture a student's complete learning trajectory. Assessment systems prioritise 'what' students know at a specific time over 'how' they learn, making it difficult to identify learning gaps or recognise alternative approaches students might use to solve problems. Designing diverse and non-repetitive assessments also places a heavy burden on human instructors and trainers.

ENTER AI IN EDUCATION

There are two major components of AI, one which is focused on how humans learn (machine learning) and the other that is focused on how humans decide (also known as reinforcement learning or RL). To reimagine education through the lens of AI, it is essential to understand how different AI methods can help transform traditional learning paradigms for humans. AI-powered educational systems leverage various learning approaches–supervised learning, unsupervised learning, and RL– each offering unique capabilities to enhance the human learning experience. Alongside these, advancements in generative models and natural language processing (NLP) have opened up new frontiers for personalised, and interactive learning experiences.

Supervised learning: Structured adaptation and personalisation

Supervised learning, a foundational AI technique, trains models using labelled datasets, where input-output pairs are explicitly defined. This approach is widely applied in educational settings for tasks that

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require structured decision-making and outcome predictions.

Some key applications include automated grading and feedback, where AI models trained on past student submissions can evaluate assignments, essays, and quizzes with high accuracy, offering detailed feedback in areas such as grammar, structure, and concept clarity. AI models can also perform student performance prediction by analysing historical data such as attendance, past assessments, and engagement patterns. Through supervised learning, at-risk students can be identified, and early intervention recommendations can be made to educators. Additionally, adaptive learning platforms can leverage supervised learning to propose tailored content based on

a student's previous performance and reinforce concepts where improvement is needed.

Despite its strengths, supervised learning requires large, well-annotated datasets and is limited to recognising patterns from past data, making it less effective for evolving, exploratory learning experiences.

Unsupervised learning: Discovering hidden patterns and structures

Unsupervised learning, which works with unlabelled data, focuses on identifying patterns, clusters, and structures within the data without explicit human intervention.

In educational applications, this capability is particularly valuable for student clustering and segmentation, where AI models can group students based on their learning behaviours, preferences, and challenges, allowing for customised teaching strategies that cater to distinct learning styles. Unsupervised learning can also create curriculum optimisation by analysing student interactions with various learning materials and identifying sequences of content, leading to optimal knowledge retention and mastery. Unusual learning patterns can be uncovered that may indicate students struggling with specific topics or concepts that require deeper intervention; this would be a form of anomaly detection.

Unsupervised learning provides powerful insights into large-scale educational data but requires careful interpretation and validation by human instructors to ensure meaningful educational impact.

Reinforcement learning: A more active mode

While supervised and unsupervised learning with NLP (see following section) play critical roles in educational settings, RL introduces a more dynamic and interactive dimension. Unlike the 'passive' nature of supervised learning where models make predictions from fixed data, RL models interact with their environment and learn from trial-and-error experiences. This interactivity is especially relevant in personalised and adaptive learning, where AI must continuously adapt to the needs of instructors and individual students.

To that end, we propose to develop human-in-the-loop systems to assist both instructors and students in educational settings, by utilising RL and generative models to interact in a natural way with students and instructors.

Natural Language Processing (NLP): Bridging communication gaps

A subfield of AI that combines supervised and unsupervised learning (including generative models), NLP plays a critical role in enabling intelligent interactions between students and educational platforms.

Chatbots and virtual tutors are AI-driven, and they provide instant feedback and explanations, helping students clarify doubts without waiting for instructor intervention. NLP-based tools also offer automated writing assistance, which assesses student essays for grammatical accuracy, coherence, and originality, as well as provide

suggestions for improvement in writing style and structure. AI-powered translation tools also enable language translation and accessibility, facilitating access to educational resources in multiple languages, while ensuring inclusivity and personalised learning experiences.

By leveraging NLP, educational platforms can create more interactive and inclusive learning environments, offering students continuous support across different subjects and linguistic backgrounds.

BUILDING THE HUMAN EXPERIENCE INTO AI

In education, the mastering of complex subjects such as calculus requires a structured and well-conceptualised progression of knowledge. For example, before learners can understand calculus, they must have a solid foundation in algebra, which in turn relies on a firm grasp of arithmetic. These learning pathways, often codified through years of pedagogical research and curriculum design, rely heavily on human expertise to structure the optimal learning experience. However, designing such curricula is not only resource-intensive but also requires a deep understanding of both the subject matter and the cognitive processes of learners.

On the other hand, modern video games present a stark contrast, where progression is often achieved through trial and error. Players engage in repeated attempts, gradually building skills through experience, exploration, and experimentation, without a

predefined learning path. In such cases, the absence of a structured curriculum means that players must rely on intuition, adaptive learning, and sometimes even external resources like online guides or communities in order to advance. Despite the lack of formal scaffolding, games are successful at engaging learners and facilitating skill acquisition, albeit in an unstructured manner.

This highlights a key challenge in learning and development across different domains: how can we balance structured learning pathways with adaptive, exploratory approaches that cater to individual learning styles? The promise of human-in-the-loop RL with generative models offers an exciting potential solution by combining the expertise of human instructors with the computational power of AI-driven adaptive learning systems.

Instructor perspective: Enhancing curriculum design

For instructors, the integration of generative models with RL in a human-in-the-loop paradigm provides a powerful tool to streamline and optimise the curriculum design process. This approach allows for iterative interactions and the following benefits.

- Human instructors set the learning objectives and granularity: Instructors can define the overarching learning goals, desired proficiency levels, and key learning milestones while providing input on the granularity of details needed in the curriculum.

- Generative models and RL algorithms automate content generation and adaptation: AI models can dynamically generate instructional materials, exercises, and assessments based on the instructor's input. These models can also adapt to feedback, identifying potential gaps in the content and refining the curriculum iteratively.
- RL models adjust curriculum dynamically: By continuously analysing student performance data, RL models can suggest modifications to the curriculum structure, ensuring alignment with diverse learning paces and preferences.

This synergy reduces the cognitive load on educators while ensuring that the curriculum remains responsive to evolving student needs and pedagogical trends.

Student perspective: Personalised and adaptive learning

From the student's viewpoint, human-in-the-loop planning presents a transformative shift towards personalised and adaptive learning experiences. The benefits of this framework include the following:

- Iterative learning with formative assessments: Students engage with learning materials through ongoing check-ins and quick evaluations (known as "formative assessments" in education). Unlike traditional standardised tests that come at the end of a course, these AI-powered assessments can adapt to each student's progress. For example, if a student struggles with algebra, the system might generate more practice problems focused on their specific pain points, while another student might receive more advanced challenges. Students receive instant feedback on what they understand well and where they need help, allowing them to adjust their learning in real time. These personalised check-ins provide valuable data about what each student knows and how they are progressing.
- Adaptive content selection by RL models: Based on student interactions, RL models can recommend the subsequent concepts to explore, ensuring a tailored learning path that addresses specific weaknesses and builds on existing strengths.
- Continuous feedback and nudging: Generative models can provide targeted nudges and scaffolding

to guide students through challenging concepts, fostering deeper understanding and engagement.

Through this iterative cycle, students benefit from a more personalised, data-driven approach to learning that evolves in response to their progress, helping them achieve mastery more efficiently.

EXPERIMENTAL STUDIES ON HUMAN-AWARE AI TEACHER ALGORITHMS

We evaluate our AI teacher algorithms against baselines using human participants who have undergone training in multiple simulation environments. Here, we present results based on a novel 3D emergency response environment designed to simulate an emergency medical care setting. Players use mouse controls to retrieve and apply medical items in an ambulance to treat patients with various conditions. The game requires correct item selection and application within a time limit, with up to four incorrect attempts permitted per task.

We conducted an experiment with 120 participants, randomly assigned to one of the four groups: (a) Reading Only (control): Learned solely through reading materials, without engaging in gameplay; (b) Random: Performed tasks selected at random from the pool, without replacement; (c) Handcrafted: Followed a predefined task sequence designed by the expert; and (d) SimMAC: Adhered to an adaptively curated task sequence using our AI algorithm.

In our evaluation, we analysed the effectiveness of teacher-guided training in improving post-training performance on the final test. Students trained using our proposed AI-based teacher algorithms significantly outperformed those in the control Random and Handcrafted curricula groups. The results were statistically significant. More importantly, we observed similar results in other environments, one of which emphasises the training of motor skills and another which stresses the cultivation of math skills.

CHALLENGES OF RL WITH GENERATIVE EDUCATION MODELS

While the potential of RL with generative models in education is substantial, several significant challenges must be addressed to ensure their effective implementation for both educators and students.

Data requirements

Unlike traditional AI models that are pre-trained on large datasets, RL requires constant interaction data from students and instructors. For educators, collecting real-time student interaction data at scale is costly and time-consuming, while also raising ethical and privacy concerns. For students, concerns about data privacy and security can affect their willingness to participate fully in digital learning environments. Privacy regulations such as the European Union's General Data Protection Regulation (GDPR) and US federal law Family Educational Rights and Privacy Act (FERPA) impose strict limitations on how student data can be collected, stored, and used. These regulations aim to protect student privacy but simultaneously restrict access to the diverse datasets needed for RL model training.

Privacy-preserving approaches such as federated learning offer a solution by allowing models to learn directly from student devices without transferring data to centralised servers, thereby mitigating privacy concerns. For example, consider an online learning platform that wants to personalise study recommendations for students preparing for university entrance examinations. Due to data privacy regulations, it cannot store student performance data on central servers. By using federated learning, the platform can analyse study patterns locally on students' devices, improving recommendations without compromising privacy.

The goal is not to replace teachers but to enhance their capabilities and create more responsive learning environments that work for every student.

Personalised learning adaptation

A key challenge in educational settings is designing personalised curricula that adapt to each student's progress without constant expert supervision. For educators, traditional approaches rely heavily on their expertise to structure the learning progression, while for students, personalised pathways can enhance engagement and comprehension. RL offers a breakthrough solution by employing AI agents as 'proxy students' to explore relationships between different learning scenarios.

An example of the above approach is in emergency medical training, where RL agents can analyse patterns across diverse medical cases, such as stabilising a patient with asthma versus handling both asthma and trauma concurrently, to determine shared medical principles and skills. This would ultimately benefit both students and educators in monitoring the learning progress.

Exploration versus exploitation trade-off

In RL, striking a balance between exploration (trying new strategies) and exploitation (using known effective methods) is crucial. For educators, this balance is essential to avoid disrupting established curricula, while for students, too much experimentation may lead to confusion and hinder learning progress. Generative models can help address this challenge by simulating potential student responses, enabling exploration without negatively impacting real students.

For instance, in a math learning application, an RL-based system might explore different teaching approaches, such as interactive quizzes versus video lectures. By simulating student responses, it can determine which method is more effective for different types of learners without disrupting actual learning schedules.

Data sparsity and generalisation

Students typically follow guided pathways, resulting in limited exploration of all possible learning trajectories, thereby hindering RL models from generalising to students who deviate from the norm. For educators, this can pose challenges in designing inclusive learning experiences. Generative models can help mitigate this issue by creating synthetic learning trajectories that fill in data gaps, offering a more comprehensive training dataset. Synthetic learning trajectories refer to artificially created data simulations that imitate real-world scenarios, improving how generative models learn and make decisions. However, ensuring that these synthetic trajectories are both realistic and representative of actual student behaviour remains a significant technical challenge.

Imagine learning as navigating a hiking trail. Most students follow the marked paths, taking similar routes to reach their destination. This creates a challenge: we do not have much data about what happens when students take different paths. It is like only knowing about the main trail but not the alternate routes that might work better for some hikers.

AI systems need this variety of experiences to learn how to help all types of students effectively. To solve this, we can use AI to imagine and create realistic 'what-if' scenarios like mapping out possible alternate trails that students might take. While this helps fill in our knowledge gaps, making sure these artificial scenarios actually reflect how real students learn remains tricky. It is similar to making sure our imagined hiking paths are actually walkable, not just lines on a map.

An example of where this RL model can be deployed would be a language learning platform which may notice that students primarily practise basic vocabulary, leaving gaps when it comes to acquiring complex grammar topics. By generating synthetic data that provides for diverse learning pathways, this RL model can provide better practice exercises tailored to individual needs.

Bias in training data

Bias in training data is another major concern. RL systems trained on data that primarily represents certain student demographics may fail to generalise to underrepresented groups. For educators, this can lead to unintentional disparities in learning outcomes. For students, this means access to equitable learning experiences may be compromised. Addressing this issue requires thoughtful data collection strategies and fairness-aware algorithms to promote equity in education.

For instance, a career guidance AI system trained predominantly on urban students' data might not provide relevant recommendations to students from rural areas. Incorporating diverse datasets and fairness-aware algorithms can help ensure more equitable outcomes.

Aligning learning with progression

Educational success is rooted in the principle of learning continuity, where new material builds upon existing knowledge. RL-driven educational systems must ensure that learning pathways introduce challenges at an appropriate pace. For educators, this means they can rely on data-driven insights to guide students effectively, while for students, it ensures a smoother learning journey.

For example, in medical training, a student who has mastered how to deal with basic respiratory distress cases should be gradually introduced to more complex scenarios involving multi-system failures, rather than being overwhelmed with advanced cases prematurely. AI-driven systems can analyse learning trajectories to construct personalised pathways that optimise the progression of skills. Or in a coding bootcamp, students might first master basic programming concepts before gradually moving on to handle more complex algorithms. An RL system can track their progress and introduce challenges such as debugging exercises or full-stack development projects at the right time.

By addressing these challenges, RL with generative models has the potential to revolutionise education by providing personalised,

adaptive, and scalable learning experiences that cater to the needs of both educators and students while maintaining ethical and privacy standards.

THE PATH FORWARD

The future of RL with generative models in education is promising but requires careful planning, ethical foresight, and continuous technical innovation. To overcome data constraints, researchers are exploring self-supervised learning techniques that enable models to extract meaningful insights from raw, unlabelled data. Additionally, advances in federated learning empower AI models to learn from decentralised student interactions while preserving privacy and complying with data protection regulations.

Generative models will continue to play a critical role in mitigating data sparsity and balancing the exploration versus exploitation trade-off. By generating realistic learning trajectories, these models help bridge gaps in student data and provide richer datasets for RL systems. Simulation-based training environments further enhance these efforts by allowing AI systems to test and refine new teaching strategies without disrupting actual student learning.

The potential impact of RL with generative models on education is profound. Unlike traditional educational methods that follow fixed, linear learning paths, RL-driven education systems can create personalised, adaptive, and equitable learning experiences. By leveraging generative models, these systems can simulate the vast diversity of human learning paths, ensuring that every student, regardless of their background, location, or learning style, has access to high-quality education tailored to their unique needs and pace of learning.

As these technologies evolve, collaboration among educators, policymakers, and technologists will be essential to ensure that RL-based educational solutions are effective, ethical, and inclusive. With the right approach, RL and generative models have the potential to revolutionise education by fostering lifelong learning and empowering students worldwide. ◼

DR PRADEEP VARAKANTHAM
is Professor of Computer Science and Director, CARE.AI Lab, School of Computing and Information Systems at Singapore Management University

SIDNEY TIO
is a computer science doctoral candidate at Singapore Management University

Skills for the Future

How Singapore's SkillsFuture Movement delivers skills and employment outcomes.

D r Gog Soon Joo, Chief Skills Officer at SkillsFuture Singapore, speaks about the country's strategy to drive upskilling and reskilling at scale amidst an environment of accelerating technological change.

How has Singapore's SkillsFuture Movement evolved since its inception? What can countries looking to upskill their citizens learn from this initiative?

SkillsFuture was launched in 2015 as a national movement to promote lifelong learning and skills development in Singapore. SkillsFuture Singapore (SSG) drives and coordinates the implementation of this movement, and we have observed that many more employers and mid-career workers are taking up SSG-supported training. In 2023, about 520,000 individuals and 23,000 employers participated in training programmes supported by SSG.

There has been a noticeable change in attitudes towards lifelong learning among Singaporeans. Increasingly, they are more aware of changing work requirements and the need to upskill. The Institute of Policy Studies 2023 study *Future of Work Singaporeans Want* found that two in three respondents anticipate significant changes in their current roles in the next few years, and three in four respondents recognise the need to upskill to adapt to these changes.

SSG has continued to strengthen collaborations with training providers, employers, and unions to create a wider ecosystem of support for individuals and employers. For example, we partner trade associations and chambers, as well as professional bodies to identify the skills needs in their sector, curate relevant training for their members, and develop skills-based career pathways. A good example would be the Skills Pathway for Cybersecurity that was created in partnership with the Singapore Computer Society.

In recent years, SSG has enhanced its skills intelligence and analytics capabilities by publishing an annual *Skills Demand for the Future Economy* report and regular *SkillsFuture Jobs-Skills Insights* that provide valuable insights into skills demand and growth while identifying key areas for upskilling and reskilling.

In January 2025, we launched the Jobs-Skills Portal— a one-stop platform that is useful to different stakeholders, including enterprises, training providers, and individuals as it provides tools for job-seekers to assess their career mobility and the possible skills pathways to bridge their skills gap to access those jobs. This should be used in conjunction with the MySkillsFuture portal, a one-stop platform for skills development and career planning for individuals. Similarly, the SkillsFuture for Enterprise portal was revamped and launched in August 2024 to provide employers with resources and tools for workforce upskilling and reskilling.

The SkillsFuture Career Transition Programme (SCTP), launched in April 2022, supports mid-career individuals in acquiring industry-relevant skills to improve employability and pivot to new sectors or job roles. This train-and-place programme is available on a part- or full-time format, typically ranging from three to 12 months. SCTP is delivered by Continuing Education and Training Centres and trainees can expect to receive employment facilitation support on top of training.

In yet another initiative, the SkillsFuture Queen Bee programme, industry leaders take on a leading role in championing skills development by providing skills advisory and support to guide organisations, particularly small and medium enterprises (SMEs), in identifying and acquiring the skills needed for business transformation.

These policies have translated into concrete initiatives that benefit individuals and businesses. Every Singaporean aged 25 and above receives an initial SkillsFuture Credit of S$500, which can be used for eligible courses. In 2020, SSG provided a one-time top-up of S$500, and those aged between 40 and 60 received an additional S$500. Eligible Singaporeans who turn 40 years old also receive the SkillsFuture Credit (Mid-Career Support) of S$4,000 under the SkillsFuture Level-Up Programme.

Feedback on training has been encouraging, with 98 percent of learners reporting better performance at work after undergoing SSG-funded training, and 69 percent agreeing to a large extent.

What are the most significant challenges in bridging the skills gap in Singapore today, and how is SkillsFuture addressing them?

There are significant challenges in bridging skills gaps today. We need to accurately and responsively identify skills needs and develop a common skills language (taxonomy) that is recognised by the ecosystem. We also need to get employers to value and better utilise the skills their workforce possesses and invest in workforce development, particularly for SMEs where manpower cost (time spent away from work due to training) is significant.

In the next five years, the Singapore workforce will be shaped by demographic changes, technological advancements, and economic shifts. The SkillsFuture Movement must therefore enable individuals to continuously upskill and reskill to remain mobile and resilient in a rapidly changing economic and labour market. As the proportion of older workers in the workforce increases, we will also need to consider how to continue upskilling and reskilling efforts throughout a longer productive lifespan or encourage economically inactive persons to return to the workforce.

The SkillsFuture Level-Up Programme was launched in 2024 to provide greater structural support for mid-career Singaporeans aged 40 and above to pursue a substantive skills reboot and stay relevant in a changing economy. This helps meet enterprises' skills and productivity needs, which are evolving at a faster pace to meet changing business goals amidst accelerating technological advancements. SSG recently announced requirements for training providers to ensure that 40 percent of their enrolment for SSG-funded courses are employer-sponsored as an indication of keeping training industry-relevant.

Older workers with substantial financial commitments are apprehensive about career transitions that often require a period of reskilling that comes with reduced incomes and resulting worries. How can this be addressed?

To address the time constraints faced by individuals when reskilling, especially those with family and work commitments, SSG has worked with training and adult educators to offer flexible learning modes and schedules to meet the needs of working adults. With more than 28,000 courses listed on the MySkillsFuture portal, individuals can find relevant courses which suit their learning needs, be they in-person, hybrid, or online.

SSG also curates modular courses, of which some are stackable and lead towards a full qualification, allowing working adults to complete modular learning at their own pace. There are also online learning options offered through ZilLearn, Gnowbe, NTUC LearningHub, Coursera, and Udemy, which are claimable from an individual's SkillsFuture Credit. Individuals who need advice tailored to their needs can register for SkillsFuture Skills and Training Advisory services to have one-on-one discussions with Skills Ambassadors on learning and skills development planning.

With the new SkillsFuture Level-Up Programme, eligible individuals will also be able to receive a training allowance when they enrol for full- or part-time courses.

What ideal mindset should today's employees and employers embody in the face of technological advancement, the ageing workforce, and a shrinking population?

Given an ageing workforce and shrinking population, employers need to look beyond qualifications in hiring and developing individuals with the relevant skillsets. This will widen employers' access to talent, as well as increase their productivity and retention rates, when they are seen as employers of choice where workers are recognised and rewarded based on skills.

As the proportion of older workers in the workforce increases, we will need to consider how to continue upskilling and reskilling efforts throughout a longer productive lifespan or encourage economically inactive persons to return to the workforce.

Employers should also see technological trends as constructive disruption, and opportunities for growth and transformation. Technology and artificial intelligence can be leveraged for business transformation, and investment in a skilled workforce can make it more productive and versatile in harnessing that technology.

Research shows that SMEs that combine business and people strategies achieve the best performance outcomes. An SSG success story is that of Ang Shu Min, Business Services Lead at Lim Kee, a food manufacturing company specialising in manufacturing and distributing Chinese steamed buns. Ang is on her way to achieving the Workplace Learning Role Badge, which will empower her to take on a wider job scope in her human resources work by implementing impactful workplace learning strategies. She has led Lim Kee through a review and refinement of its learning policies. As a result, she has created on-the-job training blueprints, developed career pathways, and conducted skills gap analyses. These efforts have led to a 50-percent increase in the staff's learning hours and an 81-percent employee satisfaction rate, driving better business outcomes and long-term success for Lim Kee.

How should organisations best approach reskilling and upskilling of their existing employees, especially when leveraging SkillsFuture funding?

First, know where your business is moving towards and identify the skills that you need. Companies can leverage many SSG resources such as *Skills Demand for the Future Economy* reports, *Jobs-Skills Insights* developed by SSG and industry partners, and *Jobs Transformation Maps* developed by Workforce Singapore and sector-relevant agencies.

Second, evaluate your workforce's skills stock and identify the skills gap they face using the Skills Profiling Tool, also known as Skills Profiler. Find the relevant courses that you would like your workers to attend to reskill or upskill in order to close the skills gap. You can visit the course directory available on the SkillsFuture for Business website. Or you could develop workplace learning processes or systems by partnering with the National Centre of Excellence for Workplace Learning (NACE).

Third, pinpoint funding sources that you can tap on, such as the SkillsFuture for Enterprise Credit.

Many companies in Singapore have successfully reskilled and upskilled by leveraging SSG resources. For instance, Commonwealth Concepts, a growing medium-sized enterprise with more than 18 distinct food and beverage brands, wanted to accelerate its business growth and develop the skills capability of its staff. As part of the SkillsFuture Queen Bee programme, the Commonwealth Concepts team was engaged by Grab to look into their training needs. With help from Grab's Skills Managers, Commonwealth Concepts solidified its training strategy and intervention plan, thus strengthening its learning ecosystem. Commonwealth Concepts will soon start granting learning leave to its employees to attend any SSG-funded training course according to their aspiration and interests. It has also been collaborating with JobKred to use the Skills Profiler tool to map out the skills gap and intervention plan for its employees and is now participating in the NACE Workplace Skills Recognition programme.

In another example, Lim Kee, also a participant of the SkillsFuture Queen Bee Programme, was engaged by supermarket chain Sheng Siong to share insights into the food industry. The workshops conducted by Sheng Siong helped Lim Kee realise that digital transformation is not only about transforming information technology systems, and Lim Kee has since adopted Sheng Siong's People, Process, Technology, Data (PPTD) approach that looks into how processes can be automated where possible while ensuring accuracy. Sheng Siong also invited JobKred to share about the Skills Profiler tool during one of the workshops, which led to Lim Kee adopting the tool. From the third quarter of 2023, Lim Kee and JobKred have been working together to identify the training needs of Lim Kee's employees and improve their skills investment efforts.

On a more personal note, what are the SkillsFuture courses that you have recently undertaken or been particularly interested in?

I completed a course related to career coaching in the longevity economy at the National University of Singapore. The course was most helpful in supporting my role as a volunteer career coach. Recently, I started a course in Arts Management with Singapore Management University-Nanyang Academy of Fine Arts. I am planning to preserve my late father Gog Sing Hooi's watercolour legacy, hence, the course is an induction into the world of art. ◾

> Technology and artificial intelligence can be leveraged for business transformation, and investment in a skilled workforce can make it more productive and versatile in harnessing that technology.

DR GOG SOON JOO
is Chief Skills Officer at SkillsFuture Singapore. She is a globally recognised thought leader in skills strategy and workforce development. She is one of the esteemed members of the World Economic Forum Global Future Council in Human Capital Development.

by
Jacinth Tan

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While social mobility provides opportunities for a better life and societal progress, it can also lead to significant challenges, including burnout from hypercompetitive environments, feelings of isolation due to cultural mismatches, and self-blame stemming from the myth of meritocracy.

2

Strengthening social safety nets and providing supportive environments in educational institutions and workplaces can help mitigate the unintended psychological and social costs of mobility.

3

A nuanced approach to social mobility that acknowledges external systemic and psychological barriers, and fosters inclusivity is necessary to ensure upward mobility benefits society while lowering the risk of exacerbating inequalities or personal strain.

SOCIAL MOBILITY
WHAT WE HAVEN'T TALKED ABOUT

More balanced understanding may curb unintended negative outcomes.

Everyone loves a good rags-to-riches story: The boy or girl who grew up in a poor village and then becomes a Chief Executive Officer or a doctor, the student who is the first to attend university in the family and then lands a dream job, or a protagonist who beats all the odds and exits the poverty cycle. These stories fuel our deep belief in social mobility that by seizing the opportunities available and putting in enough effort, anyone can rise to a better position in life.

Social mobility is often seen as a marker of societal fairness and widely believed to reduce economic inequality in society. As Singapore sociologist Teo You Yenn put it, "the promise of equality is often described as a promise of mobility."[1] More equal societies are also happier societies.[2] Therefore many countries invest in education and their policies are aimed at increasing social mobility. But is the relationship between social mobility, and individual or societal wellness perfectly linear? What if, alongside its benefits, social mobility also poses unseen or hidden challenges for individuals and society?

THE 'KNOWN' SIDE OF SOCIAL MOBILITY
A high level of social mobility is often celebrated for creating pathways to a better life, and promoting a meritocratic system where success depends on talent and effort, rather than the family you were born into. Such high levels of social mobility open avenues for education and employment, while reducing barriers that traditionally limited opportunities for marginalised groups. Policies like subsidised education, financial aid, scholarships, and affirmative action aim to level the playing field, ensuring that everyone has a shot at

success. For instance, young students from low-income backgrounds can secure scholarships to prestigious universities, gain valuable skills, and later find jobs that improve their families' financial security.

Social mobility also fosters a mindset and culture of optimism. When people believe that social mobility is well and alive, it seeds aspirations of attaining a better life and motivates them to work harder. When they see examples of others rising through determination and beating the odds, it signals to them that success is possible even in the face of adversity. In fact, such aspirations are strongly reflected in people's subjective beliefs about social mobility, which are often more optimistic than in reality. For instance, when American survey participants were asked to estimate the percentage of people from the bottom income quintile who are likely to move to the next or higher income quintiles, participants invariably provided a significant overestimate compared to what the data actually showed.[3,4]

Some might argue that such optimism may create unrealistic expectations. However, the belief in high social mobility underlying such optimism can act as a powerful motivator–people are more likely to invest in education, work hard, and persist when they perceive a high chance of attaining success. This sense of the possibilities available not only benefits individuals but also drives societal progress. When more people believe they can succeed, they innovate, take risks, and contribute to economic growth.

THE OTHER (DARKER) SIDE OF SOCIAL MOBILITY

Despite the deeply held assumption that high levels of social mobility should confer benefits, research on the links between social mobility and individual or societal wellness has revealed mixed patterns. In fact, existing cross-country data suggest there are potential social and psychological costs of moving up the ladder or when people have the desire to move upwards.

Pressure to hustle

The belief that upward mobility is achievable for everyone, along with collective aspirations to move upwards, inadvertently fosters a hypercompetitive environment. Additionally, while the belief that "you can achieve anything if you work hard enough" is empowering and motivating, it can also create immense pressure. In a society that values upward mobility, people feel compelled to constantly hustle, compete, and outperform others.

The intense focus on achievement and status attainment from 'hustle culture' often leads to burnout, as individuals juggle long hours, side hustles, and continuous self-improvement. In South Korea, for example, the intense competition for education and jobs has led to high rates of burnout and mental health issues among young people. In addition, social mobility does not just mean climbing higher, but also involves maintaining the progress that has been achieved and avoiding any downward movement. The fear of downward mobility–falling back to a lower socio-economic status–thus often creates anxiety, which intensifies stress and burnout.

The negative impact of chasing upward mobility is also suggested by existing research. A longitudinal study of adolescents into young adulthood in the US found that upward mobility predicted lower allostatic load (a physical marker of chronic stress), only for those who achieved a slightly higher educational level (i.e., moved up one step in a five-step education rank) than their parents. However, those who achieved much higher educational levels than their parents (i.e., moved up by two or more steps) did not see benefits in their health.[5] Studies have also found that socioeconomically disadvantaged individuals who exhibit traits of striving–such as high persistence and resilience–experienced more stress,[6] suffered from poorer immune function,[7] and aged faster than expected for their age.[8]

Environmental mismatch and feelings of isolation

For those who achieve upward mobility, stepping into unfamiliar environments can be isolating. Moving into higher socio-economic strata often involves entering workplaces or educational institutions with different cultural norms, values, and expectations.[9,10]

Imagine a first-generation university student attending a prestigious university where most peers come from wealthy, well-connected families. University settings also tend to emphasise independence and self-direction, which align with upper-class values of university students whose

When success is seen as a personal achievement, those who remain at the bottom of the socio-economic hierarchy may also be blamed for their circumstances by others.

parents and grandparents are also university-educated. As such, first-generation university students who feel lost and uncertain may be fearful to seek help, might struggle to fit in, and could feel out of place in a world that operates based on unspoken social norms they were never taught.

Environmental mismatch extends to workplaces as well. Employees from underprivileged backgrounds may face challenges adapting to professional environments dominated by an unfamiliar set of values and behaviours or unwritten social codes. For instance, is it appropriate to assert themselves when interacting with their colleagues or bosses, and if yes, when is it suitable to do so? How should they advocate for themselves or rely on others to be promoted or advance to leadership positions, and to what degree should they do so? Without such know-how, employees from underprivileged backgrounds often feel disconnected and unsure of how to navigate these spaces. Many may struggle to succeed, and those who do may have had to go the extra mile.

Existing research also suggests that for individuals, the sense of uncertainty and alienation from struggles to reconcile their backgrounds with their new settings can negatively impact well-being.[11,12] At a broader level, environmental mismatches may reinforce systemic barriers to full integration and success.

Blame and division
One unintended consequence of high levels of social mobility is the reinforcement of a 'meritocracy myth', that success is entirely due to individual effort. While hard work and talent are part of the success equation, systemic factors like access to quality education, healthcare, and social networks, as well as the often unseen challenges of navigating mismatches and isolation, all play a significant role. When society overemphasises individual responsibility, it overlooks these additional barriers. This creates unrealistic expectations for those trying to move up and

fosters guilt among those who do not succeed. People start believing, "If I'm struggling, it must be my fault." Such self-blame only worsens the self-worth and self-esteem of economically disadvantaged individuals, furthering gaps in psychological well-being.

When success is seen as a personal achievement, those who remain at the bottom of the socio-economic hierarchy may also be blamed for their circumstances by others. This stigma reinforces harmful stereotypes about poverty, leading people to label disadvantaged groups as lazy or incompetent.[13]

Such narratives also have far-reaching societal consequences. Individuals who are stereotyped and labelled as lazy or incompetent are likely to be seen as less deserving of help. People may start to think, "Why should the taxes I pay be spent on those who are unable to do better, even when they are given support and opportunities?" Such thinking may result in reduced public support for social safety nets and redistributive policies that are critical for alleviating

The belief in high social mobility underlying such optimism can act as a powerful motivator– people are more likely to invest in education, work hard, and persist when they perceive a high chance of attaining success.

inequalities. Increased blame on the poor and less willingness to empathise with and support them may aggravate intergroup animosity. Further downstream, this may deepen the class divide, exacerbate tensions, and threaten the social compact of society.

FOSTERING A MORE INCLUSIVE FORM OF SOCIAL MOBILITY

The takeaway so far is not that social mobility is bad. Quite the contrary, people fundamentally desire some level of personal progress and want to lead a good life. The important consideration is how governments and societies can continue to strengthen social mobility, while addressing the unintended consequences. By rethinking how we approach social mobility, we can ensure that it benefits everyone without leaving unintended harm in its wake.

Strengthening social safety nets

Fundamentally, increasing the social mobility of societies requires governments and institutions to invest in robust social safety nets. Redistributive policies such as progressive taxation and financial support for lower-income groups, affordable education, and accessible healthcare are vital for ensuring that all individuals, regardless of their socio-economic background, have the resources to pursue opportunities and a fair chance to succeed. In Singapore, these foundations have already been laid by providing highly subsidised public education, housing, and

healthcare, as well as short- to long-term financial assistance for low-income families. Nonetheless, government policies alone are necessary but insufficient.

A nuanced mobility narrative

As a society, we need to challenge the idea that upward mobility is purely about individual effort. Instead, society should reframe social mobility to include the recognition of external circumstances beyond broad systemic inequality, such as the more unseen social and psychological barriers at the individual level (i.e., environmental mismatch, isolation, blame, and stereotyping) that shape the opportunities available. This does not mean downplaying personal responsibility, but rather acknowledging that success is a combination of individual qualities, social understanding, and collective support.

Address cultural mismatches by creating supportive environments

While individuals can expect to face initial adjustment challenges in a new school or workplace, the challenges should not be assumed to be the same for all. Educational institutions and workplaces must understand, value, and prioritise the creation of environments where individuals from diverse backgrounds feel welcome and supported. This can be achieved through mentorship or diversity training programmes that recognise and celebrate differences. For instance, universities can provide

first-generation students with access to advisors who understand their challenges, while companies can implement programmes that better support the adjustment of new employees, particularly those from lower socioeconomic or working-class backgrounds.

An important aspect of such programmes should be to help educators and managers become aware of and identify behaviours that signal uncertainty about unfamiliar cultural norms and the need for greater support. For instance, educators and managers should not misinterpret the less vocal or assertive behaviours of a first-generation student or fresh employee from a disadvantaged background and conclude that they lack initiative, motivation, or competence. They could just be taking more time to observe and learn the less familiar cultural norms of their new environment. Instead, educators and managers should be more aware and sensitive to 'passive behaviours'.

Research finds that organisations can make workplaces more comfortable and engaging for employees from working-class backgrounds by fostering a more interdependent culture.[14] Therefore, educators and employers can provide more support for lower socioeconomic or working-class individuals navigating social mobility to develop greater confidence in navigating the new culture, or adjust some aspects of the learning or work environments to be more aligned with the interdependent orientation of these individuals. By addressing cultural mismatches,

we can help individuals integrate more effectively, and reduce the stresses and alienation associated with upward mobility.

Redefining success

It is essential to challenge the hypercompetitive narrative that equates social mobility with status attainment, and move beyond a narrow definition of success that prioritises wealth and status. Instead, society should celebrate diverse aspirations, whether it is pursuing a passion, contributing to the community, or achieving personal well-being. By shifting the focus from hyperachievement to holistic fulfilment, we can reduce the pressure to constantly compete and allow individuals to define success on their own terms.

The Singapore government leadership—much to their credit— has understood and recognised the need for a reset of such mindsets. In fact, this vision is explicitly laid out in the Forward SG report that charts Singapore's vision moving forward.[15] The key question would be how this vision can be translated into action and reality. The government clearly cannot do this alone. This vision must also be shared and driven by the people via social influence, whether as parents, educators, or even just as individuals who want to play an active role in reshaping our society's mindset and culture.

CONCLUSION

Social mobility is a powerful force for good, offering hope, opportunity, and a path to a better life. But it is not without its challenges. From the pressure to hustle to the myth

of meritocracy, the journey towards upward mobility can be fraught with unintended consequences. The key to addressing these issues lies in balance. By promoting a nuanced understanding of mobility, creating supportive environments, and investing in systemic solutions, we can build a society where opportunity is accessible to all—and where success does not come at the expense of well-being. **AMI**

DR JACINTH TAN
is Assistant Professor of Psychology at Singapore Management University

by Hao Liang, Yongheng Sun,
and Tianhao Yao

Greening Brown Sectors through Transition Finance

Financing not-so-green industries' environmental transition could really move the climate needle.

Directing capital away from carbon-intensive sectors and only financing green sectors may fail to achieve green transition targets.

Transition finance plays a critical role in addressing climate challenges.

Research suggests that the transition finance logic works and has promising potential.

Climate change is one of the most urgent challenges facing humanity today. According to the Intergovernmental Panel on Climate Change (IPCC), global temperatures in the past 50 years have risen at the fastest rate over two millennia.[1] To address this alarming trend, 196 parties at the 2015 United Nations Climate Change Conference adopted the Paris Agreement. This landmark treaty commits all signatories to actions aimed at limiting the global temperature rise to below 2ºC above pre-industrial levels, with an aspirational target of 1.5ºC. However, achieving these targets requires decarbonisation, with a critical focus on transforming 'brown' sectors, which are industries heavily reliant on processes or energy sources that are challenging to decarbonise, such as the fossil fuel-dependent energy sector.

In Asia, unique regional factors make this energy transformation particularly complex and slow-moving. Many economies in the region not only remain heavily reliant on fossil fuels, but they also suffer from having limited capacity to produce renewable energy due to geographic and climatic constraints. Additionally, the intermittent nature of renewable energy sources further complicates their role as a reliable and stable energy solution. For example, the Southeast Asia Energy Outlook 2024 by the International Energy Agency (IEA) projects that renewable energy demand in Southeast Asia under current policies will increase by 184 percent, from 6.2 exajoules in 2023 to 17.6 exajoules by 2050. If all announced energy

and climate targets are met, this demand could surge by 376 percent, reaching 29.5 exajoules by 2050.[2] However, as total energy demand continues to grow, reliance on fossil fuels remains significant. In some scenarios, combined demand for oil, natural gas, and coal is projected to rise by as much as 37 percent.[3] These findings underscore that while renewable energy is becoming a more viable alternative, achieving systematic energy transformation across Asia remains a complex and lengthy process.

In this article, we explain why the conventional approach to green finance may fall short of meeting green transition targets. We also highlight why it is critical to adopt transition finance as a new strategy to effectively engage brown sectors in our efforts to address climate change. We also take the opportunity to introduce new tools and approaches such as blended finance, which combines the use of public and philanthropic funds, and private capital to support decarbonisation initiatives. Insights from our research on Chinese firms also tell us that reducing debt costs can incentivise greener activities, suggesting the feasibility of transition finance.

WHY WE NEED TRANSITION FINANCE

Transforming brown sectors requires substantial financial resources. IEA estimates that achieving net-zero emissions by 2050 will demand annual energy sector investments of nearly US$4 trillion from 2030 onwards.[4] While the global financial sector is increasingly adopting

sustainable investment practices to support the energy transition, one question remains: can these investments effectively deliver sustainable outcomes?

Traditionally, sustainable investment has focused on either divesting from or reducing investment in brown sectors like fossil fuel-driven ones, while channelling funds towards green sectors. By raising the cost of capital for brown firms, this approach aims to pressure them into adopting greener practices, while simultaneously providing green firms with more affordable financing. However, recent academic research indicates that such current sustainable investment practices may be ineffective, or even counterproductive, in reducing carbon emissions. For instance, providing funds exclusively to green firms has limited potential to significantly lower global emissions. This is because high-emitting firms not only produce 1,700 times more emissions than low-emitting firms, but their emissions are also far more sensitive to changes in capital costs.[5] As a result, by prioritising capital for green firms and restricting funding for brown firms, we may miss the opportunity to unlock the substantial emissions reduction potential of high-emitting industries if we only rely on sustainable investment.

In addition, the success of the green transition depends heavily on significant advancements in green technologies. As a United Nations Environment Programme (UNEP) report highlights, continued innovation to reduce the costs of renewable energy technologies

such as solar and wind paves the way for renewable energy to potentially supply the majority of global electricity in the future.[6] Surprisingly, the primary drivers of green technology innovation are brown firms.[7] Analysis of green patents reveals that brown firms generate more, and often higher-quality, sustainability-related innovations, with many classified as 'blockbuster' patents. Without adequate funding support, these firms may face setbacks in advancing green innovation, ultimately delaying global decarbonisation efforts.

Moreover, restricting brown firms' access to affordable financing can unintentionally result in higher emissions. Evidence shows that financially-constrained brown firms often increase carbon emissions to boost short-term cash flow while scaling back efforts towards long-term carbon reduction.[8,9] As a result, diverting capital away from brown firms fails to provide them with the necessary incentives to adopt renewable energy or pursue greener practices. In fact, financial constraints may compel these firms to prioritise emissions over abatement, leading to even greater environmental damage.

Therefore, brown firms should not be entirely excluded from receiving financial support. As a result, a new investment strategy, specifically transition finance, has been introduced to facilitate the global green transition more effectively. First proposed by the Organisation for Economic Co-operation and Development (OECD) in 2019, transition finance aims to

By prioritising capital for green firms, restricting funding for brown firms, and only relying on sustainable investment, we may miss the opportunity to unlock the substantial emissions reduction potential of high-emitting industries.

support sectors that are not yet fully sustainable but are committed to progressing towards sustainability over time. This approach emphasises the dynamic process of transformation, focusing on long-term progress rather than a static evaluation of current practices.

According to the Glasgow Financial Alliance for Net Zero, transition finance includes "investment, financing, insurance, and related products and services necessary to support an orderly real-economy transition to net zero".[10] In essence, transition finance involves providing financial support to brown sectors to help them adopt greener practices through credible transition targets, taxonomy frameworks, and technology roadmaps. Successful implementation requires the development of credible transition plans with clear, time-bound

targets for reducing greenhouse gas emissions. Despite its significant potential, transition finance remains in its early stages of development.

TRANSITION FINANCE INSTRUMENTS

Transition finance has garnered significant global attention, spurring the development of numerous frameworks, guidelines, and policies. A notable example is the Group of Twenty (G20) Transition Finance Framework (G20 TFF) unveiled at the 2022 G20 Summit. This framework outlines 22 high-level principles across five pillars, providing comprehensive guidance for countries to establish robust transition finance systems. It is widely regarded as the most comprehensive transition finance framework to date.

Before the launch of the G20 TFF, other influential guidelines were introduced by non-governmental organisations (NGOs) and governments, including the *Climate Transition Finance Handbook* by the International Capital Market Association, *Financing Credible Transitions* by the Climate Bonds Initiative, and the *Basic Guidelines on Climate Transition Finance* issued by the Japanese government. However, these frameworks and guidelines are still in their early stages of development, lacking comprehensive details and comparability, and requiring further refinement to address the complexities of transition finance. As the field matures, these initiatives are expected to evolve into more robust and actionable systems.

The financial market is evolving with innovative instruments designed to support green transition, particularly in the bond market. One prominent example is sustainability-linked bonds (SLBs), a groundbreaking debt instrument that ties interest payments to sustainability-related Key Performance Indicators or KPIs. This structure incentivises brown firms to adopt greener practices. Another example is transition bonds, whose proceeds are dedicated to funding green transition projects. Unlike traditional sustainable investment, which primarily focuses on already-green firms, transition bonds are specifically tailored for brown firms seeking to transform themselves. Additional instruments in transition finance include sustainability-linked loans or SLLs and labelled transition bonds or loans, each offering unique mechanisms to promote sustainable practices.

Transition finance instruments have seen remarkable growth since their introduction in December 2018. By the end of 2023, the cumulative issuance of SLBs reached US$48.6 billion. Although the SLB market is still smaller than that for traditional sustainability bonds such as green bonds, it has demonstrated rapid expansion in recent years. In 2023 alone, the issuance of SLBs increased year-on-year by 95 percent.[11] Notably, the utilities and industrial sectors—both crucial to global decarbonisation—are the leading issuers of SLBs.

Policymakers across Asia are increasingly emphasising transition finance to drive sustainable development. The Japanese government has taken a leading role by promoting transition finance to support industries in their shift towards sustainability. Japan currently leads the world in transition bond issuance, with plans to issue approximately 20 trillion yen (US$133 billion) in sovereign transition bonds over the next decade, which could unlock up to 150 trillion yen (US$1 trillion) of transition investments.[12] Similarly, in 2021, the People's Bank of China initiated research on transition finance and established foundational principles for its implementation.[13] The bank is developing transition finance standards for four critical sectors: steelmaking, coal power, construction materials, and agriculture. That same year, one of China's bond markets launched a pilot programme for transition bonds to provide financial support for high-emitting industries. Additionally, provinces and cities such as Hebei, Tianjin, and Guizhou have introduced tailored guidelines to advance transition finance in key sectors like steel, chemicals, construction materials, and non-ferrous metals. While still in its early stages in China, transition finance holds significant potential to become a cornerstone of the country's sustainable economic growth. These efforts provide valuable lessons for other countries seeking to establish their own transition finance frameworks.

Clear and well-defined transition plans are vital for transition finance, providing structured frameworks to steer investments into sustainable economic activities. The Singapore-Asia Taxonomy for Sustainable Finance (Singapore-Asia Taxonomy), launched by the Monetary Authority of Singapore in December 2023, marks a significant milestone as the world's first multi-sector transition taxonomy.[14] This comprehensive framework establishes detailed thresholds and criteria to define green and transition activities across eight key sectors, including energy, transport, and real estate. By introducing a 'transition' category, it acknowledges the gradual journey towards sustainability, enabling capital to flow towards activities that demonstrate credible progress to achieving environmental goals.

The importance of taxonomies like the Singapore-Asia Taxonomy lies in their ability to provide clarity and consistency in classifying economic activities. This clarity is essential for financial institutions, investors, and policymakers to make well-informed decisions aligned with sustainability objectives. The taxonomy uses a 'traffic light' system—green, amber, and red—to categorise activities based on their environmental impact and transition potential. This nuanced approach helps stakeholders distinguish between fully sustainable activities, those on a transition pathway, and those misaligned with sustainability goals. By doing so, it mitigates the risk of greenwashing and strengthens the credibility of transition finance initiatives.

Alongside transition taxonomies, technology roadmaps play a crucial role in steering industries towards decarbonisation. For example, Japan has developed technology roadmaps for key sectors such as iron and steel, cement, and chemicals, which form an integral part of its transition finance framework. These roadmaps identify viable technologies and establish clear pathways for reducing greenhouse gas emissions within each sector. By providing detailed guidance on technological advancements and investment priorities, they help companies design and

As Asia grapples with its reliance on fossil fuels and the complexities of renewable energy adoption, transition finance emerges not just as an investment strategy, but as a transformative force for sustainable development.

implement effective transition strategies. Additionally, they equip investors and financial institutions with the insights needed to assess the feasibility and credibility of transition plans, enabling the allocation of capital to projects that make meaningful contributions to a low-carbon economy.

LEVERAGING BLENDED FINANCE FOR TRANSITION

The immense financial resources needed for the green transition highlight the critical importance of mobilising private capital. However, transition finance often entails considerable risks for investors, particularly with regard to renewable energy adoption and concerns about below-market returns on such projects. Blended finance offers a strategic solution by combining public or philanthropic funds with private capital to support decarbonisation in high-emission sectors. One key advantage of blended finance is its ability to distribute returns from sustainable projects in line with the risk appetite of participating entities. For example, public and philanthropic capital can accept concessional (below-market) returns, enabling private investors to achieve more attractive risk-adjusted returns than would be possible through direct investments. By mitigating risks, blended finance encourages greater private sector participation in transition projects, unlocking the funding needed to accelerate the green transition.

According to Convergence, a specialised NGO focused on the blended finance market, 1,123 blended finance transactions have been recorded in its database, amounting to a total investment of US$213 billion.[15] Energy-related transactions, predominantly focused on renewable energy development, represent the largest segment of the blended finance market, encompassing 319 deals with a combined value of US$101 billion.[16]

Singapore has taken significant steps towards leveraging blended finance for the green transition. At the 28th Conference of the Parties or COP28 in 2023, Singapore introduced the Financing Asia's Transition Partnership (FAST-P), a blended finance initiative designed to accelerate the region's green transition. The initiative will draw concessional funds from governments, multilateral development finance institutions, and philanthropic organisations, including a US$500-million commitment from the Singapore government and US$50 million from the Australian government. These concessional funds, expected to total US$1 billion, aim to mobilise private capital, ultimately generating up to US$5 billion in total investments. The combined funds will be directed towards critical projects that include energy transition, clean technologies, sustainable infrastructure and so on.[17,18]

FEASIBILITY OF TRANSITION FINANCE: INSIGHTS FROM RESEARCH

While the concept of transition finance is logically sound and is gaining traction among policymakers worldwide, there is still no systematic empirical evidence to confirm its effectiveness. A key question remains: Does reducing the cost of capital incentivise green transitions, especially for high-emission firms? To address this, our study aims to empirically test the core premise of transition finance by analysing data from China.

In collaboration with the Central University of Finance and Economics in China, we gathered data on firm-level transition paths–or 'greenness'–for all listed companies in China. Greenness is defined as the percentage of a firm's revenue derived from green activities, offering a practical measure of green transition. This metric captures fundamental changes in business models and aligns closely with transition taxonomies. Moreover, it is more forward-looking and less susceptible to greenwashing compared to conventional measures like greenhouse gas emissions. Our analysis shows a significant correlation between lower costs of capital, measured by firms' debt costs, and higher revenue from green activities, particularly among brown firms. These findings indicate that reducing debt costs can incentivise firms to expand their green activities and transition towards greener business models.

We find consistent evidence that firms' green transitions are linked to lower equity costs when measured using the implied cost of equity, defined as the discount rate that equates future cash flows with the current stock price. To validate these findings, we expanded our analysis to a global sample of listed firms, measuring their greenness based on alignment with the EU Taxonomy. The global analysis confirms that lower capital costs are associated with wider-scale green transitions, suggesting that our findings are not unique to China but are broadly applicable to other countries.

Although the financing mechanisms examined in our study are not explicitly labelled as "transition finance", the empirical findings strongly support the theoretical foundations of transition finance and highlight its potential as a critical tool for accelerating green transitions. By demonstrating a strong correlation between lower capital costs and higher revenues from green activities, this study validates the core premise of transition finance. It emphasises the importance of providing financial support to brown firms to unlock their potential for significant emissions reductions and foster innovation in green technologies. Additionally, the findings underscore the risks of excluding brown firms from affordable financing, which could hinder global decarbonisation efforts.

UNLOCKING THE POTENTIAL OF TRANSITION FINANCE

Transition finance offers a groundbreaking pathway to address the dual challenge of reducing carbon emissions while maintaining economic growth. By strategically channelling financial resources to high-emission industries committed to change, we can unlock a powerful catalyst for decarbonisation and green innovation. As Asia grapples with its reliance on fossil fuels and the complexities of renewable energy adoption, transition finance emerges not just as an investment strategy, but as a transformative force for sustainable development. To fully realise its potential, various stakeholders, ranging from governments and financial institutions to businesses and NGOs, must collaborate to establish robust frameworks, credible targets, and clear accountability mechanisms. This collective effort can pave the way for a resilient and sustainable future, demonstrating that even the hardest-to-transform sectors can lead the charge towards a greener tomorrow. ⬛

DR HAO LIANG
is Associate Professor of Finance, Academic Director of Singapore Green Finance Centre, a recipient of Ho Bee Professorship in Sustainability Management, and Co-Lead of Sustainability Research Peak, Singapore Management University

YONGHENG SUN
is a PhD student in Finance at Singapore Management University

DR TIANHAO YAO
is Assistant Professor of Finance, Singapore Management University

by **Debjit Roy**
and **Shubham**

How Can Foreign Commercial Vehicle Manufacturers Succeed in India?

Seven steps to achieve market entry based on lessons from recent market exits.

New entrants need to tailor their trucks for India's geography, infrastructure, and conditions to improve acceptability and market share.

Align service offerings with customer expectations to gain greater vehicle acceptability.

Boost demand by building an export-driven business model in India to counter the threat from inadequate and stagnant domestic demand.

n 2023, the Indian automotive industry accounted for half of the country's manufacturing GDP and more than seven percent of its total GDP, making it one of the top contributors to the nation's economy.[1] Furthermore, the industry provides employment to over 30.7 million people.[2] India is also a manufacturing powerhouse in commercial vehicles (CV), emerging as the world's largest manufacturer of buses, and third largest manufacturer of trucks globally in the year 2023.[3] Besides, India became the third largest automobile market worldwide in 2023.[4] In the financial year ending March 31, 2023, CV sales in India reached almost a million units, out of which 359,004 were medium and heavy commercial vehicles (M&HCV).[5] Mordor Intelligence predicts the CV segment is set to grow at a compound annual growth rate (CAGR) of 5.15 percent between 2024 and 2030.[6] About 70 percent of all goods transported in India is via road transportation in comparison to EU countries where the road freight share in 2022 stands at 53 percent.[7,8] The growing market size and India's strong production capabilities make a compelling case for the entry of prominent global original equipment manufacturers (OEMs) seeking to diversify their supply chains and establish multi-country dependencies.

Following its 1991 economic reforms, India opened its automobile market to foreign players with the Auto Policy of 2002 that allowed 100-percent automatic FDI (foreign direct investment) for automotive manufacturing. Numerous foreign players entered the Indian CV market between 2002 and 2015, starting with German automaker MAN Truck and Bus in 2003. The Indian CV market grew at a CAGR of 12.7 percent between 2000 and 2010. However, the next decade witnessed a CAGR of just three percent.[9] By 2020, several foreign players had exited the market, giving India the moniker of the 'graveyard' of global automotive players (refer to Table 1).

TIMELINE OF SOME GLOBAL MARKET PLAYERS' ENTRY INTO AND EXIT FROM THE INDIAN MARKET

OEM	Year of Entry	Year of Exit
MAN Truck and Bus (Germany)	2003: Joint venture (JV) with Force Motors 2012: Full stake acquired from Force	2018
Scania (Sweden)	2007: Partnership with L&T 2011: Incorporation of Scania Commercial Vehicles India (SCVI)	2018: Exit from bus body building
Navistar (US)	2005: JV with Mahindra Group	2013
Hino Motors	2008: JV with Marubeni Corp	2021: Transfer of domestic parts and service to a local Indian dealership

TABLE 1

Source: Authors' analysis

In this article, we explore the key reasons behind the exit of foreign OEMs and the persistent challenges hindering their success. We derive insights from numerous field visits, interactions with fleet operators and top executives from OEMs, and a primary survey on truck-buying behaviour. We then present a seven-step market entry strategy for foreign entrants to achieve success in the Indian CV segment.

WHY DO FOREIGN ENTRANTS STRUGGLE?

Apart from industry-wide challenges faced by all players such as supplier unreliability, semiconductor chip shortages, as well as high raw material prices and taxes on auto components, foreign entrants face three additional challenges.

1. Duopoly in the Indian truck business

Tata Motors and Ashok Leyland were among the first OEMs in the Indian CV space, and they have consolidated their positions over the last few decades. As of 2023, they hold 47 percent and 32 percent of the M&HCV market share respectively, leaving other companies to jostle for the remaining 20 percent.[10] One prominent tool the two companies used is deep discounts. Numerous reports emerged about Tata Motors and Ashok Leyland offering discounts of up to INR 800,000 (US$11,360)[11] on 40-42T truck variants in the wake of sluggish sales in 2019.[12,13]

Deep discounting adversely affects other players who struggle to match their discount levels, so they consequently sell less.[14] From our field research, truck owners have also indicated that their preference for Tata Motors and Ashok Leyland stems from their timely, attractive discounts, and easily accessible financing options. Furthermore, new players face resistance from dealers and financiers who prefer the status quo as they have established comfortable relationships with the existing market leaders.

2. Low margins with highly variable demand

The annual demand for M&HCVs in India has remained subdued, contrary to the high growth market expectations during the late 2000s. Numerous companies have highlighted India's small and saturated market. MAN Truck and Bus, which exited the Indian market in 2018 to focus on the global premium vehicle market, was producing only 3,500 to 4,000 trucks annually at its Pithampur plant despite the factory's production capacity of 12,000 trucks per annum.[15] While the company sold 25,000 units in India between 2006 and 2018, it sold 20,242 units in Brazil in 2018 alone.[16,17] Similarly, Scania, the Swedish premium CV manufacturer, also shut down its bus body manufacturing plant in 2018 as it struggled to achieve profitability, owing to low demand.[18]

Low profit margins in India are another problem. They are estimated to remain at three percent till 2030.[19] The margins for OEMs in Asia are generally lower than in North America or Europe, owing to hypercompetitiveness, deep discounting, and price sensitivity. For instance, Daimler Truck's margin was 2.6 percent in Asia, compared to 10 percent in Europe and

North America in 2022. When US truck manufacturer Navistar (now International Motors) announced its market exit in 2012, it had flagged underwhelming sales and aspiration to pivot to a high return on invested market capital in its press release.[20] With low sales volume, thin margins, and little space for market share expansion, foreign players find it incredibly difficult to remain invested in the Indian M&HCV market.

3. Preference for an extensive service network

Each day lost from vehicle breakdowns and the associated maintenance required leads to revenue loss for a fleet operator. This compels fleet owners to evaluate the coverage of an OEM's service network and response time to vehicle breakdown calls while making a purchase decision. Our fleet owner survey results align with these decision-making attributes (refer to Figure 1). Timely maintenance with a sprawling service network presence and spare part availability can enhance the fuel efficiency of vehicles, increase vehicle reliability, and reduce the total cost of ownership. However, setting up service centres along major highways in India requires huge

investments ranging from INR 7 million (US$82,233)[21] for an authorised service centre to INR 25 million (US$293,688) to set up a car dealership.

Companies recognise the significant role of service networks in sales conversion. Tata Motors, with customer touchpoints in 90 percent of Indian districts, and Ashok Leyland, backed by its 1,700-odd exclusive service outlets, have established a robust service network leading to an immense competitive advantage over other players in the industry. During its decade-long presence in India, BharatBenz has also aggressively expanded its service network, boasting 330 customer touchpoints by December 2023. In stark contrast, MAN Truck and Bus could only establish 64 customer touchpoints between 2006 and 2017.

SEVEN STEPS TO STRATEGISE FOREIGN PLAYERS' ENTRY INTO INDIA'S M&HCV MARKET

While many foreign players have faced challenges in serving the Indian market, companies like Daimler Truck and Scania posted their first ever profit from the Indian market in FY2023. How can foreign OEMs achieve

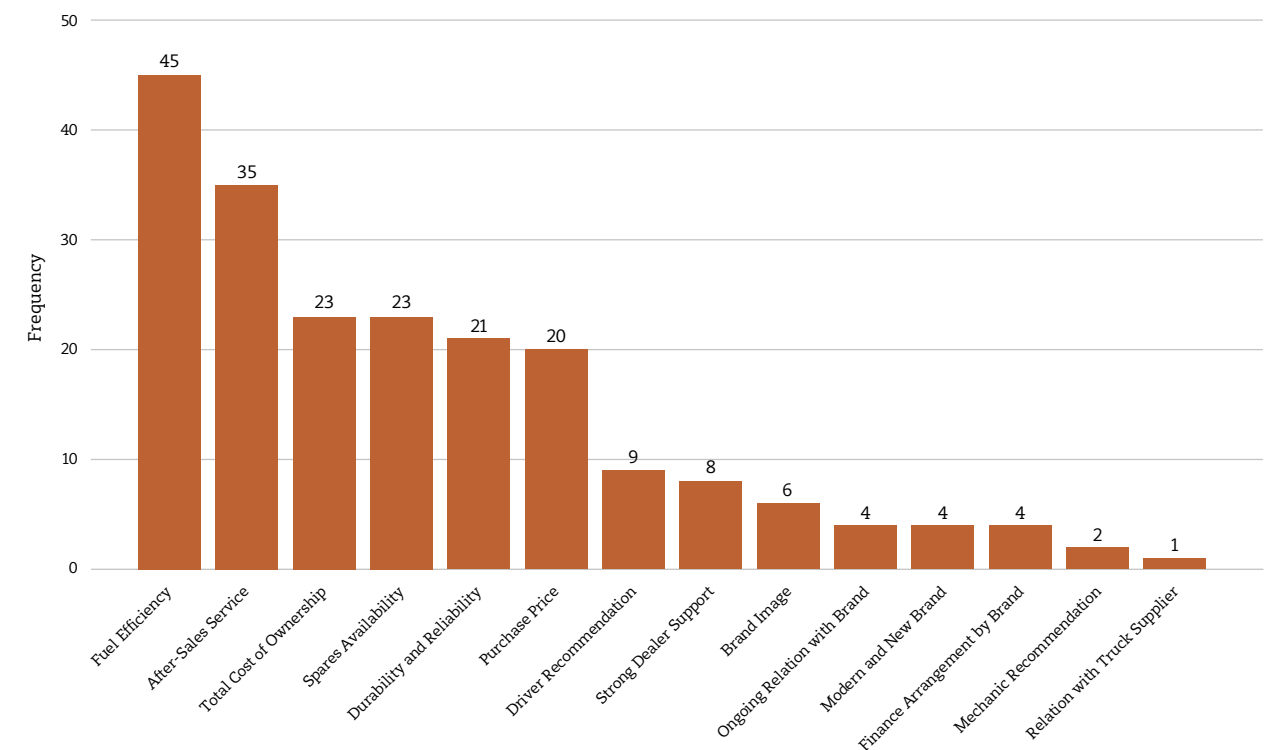**FACTORS AFFECTING FLEET OPERATORS' BUYING BEHAVIOUR**

FIGURE 1

profitability in India? This section presents a seven-step strategy for a foreign player planning to make a successful entry into India.

1. Tailoring the product to local conditions: redesign and redevelopment of variants

Successful market entry for any firm requires a carefully developed product portfolio tailored to the host country's market conditions. The Indian trucking environment differs from the Western trucking environment according to multiple factors like customer preferences, vehicle operating conditions, road network and quality, climatic conditions, topography, and domestic regulations. In-depth discussions with top OEM executives suggest that market entry should begin with a study of the road and vehicle operating conditions of the target/ new market.

A prominent trans-continental OEM with a presence across 60 countries classifies roads as 'smooth' or 'rough' based on the percentage of unpaved and dirt roads on a truck's projected journey. Countries classified as having 'rough' roads are characterised by unpaved and dirt roads making up more than 30 percent of their road networks; India was classified as such. Our evidence suggests the same. Data from the government's Mission Antyodaya[22] reveals more than 26 percent of Indian villages were not connected via paved roads in 2019. According to World Economic Forum's Global Competitiveness Index 2019, the road connectivity score for India was 75.83, significantly lower than that of other truck manufacturing

countries such as Germany (95.05), Sweden (95.9), and the US (100).[23]

Therefore, OEMs would have to make changes in their models to suit India's rough roads. For instance, OEMs use three leaf springs in their suspension system for trucks with smooth road applications, while an additional spring is required for application on rough roads. Similarly, OEMs use 8mm-thick axles for rough roads against 7mm for smooth roads.

Customisation is another key difference. For instance, Japanese CV provider UD Trucks customises its models for different countries based on road conditions, emission standards, climatic conditions, and purchasing power, among other factors. Hence, while its Croner PK variant in New Zealand comes with only automatic transmission, the Croner PKE variant in Malaysia comes with both manual and automatic transmission options. Additionally, the variant in New Zealand is fitted with a Euro 5 GH8E engine that provides a high torque for heavy (building and construction), medium (waste and cargo), and light (local distribution) duty applications. On the other hand, the Croner PKE in Malaysia is fitted with another Euro engine variant that generates a lower range of torque meant only for medium and light duty applications.

Such customisation is possible due to modular manufacturing and standardised components that bring interoperability. For modularity, a steady supply of high quality components is required. However, in the absence of a localised supply chain, importing such components drives up costs. But a high level

of price sensitivity puts intense pressure on OEMs to minimise costs and adopt a model-based approach. Consequently, foreign players may avoid designing new models and enter the Indian market with fewer models and minor tweaks.

Indian regulations also necessitate changes to vehicle configuration, as they permit higher load capacities compared to Western markets. For instance, the permissible truck axle load for a tandem axle truck is 21 tonnes in India while that for the US is 15.5 tonnes. Overloading, estimated at 33 percent by Indian policy think tank NITI Aayog, coupled with low and ineffective enforcement of load norms, requires truck manufacturers to modify their cross-sectional design, as well as increase the axle diameter and wall thickness.[24]

Perceived product superiority and a small Indian market offer little incentive for foreign OEMs to redesign their products and reorient their supply chains. However, India-specific truck variants are critical to achieving success in the Indian market. German truck maker Daimler Truck has succeeded in capturing six to nine percent in market share across different categories within 10 years due to its India-specific product designs. It created a corpus of INR 12 billion (US$140 million) for India-specific design and development, and constructed a 47-acre test-track in Chennai to develop truck variants suited for Indian road conditions. Understanding the preference of Indian truck owners for fuel-efficient and low-maintenance trucks, Daimler India Commercial Vehicles

> The automotive industry can learn from the quick commerce industry, which uses advanced data analytics for demand forecasting and strategic management of its inventories in its dark stores or distribution centres.

(DICV), a wholly-owned subsidiary of Daimler Truck, has rolled out trucks under the BharatBenz brand name with a 20-percent longer service interval which reduces maintenance cost by six percent.[25]

2. Delivering clear product positioning for strategic brand-building

A new entrant needs to identify gaps in the host country's market to strongly position its product in the segment that aligns with its inherent strengths. German truck maker Volvo, globally renowned for heavy duty, special application premium trucks, has created a niche market for its premium segment truck models FM and FMX, commanding a market share of 85 percent in the premium truck segment.[26] Its heavy duty mining trucks deliver superior performance on unpaved and dirt roads, and this supremacy comes from its highly sophisticated technology that domestic OEMs do not possess. Similarly, Daimler Truck is expanding in the tipper segment by building a 20-percent deeper steel chassis, heavyweight gearbox, and robust vehicle for Indian markets. As mentioned, it also launched BharatBenz to position itself as an Indian-centric brand and build customer trust. Foreign players can therefore enter the Indian market by identifying underserved niche segments and optimising variants, and improving their product's core strength.

3. Stabilising demand through export-driven business model

The cost of manufacturing trucks in India consists of material cost, process/factor cost, competition expenses (price discounting), salaries, spending on marketing, and the cost of capital tied to inventory and logistics. Material, inventory, and salary costs are similar for all firms. However, market challengers have to follow market leaders in providing deep discounts. An executive of a prominent company referred to this practice as 'competition cost'. For new OEMs, the cost of discounting can reach up to 25 percent. It has been observed that process cost is higher by three to five percent for emerging and new players. As plants age, overall costs can decline due to depreciation, scale, and debt repayments. In the case of Mahindra & Mahindra, a Mumbai-based Indian automotive company, the process costs in its Kandivali plant (established in 1964) are 30 percent lower than those for its Chakan plant (established in 2010). Therefore, optimisation measures to reduce process costs are critical for any new player to achieve parity with market leaders in the medium term. Marketing is another cost head where new players have to spend more than the established old players by one to two percent.

Achieving scale is important for a new player to reduce the per-unit cost of manufacturing a truck. However, the Indian M&HCV market is considerably smaller as compared to that of the US and China.[27] Hence, India can be used as a manufacturing base by global automakers to build scale based on an export-driven strategy. This can help foreign players in scaling up their production, utilising their capacities, diversifying their markets, stabilising their revenue, and improving their profitability while building upon the cost-related benefits of manufacturing in India. For instance, BharatBenz registered sales of 29,470 vehicles in 2022, which included exports of 11,000 units, amounting to almost 60 percent of the total vehicles sold in the Indian market and around 40 percent of the total vehicles produced.[28]

4. Devising an innovative demand management strategy

India's truck demand is influenced by macroeconomic factors like the GDP growth rate, inflation, and government projects, as well as customer buying behaviour which is affected by festive and quarter/year-end discounts, which leads to large seasonal demand variations and challenges in demand forecasting. A truck manufacturer must therefore maintain a flexible production and sales target that accounts for such variations to minimise inventory costs.

Artificial intelligence (AI) can potentially lower demand forecasting errors by 30 to 50 percent, thus reducing inventories by up to 50 percent in the automotive industry.[29] The industry can learn from the quick commerce industry,[30] which uses advanced data analytics for demand forecasting and strategic management of its inventories in its dark stores or distribution centres. Truck manufacturers can follow a similar strategy for their inventory management of components, finished trucks, and aftermarket spares. For instance, Mahindra & Mahindra categorises its variants into runners (highly frequent sales), repeaters (frequent sales), and strangers (low sales) for its sales management based on market demand. However, this requires real-time data sharing across the company's internal functional divisions and its strategic suppliers, which remains hindered due to data confidentiality concerns. Since each supplier caters to multiple OEMs, there is a high risk of data breaches for critical data like daily enquiries, as well as manufacturing, inventory, and sales data. A potential solution lies in creating a sourcing hub wherein the OEM plays a greater role in creating critical technological and financial capabilities of its Tier-1 and Tier-2 suppliers to improve upstream demand management by creating supplier dependency on OEMs.[31]

5. Sourcing localisation for resilient supply chains

An internal combustion engine truck requires more than 20,000 components, and the procurement of these components involves navigating through a complex multi-tiered supplier network spanning across different countries. Global supply chain disruption events such as pandemics and geopolitical tensions escalate the manufacturer's sourcing costs (which constitute 65 percent of the total cost), leading to a strong focus on building a reliable localised supplier base. In the Indian context, localisation can help OEMs attain a 10- to 25-percent operational cost benefit vis-à-vis that for Western markets, and also leverage the government's localisation-based programmes like Production-Linked Incentive Scheme and public procurement guidelines. Localisation efforts further improve cost management because India has a high import duty, such as a 25-percent duty on completely knocked down pre-assembled units of auto parts for commercial vehicles.[32]

Localisation significantly enhances foreign OEMs' ability to incorporate modularity into their product development approach. OEMs such as DICV, SANY India, and Ashok Leyland India have percentages of 95, 40, and 98 respectively.[33, 34, 35]

6. Leveraging telematics and dealer incentive mechanisms to maximise service coverage

While most OEMs provide road assistance guarantees and compensation programmes for vehicle downtime, our interactions with fleet operators revealed that their primary concern is vehicle uptime. A fleet operator explained, "Existing compensatory programmes offer little solace to us since we work on strict deadlines. Often, we have to keep a truck on stand-by to ensure delivery schedules are not hit by vehicle breakdowns. This means additional cost and lost revenue from the idle truck kept on stand-by."

OEMs are now leveraging AI and the Internet of Things to minimise the maintenance needs of a vehicle.

> While most OEMs provide road assistance guarantees and compensation programmes for vehicle downtime, our interactions with fleet operators revealed that their primary concern is vehicle uptime.

The development of telematics has led to the generation of vast amounts of vehicle data that can be used to predict vehicle breakdowns and failures. The service brochure of a prominent OEM claims it has achieved a 75-percent reduction in powertrain breakdowns, a 10- to 15-percent reduction in warranty costs, and a seven- to 15-percent improvement in fuel efficiency due to its telematics systems' predictive analytics. Such subscription-based systems are deployed by new OEMs to compensate for their limited service network.

However, offering digital technology tools should not detract new OEMs from expanding the geographical reach of their service network by adding more dealerships, service centres, and roadside assistance units. New players must devise innovative incentive schemes to attract potential dealers. A common practice in the industry involves establishing an operational cost and profit-sharing agreement with dealers for a predetermined period to generate dealership interest. This puts an additional cost burden on market challengers, which every new player must also plan for. Importantly, service networks also generate revenue for OEMs through repeat purchases and referrals, sales of aftermarket spares, warranties, and service contracts. The key lies in ensuring that the revenue generated from the service network exceeds the cost of incentives provided to dealers in the long run. Physical service networks can also be expanded by creating strategic tie-ups with existing players in the

market. However, the efficacy of the partner's service network reach is a critical determinant in attracting customer interest.

7. Maintaining perseverance for market pursuit endeavours

In India, CV buyer behaviour is mainly driven by price sensitivity and word of mouth. Furthermore, the domination of Tata Motors and Ashok Leyland over the last few decades has generated intense brand loyalty and customer hesitancy towards new players. New entrants must be prepared to tolerate a longer time horizon before generating a positive return on capital. Many firms like MAN Truck and Bus, Scania, and Navistar exited India due to continued losses in their early stages of operations. However, a long-term business value proposition and commitment to the Indian M&HCV market are key to attaining success. Daimler Truck and Scania finally attained profit in 2023 after almost a decade of operating in India due to their continued commitment to the Indian market.

CONCLUSION

A foreign player can taste success in the rapidly growing Indian truck market through a carefully driven sustenance strategy. This requires developing India-centric truck variants, identifying niche areas for market expansion, creating an export-driven business model, and devising innovative demand management strategies. Furthermore, localisation can help OEMs incorporate modularity into their manufacturing activities while minimising costs. Emerging

technologies can also be leveraged to improve service coverage. However, OEMs must continue to aggressively expand their network of physical service touchpoints. Finally, long-term commitment to the Indian market is essential for building customer trust and generating market demand. AMI

DR DEBJIT ROY
is Institute Chair Professor and Professor of Operations Management, Operations and Decision Sciences Area at Indian Institute of Management Ahmedabad

SHUBHAM
is Research Associate at Indian Institute of Management Ahmedabad

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THE SECRET INGREDIENTS OF STRATEGY IMPLEMENTATION

Knowing what to do and actually doing it are two very different things.

There are seven key principles that can guide an organisation to succeed in strategy implementation.

Implementation is about taking the right actions, so leaders need to support and guide employees to work differently.

Leaders need to develop the same discipline, passion, and tenacity for implementing strategy that they had when crafting it.

Organisations understand the need for sound strategies, but few successfully implement those strategies and deliver long-term sustained value. Hence there exists an imbalance between strategy and implementation. Leaders spend more time, effort, and energy on crafting the strategy than guiding its implementation. The imbalance is partly attributed to the availability of a plethora of tools and frameworks (and consultants) to support the devising of the strategy, but much fewer resources (and consultants) to guide its implementation.

To correct this issue and deliver world-class implementation, organisations need to develop a disciplined implementation mindset. This involves both leaders and their teams taking consistent, deliberate right actions to move the strategy forward. It is about building the "discipline of doing it right". This article delves into how leaders need to adopt a different way of thinking and approach to deliver world-class implementation in today's rapidly evolving digital world, where organisations may be excellent at crafting innovative strategies but not good at implementing them.

DO THE RIGHT THING AND DO IT RIGHT

Strategy is about making the right choices. Crafting a new strategy involves making multiple choices about things such as the markets to compete in, growth strategies to pursue, customer segments to target, what sustainability and social responsibility initiatives to incorporate, which technology to invest in, and the ecosystems to participate in.

Implementation is about taking the right actions. Implementation moves the organisation from planning to doing, from thinking to achieving, and from making choices to taking the right actions. It requires employees

to work differently since a new strategy means doing things differently. Employees, however, are already busy every day. The challenge for leaders is to ensure they are busy doing the right things—that is, taking the right actions. INSEAD Professor Manfred F.R. Kets de Vries commented, "There is often a gap between our good intentions and our actual behaviour. Alarmingly, we're sometimes not even aware of the difference between what we think we're doing and what we're really doing." In his opinion, while we may believe that our actions are a result of conscious and rational thought, "only a small part of our brain is actively engaged in conscious reasoning."[1]

Hence, despite our good intentions, somewhere between thought and action, we lose focus. Consider these examples. After having potentially life-threatening heart surgery, people know they need to change their daily actions, but most do not. Dr Edward D. Miller, dean of the medical school and CEO of the hospital at Johns Hopkins University, said, "If you look at people after undergoing coronary-artery bypass grafting two years later, 90 percent of them have not changed their lifestyle."[2] In yet another example, the *International Journal of Environmental Research and Public Health* indicated that as many as one in five doctors smoke. Despite knowing the risks of smoking—and the supposed need to set a good example for their patients—they still smoke.[3] Similarly, even though people know it is good to exercise and eat

right, it is estimated that half of the American population will be obese by 2030.[4]

Having a disciplined implementation mindset means that the organisation applies an equal balance of tenacity, passion, and commitment to both the strategy and its implementation.

Deloitte's 2023 analysis of organisations' success at digital transformation found that "organisations often struggle to determine which actions drive the most impact and which investments yield the most enterprise value... the link between strategy and action is the determining factor in an organisation's ability to derive the most value from its digital transformation."[5]

How can a leader bridge this gap between strategy creation and its implementation? Amazon founder Jeff Bezos once said, "As a senior executive, what do you really get paid to do? You get paid to make a small number of high-quality decisions." This sentiment reflects the kind of disciplined focus required from leaders—they need to identify the small, impactful actions that will drive their

strategy implementation forward while resisting the temptation to become bogged down in day-to-day operational tasks. But this is not easily accomplished and demands a disciplined implementation mindset focused on consistent, deliberate actions.

FRAMEWORKS FOR SUCCESSFUL IMPLEMENTATION

To correct the imbalance articulated above and guide the leaders and employees through the implementation journey, I have developed two frameworks. These frameworks have been adopted by both governments and businesses.

The Implementation Compass™ highlights the eight areas of excellence in implementation and is a proven framework that has been used by the public sector and businesses since 2004.

Meanwhile, the Implementation Canvas© assists leaders in identifying the right actions that the organisation requires employees need to take, especially at the launch of a new strategy so as to build momentum and traction. The Canvas builds on expanding the Compass.

Many organisations understand the need for sound strategies, but few successfully implement those strategies and deliver long-term sustained value.

THE IMPLEMENTATION COMPASS™

The Implementation Compass™ is a proprietary framework that highlights the eight critical areas of successful implementation. It serves as a guide for leaders, ensuring that they are addressing all the key components needed for effective implementation. Each direction of the compass represents an area that leaders must focus on—from engaging people effectively to ensuring that measurement systems are in place to track implementation progress.
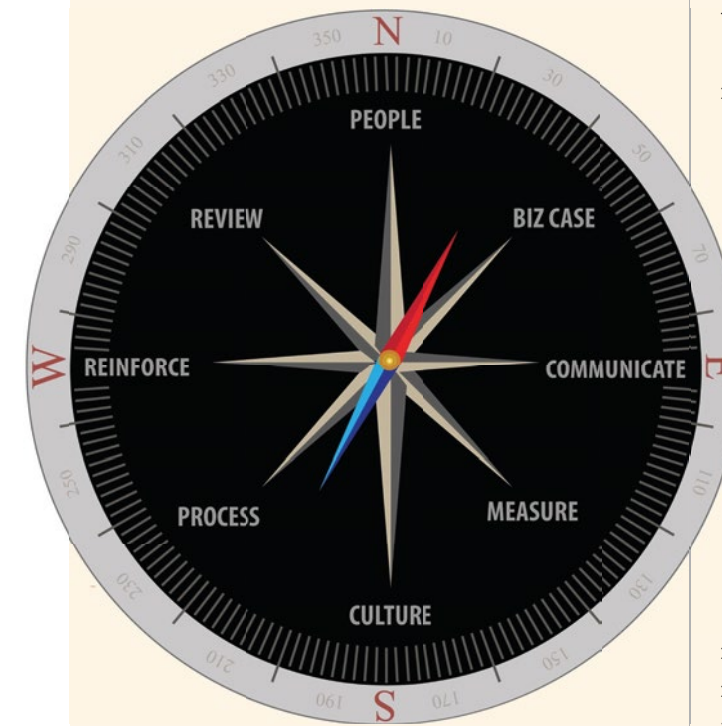
The Compass is made up of the following eight areas.

North: People – The calibre of the people dictates the quality of the implementation. Employees need to be trained in new skills to deliver the strategy.

Northeast: Biz Case – This explains why the organisation must change strategies, creating a sense of urgency to get started.

East: Communicate – Communication should be nurtured throughout the whole implementation, and not just for the first few months. This involves, for example, sharing customer feedback and informing employees of what is going on, what is working or not working, what lessons are being learnt, and any changes to the objectives.

Southeast: Measure – A change in strategy requires an adjustment in measurement. Leaders need to create new measures that track the implementation advancement and identify where to take corrective action.

South: Culture – This drives the way the strategy is being implemented. Two companies can have the same strategy, but how they implement it is driven by their culture. Leaders must ensure the culture supports the implementation and drives employees to take the right actions.

Southwest: Process – Changing the strategy means modifying how to operate things. Processes need to be continually improved and reinvented by employees who are empowered to change how they work.

West: Reinforce – When employees step up and take the right actions, they have to be encouraged to keep taking the right actions with the appropriate recognition.

Northwest: Review – Regular monitoring is critical, as it reinforces the importance of the implementation and ensures small problems can be resolved before they snowball into large problems. It also emphasises the importance of the implementation and keeps everyone on track.

Not all the directions on the Implementation Compass are of equal importance to an organisation at the same time, but all are ultimately important. At different stages of an organisation's implementation journey, the relevance of each area can increase or decrease. The challenge for leaders is to identify and prioritise what needs to be done, and guide employees through the implementation journey.
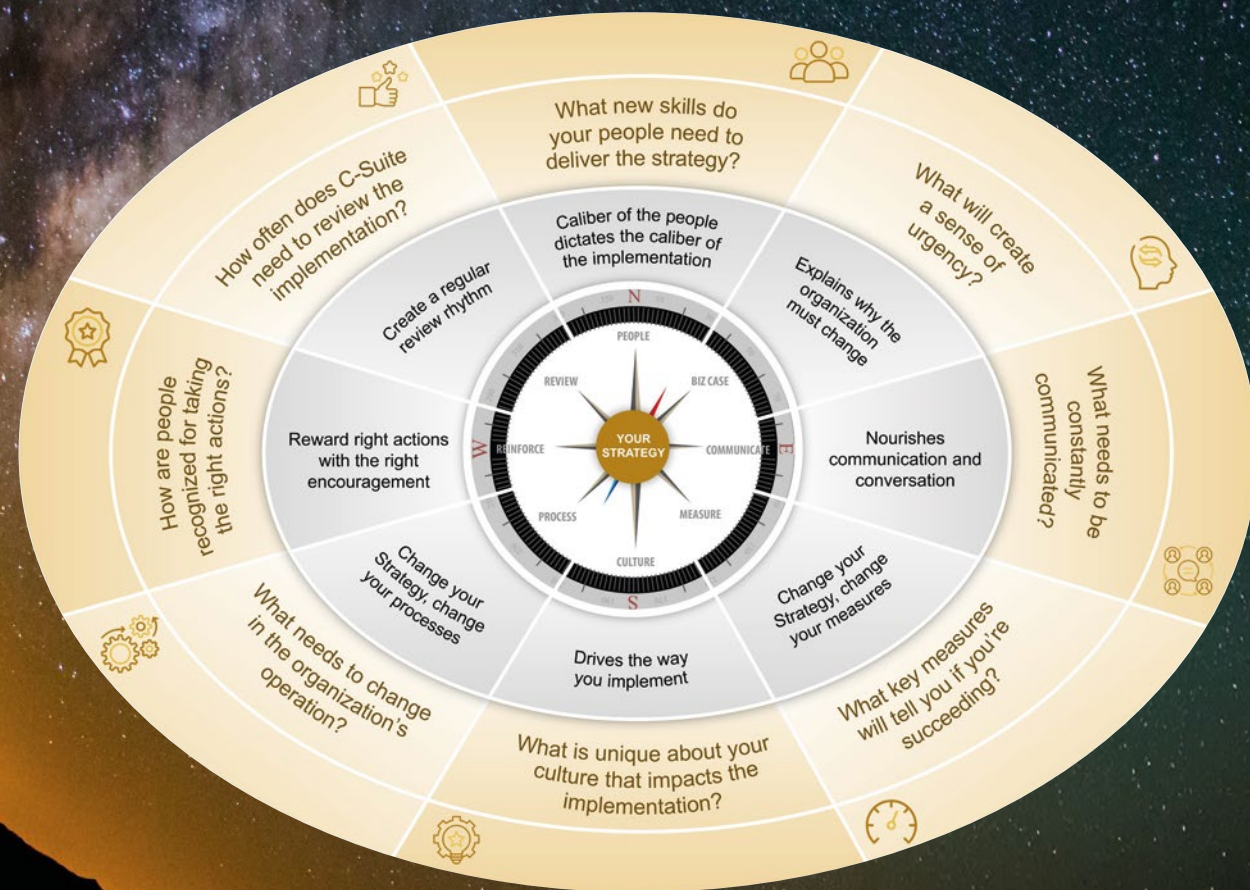
The Implementation Canvas©
The Implementation Canvas© builds on the Compass, and further facilitates discussions about identifying the right actions to take and prioritising those actions. This Canvas enables organisations to map out the steps involved in translating strategy into action, providing a clear, visual representation of what needs to be done and by whom. It serves as a practical blueprint, ensuring that everyone in the organisation understands their role in the implementation journey.

- At the centre of the Canvas discussion is the organisation's strategy
- The second circle from the centre is the Implementation Compass, which draws out the eight areas discussed earlier
- The third circle features brief descriptions of each area of the Compass
- The fourth circle highlights the critical discussion questions for each of the eight areas
- The outermost circle is where leaders record the right actions for their organisation

To start using the Canvas, leaders must first brainstorm the critical discussion questions for each of the eight areas, and then prioritise the 'correct' actions that have been identified against their impact and urgency.

ADOPTING IMPLEMENTATION PRINCIPLES FOR SUCCESS

In using the Compass and Canvas to implement strategy, there are seven practical and easy-to-adopt implementation principles to adhere to, which I have elaborated on below.

1. Right actions

The right discipline drives the right actions to deliver the right performance. By adopting the Compass and then the Canvas, leaders have the frameworks to identify the correct actions they need employees to take. Research by Bridges Business Consultancy Int. since 2002 revealed that only five percent of employees in an organisation knew their organisation's strategy.[6] Articulating the right actions and then breaking them up into small steps is critical because it translates the big-picture strategy into meaningful insights and viable actions for employees. It explains to employees how they can participate in the strategy and encourages greater participation across the organisation. Moreover, it acknowledges that behaviours are contagious while ensuring the right actions are being adopted. It exerts more control over the actions employees are taking, rather than waiting to see the eventual outcomes. And also by doing so, it ensures the organisation is spending its energy, time, and focus on the correct areas, rather than on actions that do not create the right outcomes.

2. Measure everything

When you change your strategy, you must change your measures. Otherwise, you are tracking the old strategy. However, identifying a new strategy is already challenging, and putting in new measures to track it makes implementation even tougher. From the eight areas on the Compass, *Measure* encounters the most resistance from employees. This is because employees are traditionally used to being measured once or twice a year. But many organisations are now able to track employee performance daily, and employees begin to feel threatened and greatly resist the new measures. This is why, for both the Compass and Canvas, it is critical for leaders to identify the right measures and ensure they are driving the appropriate actions. It is alarming to discover that, from Bridges' research conducted since 2020, 72 percent of leaders do not

believe their organisation has an effective measurement system to track their strategy implementation.[7]

When the right measures are in place to track the implementation, they enable the organisation to identify the right actions to take, see where to make corrections along the implementation journey, and enable leadership and employee accountability. Over the last 25 years, the ability to identify and track strategy has improved with the introduction of management tools such as the Balanced Scorecard, and Objectives and Key Results (OKRs). These provide a framework to guide leadership teams in identifying the right measures for their strategy. Once identified, they then have to be integrated into the business.

Sometimes the resistance to implementing a strategy comes from high up in the organisation. For example, a global hearing aid organisation had a Chief Executive Officer (CEO) in New Zealand who came up with an innovative idea for growing revenue and reaching new customer segments. The idea was to develop a subscription payment model since hearing aids are expensive and unaffordable for many people. The new scheme never got off the ground because the finance leaders at the head office were focused on immediate revenue and could only see the loss of upfront revenue. They could not see the long-term customer value or the potential of opening up sales to a new segment of customers who could not afford to pay the full amount in one instalment.

3. Less is more

When a new strategy is being rolled out, every activity seems important and urgent, especially at the start. Implementation discipline is required for leaders to prioritise and recognise what can be achieved when they focus on 'less' rather than 'more' actions. When the focus is on 'more', and the organisation puts out too many objectives and actions, employees become confused about what is important. They compete for limited resources, attend an endless number of meetings, cannot get ahead of their work, and fight a slow and often bureaucratic culture as they try to please everyone (but often end up pleasing no one). On the other hand, the 'less is more' technique enables the organisation to be resource-rich as it is able to provide the required resources for the limited

initiatives, rather than spreading resources too thin over too many initiatives. It also creates an implementation-focused culture, where employees have the time, space, and support to do their daily work, as well as take the right implementation actions.

This technique also reduces the number of strategic objectives an organisation focuses on every 12 months. From my consulting experience, focusing on three strategic objectives within 12 months optimises the implementation. When focusing on four to 10 objectives, typically only one or two are completed, and when focusing on over 11, none is completed.

Successful implementation requires leaders to prioritise the necessary actions. For example, when Roz Brewer became Chief Operating Officer (COO) of Starbucks in 2017, she restructured the business by eliminating two-thirds of the projects underway in the corporate office.

Instead, Brewer focused on three priorities: beverage innovation, store experience, and the digital business. Before long, she gained a reputation for making tough decisions and sticking to them: "We just lined everybody up and said if it doesn't fit in these three lanes, we're stopping the work."[8]

4. 90-day chunks

Successful implementation requires early and quick wins to build traction and momentum. When an action is set with a deliverable date that is say, 12 months into the future, it sends a message that action is not necessarily urgent and that can delay its initiation.

The 90-day chunks principle encourages employees to take the right actions by simplifying what is expected of them, thus making it easier for them to engage and participate in the implementation. It also ensures the right actions are being taken. By breaking down the right actions into 90-day chunks— and then recognising people

and teams when the actions are complete—leaders send a powerful message while also reinforcing the right behaviours. Furthermore, it also discourages procrastination, breaks down long-term goals into achievable chunks, and drives leaders to review the progress of the implementation more frequently.

5. Nurture communications

Leaders are often guilty of front-loading their communication when launching a new strategy, and then the communication rapidly dissipates. To overcome poor communication—one of the top reasons why implementation fails—leaders require a mindset shift from being focused on launching the strategy to nurturing communications throughout its journey.

When launching a strategy, leaders are like politicians on an election campaign trail who need visibility and therefore have to meet their voters, shake their hands, and listen to what the latter have to say. Similarly, to support the new strategy, leaders need to find space in their schedules to be visible across the organisation. Their visible presence reinforces the importance of the messaging. And along with their "stump speech", their presence boosts employees' understanding and creates opportunities for them to discuss the new direction. The leaders must do this with sincerity and authenticity. When they do so, employees pick up on that and react accordingly. For example, when Alan Mulally joined Ford in 2006 as the new CEO, he noticed that

many of his executives were not driving Ford cars! If the leaders do not use their own product, how can they lead by example to execute a strategy? Similarly, when Angela Ahrendts became CEO of Burberry in 2006, she observed at her first strategy meeting on a cold rainy day with her top 60 leaders that not one was wearing a Burberry trench coat. Her leaders clearly were not being authentic about endorsing their own product, even on a rainy day.

6. Culture of accountability

This is one of the least practised principles of leadership and yet one of the easiest to adopt as it requires only implementation discipline and no financial resources. When leaders follow up with employees to hold them accountable, they send a signal about the importance of the implementation and ensure that employees are held accountable for their actions. It also serves to reinforce the priorities across the organisation. Additionally, they are also able to discern if employees require additional resources to succeed, guidance to stay on the right path, coaching and training to enhance their capabilities, and encouragement to stay motivated throughout the whole implementation journey. But although the benefits of following up with employees are clear, many leaders fail to do so.

When conducted regularly, follow-up requires as little as a 10-minute commitment each time. After asking an employee or a team to take the right action, the leader needs to state when

the follow-up will occur. He could say, for example, "In seven days' time, I will follow up at 10:20 am for 10 minutes to check in on your progress and to see if you need any assistance or support." To do this, they can set up a nudge using a phone reminder or calendar invite. Stanford University professors Jeffrey Pfeffer and Robert I. Sutton summed it up succinctly: "Closing the loop—following up to make sure something actually happens after it has been decided on—isn't a very complicated idea. But it is a potent means for preventing talk from being the only thing that occurs."[9]

7. Review rhythm

The organisation needs to create a structure to review the implementation advancement regularly and ensure it is heading in the right direction. This prevents small problems from snowballing and enables the organisation to take corrective action. Setting up a review rhythm means establishing the discipline to review if staff are making headway on the implementation on a regular and structured frequency. From my experience, the result of lacking such an implementation discipline is that many leaders do not even know how their strategy implementation is coming along. Creating the review rhythm thus sets the structure for leaders and supervisors to follow up frequently with employees.

DELIVERING WORLD-CLASS IMPLEMENTATION

For senior leaders, developing an implementation-disciplined mindset

is critical for success. The difference between organisations that succeed in realising their strategic initiatives and those that fail lies in how well they implement their plans. Successful implementation requires more than just a good strategy—it requires leaders who are disciplined, who can navigate the complexities of implementation, and who can motivate their teams to take the right actions.

By using tools like the Implementation Compass™ and Implementation Canvas©, and adopting the seven implementation principles, leaders can significantly increase their chances of success. Implementation is not easy, but with the right mindset and approach, it can become a powerful differentiator that drives lasting value for the organisation. **AMI**

ROBIN SPECULAND
is Chief Executive of
Bridges Business Consultancy Int.,
adjunct faculty of
Singapore Management University
and author of *Implementation:
Doing It Right in a Digital World*,
which this article is based on

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> When you change your strategy, you must change your measures. Otherwise, you are tracking the old strategy.

by
Panchali Guha
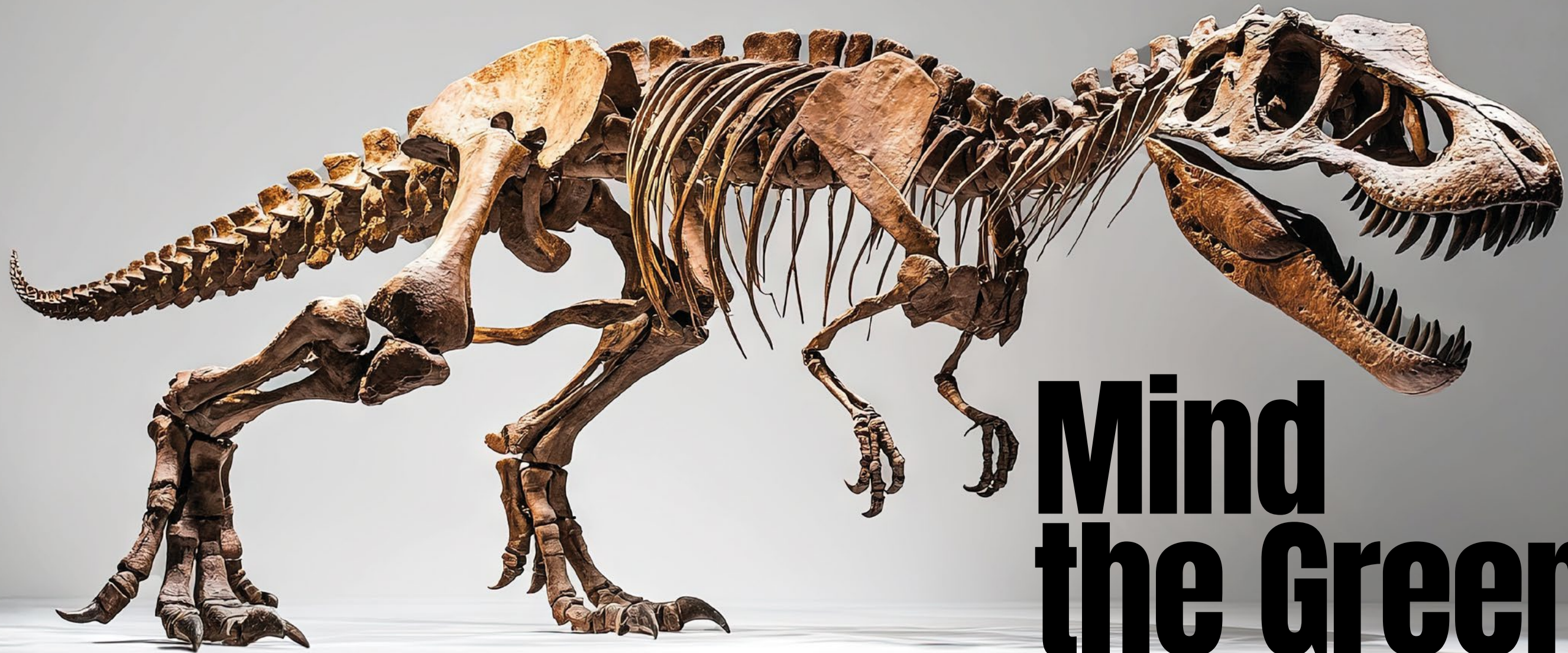
Mind the Green Skills Gap

The need to build tomorrow's
sustainable green economy today.

Climate change and the shift towards a net zero economy pose significant risks to jobs globally unless workers are equipped with green skills and competencies.

There is already a green skills gap in the labour market that will only widen over time if it is not addressed.

Comprehensive and coordinated policies must be developed to define and measure green jobs and skills, enhance educational offerings, and provide support for workers and employers during the transition.
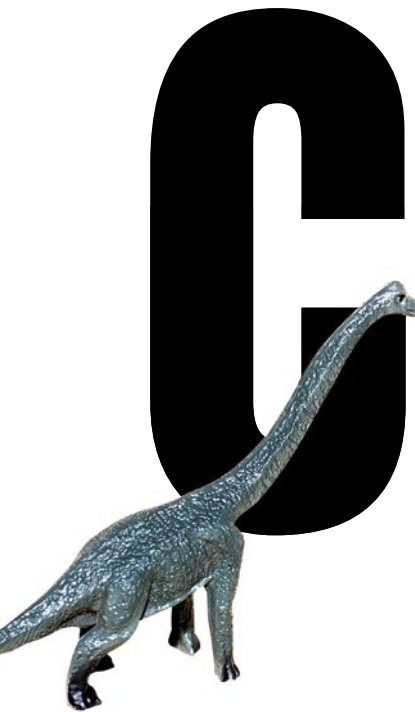
C limate change and the transition to a net zero economy to limit its environmental impact are going to profoundly affect the world of work. Globally, a quarter of all jobs are highly vulnerable to shifts induced by both trends, with jobs in Asia Pacific at particular risk.[1] This suggests a significant risk of job losses in the short and medium term unless workers can be swiftly reskilled and redeployed in new industries and occupations. In the longer term, the green economy has the potential to generate significant economic growth and job creation, with some estimates forecasting the creation of 300 million additional jobs by 2050.[2] However, the extent to which these new positions can be filled depends on the extent to which education and skills development systems are successful at equipping people with the right skills and competencies.

What are the right skills and competencies? A quick search for green job vacancies in Singapore on LinkedIn reveals that employers are looking for qualities such as "good understanding of regional sustainability dynamics", "deep commitment to driving positive environmental change and fostering sustainability practices", "strong understanding of the key technologies and economics driving industry decarbonisation", "familiarity with carbon accounting software and tools", and "experience in developing and executing strategies, programs, standards, and policies that drive sustainability goals". These are all examples of green skills, and their relative scarcity in the labour force is already proving to be a key hurdle in the transition to a green economy and the journey to attaining net zero. A recent LinkedIn report based on jobs data from 48 countries highlighted that only one in eight workers has any green skills at all.[3]

As more countries commit to and take action on their net zero carbon dioxide emissions targets, the demand for green skills will only grow. This article explains what green skills are and why it is important to invest in developing them. It also elaborates on the current demand-supply gap in green skills and discusses policy implications for the Asia Pacific region to address this gap.

GREEN SKILLS

Although there is no universal definition of green skills, they are often understood as "the knowledge, abilities, values, and attitudes needed to live, work, and act in economies and societies seeking to reduce the impact of human activity on the environment".[4] They are essential for the performance of green jobs. There is no universal definition of green jobs either, although most definitions suggest that they are jobs that contribute to preserving or restoring the environment, both in traditional industries seeking to reduce their environmental impacts, as well as in emerging green industries.[5]

Transitioning to the green economy is going to create new occupations and change the demand for many existing ones. Climate change mitigation measures such as phasing out fossil fuel use, for instance, are expected to create job losses in conventional energy sectors. On the other hand, other mitigation measures such as the adoption of renewable energy or promotion of public transport, and climate change adaptation measures such as seawall construction or the establishment of rainwater harvesting systems will create new occupations and jobs. Overall, the net effect of climate change adaptation and mitigation measures on jobs is expected to be positive, meaning that job losses will be more than offset by new job creation.[6]

Some of these sectoral and occupational shifts may not have significant implications for workers' skills. For instance, the demand for bus drivers will probably increase in future as city-dwellers embrace more public transport, but bus drivers will still need the same skillset they have now to perform their jobs. In many other existing occupations, however, workers are likely to need new skills as their job scope changes: think of civil engineers who will need to design buildings with reduced carbon footprints, or even marketing managers who will have to promote the sustainability initiatives of the companies they represent. Additionally, new occupations in the green economy will obviously require new skills: imagine biomass plant engineers, whose responsibility will be to design plants that generate electricity from biomass combustion, or greenhouse gas emission report verifiers, who will be tasked with conducting data audits of reported emissions.[7]

The green skills required for these jobs encompass both technical and non-technical aspects.[8] Technical green skills such as engineering, science, operations management, and monitoring skills are the 'hard' skills associated with the use of green technologies and implementation of processes aimed at improving environmental sustainability. They help organisations build green infrastructure and utilise green technology, make requisite changes to organisational structure and processes to support sustainable production and practices, and ensure that the organisation is compliant with regulatory standards and technical criteria.[9] Non-technical green skills are the 'soft' skills or competencies required to develop, communicate, promote, and embed sustainability thinking and solutions. They are cross-sectoral and include skills like critical thinking, problem-solving, collaboration, creativity, adaptability, and resilience. Together, technical and non-technical green skills help organisations and the economy address environmental change and degradation in multiple ways. They limit greenhouse gas emissions, ensure sustainable use of natural resources, support climate change adaptation efforts, and encourage green innovation and economic growth.

THE GREEN SKILLS GAP

Comprehensive education, training, and skills development policies are needed to tackle the challenges and utilise the opportunities associated with the transition to a green economy. Workers in jobs that are being phased out can, with the right support, be reassigned to similar occupations in different industries.[10] For instance, machine operators and metal workers currently working in environmentally-damaging industries can be supported to get re-employed in greener industries. Workers who cannot be thus redeployed have to be equipped with new skills to help them move into new occupations. Finally, both current workers and new entrants into the labour force need the right education and training to prepare them for the new jobs created in the green economy.

However, education and skilling policies have been slow to respond, and consequently green skills gaps have already emerged. The LinkedIn report referred to previously noted that postings for jobs requiring at least one green skill grew by 22.4 percent in 2022 to 2023 while the share of green talent in the labour force grew by only 12.3 percent.[11] In other words, demand grew almost twice as fast as supply. Commentators have cautioned that "[t]he unprecedented acceleration that we have seen in

clean energy transitions is creating millions of new job opportunities all over the world, but these are not being filled quickly enough"[12] and that "skills development policies in support of transition still have a short-term horizon and are implemented on a limited scale."[13]

Unless policies catch up, these green skills gaps will only grow larger over time. Management consulting firm Boston Consulting Group has estimated that the size of the skills gap will grow to seven million people by 2030, with the largest gaps expected in the solar energy, wind energy, and biofuels industries.[14]

GREEN SKILLS IN ASIA PACIFIC

The Asia Pacific region is particularly vulnerable to climate change impacts: six of the 10 countries most affected by climate change-induced extreme weather events between 2000 and 2019 were in Asia.[15] The region is also home to nearly 60 percent of the world's workforce.[16] The transition to the green economy, if properly harnessed and supported by the right policies, has the potential to create significant opportunities for growth. A recent report estimated that US$1 trillion worth of market opportunities and 30 million green jobs could result in Southeast Asia alone by 2030.[17]

So far, however, the signs are not promising. Green skills shortages are already acute for certain sectors—they include wind, wave, and tidal power, green construction, and renewable energy—and skills shortages,

especially for highly-skilled jobs, are expected to increase further under business-as-usual conditions.[18] An International Labour Organization (ILO) investigation of green jobs policy readiness in ASEAN concluded that most of the member states, except Malaysia, the Philippines, and Singapore, have been slow to develop policy frameworks for green skills development.[19] It found that Myanmar had no policy elements in place at all, while Brunei, Cambodia, Indonesia, Laos, Thailand, and Vietnam had only introduced some policy elements.

WHAT NEEDS TO BE DONE?

### Design policy frameworks for green skills development

The first step is to design policy frameworks that explicitly plan for green skills development. This might sound obvious, but an examination of the Nationally Determined Contributions (NDCs)—detailed plans by national governments outlining climate change mitigation and adaptation measures—of the signatories to the 2015 Paris Agreement shows that such comprehensive policy design is the exception, rather than the norm. In fact, 22 percent of NDCs omit any mention of human capital development measures at all, and most that do mention it only when discussing capacity-building in broad terms without referencing specific sectoral skills needs or systemic national policies and programmes for skills development.[20] A key exception in Asia is the Philippines, which

was the first ASEAN member state to pass a law to support the creation of green jobs in the form of the Philippine Green Jobs Act of 2016. Under the Act, the country's Department for Labor and Employment is responsible for developing a detailed national green jobs human resource development plan.

Key aspects of developing a comprehensive policy response include creating operational definitions of green jobs and green skills; collecting real-time data on green jobs and green skills; improving policy coordination; and involving non-governmental stakeholders such as educational institutions, employers, labour unions, and civil society in policy design and implementation.

Creating operational definitions of green jobs and green skills is not easy; as mentioned previously, there are no universal definitions of either. It is, however, a useful starting point, as adopting clear definitions helps achieve clarity on what jobs do (and do not) constitute green jobs, which in turn facilitates identification of the green skills required to perform them effectively, and how these skills differ from those already possessed by the workforce. Malaysia, for instance, has adopted a definition of green jobs and is using it to identify key sectors and job titles or occupations that are going to be affected.[21]

Once operational definitions are in place, data collection on green jobs and green skills is essential for green skills policy development and planning. In general, there is a lack
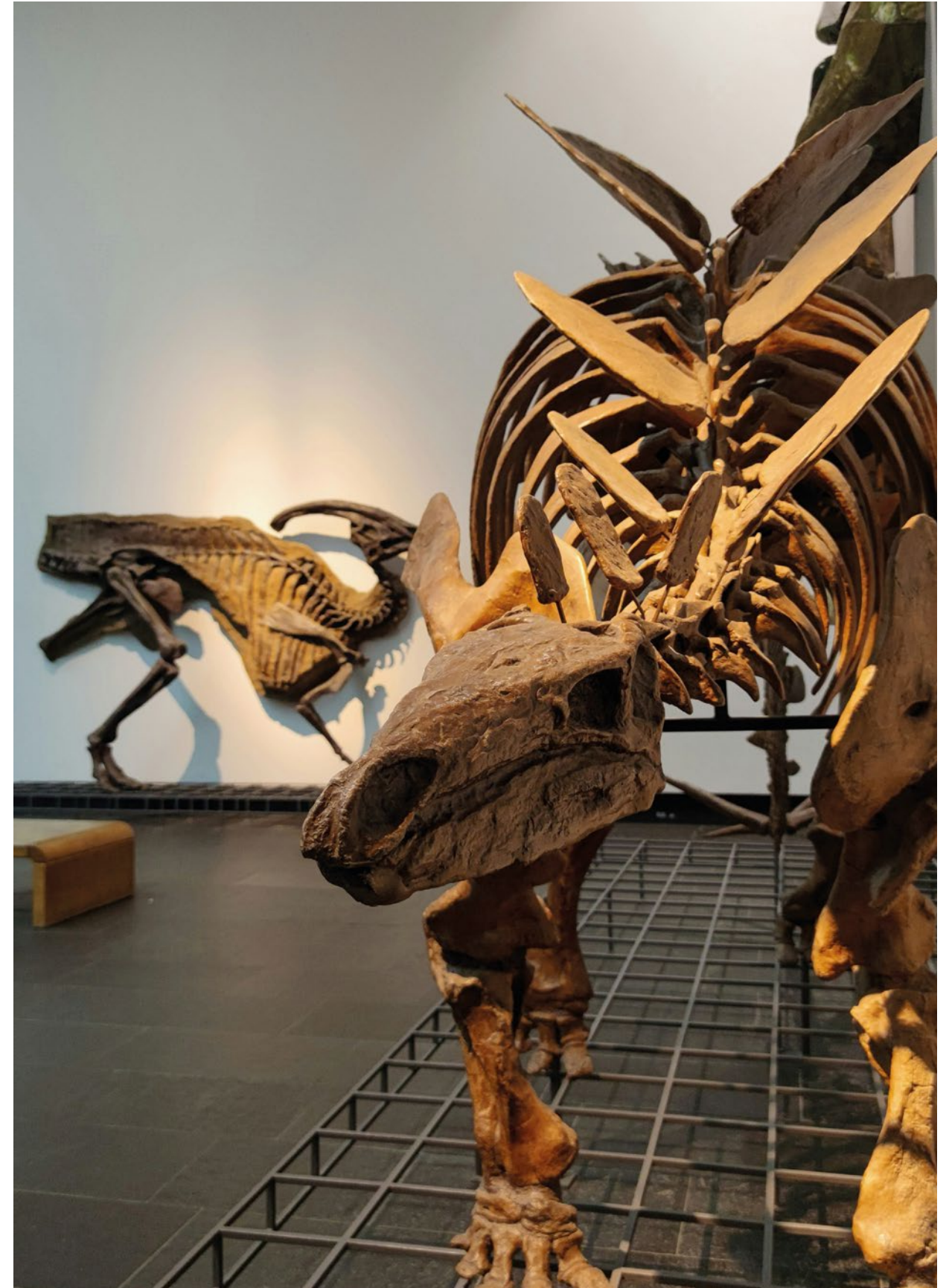
of green labour market forecasts in Asia Pacific.[22] Overcoming this is going to be easier for some countries than others. While countries such as Japan, Singapore, and South Korea have sophisticated labour market data collection systems in place, some Asia Pacific countries such as Tonga or Papua New Guinea do not undertake labour force surveys; instead, they glean labour force data from the population census or household income and expenditure surveys.[23]

Policy coordination is key to ensuring that green skills development is embedded in sector-specific strategies. Policy development must also engage all relevant stakeholders to ensure that the policies being formulated are practical and implementable, inclusive, and responsive to actual labour market needs.

Increase and extend educational offerings

Once the relevant green skills have been identified, policies must be put in place to ensure that they are being taught. Key actions include expanding the range of technical and vocational education and training (TVET) offerings, updating higher education curricula and introducing new course offerings, remembering to address both technical and non-technical competencies, developing clear pathways for lifelong learning to enable workers to reskill and upskill to adapt to changing labour market demands, and emphasising the importance of micro-credentials that provide flexible upskilling options for working professionals.

To inculcate sustainability knowledge and attitudes from an early age, schools should revise their curricula to incorporate climate change and sustainability topics.

It is important to ensure that the transition to the green economy is equitable. Education and skills policies must take equity issues into account and address the unique needs of specific groups (e.g., women, older workers, youth, and individuals with disabilities) to ensure that they are not left behind.

Governments must also ensure that there is a pipeline of educators who can deliver green skills education, since there are concerns about the lack of teachers and trainers, particularly in new green areas.[24]

Increase awareness and provide support

Policies to increase the availability of education and training options for green skills development must be accompanied by policies to extend green careers guidance services, and increase the public's awareness about green jobs and

skills development pathways. Asia Pacific has an advantage as there is high interest in green jobs in the region, particularly among younger people. In a global survey conducted by Accenture, 77 percent of people aged 15 to 39 in Asia Pacific said that they aspired to work in the green economy within the next 10 years, compared to only 57 percent in Europe and 52 percent in the US.[25] However, there is a lack of knowledge about the skilling or training pathways that can lead to green jobs. Non-governmental organisation (NGO)-led research on rural youth in Indonesia, Myanmar, Thailand, and Vietnam concluded that "[f]or many students, working in an environmentally-responsible way is important, but they do not know how to access the skills and knowledge they need."[26]

It is not only employees who need support; employers too require assistance as they transition to green jobs and seek to hire workers with green skills. Often, they need practical, on-the-ground support to implement high-level policy decisions effectively. For example,

while many Asian countries have policies in place to promote work-based training, the actual adoption of work-based training schemes is low because employers face a host of implementation challenges, ranging from a lack of knowledge about which educational or training institutions they can partner with, to uncertainty about how they should define trainees' roles and responsibilities in the workplace.[27] Providing practical support to overcome such challenges would go a long way.

Finally, we must not lose sight of the fact that the transition to the green economy will invariably create job losses and disruptions for workers. While having good skills development policies in place will make it easier for them to be redeployed eventually, it is also important for governments to put in place social safety nets such as unemployment benefits to ensure that they are protected through periods of job loss. This is an area in which many ASEAN nations, with the exception of Singapore, Thailand, and Vietnam, are lagging behind.[28]

FILLING THE GREEN SKILLS GAP

The transition to a green economy poses both challenges and opportunities for Asia Pacific nations. Although a significant proportion of the workforce is vulnerable to climate change and economic transition impacts, there is also considerable potential for green growth and job creation. However, the extent to which this potential can be realised depends,

in large part, on the ability of governments to implement policies for green skills development. Unless a comprehensive policy framework is put in place, the green skills gaps that have already emerged are likely to only get larger over time.

The policy framework must enable clear definition and measurement of green jobs and green skills; identify the key green skills required by the economy and put skills development plans in place to grow them; expand the range of education and vocational and on-the-job training pathways to develop green skills; ensure that these pathways address the needs of diverse groups including females, older workers, youth, and people with disabilities; increase public awareness of these pathways; improve coordination amongst government agencies, and between government and non-governmental actors; and ensure that social safety nets are available to protect displaced workers.

Investing in green skills development today will ensure that the workers of tomorrow are well-equipped to meet the demands of the green economy, ensuring a sustainable future for all. ◼

DR PANCHALI GUHA
is Senior Research Fellow and Adjunct Lecturer at the School of Social Sciences, Singapore Management University

A Mother's Work at

Motherswork

Sharon Wong turned a desire for fashionable maternity wear into a journey with women into motherhood.

Premium mother and baby products retailer Motherswork started off as a maternity fashion label that founder Sharon Wong created to dress herself professionally while pregnant with her first child. Twenty-five years on, the company hires over 160 employees in stores across China, Vietnam, and its home market of Singapore. Following Motherswork's acquisition by parent-tech company The Parentinc, the mother of three looks back at how the business which she dubs "a hobby" became synonymous with premium mother and baby products, and how "having it all" is all about having the right mindset.

How did the idea of Motherswork come about? How has it grown from what you described as your hobby into what it is now?

It started off when I was first pregnant in 1996, a time when fashion for maternity clothes was still in its infancy. I was in a corporate role in Hong Kong then, and I wasn't going to meet bankers dressed in a frock that looked like a curtain. I contacted a fashion designer, and he said, "I could design something for you." So, without knowing anything about the fashion industry, I created my own fashion label called Mothers Work Maternity.

It got off to a good start because everybody needed some basic pieces, but I couldn't scale without a fashion background. I ran my store for two years until we moved back to Singapore. That's when I closed it because I didn't know how to manage it remotely. At that point in time, I was pregnant with my second child, and I was getting stopped by people asking about my maternity clothes. "The entrepreneur in me came to life again. I realised, there's a market for this in Singapore!"

After that, I discovered that there were fashion designers overseas who had become mothers, decided that they had nothing to wear, and so they designed their own clothes. I got in touch with them and became their stockist in Singapore. By the time I was pregnant with my third baby, I had done a lot of research on baby products and put together a little black book of what to buy and when to buy. And I wanted to share this with other women.

So instead of waiting around for someone else to build it, I decided I would do it: Create a one-stop shopping experience to journey with women to make motherhood a little less overwhelming.

Then right after my third baby was born, my husband got a job in the US. I convinced a supplier to join me to help handle day-to-day operations in Singapore. Once we settled down, I started attending baby fairs and contacting American baby product suppliers, and began building relationships with the major brands in the baby industry.

Once you have a few brands under you, you gain credibility. I also believe we do justice to these brands. Once we take a brand, we grow it, and the brand blossoms and the brand principals trust us. We entered Vietnam in May 2024, and because of the good relationships we have with the brand principals, we secured most of the brands we have been working with. But we also have to run fast because there is a time period when you are allowed to play without delivering, and thereafter you must deliver. And luckily for us, because my whole team is very hands-on, we have always managed to deliver. Come crunch time, we deliver. And I think that's what's important in getting us to where we are today.

China is your first international market. What prompted you to expand into China? What obstacles did you face?

I moved back to Singapore in 2009, and Motherswork was still very much a mom-and-pop store then. After living in the US for almost 10 years and window shopping while the kids were in school, I saw firsthand how shops can be transformed visually and become successful. I travelled back to Singapore for three months every year during those 10 years, and the store was already evolving. I expanded the business, redecorated the store to improve its ambience and the experience for mothers, and we've grown rapidly since.

But at that time, only around 40,000 babies were born in Singapore a year, so the market didn't have a lot of growth potential. A number of people said, "Sharon, your business is too small. If you want to support more mothers, if you want investment, Motherswork needs to grow." So we looked at Malaysia, Indonesia, and China, and found that Indonesia and Malaysia were no-go's for several reasons at that moment in time.

In fact, China was also initially a no-go. We had chosen Beijing instead of Shanghai, as I thought Shanghai was too competitive. But when we met the Beijing mall operators, they all said the same thing: "You've not operated outside of Singapore. How do we know you can be successful?" And then they added, "Open one store, and if you are successful, we will give you space." But how do I open a store if nobody gives me that first opportunity?

Two months later, one of the malls had a change in leadership and the new management invited us to look at a space. It was dead space in the middle of the mall, but I also saw the potential for it to become a one-stop shopping experience that did not exist for mothers, babies, and children in China at that point. Imagine the possibilities if we can make it in Beijing, and those three words—"imagine the possibilities"—took us to the fastest growing consumer market where we had to run fast, evolve, and adapt to what I call 'China speed'.

That first store we opened in 2012 turned out to be a big success. We learnt so much from operating in China because it's such a huge country and the players move so fast. We had landed in one of the largest retail landscapes in the world, and we survived. Since then, we've brought all those best practices back to Singapore.

When I first went in, I had dreams of opening 100 stores. I then scaled that back to maybe 30 stores. At our peak, we had 14. When the COVID-19 pandemic struck, we closed a few stores and now we're down to eight very profitable, successful stores in China. You quickly pivot when you realise that a dream is unreachable and not realistic, so it's always changing. If you ask me what our plans are for the next five years, I'll tell you we want to expand in Southeast Asia. We've made it work in Vietnam and Bangkok will be our next stop.

You bootstrapped Motherswork's expansion in China without external funding, and you rejected numerous buyout offers before The Parentinc approached you. Why did you accept this deal after turning down the previous ones?

As soon as we entered China, there had been offers on the table. Some of those offers didn't align with our values. At different points in time, I thought, "I'm tired. Maybe I will accept an offer and exit." But when we got to the negotiation table, it just didn't feel right. Our purpose and mission was to journey with women into motherhood. It was passion that got me starting the business, and it has always been the purpose that kept me going, not forgetting the people too. We became one giant family where you have many families to support. You realise that you're responsible for not just yourself when you walk away, but that there are so many people whose livelihoods depend on this and they've been happy doing this.

So why now? Why am I doing this after 25 years? I started and scaled the business, but now I want to sell it to scale it further. Do I still want to bootstrap all the way? No. For me, when you come across the right partner that you can trust, it changes things. I've known Roshni Mahtani Cheung, The Parentinc founder, for a long time and we catch up regularly. On Motherswork's 25th anniversary celebration in 2023, we decided we would seriously discuss the possibility of The Parentinc acquiring Motherswork. I always say,

You quickly pivot when you realise that a dream is unreachable and not realistic, so it's always changing.
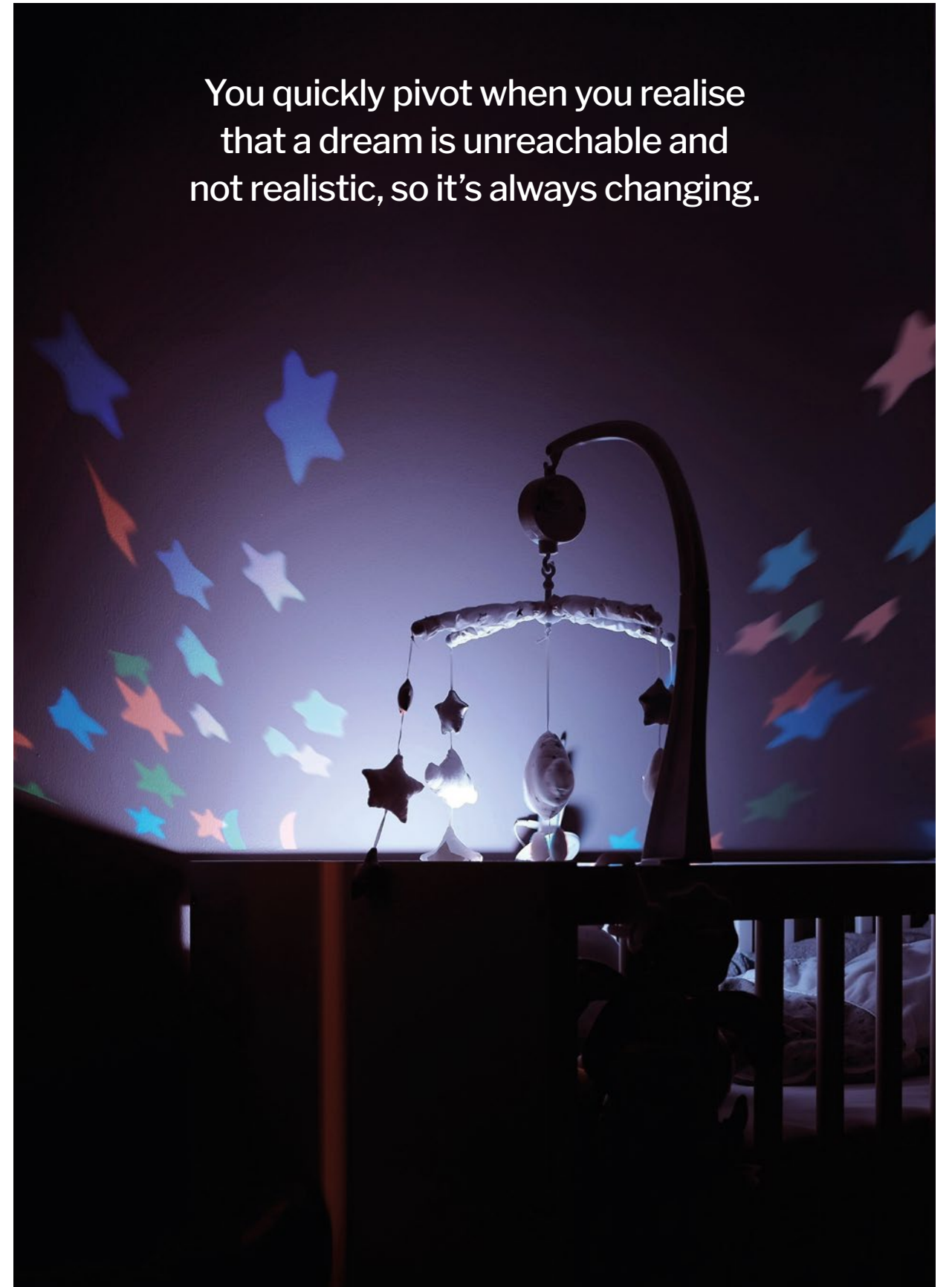
"I'm constantly learning to dance, whether it's with my staff or the customers, and similarly, they're also doing the same with me."

So Roshni learnt to dance with me. She understood what is important, rather than saying, "We want your business. I need you to work for me." For her, the acquisition was a merger of two families. Her message was, "I love and believe in what you've done. Is this what you want to do to continue to grow?" That's why I said yes, and I sold it. When the investors to whom I said "No" asked me why I chose The Parentinc, I told them it's because Roshni learnt to dance with me, and she understood what we needed.

Some of your staff have been with you for over 20 years. How did you achieve that when retail jobs are often perceived as dead-end jobs with little prospects for development?

Before we expanded into China, I was losing my retail staff. In Singapore, people seem to believe that retail sales is at the bottom of the food chain. I wanted them to understand that this can be a career, and they can work with us for a long time.

I thought maybe they just needed to see something different, so I took my top store managers to one of the baby fairs in Las Vegas in the US. We did three days of store visits, walking into literally every single store just so that they understand what it's like in the US where people are full-time sales associates who make decent money.

My staff were like, "Why are they all so friendly?" In Singapore, salespeople are often accused of running away from customers! After that trip, they came back refreshed and wanted to try out many ideas to improve the business.

When we expanded into China, that empowered them as well because they got to train people. They got to travel when the perception was that salespeople just sold products in stores. So we created a whole different type of culture, and that is why my chief operating officer has been with me for 24 years. And the new hires usually stay for at least three to five years because they are learning new things.

Instead of calculating the risk, imagine the possibilities.

We want the people we hire to stay because I dedicated my time to growing and grooming them. Hiring new people costs you more and the downtime is longer, but people don't realise this. To retain people, we need to groom them. We must harness their strengths and continue to help them grow, so that they can grow with the company. We don't hire and fire. We grow together. In fact, my daughter was the one who said, "Mum, you run the business almost like a family. When people make mistakes, sometimes you get mad at them but you continue to let them grow."

So our company culture is very much like that of a family where you grow your children. I grow the team, and they are happy to follow me. Actually, it's a privilege to be able to lead. That's why I always say, "Success to me is when they walk through fire with me."

You seem to epitomise the dream of "having it all": marriage, career, and children. Is that so?

I think we should change the narrative of what "having it all" means. I used to say, "Women can have it all." You don't have to choose between having a family and being a business owner or a high-level corporate leader. It is actually a mindset. For the new generation, with all the new technology available and everything else, I think the question shouldn't be, "Can we have it all?" The question should be, "Do we want it all?" If you answer, "Yes", then what is the

problem? If someone throws you a curve ball, you run the curve. For me, it's really that simple.

Here's an example of running the curve. When we were preparing to open our first store in Vietnam, we applied for all the relevant licences except one, which we didn't know we needed. Four weeks before opening, we realised we needed this licence to sell merchandise at the store, so we applied for it. Two weeks before opening, I knew it wasn't going to happen, so we pivoted very quickly. As we had an online licence, we pivoted to a click-and-collect model, where customers bought online but collected the merchandise at the store. We began to be associated with terms like 'click-and-collect' and 'omnichannel', and we got covered in every major newspaper in Vietnam as being the new player in the market with a new gig in town. Actually, it was because we failed to do something that we needed to in order to open on time. We move fast, evolve, pivot, and adapt to the market.

What advice do you have for budding entrepreneurs, especially female entrepreneurs?

I have an acronym for that: CCIR. *Courage*, *Confidence*, a bit of *Insanity*, and taking a *Risk*.

Ninety percent of our journey is about courage. Do you have the courage? Do you have people who give you courage to believe in yourself, trust in your instincts, and take action? Today, we have a community of female entrepreneurs that has come together in the last

10 years, and we can bring these women together to share with those who may not have access to the right contacts or expertise. Previously, there used to be private boys' clubs; now we have these women's clubs, and we're happy to come together, and share our knowledge and experiences. I really hope people can find others who can give them courage.

As for confidence, if you have no confidence, who's going to help you? Most Asians seem to think, "Hey, don't brag! It's not good to brag." I learnt in the US that it's not bragging. This is standing up for yourself and pitching yourself to others. We don't teach university students enough about how to communicate and tell people what you're selling. It's getting better now, but for my generation, it was different then.

And finally, insanity and risk— why would you give up a stable income and a high-level job to be an entrepreneur? Because you see the opportunity, of course. So go a little bit insane and say, "I'm going to take this risk and jump in." Instead of calculating the risk, imagine the possibilities. Of course, there also needs to be a little bit of luck, and luck is really that intersection where opportunity and your ability to run with it come together.

I've had new entrepreneurs or relatively unknown brands that came to us and managed to set up a meeting. Instead of thinking, "I will do whatever it takes to get into Motherswork", some of them are not willing to play because they're too conservative or scared, and the opportunity is lost. When

they come back a year later, we no longer have space for them. What many young entrepreneurs don't realise is that when you want to go somewhere, you need to give in. It's almost like being a loss leader. Why do we give space to certain brands and not others? It's not always just the numbers. Sometimes it's as simple as, "We'd love to be able to work with you and support you, and see how we grow together." If you're not ready, the opportunity is gone.

Motherswork was the first to believe in local brands such as Hegen and Maison Q, and give them a platform to lift off as their first retailer. They know we were the first to give them their big break, and they were ready at the time. So, I say to many entrepreneurs, "Don't calculate your risk; imagine the possibilities." ▣

74 | CASE
IN POINT

by Adam Tatarynowicz, Wee–Kiat Lim,
and Mahima Rao–Kachroo

ASIAN MANAGEMENT INSIGHTS
MARCH 2025 | 75

Wingspan

Taking Digital Learning to New Heights

How an internal learning platform became a market success.

Launched in April 2018, the learning experience platform (LXP) Wingspan was the brainchild of Infosys Co-Founder and Chairman Nandan Nilekani. He had observed that several critical trends were reshaping the world economy. For instance, digital natives were increasingly expecting the learning environment at their workplace to be available 24/7. The late 2000s were also a time when Infosys' corporate clients had just started on their digital transformation journey. Hence, capturing talent and market share was a strategic priority for the company.

In contrast, the learning delivery landscape at Infosys then was decentralised and fragmented, with a plethora of applications developed for myriad groups of users. Human resources also had to contend with giving recognition to the diverse range of certification that Infoscions–which was what Infosys staff called themselves– had acquired through third-party massive open online courses (MOOCs) and learning providers, such as Udacity and Coursera.

The ultimate push to build a new digital learning platform thus came from Chairman Nilekani, who believed Infosys already had the talent, experience, and capability to do so. The task then fell on Thirumala Arohi, Senior Vice President and Head of Education, Training, and Assessment (ETA).[1]

NOT JUST A NEW LXP

Infosys understood that the profound change the information technology (IT) giant needed was not simply a technological upgrade, with cutting-edge bells and whistles attached to the new LXP. There were several critical questions that Arohi and his team had to grapple with: What would truly differentiate the company from its rivals? How should they proceed to build the next-generation learning platform?

Essentially, Infosys had to reimagine its talent strategy and transform how its staff work. The company needed to become so attractive that it would be an employer of choice, especially for digital natives. Jobs should be designed to align with new capabilities requiring technical and solution expertise in digital areas. Accordingly, the rejuvenated learning ecosystem should be equipped to train upwardly mobile Infoscions. However, there was also another objective behind the refresh: By transforming the organisation and realising the digital potential of Infoscions, Infosys could demonstrate to its clients that it could walk its digital transformation talk. It could also convince them that it knew exactly how to prepare others to ride the digital wave.

Part of the new talent development strategy was to introduce an employee upskilling plan which would profile employees' skills, and then recommend target skills that Infoscions could attain via the structured learning paths and competency development enabled by the platform. For example, by completing these new learning paths, Java programmers at Infosys could expand their career profile to include roles such as cloud software developer or IT operations specialist within a month. Similarly, a consultant could prepare to apply for a data scientist position within five weeks by following a curated learning plan that combined theoretical modules with hands-on, project-based learning. These pathways were designed collaboratively by the Infosys Learning and Development (L&D) team, along with human resources and organisational development counterparts, to align with market demands and client goals.

Arohi's team also divided employee skills requirements into three categories—core, new, and emerging skills—according to the time horizon under which Infoscions could acquire those skills during their tenure. The team further developed specific training programmes and learning paths, taking into consideration the fact that individuals would approach their training not only based on varying skill levels, but also according to different job categories.[2] They also planned to incorporate the concept of 'cohort', which emphasised that learning

was to be a social activity and not a solitary endeavour. Finally, learning became purposive and performance-driven, where managers played a key role by discussing with their staff the best potential learning paths and the expected outcomes.

DEVELOPING WINGSPAN

The only friction between employees and their learning should be their motivation.
– Infosys Chairman and Co-Founder, Nandan Nilekani[3]

In October 2017, the L&D team under Arohi kicked off the Wingspan project. Four design tenets guided the team's decisions. First, the new LXP had to facilitate learning anytime, anywhere, and on any device. Second, learning had to offer "real life, first-in-class curated content". The LXP also had to result in a psychologically safe environment where learners could gain mastery and develop confidence to apply their new skills.[4] Third, learning on the LXP was supposed to be engaging and fun. By introducing games and social learning mechanisms into the LXP, learners could feel engaged and connected, even when they were learning by themselves. This was where the design for the new LXP took inspiration from gaming platforms where gamers could connect with one another across different geographies; it was just that in Infosys' context, the idea was not only to have fun, but also to learn new things. Finally, learning must create an impact. Acquiring new skills and knowledge on the new platform

therefore needed to be tightly integrated with Infosys' human resources and IT systems, enabling the assessment of Infoscions' progress in their personal and professional journeys.

Arohi and his team wanted to design a platform that would be intuitive and easy to use for everyone. It needed to feel as seamless and familiar as popular digital platforms like Netflix, Amazon Prime, YouTube, and Spotify.[5] To achieve this goal, they initiated focus group discussions to listen closely to the needs of Infoscions. These groups even included a few of Infosys' own clients. What emerged from these discussions was the expectation that the new LXP should be able to promote "learning anytime, anywhere, and [on] any device". Learners also wanted to be able to share their personal learning paths with others, akin to how Spotify users could share their playlists with the outside world. As Arohi pointed out, "Why shouldn't learners enjoy the same flexibility to share their personal learning paths?"[6]

Learners could find a variety of searchable content on Wingspan. The platform could also recommend continuous learning opportunities and ways to access resources at the users' disposal. Other offerings included bridge programmes, which were structured solutions that enabled employees to shift their careers within an organisation, thus providing new opportunities that would otherwise require higher education.[7]
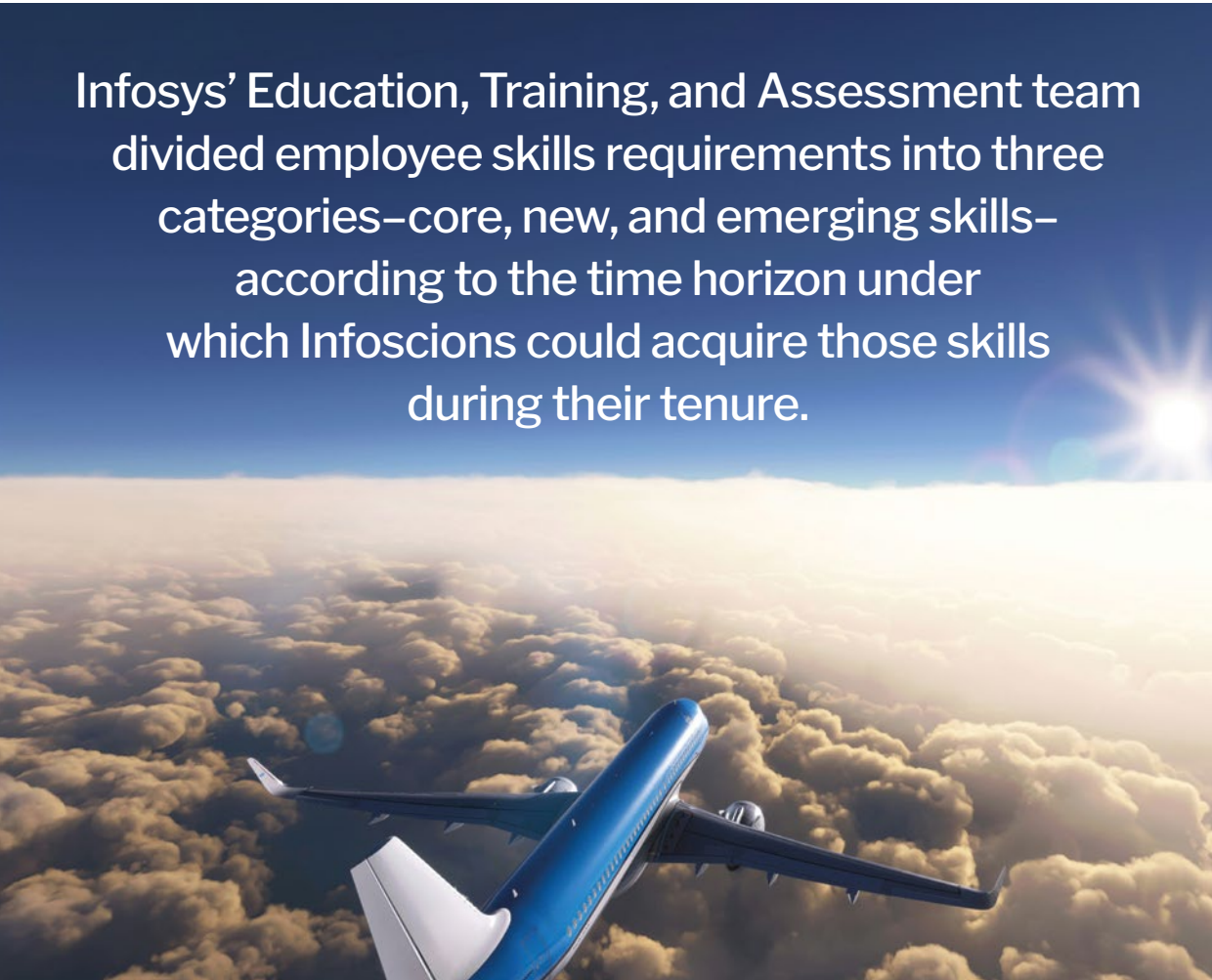
Finally, Arohi and his team made sure to introduce artificial intelligence (AI), machine learning (ML), Internet of Things (IoT), and other emerging technologies to Wingspan to make the learning experience more immersive and effective. As Arohi highlighted, "Today's learners do not seek just learning content, learning sessions, or training programmes; they really seek experience."[8] For example, AI would provide Infoscions with more personalised recommendations on suitable courses. The platform would also enable peer learning as learners could find mentors among colleagues who had completed similar training programmes in the past. This marked a fundamental shift in learning philosophy from the traditional 'sage on the stage' model to the more collaborative 'guide on the side' framework. Under this model, the instructor was

no longer the sole repository of wisdom and knowledge. Instead, learners became the focal point by fostering peer learning through active participation in a collective learning journey with others.

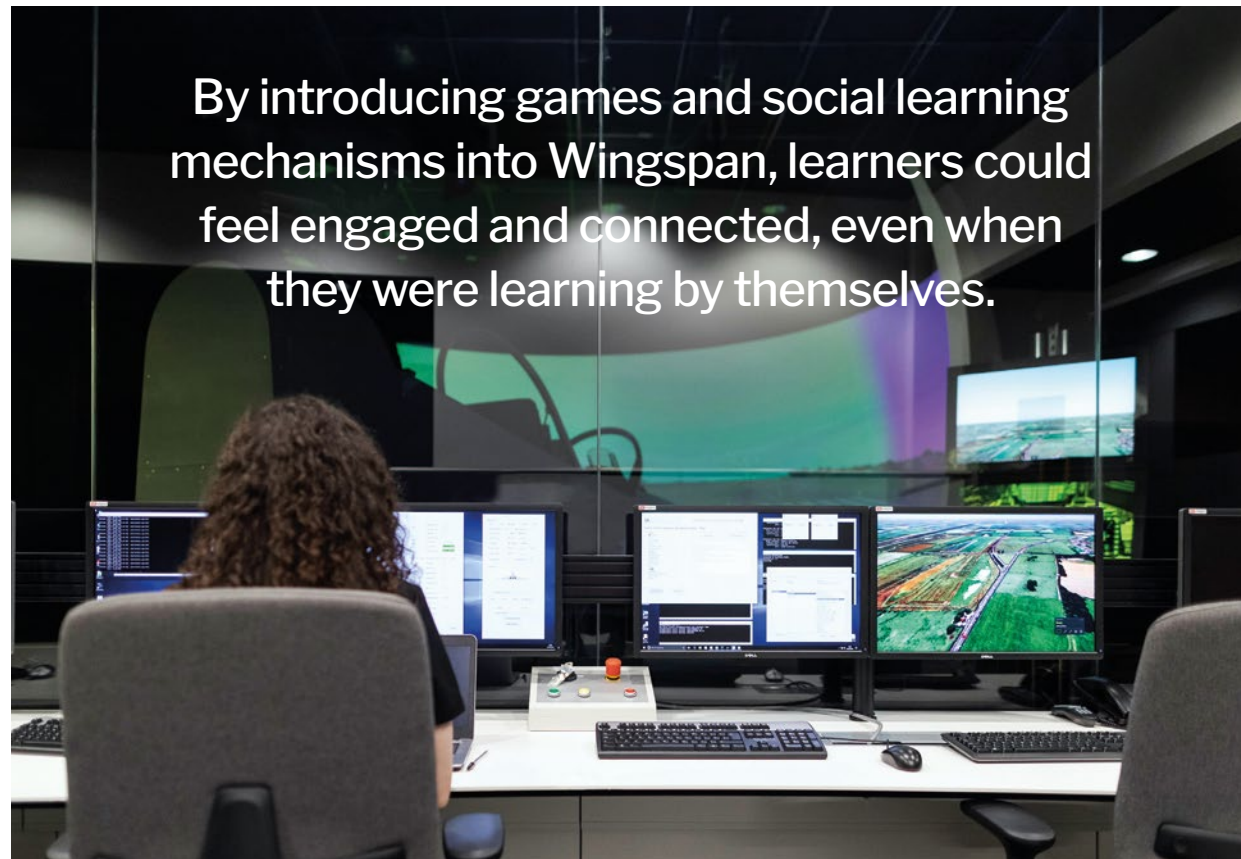### INFOSCIONS EMBRACING WINGSPAN

On April 24, 2018, Wingspan was rolled out within seven months of its initiation, a feat accomplished by a team of just 20 Infoscions, with Arohi acting as the overall project manager. The team approached the development in an agile and iterative way, delivering three beta releases before the final rollout.

Before the launch, some Infoscions were concerned that Wingspan would 'cannibalise' existing learning platforms, practices, and processes. There was also some hesitation over whether to switch from Udemy,

Infosys' Education, Training, and Assessment team divided employee skills requirements into three categories–core, new, and emerging skills– according to the time horizon under which Infoscions could acquire those skills during their tenure.

By introducing games and social learning mechanisms into Wingspan, learners could feel engaged and connected, even when they were learning by themselves.

Coursera, and other established MOOC providers. Others argued that Wingspan would dilute the relevance of in-person education at Infosys' corporate university, the Global Education Centre. Despite the trepidation, over 90 percent of Infosys employees, or about 180,000 Infoscions, had successfully tested Wingspan by the end of 2018.[9] According to Arohi, "We've seen a fantastic response, with about one-third of the employees using it on their own time at night and on the weekends."

AN LXP NOT JUST FOR INFOSCIONS

The commercial version of Wingspan became available for Infosys' clients and partners in September 2018. It had taken only another five months to convert the original Infoscions-only LXP for external deployment. This move came about because word on Wingspan had got out to the clients and partners soon after it was launched within Infosys, and interest had been mounting.

The timing was also ideal for an external launch. The proprietary learning portals developed by large companies were often complex, overpriced, and yet underutilised by their own staff. The growing consensus was that employee learning should not be burdensome. By the late 2010s, even smaller companies had ditched building their own learning platforms from scratch in the wake of the near ubiquity of powerful search engines, rich knowledge repositories, and highly interactive online media. One needed to look no further than Google, Udemy, and YouTube.

The reception from the market was overwhelmingly positive. Many companies had signed on to Wingspan, thus validating Infosys' belief that "learning is earning". One of the LXP's most notable clients was the German IT giant Siemens, among other multinationals from finance, pharmaceuticals, and other industries. Infosys firmly believed that what worked for Infoscions could be adapted to work for its clients as well. Through Wingspan, the global tech advisory firm aimed to help its clients accelerate their digital strategy in research and development.[10] When specific functions were unavailable, Infosys would absorb the costs of co-developing them with the client as new features in Wingspan. By serving as a one-stop shop for learning and knowledge sharing, Wingspan quickly became the clients' unified digital platform, enabling enterprise-wide access to rich, contextualised content for all staff.

RIDING THROUGH THE COVID-19 CRISIS

On March 24, 2020, India went into lockdown as COVID-19 swept through the country and Infosys switched to remote work mode on the same day. Consequently, over 9,000 trainees who had been housed at its Mysuru residential campus were sent home, so they resumed their training online through Wingspan.[11] The transition to working and learning from home was smooth because Infosys had already implemented policies allowing Infoscions to do so for up to nine days a month with their manager's permission.

During the pandemic, Infosys also added a range of new features to Wingspan, including fun and light-hearted quizzing tools designed to help learners stay engaged. These features were developed after Arohi and his team had recognised that learners often struggled to maintain attention during extended synchronous or 'live' sessions.

WHAT'S NEXT?

By March 2021, over 240,000 Infoscions were spending an average of 45 minutes per day on Wingspan.[12] At that time, the platform was offering more than 2,700 courses created by Infosys' educators and its external partners, including Knowledge@ Wharton, Harvard ManageMentor, E-Cornell, IEEE, and Microsoft Learn.[13] As many as 30,000 users logged on during weekdays, and at least 7,000 continued to do so over the weekends.[14] Outside of Infosys, Wingspan had become the organisational learning platform of choice for more than one million client users.

In May 2022, Wingspan was selected to be the digital platform behind Infosys Springboard, the company's flagship environmental, social, and governance (ESG) initiative.[15] By aligning with the Infosys ESG Vision 2030 to enable digital skills at scale, it became the primary LXP to empower people, communities, and society with digital skills to be successful in the 21st century. The initiative was led by a dedicated group of experts collaborating with the Infosys ETA team, curriculum partners, non-profit organisations, and a global network of leading educational institutions.

The LXP had clearly taken off in a matter of just three years, embodying what Arohi said about Infosys as a place where "lifelong learning is the North Star for organisational progress and talent development". **AMI**

DR ADAM TATARYNOWICZ
is Associate Professor of Strategic Management at Lee Kong Chian School of Business, Singapore Management University

DR WEE-KIAT LIM
is Senior Associate Director at the Centre for Management Practice at Singapore Management University

MAHIMA RAO-KACHROO
is Case Writer at the Centre for Management Practice at Singapore Management University

For a list of endnotes to this article, please visit https://smu.sg/z9fc or scan the QR code below.

BUILDING SKILLS NOW FOR ASEAN'S FUTURE

Upskilling of workers is critical for building a more resilient workforce and future-proofing economic growth.

Upskilling has become a buzzword for governments across the region as they gear up to boost economic growth and improve productivity. A confluence of factors such as digitalisation, automation, and artificial intelligence is heralding a new age where these elements have become powerful drivers of economic success.

There is enormous potential for Southeast Asia, which is home to the third largest labour force in the world and has a relatively young population, to upskill its workers. Historically a region that has depended on low-skilled manufacturing and labour-intensive industries, Southeast Asia is at risk of not maximising its economic potential if governments and the private sector are unable to equip the workforce with the skills needed to take on higher value-added jobs.

In countries such as Indonesia, Thailand, Malaysia, Vietnam, and the Philippines, there is a growing demand for more highly-skilled jobs as their economies transition to higher value-added industries that are green and more sustainable. The lack of workers with the right skills has resulted in a widening skills gap, especially amongst micro, small and medium enterprises (MSMEs), which account for as much as 99 percent of the total number of businesses in these countries. With more than 70 million MSMEs in ASEAN, skills upgrading will be necessary to achieve long-term and sustainable economic growth.[1]

STATE OF AFFAIRS ON THE GROUND

In Indonesia, there are more than 60 million ultra-MSMEs, i.e., extremely small micro-sized businesses, and many of their founders have at best limited basic financial literacy and management skills, according to Aria Widyanto, Chief Risk and Sustainability Officer of Amartha, a fintech company that offers micro-finance loans and services to ultra-MSMEs. Widyanto noted that many ultra-MSMEs lack an understanding of financial products and services beyond basic transactions. And while ultra-MSMEs use digital services for communications and entertainment, leveraging these tools to grow their business is still a work in progress. "Issues such as limited knowledge of e-commerce platforms, high logistical costs, and lack of confidence impede progress and require interventions," he said.

To unlock the full potential of ultra-MSMEs, collaboration among the government, private sector players, and other stakeholders is essential. Lawmakers, business leaders, financial institutions, training providers, and support groups thus need to come together to create an ecosystem that addresses the needs of both ultra-MSMEs and workers.

"Our research highlights two critical dimensions that inform the segmentation of MSMEs and their needs: innovation level reflects the degree of financial literacy, digital skills, and entrepreneurial drive of ultra-MSMEs, while loan level indicates the extent of financial resources they can access to support business development," Widyanto noted. "These dimensions provide a foundation for stakeholders to design targeted and impactful interventions."

Such interventions usually revolve around providing subsidised training programmes to help these micro-entrepreneurs and workers upskill themselves.

GOVERNMENT STEPS IN TO NARROW SKILLS GAP: THE INDONESIA CASE

Realising the urgent need to upgrade the skill levels of their workforce, governments in the region have stepped in by launching a plethora of upskilling programmes. Nevertheless, the challenge lying before them is significant.

In Indonesia, for example, only six percent of the population holds a diploma or higher education degree, with 20.9 percent holding high school diplomas and 23.4 percent having elementary school certificates, according to 2022 data from Statistics Indonesia.[2] Until recently, opportunities for upskilling in the country have been limited, and 90 percent of the workforce have never attended formal training courses due to a lack of financial support and limited access to information.[3] The region's most populous country is also home to the world's fourth largest workforce with 140 million workers. However, the country's productivity remains low. According to the International Labour Organization, Indonesia's 2024 output per hour worked was US$15.10, while Malaysia's was US$29.70 and Singapore's was US$95.80.[4] Moreover, there is a significant challenge for conducting offline training given that Indonesia is an archipelago stretching over 5,000 km. In fact, the government of Indonesia has long recognised the importance of implementing nationwide training programmes, but geographical challenges meant that offline localised initiatives were difficult to scale.

In 2020, amidst the widespread job losses and uncertainty caused by the COVID-19 pandemic, then President Joko Widodo launched the Kartu Prakerja programme to enable workers who had lost their jobs to obtain access to inclusive learning and financial assistance. Prakerja is the national skills development agency that runs Indonesia's largest vocational training programme. The programme aims to provide training scholarships to improve workers' competence and entrepreneurship capabilities. The Kartu Prakerja programme proved to be a huge success. By the end of 2024, there were 284 offline training programmes available across 31 provinces. The training courses offered included those for truck and bus driving, technical equipment maintenance, basic security, housekeeping, and bridal make-up. While the programmes were funded by the government, they were run in partnership with 247 registered training providers from the private sector.

"From 2020 to 2024, we have strived to provide the best we could to 18.9 million Prakerja beneficiaries and society at large," noted Denni Puspa Purbasari, Executive Director (Program Management) at Prakerja. "There have certainly been shortcomings, particularly given the difficulty of closing the skills gap when the target continuously shifts, but with the guidance of the Coordinating Minister for Economic Affairs and all members of the Job Creation Committee, we are committed to moving forward, raising awareness, and enhancing the capabilities of our workforce to adapt to the challenges of the labour market," she said in the foreword to Prakerja's 2024 annual report.[5] Purbasari added that the government's commitment to upskilling is critical if the country is to improve productivity and economic growth. "A country's productivity lies in its human capital. Efforts to keep people productive cannot only rely on philanthropy and corporations," she noted.

As such, Prakerja will collaborate with the country's education system, as well as the Indonesian private sector to ensure that its

programmes are relevant to market needs. According to research from the Svara Institute, Prakerja has helped raise worker income by 15 to 17 percent per month on average while also meeting a number of sustainable development goals. Its success has meanwhile been studied by Cambodia's National Social Protection Council (NSPC) and Thailand's Equitable Education Fund (EEF) with the objective of introducing similar programmes in their respective countries.[6]

THE SITUATION ELSEWHERE IN ASEAN

Vietnam's National Innovation Center (NIC) is also working with private sector players to upskill the nation's workers, especially those in the manufacturing sector. The NIC had partnered with two US firms to train 50,000 Vietnamese semiconductor engineers by 2020 and, according to the Vietnamese Minister of Planning and Investment, Nguyen Chi Dung, the training programme aims to develop manpower for the semiconductor industry and promote a Vietnamese semiconductor ecosystem.[7]

Under a programme supported by the United States Agency for International Development (USAID), Vietnam is also launching training courses to upskill its workforce for the digital economy,[8] which is projected to reach US$45 billion by 2025, and US$90 billion to US$100 billion by 2030.[9] At the same time, in July 2023, it was reported that 61 percent of Vietnamese employers said that they were unable to find appropriately-skilled workers at the right time.[10]

As for Thailand, after realising the need to upskill its workforce, its Ministry of Labour (MOL) has identified a number of sectors to prioritise; they include services and agriculture. Under the MOL, the Department of Skill Development (DSD) plans to upskill and reskill more than five million workers by the end of 2025.[11] In June 2024, the government also announced that it was aiming to develop a skilled workforce of 280,000 people in advanced industries over the next five years to help the country become a high-tech hub.[12] Additionally, to encourage private sector players to train their workers, the Thai government will offer up to a 250-percent tax deduction incentive for companies that send employees for training at accredited universities or government agencies.

Meanwhile, Singapore's SkillsFuture programme remains the gold standard in the region for how the government and the private sector work hand in glove to prepare the workforce for future jobs, and the country is focused on future-proofing its workforce through upskilling proactively, working with both the private and public sectors, investing in the workforce, and involving the older generation of workers.[13] As part of its lifelong learning philosophy, the Singapore government regularly provides financial support to Singaporeans who wish to upgrade their skills and take on new careers. In January 2025, Minister of State for Education Gan Siow Huang announced that in a sign of Singapore workers taking upskilling seriously, more than 25,000 Singaporeans aged 40 and above had utilised the S$4,000-SkillsFuture Credit top-up as of November 2024.[14]

CONCLUSION

As the technological revolution gathers pace, upskilling will grow in importance at all levels. According to the World Economic Forum, over the next five years, "22 percent of today's global jobs will change due to technological advancements [and] the transition to a more sustainable economy."[15] While these trends will create new opportunities for productivity growth, innovation, and climate resilience, they will also pose challenges with job displacements, skills mismatches, and inequitable access to opportunities in their wake.

While Southeast Asian countries face a daunting uphill task to upskill their workforce, they are acutely aware that not doing so will not only impact future economic growth, but also adversely affect the livelihoods of millions of their citizens. There is therefore an urgent need to ensure that everyone's mind is focused on the task at hand.

SHOEB KAGDA
is Centre Director (Jakarta) at the Office of Overseas Centres, Singapore Management University

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The Ethics of AI Nudges
How AI Influences Decision-Making

And why decision-makers should care about it.

○ Artificial intelligence (AI) systems, through mechanisms like nudges and choice architecture, actively, yet often subtly, shape human decision-making in everyday life and professional settings.

○○ AI systems can prioritise profit or efficiency at the expense of human agency, fairness, and well-being, highlighting the need to balance AI's capabilities with ethical considerations.

○○○ The EU AI Act is a landmark framework designed to curb manipulative AI practices, emphasising the protection of human autonomy and accountability in decision-making.

Picture Tom, a gig economy driver working for a major ride-sharing platform. After a gruelling 10-hour shift, he is ready to head home when he receives a notification, "You're just $15 away from earning your daily target of $300!" What Tom does not realise is that this seemingly helpful reminder is part of an AI-driven engagement system designed to maximise platform profits by keeping drivers on the road longer. The AI has analysed Tom's behavioural patterns, identified his personal financial goals, and calculated the precise moment when such a message would most likely trigger his loss-aversion bias–the psychological tendency to avoid 'missing out' on potential gains. Hence despite his fatigue and earlier decision to end his shift, Tom continues driving for another hour. This decision, subtly engineered by AI, prioritises the platform's need for driver availability over Tom's well-being and safety.

Here is another example. Consider your typical workday. Whether it is the embedded email assistant that suggests response times, the calendar that optimises meeting schedules, or the project management tool that prioritises tasks, each one of them represents an AI system that is quietly tweaking your behaviour. These digital nudges, while seemingly benign, accumulate to shape professional judgments, team dynamics, and ultimately, organisational outcomes.

As you can see, in the modern workplace and beyond, AI does not just automate tasks; it is a subtle but powerful form of influence that actively shapes our choices. While most executives understand AI's role in data analysis or process optimisation, few recognise how AI systems systematically guide decision-making through sophisticated behavioural interventions.

In this article, I examine the sophisticated mechanisms through which AI influences human decision-making, revealing patterns that often escape conscious awareness. By understanding how AI systems leverage behavioural psychology–from anchoring effects to choice architecture–leaders can better evaluate where algorithmic guidance ends, and human judgement begins.

Drawing on recent research in behavioural science and real-world cases, we will explore why humans are surprisingly susceptible to AI influence, even in high-stakes professional contexts. More importantly, we will examine how organisations can harness this understanding to design AI systems that enhance, rather than undermine, human agency in decision-making.

PERVASIVE AI PRACTICES THAT POSE ETHICAL CHALLENGES

Most commercially-developed AI systems are often programmed to modify user behaviour to either maximise conversion or increase engagement to drive behaviour that maximises profit. In some situations, the humans interacting with these systems might be aware of being influenced by these tools, but not about how the influence works or to what extent the influence will impact their decision-making outcomes. In most cases, users are not aware of the impact of these outcomes on their lives and well-being.

Unintended AI influence extends beyond the corporate domain; it can also be found in the use of AI-enabled decision support systems, such as judiciary processes. These AI systems process defendants' data to generate risk scores, presenting them as objective inputs for judicial consideration. However, this integration of AI into legal decision-making can create automation bias–an unconscious tendency to defer to automated assessments even when they conflict with professional judgment.

A 2013 criminal case in the US crystallised these concerns. When sentencing a defendant for theft, a judge doubled the recommended one-year sentence solely based on an AI risk assessment score.[1] This dramatic departure from both prosecutor and defence recommendations demonstrates how AI inputs can override experienced legal judgment, often without the decision-maker recognising the extent of this influence. Investigations conducted by a non-governmental organisation (NGO) named ProPublica revealed that AI scores in the US were biased against African Americans, leading to systematic biases in decision-making.[2]

In such situations of human-AI collaborations, an AI system's output creates an anchor point that can unconsciously skew perceptions, leading to decisions that may deviate from expert judgement. While judges might view the AI's input as just one factor among many, these algorithmic assessments can fundamentally reshape their evaluation of evidence and circumstances. This situation exemplifies a critical challenge in AI-assisted decision-making:

maintaining meaningful human agency when algorithmic influences operate below the threshold of conscious awareness.

AI assistants are increasingly used in medical diagnosis, particularly when analysing medical images like chest X-rays. However, research has shown that the AI models powering these systems demonstrate lower accuracy when evaluating women and people of colour.[3] Studies revealed that these systems were relying on demographic shortcuts to compensate for performance discrepancies, resulting in inaccurate diagnoses for these patient populations.

Credit scoring firms in Vietnam have also turned to digital footprint, such as data from smartphone use and social media activities, to evaluate the creditworthiness of individual applicants. While this approach may enable financial institutions to reach out to unbanked individuals, it could also result in the unintended consequence of reinforcing financial exclusion for those with limited or no access to digital technology.[4] This is because the creditworthiness assessment may be biased or it could discriminate against specific groups, such as rural applicants who leave less of a digital footprint than those residing in bigger towns and cities.

These scenarios underscore the pervasive ethical challenges posed by AI applications and their potential to negatively impact our businesses, lives, and society at large. The AI tools of today are different from other technologies as they are fully capable of acting

as autonomous decision-making agents, albeit with unforeseen consequences. Unethical outcomes such as infringement of privacy, leaking of proprietary and private information, biased outcomes, and propagation of misinformation are just some of these possible issues.

Despite such ethical concerns, recent studies and reports highlight the growing adoption of AI tools by businesses to enhance productivity and decision-making. A Deloitte Insights report released in May 2024 highlighted that 67 percent of employees in Singapore are utilising generative AI tools, surpassing the Asia Pacific average of 62 percent.[5] It also highlighted that employees in the country believe that 64 percent of their tasks will be automated or augmented by AI within the next five years, underscoring the technology's significant impact on productivity and decision-making.

Another survey in 2024 revealed that 68 percent of business leaders in the Asia Pacific region, including ASEAN countries, agree that emerging technologies like AI are crucial for driving innovation, creativity, and productivity.[6] AI tops the list of technologies deemed most

important for businesses over the next five years, followed by cloud computing and robotic process automation.

Even our daily interactions with technology are increasingly shaped by subtle AI influences that we may not fully recognise. For example, social media platforms employ sophisticated recommendation algorithms that shape our information consumption and social interactions. These systems analyse our behavioural patterns, emotional responses, and social connections to present content that maximises engagement, often without consumers understanding the extent of this curation.

E-commerce platforms use AI-driven pricing and presentation strategies that influence purchasing decisions. For instance, dynamic pricing algorithms might adjust prices based on user behaviour patterns, while product recommendation systems employ psychological targeting to present items in ways that maximise purchase likelihood.

Search engines represent another pervasive form of AI

influence in daily life. Studies show that the ordering and presentation of search results can significantly impact decision-making, from consumer choices to political opinions. Researchers confirmed that search result rankings can influence voting preferences by more than 20 percent, often without users being aware of this influence.[7]

Digital wellness and productivity apps increasingly use AI-driven nudging techniques to influence behaviour. While often well-intentioned, these systems can sometimes override user autonomy through persistent notifications and psychologically-optimised messaging and notifications.

SHAPING AI INFLUENCE THROUGH CHOICE ARCHITECTURES

Behavioural scientists in recent decades have found that decision-making deviates significantly from the rational ideal depicted by classical economic theory where humans are expected to consistently evaluate all available options by carefully weighing costs and benefits to maximise value. In reality, humans are

While most executives understand AI's role in data analysis or process optimisation, few recognise how AI systems systematically guide decision-making through sophisticated behavioural interventions.

cognitive 'misers'. To cope with the overwhelming complexity of daily decisions, we choose to 'satisfise' by employing mental shortcuts and simplified strategies that, while not mathematically optimal, allow us to navigate and make 'good enough' choices effectively.

This understanding has given rise to the concept of 'bounded rationality' in economics, which acknowledges that our capacity for rational analysis has clear constraints. This tendency is compounded by inherent limitations in attention spans and self-regulation, particularly when we are confronted with the allure of immediate rewards.

Human decision-making is also profoundly shaped by the context in which choices are presented, along with the accessibility of different options. These seemingly minor factors, such as how alternatives are arranged, the format in which information is displayed, and which options are set as defaults, can significantly influence final choices. The environmental context surrounding a decision acts as a powerful force that can either facilitate or impede certain choices.

Considering both bounded rationality and the environmental context, designers of AI systems can then deliberately shape human choices by thoughtfully redesigning the environment in which decisions are presented. This strategic modification of the social, physical, and cognitive landscape surrounding decision points is known as 'choice architecture intervention' or 'nudges'.[5] Just as an architect designs physical spaces to

Studies show that the ordering and presentation of search results can significantly impact decision-making, from consumer choices to political opinions.

guide movement and interaction, choice architects craft decision environments to guide people toward certain behaviours while preserving their freedom to choose.

While behavioural scientists have extensively studied how choice architecture affects behavioural change, context dependency makes it difficult to draw universal conclusions about the impact of choice architecture, as its effectiveness often depends on subtle interactions among the decision environment, the nature of the choice itself, and the characteristics of the decision-makers involved.

Sophisticated AI applications can influence decision-making through strategic designing of the decision environment. Below are three key strategies which are most commonly used by AI systems using the choice architecture approach.

Designing the information presentation

Given that decision-makers primarily rely on immediately available information rather than conducting exhaustive analyses, AI systems can personalise and present information in ways that influence decision-making. This can be done by providing social reference points (comparing individual behaviour to that of peers), making hidden information visible through feedback mechanisms, and translating complex data into comprehensible formats. For instance, streaming platforms do not just recommend what to watch next—they carefully curate thumbnails, descriptions, and timing of recommendations based on your psychological profile and viewing patterns. When Netflix shows different artworks for the same movie to different viewers, it is leveraging AI to present information in the most persuasive way possible for each individual.

Altering the structural design of choices

Given that the arrangement and format of options significantly impact choices, AI systems use techniques such as setting strategic defaults (pre-selected options), adjusting the effort required to choose different options, and carefully curating the range and composition of choices. For example, e-commerce platforms modify the sequence and presentation of products based on an AI analysis of your browsing patterns and psychological profile.
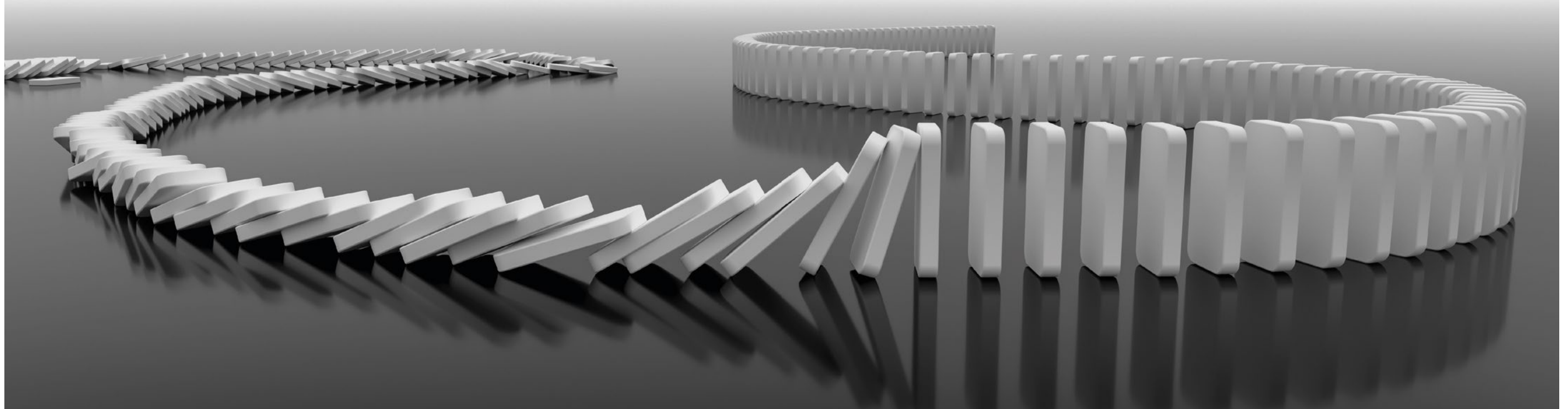
Providing strategic decision assistance

Even when people intend to make certain choices, limited attention and self-control can prevent them from following through on their original choices. AI systems influence this intention-behaviour gap through commitment devices that lock in future decisions, timely reminders that increase behavioural salience, and the removal of psychological barriers such as a call to take immediate action to prevent procrastination.

Consider how fitness apps use personalised goal-setting and reminders. These seemingly helpful nudges are often powered by AI systems that analyse patterns to determine the most effective timing and framing of interventions. Banking apps similarly use AI to suggest spending limits or savings goals, presenting them as helpful tools while potentially influencing financial behaviour.

The EU AI Act highlights how sophisticated AI techniques can exploit human psychological vulnerabilities in ways that might be visible, but whose manipulative mechanisms remain hidden from human awareness.

COUNTERING UNETHICAL AI INFLUENCE: THE SIGNIFICANCE OF THE EU AI ACT

As AI systems increasingly shape human decision-making, there is a need to carefully distinguish between the ethical and unethical forms of influence of AI systems. Countries and regulatory bodies are trying hard to keep pace with the state of progress of AI capabilities to address the complex nuances of its influence, which can bring about widespread impact on the well-being of humans and society at large.

The European Union's AI Act, which was passed in May 2024, establishes clear parameters for protecting the autonomy of human decision-making from AI manipulation.[9] It acknowledges that when AI systems deploy deceptive techniques at scale, they can significantly alter societal behaviour patterns and reshape cultural norms. Article 5 of the Act in particular identifies and prohibits AI systems that are designed to exploit psychological vulnerabilities, creating a distinct boundary between ethical AI applications and those that deploy manipulative techniques to influence human choices. By prohibiting such systems, the provision serves as a safeguard against the potential for AI to undermine collective decision-making autonomy. As a result, the EU AI Act also ensures that AI systems respect the fundamental human rights of integrity and autonomy in all instances.

The definition of prohibited AI influences in the EU AI Act is based on three key dimensions: the nature of influence, its intended effects, and its underlying mechanisms. The nature of influence exists on a spectrum ranging from the subliminal to the supraliminal. Subliminal influences operate below the threshold of human consciousness, where individuals are unaware of either the influence itself or its potential impact on their behaviour. In contrast, supraliminal influences operate above the perceptual threshold, allowing individuals to consciously recognise and evaluate the AI's impact on their decision-making process.

While the concept of subliminal influence has been studied for decades, its regulation in the context of AI systems only received formal recognition through the EU AI Act. This Act marks one of the first major regulatory frameworks to explicitly address this form of algorithmic manipulation.

The second dimension examines the intention and effects of AI influence. Systems designed with malicious intent and a deliberate disregard for user well-being should be considered harmful and hence must be prohibited. This category includes AI systems that cause or risk causing physical, psychological, or financial harm to individuals or groups, regardless of their stated intentions.

The third dimension focuses on the mechanisms through which AI systems influence human decision-making. The EU AI Act specifically prohibits systems that impair an individual's ability to make informed decisions, leading them to choices they would not otherwise make. This aspect emphasises the need to preserve autonomous decision-making capacity. The underlying fundamental principle is that ethical AI systems should enhance, rather than diminish human agency.

These three dimensions—nature, intention, and mechanism—together can help to create a comprehensive framework for evaluating the ethics of AI influence. By understanding these distinctions, we can better identify and promote AI systems that support positive behavioural changes while protecting against manipulative or harmful influences that undermine human autonomy and well-being.

For business leaders in Asia, this regulatory development marks a critical juncture in the ethical deployment of AI systems. While the potential for AI to optimise business operations is immense, the EU AI Act highlights how sophisticated AI techniques can exploit human psychological vulnerabilities in ways that might be visible, but whose manipulative mechanisms remain hidden from human awareness. As Asia continues to lead in digital innovation and AI adoption, understanding these influence mechanisms becomes crucial not just for regulatory compliance, but also for building sustainable business models that balance profit optimisation with ethical considerations and genuine user well-being.

CONCLUSION: PROTECTING HUMANS DURING AI-HUMAN INTERACTIONS

The age of sophisticated AI is on us now and we find ourselves in an environment saturated with AI nudges. In this article, I aimed to draw your attention to the subtle algorithmic interventions that shape our daily choices, habits, and ultimately, life outcomes. While we cannot completely insulate ourselves from AI nudges, awareness of their presence and mechanisms empowers us to maintain autonomy in our decisions.

It is also clear that for executives navigating the AI revolution, recognising AI's subtle influences is not only about maintaining decision autonomy. It also involves ensuring that AI augments, rather than supplants, human judgment in shaping organisational strategy and culture. Understanding the psychology behind AI influence has therefore become as crucial as understanding the technology itself.

Executives also need to grapple with the issue of accountability for AI-augmented decisions. We need to figure out how to parse out the distribution of responsibility when outcomes are increasingly shaped by both human judgement and algorithmic influence. The answer must emerge from a nuanced understanding of human-AI interaction.

Lastly, the EU AI Act marks a significant milestone by explicitly prohibiting AI systems that employ manipulative techniques. In doing this, the EU affirms a fundamental principle: human agency must be preserved in an AI-augmented world. As various legal regimes in Asia develop their own regulatory responses to these challenges, the EU AI Act provides a valuable blueprint for balancing technological innovation with the preservation of human agency. The future of ethical AI deployment lies not in eliminating algorithmic influence, but in ensuring that it operates transparently and respects human autonomy in decision-making. **AMI**

DR SEEMA CHOKSHI
is a researcher and speaker on AI ethics, and also founder and CEO of DataWyz.ai

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