



Return on Intelligence:

Rethinking Value in the Age of Human–AI Synergy

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Executive Summary

For more than a century, organisations have measured success through **Return on Investment (ROI)**, a logic born in the industrial age when efficiency, cost reduction, and scale defined advantage. But today, this lens blinds us to the deeper assets on which competitiveness depends: the tacit, cultural, and relational capabilities that sustain adaptability and resilience.

This paper introduces **Return on Intelligence (ROI²)** as the **missing metric in the productivity debate** and an essential evolution of the concept. ROI² is not a rebrand but a recognition that genuine return now depends on two inseparable streams of intelligence:

- **Machine intelligence** – the infrastructure and hidden costs of AI, including compute, inference, training, data preparation, and cybersecurity.
- **Human intelligence** – the capabilities of people, including critical thinking, adaptive mindset, collaboration, learning velocity, and resilience.

Only when these dual streams are measured together can organisations assess not just outputs, but their long-term competitiveness, adaptability, and relevance in a world where AI technologies are rapidly commoditised.

The paper argues that traditional ROI obscures a critical risk: automation delivers short-term gains but often erodes tacit knowing—the lived, contextual, and relational intelligence that underpins human judgement, creativity, and resilience. This “industrialisation of intelligence” hollows out higher-order capabilities just as they become most vital.

By contrast, ROI² reframes value around the flows of explicit and tacit intelligence—decision quality, learning velocity, cognitive diversity, adaptability, and leadership behaviours. These flows represent the Human Dividend—the compounding return realised when human capabilities are consistently developed and embedded in culture. They reveal whether organisations can respond intelligently to disruption, rather than simply process information faster.

Drawing on intellectual capital theory, dynamic capabilities, and the Human Capability Standards (HCS), the paper shows how ROI² provides a practical framework for ensuring AI acts as a capability amplifier. Instead of displacing human effort, AI should be designed to preserve and strengthen the uniquely human capacities that drive adaptability, innovation, and ethical judgement.

The call to leadership is clear: stop asking “How much more can we produce?” and start asking “How much more intelligently can we think, decide, and adapt?” ROI will still indicate whether an organisation is profitable today, but ROI² reveals whether it is genuinely future ready.

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Introduction: Why ROI is No Longer Enough

For more than a century, **Return on Investment (ROI)** has served as the benchmark of organisational performance. Born in the industrial age, ROI rewarded efficiency through metrics such as units produced per hour, costs reduced, and waste eliminated.¹ This logic was well suited to economies based on physical capital and scale. However, in today's volatile, AI-driven economy, such a narrow lens no longer captures the true sources of value.

Contemporary advantage depends on **intangible assets**: human capabilities, adaptive capacity, knowledge flows, and the quality of relationships with customers, stakeholders, and communities.² Yet many organisations still apply industrial-era lenses. ROI remains grounded in cost-cutting and the exploitation of stable systems, rewarding automation and short-term gains while overlooking creativity, cultural alignment, and resilience.³ As Taleb (2012) observes, systems optimised for efficiency but stripped of resilience are fragile by design.⁴

The deployment of Artificial Intelligence (AI) amplifies this tension. Evaluated through an ROI mindset, AI is often measured by speed, cost savings, and headcount reduction. While these metrics demonstrate visible efficiencies, they conceal deeper risks: the outsourcing of core cognitive functions, the codification of situational expertise, and the erosion of tacit knowing.⁵ These are precisely the capabilities that sustain adaptability, problem-framing, and ethical judgement.⁶

This paper advances the case for **Return on Intelligence (ROI²)** as an essential evolution of the ROI concept. ROI² recognises that genuine return depends on two inseparable streams of intelligence:

Machine intelligence: the infrastructure and hidden costs of AI, including compute, inference, training, data preparation, and cybersecurity.

Human intelligence: the capabilities of people—including skills and innate attributes such as mindsets and behaviours—that shape their personal and collective capacity to fit a culture, perform, lead, adapt, learn, innovate, and be resilient.

Only when these streams are measured together can organisations assess not just outputs, but also their long-term competitiveness, adaptability, and relevance in markets where AI technologies are rapidly commoditised. The squared symbol in ROI² is deliberate: it shifts the focus from **investment as input** to **intelligence as input**, with “2” representing the fusion of machine and human intelligence

ROI² provides the new evaluative lens for productivity and performance. It captures the flows of intelligence—learning velocity, decision quality, resilience, cognitive diversity, and leadership behaviours—that determine whether organisations can adapt and thrive under complexity. Case illustrations from Australian rail, healthcare, PwC, banking, and retail show that efficiency alone is fragile, but when AI is used to amplify human capability, organisations become more resilient, innovative, and prepared for disruption.

Building on exploitation theory⁷, intellectual capital models⁸, and capability-based development⁹, ROI² shifts measurement from static, codified stocks of knowledge to the dynamic **flows of intelligence** that sustain competitiveness. Rather than focusing narrowly on short-term outputs, ROI² captures long-term adaptive capacity—how well organisations can learn, decide, and act under uncertainty.

Finally, the paper outlines how leaders can operationalise ROI² by embedding the Human Capability Standards (HCS) into AI deployment and aligning them with dynamic capabilities theory.¹⁰ In this

framing, AI is not a substitute for human effort but a **capability amplifier**, strengthening higher-order abilities such as critical thinking, collaboration, and adaptive judgement.

The central claim is clear: the future will not be won by those who automate the fastest, but by those who learn faster, adapt with purpose, and decide more intelligently. ROI may still indicate profitability today, but ROI² reveals whether an organisation is truly future ready.



The Erosion of Higher-Order Thinking in the Age of Persuasive Technology

The decline of higher-order human capabilities did not begin with AI. For more than a decade, digital systems and persuasive technologies have been shaping cognition in subtle but profound ways. Shoshana Zuboff's (2019) analysis of surveillance capitalism shows how platforms are designed not simply to meet user needs, but to engineer environments that capture attention, trigger predictable behaviours, and maximise engagement.¹¹ In doing so, they condition individuals into predominantly "fast-thinking" states—reactive, externally cued, and optimised for clicks—while under-activating the slower, reflective processes essential for adaptability and judgement.¹²

Repeated exposure to these architectures erodes critical capabilities:

- **Metacognition** – monitoring and regulating one's own thought processes.¹³
- **Critical reflection** – questioning assumptions, reframing problems, and considering alternatives.¹⁴
- **Adaptability** – shifting frames and adjusting behaviour in response to change.
- **Systems thinking** – perceiving complex interdependencies and anticipating long-range consequences.¹⁵

This cognitive shift is compounded by the industrial logic of codification. For much of the twentieth century, codifying expertise into repeatable processes enabled scaling and transfer. But in knowledge-rich, complex environments, codification strips away situational nuance and reduces opportunities to develop tacit knowing—the embodied, relational, and context-specific processes of acting, reflecting, and adapting that cannot be fully captured in rules or data.¹⁶

Tacit knowledge is not a hidden stock to be extracted, but a lived process:

- The nuanced judgement of a leader reading a negotiation room.
- The subtle adjustments of a clinician when patient cues contradict diagnostic data.
- The intuitive pattern recognition of an engineer diagnosing a system fault.

As opportunities for such experience diminish, so too does the development of the very capabilities that enable resilience in uncertain conditions.

While AI is now accelerating these dynamics, it is essential to recognise that the foundation for this erosion was laid by **non-AI digital systems** that:

1. Prioritised engagement over depth of thought.
2. Structured environments around short-term metrics rather than long-term capability.
3. Normalised reactive, fragmented attention over sustained, reflective cognition.

Recognising this pre-AI trajectory is critical. AI adoption does not occur in a cognitive vacuum; it inherits and amplifies these patterns. Unless leaders acknowledge the pre-existing erosion of higher-order thinking, AI deployment risks layering new efficiencies onto a weakened foundation—further hollowing out the human capabilities that underpin resilience and long-term organisational advantage.

The Intelligence Imbalance: From Tacit Erosion to Organisational Risk

When viewed through a traditional operational lens, AI-driven efficiency gains appear unequivocally positive—lower costs, faster processes, and consistent task execution. Yet this perspective conceals a more troubling shift: the progressive erosion of tacit, contextual human intelligence in favour of explicit, codified machine intelligence.

The Risks of Over-Codification

The industrial-era productivity mindset, still dominant in many organisations, privileges what can be counted, codified, and scaled.¹⁷ Explicit knowledge—procedures, datasets, and rules—fits neatly into this paradigm because it is portable, transferable, and readily automated. By contrast, *tacit knowing*, understood through Polanyi's¹⁸ insight and Schön's¹⁹ concept of *knowing-in-action*, is harder to formalise. That is because tacit knowledge is context-bound, relational, and acquired only through lived experience, reflection, and interaction. Precisely because it resists codification, tacit knowing becomes indispensable in complex or novel environments where rules and data are insufficient.²⁰

Reducing knowledge to what can be codified risks eroding the human processes of judgement, adaptation, and meaning-making that sustain long-term capability. This creates what can be called an **intelligence imbalance**: an overproduction of explicit, codified outputs alongside a slow depletion of tacit, relational, and adaptive capacities. The imbalance is not just cognitive, but strategic, leading to two interrelated organisational risks:

1. **Loss of applied learning** – Without regular engagement in novel problem-solving, individuals and teams miss opportunities to build both individual and collective cognitive capacity and adaptive mindsets.²¹
2. **Erosion of verification capacity** – over-reliance on algorithmic outputs dulls the instinct for critical reflection, bias detection, contextual reasoning, and ultimately, metacognition.²²

If organisations continue to focus on the mass production of answers without cultivating the capacity to frame questions, adapt mental models, and contextualise insights, they risk hollowing out the very capabilities that underpin competitiveness. This “industrialisation of intelligence” commodifies creativity and marginalises human agency.²³

The danger is amplified by algorithmic curation and persuasive system design. These not only shape the information individuals receive but also influence the *conditions of cognition*. Attention becomes fragmented, decision horizons shorten, and reflective practice declines. In such contexts, organisations risk producing faster answers but fewer original questions—an inversion of what is needed for resilience.²⁴

The Counterweight: Human Capability Standards

The Human Capability Standards (HCS) provide a counterweight.²⁵ It emphasises durable, transferable, non-technical capabilities—critical thinking, creativity, empathy, ethics, and adaptive mindset—that are foundational to long-term resilience. Aligning AI adoption to these standards ensures automation amplifies, rather than substitutes, human capacity for contextual understanding and ethical judgement.

In terms of ROI² the contrast is stark:

- **Old ROI Lens** – Fixates on short-term wins: faster throughput, lower costs, higher output, and visible boosts to the bottom line. Optimises for efficiency and standardised returns Providing a limited snapshot or scope on short term productivity and profitability.
- **ROI² Lens** – Evaluates the health, depth, and mobility of organisational intelligence, ensuring human and technological capacities evolve in tandem. Providing both a short and long term indicator of productivity, profitability, and capital growth.

Without reframing ROI, organisations and their leaders fall into what Taleb calls fragility by design—over-optimising for efficiency while eroding resilience.²⁴ They may process information faster than ever instable operating environments, but become brittle as they become progressively less able to interpret, question, and adapt in unfamiliar or high-stakes contexts.

By contrast, ROI² insists on measuring not only outputs but also the flows of intelligence that renew them. It recognises that cultural identity and resilience lies in the interplay between explicit and tacit knowledge, between human relationships and machine capacity. Without this interplay, organisations may appear more efficient on paper even as they become less capable in practice due to two profound risks:

- **Cultural hollowing** – as less visible rules and practices are stripped away, organisations lose the subtle, often invisible cues that bind collective sense-making, eroding trust and shared purpose.
- **Capability decay** – without sustained opportunities for critical reflection and adaptive challenge, higher-order capabilities atrophy.

Together, these risks create what we call the **intelligence imbalance**: an over-production of explicit, codified outputs coupled with a slow depletion of tacit, relational, and adaptive capacities. It is this imbalance that makes traditional ROI an increasingly misleading measure of organisational health.

To understand how this imbalance became entrenched, we must examine the industrial-era foundations of measurement itself—how organisations came to privilege stocks of output over flows of intelligence.

Case Study: Australian Rail Transport – When Tacit Knowledge Was Overlooked

In one Australian state, rail operations were increasingly standardised through automated monitoring systems and codified safety procedures. These systems tracked measurable indicators such as signal failures, train timings, and maintenance schedules. However, safety reviews revealed incidents that occurred not because procedures were absent, but because they excluded tacit operational knowledge held by frontline staff.

Experienced drivers, signallers, and platform staff had long recognised subtle situational cues—unusual vibrations, track noise, or shifts in passenger behaviour—that often preceded faults or human error. These cues were rarely documented and were invisible to dashboards and compliance registers. When responsibility shifted toward automated alerts, this tacit intelligence was marginalised. Near misses that once could have been prevented through lived expertise were instead missed, exposing systemic vulnerabilities.

The lesson is clear: codified systems may reduce some categories of error, but without embedding the tacit practices of frontline operators, both safety and resilience are compromised. Tacit knowing, developed through situated experience, remains indispensable in environments where the cost of failure is high and the unexpected is inevitable.

The Lesson

Organisations risk long-term fragility when they prioritise easily replicated, codified efficiency over the tacit knowing embedded in their cultural context. Persuasive technologies and AI accelerate this imbalance, eroding metacognition, reflection, and adaptive judgement—the very capabilities that sustain resilience. ROI² exposes this hidden risk by making the erosion of higher-order human intelligence visible and measurable. By protecting and amplifying tacit knowing alongside explicit knowledge, leaders can prevent capability loss and secure enduring advantage.

Measuring Intellectual Capital – Beyond Physical Productivity

For most of the last century, productivity was judged by the metrics that best served industrial production—units per hour, cost per unit, and output speed. In that world, efficiency meant winning by doing more with less, faster, and at scale.²⁶

Those measures were built for economies dominated by physical labour and linear processes. Today, advantage comes from assets that rarely appear on a balance sheet—trusted relationships, brand equity, data, intellectual property, and above all, the human capabilities that drive learning, adaptation, and innovation.²⁷

The Limits of the Old ROI Lens

The ROI mindset privileges what can be counted and codified: throughput, cost savings, and capital returns. While still useful for operational control, this narrow framing is dangerously incomplete in volatile, uncertain, complex, and ambiguous (VUCA) environments.²⁸ It rewards the exploitation of what is known while undervaluing the exploration and creative problem-solving required for long-term relevance.

March's (1991) distinction between exploitation and exploration is instructive.²⁹ Exploitation refines existing processes and delivers predictable returns; exploration invests in new knowledge, new capabilities, and new ways of working. Over-reliance on exploitation can produce strong short-term results but erodes adaptive capacity—what March described as the “self-destructive” neglect of exploration.

” neglect of exploration.

The Three Pools of Organisational Intelligence

Edvinsson and Malone's (1997) framework remains a powerful tool for reconceptualising measurement:³⁰

1. **Human Capital** – the knowledge, skills, and capabilities of individuals. Traditional measurement reduces people to explicit, job-related outputs, undervaluing capabilities such as systems thinking, reflection, and adaptive leadership.³¹
2. **Structural Capital** – systems, processes, and intellectual property. While codified knowledge dominates here, over-reliance risks stripping away tacit expertise that provides context and meaning.
3. **Relational or Social Capital** – The trust, networks, and collaborative know-how that enable joint problem-solving and innovation. These take years to build, can be lost quickly, and are crucial to long-term competitiveness.³²

The value of these forms of capital does not reside in their static stocks but in the flows of knowledge and intelligence: how they are renewed, mobilised, and recombined. Tacit knowing—embodied, relational, and behavioural—is the foundation of adaptive capacity, resilience, and long-term value creation.³³ When AI is assessed solely for its automation potential, it risks depleting tacit and relational capital, undermining the very capabilities that differentiate organisations in complex and fast-changing markets.

From Stocks to Flows of Intelligence

The ROI² lens moves beyond measuring static “stocks” of knowledge to tracking the flows that renew and expand them. These flows include:

- **Cognitive diversity** – The breadth of perspectives and problem-solving approaches within teams.
- **Tacit knowledge retention** – The preservation of embedded expertise during workforce change.
- **Adaptive cycle speed** – How quickly the organisation can detect change, reframe challenges, and execute new strategies.
- **Innovation resonance** – The extent to which new ideas emerge, spread, and translate into value.

Earlier analyses highlighted that the value of human, social, and structural capital is realised not in codified stocks but through mobilisation in context. Schön’s (1983) concept of knowing-in-action reinforces this: knowledge gains value through lived processes of reflection and adjustment.³⁴ These flows are most powerful when they cut across domains—human, social, and structural—rather than being measured in isolation.³⁵ Taken together, they show how capability value compounds over time.

Earlier analyses highlighted that the value of human, social, and structural capital is realised not in codified stocks but through mobilisation in context. Schön’s (1983) concept of knowing-in-action reinforces this: knowledge gains value through lived processes of reflection and adjustment. These flows are most powerful when they cut across domains—human, social, and structural—rather than being measured in isolation. These flows represent the **Human Dividend**—the compounding return generated when human capabilities are consistently developed and embedded in culture and workforce capacity.³⁶

The AI Measurement Imperative

AI magnifies the need for richer metrics. Automation of explicit tasks may register as productivity gains, yet it can quietly erode the cognitive, emotional, and relational capabilities that underpin long-term advantage.

As Brynjolfsson, Rock, and Syverson (2019) show in their analysis of the **productivity J-curve**, traditional measures systematically understate the value of intangible assets—human capital, tacit knowing, and organisational learning—that complement general-purpose technologies like AI.³⁷ In the short term, efficiency gains may appear modest or even negative. The deeper value only emerges over time, when investments in capability development, knowledge flows, and cultural adaptation begin to pay dividends

A ROI² framework reframes the key measurement questions:

- Does AI deepen the organisation’s embedded knowledge base (e.g., mobilisation and retention of tacit expertise during workforce transitions)?
- Does it expand the capacity for contextual reasoning and systems thinking (e.g., frequency of reflective learning practices, cross-functional problem-solving)?
- Does it strengthen the balance between tacit and explicit knowledge (e.g., proportion of work requiring human judgement versus automated outputs)?

A comparative framework (Table 1) contrasts traditional ROI measures with ROI² metrics, showing how the “human dividend” of AI can be captured in practice.

Table 1 ROI² Metrics

Domain	Traditional ROI focus	ROI ² metrics (post-2020 research)
Relational/ Social Capital ³⁸	Headcount, network size, tenure	• Trust density (within and across teams) • Reciprocity and collaborative norms • Mobilisation capacity – speed at which networks are activated to solve novel problems
Human Capability/ Capital ³⁹	Training spend, turnover, job roles, employee satisfaction, capability recognition	• Learning access and equity of opportunity • Psychological safety and inclusion • Fair treatment and wellbeing
Structural / Hybrid (Human–Machine) ⁴⁰	Cost savings from automation, process efficiency, reduced waste/ defects	• Workforce resilience and agility (redeployment capacity) • Trust and transparency indices (ethical leadership, credible communication) • Effectiveness of human–machine collaboration (augmentation vs substitution)
Cognitive & *Adaptive Flows	Output per hour, efficiency ratios, absorptive capacity, latent potential, cognitive diversity	• Learning velocity (rate of acquiring and applying new knowledge) • Decision quality (robustness and contextual appropriateness) • Adaptive cycle speed (capacity to sense, reframe, and respond)

As Woolcock⁴¹ and Portes⁴² long argued about social capital, value does not reside in the stock of what a workforce can do or relationships but in the capacity to mobilise and utilise them. The same principle applies to organisational intelligence: its effectiveness lies not in codified assets but in tacit knowing expressed through human capability.

Without this lens, ROI may signal that we are “winning,” while ROI² reveals we are quietly losing the race that matters most. Framing knowledge not as static stocks but as knowing-in-action reframes measurement itself: it shifts attention from counting codified assets to valuing the dynamic flows of capability that enable organisations to adapt, innovate, and sustain resilience.

Case Study: Australian Healthcare – When Dashboards Missed What Nurses Knew

An Australian state hospital network invested heavily in digitising patient monitoring, introducing dashboards that tracked dozens of indicators—blood pressure, oxygen saturation, fluid levels—in real time. The system was designed to reduce errors by standardising reporting and escalating alerts automatically. By traditional ROI metrics, the initiative looked successful: improved reporting compliance, faster data entry, and measurable reductions in administrative cost.

Yet staff reported a different reality. Experienced nurses noticed subtle changes in patient demeanour—fatigue in speech, unusual restlessness, or skin tone shifts—that were not captured by dashboards. In several cases, deterioration was missed because the system recorded values as “within range,” even when tacit judgement suggested otherwise. Post-incident reviews showed that the codified system displaced tacit knowing: staff had learned to rely on dashboards rather than their own situated expertise.

Hospitals that adopted a hybrid model—embedding tacit observations into escalation protocols and creating spaces for reflective debriefing—avoided similar failures. Here, the flow of tacit knowledge across human, social, and structural capital made the difference. The lesson was clear: ROI captured efficiency; ROI² revealed resilience.

The Lesson

Traditional ROI metrics focus on visible outputs like cost and throughput, but real value now comes from intangible assets—human, structural, and relational capital. ROI² reframes measurement from static stocks to dynamic flows of intelligence, capturing how capabilities are mobilised and renewed. Without this lens, organisations risk mistaking short-term efficiency for long-term competitiveness.

From ROI to ROI²: Reframing Productivity and Value

In the twenty-first century, disruption is constant. Competitive advantage depends less on efficiency and more on adaptability—doing the right things under shifting conditions. Static gains in efficiency are no longer sufficient when competitors, technologies, and markets are in continuous flux.

James March's (1991) seminal distinction between **exploitation** and **exploration** highlights this challenge.⁴³ Exploitation refines existing processes and delivers predictable returns; exploration invests in new knowledge, new capabilities, and new ways of working. Over-optimising for exploitation can yield strong short-term results but undermines adaptive capacity—a “self-destructive” neglect of exploration. This insight is foundational to ROI², which rebalances organisational metrics to value experimentation, capability development, and resilience alongside operational efficiency

Case Study: PwC Australia – Shifting Entry-Level Hiring in the Age of AI

PwC, one of Australia's largest graduate employers, has reoriented its hiring practices in response to AI. Rather than focusing primarily on technical qualifications, it now screens candidates for capabilities such as curiosity, collaboration, emotional intelligence, and ethical judgement. As Chief People Officer Karen Lonergan explained, *“AI is better at facts and figures—but humans must get better at what we call the human skills of creating context, fine judgement, ethical considerations, building trust, and critical thinking. That’s why it’s critical there’s a human in the loop.”*¹

This shift reflects recognition that automation threatens the traditional graduate “career ladder.” Entry-level auditing and analysis roles—once critical training grounds—are increasingly absorbed by AI tools. Instead of cutting pipelines altogether, PwC has reconfigured recruitment through collaborative assessment centres and micro-credential pathways that continuously upskill staff for hybrid AI–human roles.

The implications for ROI² are significant. Eliminating entry-level roles would appear as a short-term ROI gain but would erode learning velocity, tacit knowing transfer, and leadership pipelines. By reframing hiring around human capabilities, PwC signals that adaptability and resilience—not just efficiency—will define its future workforce.

The AI Case Study: Old ROI vs ROI²:

AI illustrates this trade-off clearly. Under an “old ROI” lens, investments in AI are judged on:

- Cost savings from automation.
- Increased process speed and throughput.
- Reduction in headcount or resource use.

While relevant, these measures reward the outsourcing of core cognitive functions, accelerating the erosion of tacit knowing. Over time, this diminishes the very human capacities—judgement, reflection, contextual reasoning—that underpin resilience and originality.

By contrast, ROI² proposes richer metrics that capture adaptive capacity and regenerative potential, including:

- **Learning velocity** – The speed and effectiveness with which new knowledge is acquired, shared, and integrated into action.
- **Decision quality** – The robustness and contextual appropriateness of decisions, not just their speed.
- **Resilience** – The ability to absorb shocks, recover quickly, and adapt to emerging conditions.
- **Cognitive diversity** – The variety of perspectives and problem-solving approaches in decision-making processes.
- **Leader behaviours and habits**– the extent to which leaders role-model reflective practice, ethical judgement, and adaptive mindset, reinforcing that situated knowing is recognised and valued within the organisation.⁴⁴

From Productivity Metrics to Capability Metrics

Traditional ROI asks: Did we produce more, faster, and cheaper?

ROI² asks: Did we strengthen our ability to learn, adapt, and decide under uncertainty?

Traditional productivity measures fail to capture the intangible, non-rivalrous value created by digital systems.⁴⁵ Economists describe this as the **productivity J-curve**⁴⁶: new technologies often appear to deliver modest or negative returns at first because the intangible investments that make them productive—human capability, tacit knowing, and cultural adaptation—are invisible to conventional metrics. The deeper dividend emerges later, through amplification of collective intelligence and acceleration of innovation cycles.

This is where ROI² reframes the measurement lens: from counting visible outputs of labour and capital to assessing the quality, resilience, and adaptability of the capabilities that produce them.

In a NextGen economy—where more than one-third of emerging roles lack formal qualification pathways—capabilities become the currency of workforce planning. Organisations that adopt ROI² can:

- Identify hidden workforce potential.
- Mobilise talent across roles and functions without waiting for reskilling pipelines.
- Preserve relational and tacit capital that AI alone cannot replicate.
- Anchor AI adoption in augmentation, ensuring human intelligence is amplified rather than displaced.

By embedding capability metrics into ROI², leaders can track learning velocity, decision quality, innovation resonance, and adaptive cycle speed alongside operational efficiency. This represents a fundamental shift: from measuring what is produced now to assessing the capacity to continue producing, adapting, and creating value into the future.

In short, the shift from ROI to ROI² represents a paradigm change. Organisations that thrive in an AI-rich future will not simply produce more, faster. They will learn faster, adapt better, and think more deeply than competitors—amplifying human capability and leader behaviours rather than eroding them.

Case Study: Australian Banking – ROI vs ROI²

In 2019, an Australian bank deployed AI-driven chatbots to automate frontline customer service. ROI metrics indicated success: faster response times, reduced staffing costs, and increased query throughput. Yet deeper analysis revealed fragility. Customer trust scores declined as chatbots mishandled complex cases. Staff lost opportunities to exercise tacit judgement, eroding their problem-solving depth.

By contrast, a competitor implemented a **human-in-the-loop model**. Routine queries were triaged by bots, but ambiguous cases were escalated to staff, who then used reflective debriefs to strengthen tacit expertise. The result: customer satisfaction rose, and the bank's workforce built adaptive capabilities. Both banks achieved ROI; only one enhanced its ROI².

The Lesson

Efficiency alone no longer guarantees advantage. ROI² shifts the focus from cost savings and speed to adaptability, innovation, relationships, decision quality, and resilience. By valuing learning velocity, cognitive diversity, and leadership behaviours, ROI² ensures organisations can navigate disruption. Those that invest only in automation risk hollowing out adaptive capacity; those that amplify human intelligence will thrive.

Designing for AI Augmentation

Breaking the cycle of tacit erosion requires designing AI not to replace human capability but to grow and amplify it. ROI² reframes evaluation so that operational metrics—cost, speed, and throughput—are considered alongside indicators of intelligence uplift.

Key design principles include:

- **Human-in-the-loop reasoning** – AI should support, not supplant, human sense-making and contextual judgement.
- **Context-rich outputs** – AI systems must make their reasoning transparent, enabling metacognitive engagement rather than blind acceptance.
- **Scenario diversity** – workflows should include ambiguous and exception-rich cases to keep adaptive reasoning sharp.
- **Capability-focused metrics** – evaluation should track impacts on decision quality, learning velocity, and adaptive cycle speed—not just operational KPIs.

Embedding Human Capability Standards (HCS) in AI Deployment

The **Human Capability Standards (HCS)** provide a framework for ensuring AI strengthens, rather than substitutes, higher-order human capacities. By embedding durable capabilities—such as critical thinking, adaptability, collaboration, and ethical judgement—into AI adoption strategies, leaders can:

- Preserve the tacit–explicit balance.
- Ensure AI outputs remain grounded in human contextual understanding.
- Build organisational intelligence that grows more resilient with each iteration.

Viewed through ROI², AI becomes more than a productivity tool: it becomes a **capability amplifier**. The central question shifts from “*What can AI automate?*” to “*How can AI help humans think better, adapt faster, and act with deeper contextual awareness?*”

The Role of Leaders as Modellers of Situated Knowing

Leadership behaviours are pivotal in this shift. Leaders who demonstrate reflective practice, situational awareness, and ethical judgement send a strong cultural signal that tacit knowing is not peripheral but central to organisational success. By engaging openly with AI outputs—questioning assumptions, reframing problems, and involving teams in sense-making—they legitimise the value of situated expertise.

In this way, leadership behaviours become the cultural mechanism that sustains tacit flows. They ensure AI is embedded in ways that reinforce, rather than erode, collective intelligence.

Successful AI Augmentation

Designing for AI augmentation is not simply a technical challenge. It requires embedding frameworks such as the HCS, which standardise without constraining the situated development of skills and mindsets; cultivating leadership behaviours that legitimise tacit knowing; and building evaluation systems that privilege flows of intelligence. To make this practical, organisations must connect the **micro-level of human capability** with the **macro-level of organisational agility**. Dynamic capabilities provide this bridge, showing how individual behaviours and collective intelligence translate into system-wide adaptability.

Case Study: NSW Health – Leaders in Hybrid Decision-Making

During the COVID-19 response, NSW Health invested heavily in predictive dashboards to forecast case numbers, ICU demand, and supply chain needs. While these systems provided vital data, leaders quickly recognised that they could not capture all contingencies—especially localised outbreaks or behavioural shifts in communities.

Senior leaders adopted a hybrid approach. They treated AI outputs as inputs to deliberation, not as deterministic forecasts. In daily briefings, leaders explicitly invited clinical staff to add tacit observations from the frontline—subtle patterns in patient presentations, cultural factors shaping compliance, or emerging bottlenecks. This practice not only improved decision quality but also reinforced the legitimacy of situated expertise. Staff reported greater confidence in contributing, knowing their contextual knowledge mattered alongside data models.

In this case, leadership behaviours determined the outcome: AI was not a narrow efficiency tool, but an **amplifier of collective intelligence**.

The Lesson

To truly enhance human capability, AI should serve as an enabler rather than a replacement. Achieving real returns on AI investment (ROI²) depends on leaders embedding Human Capability Standards, modelling key behaviours, and nurturing habits of reflection. This approach ensures technology amplifies critical strengths—such as analytical reasoning, strategic vision, adaptability, and ethical judgement—vital for effective AI integration. By measuring improvements in these human capabilities alongside efficiency gains, organisations allow AI to raise future readiness and collective intelligence, instead of introducing new vulnerabilities.

Bridging Dynamic Capabilities and Human Capability Standards

Dynamic capabilities theory holds that sustainable competitive advantage comes not from static resources, but from an organisation's ability to sense emerging opportunities and threats, seize them through timely action, and reconfigure resources to adapt to change.⁴⁷ In practice, these capabilities operate at the intersection of technology, processes, and—critically—human judgement

While dynamic capabilities provide a powerful organisational-level lens, they can remain abstract without a human-level capability framework that makes them measurable, developable, and transferable. This is where the Human Capability Standards (HCS) provide a complementary foundation.⁴⁸

The HCS distils durable, transferable, non-technical human abilities—such as critical thinking and judgement, adaptive mindset, collaboration, systems thinking, and innovation—into observable behaviours and proficiency levels. Each is anchored by three universal dimensions.

- **Autonomy** – the ability to self-direct and take responsibility.
- **Influence** – the ability to shape decisions, behaviours, and outcomes.
- **Complexity** – the ability to operate effectively across increasingly ambiguous contexts.

By mapping HCS capabilities directly to the three pillars of dynamic capabilities, we create a bridge between where AI deployment strengthens micro-level, short term performance and augmenting human capabilities builds the organisational-level capacity required for long-term success.

Aligning the Macro and the Micro

Dynamic capabilities at the organisational level are only as strong as the collective human capabilities within the system. For example:

- **Sensing** requires individuals who can engage in systems analysis—critical thinking and data-driven problem solving—to challenge assumptions, plot the consequences of decisions, and scan the environment to anticipate opportunities or challenges.
- **Seizing** depends on *adaptive mindsets*, *innovating*, and leading in a way that can mobilise people across functions and networks.
- **Reconfiguring** draws on *critical thinking*, *empathy*, and *ethical judgement*, as well as the communication and collaborative capacity to reframe problems and co-create new solutions under uncertainty.

Why This Matters for ROI²

A purely technological or structural investment in dynamic capabilities can fail if the human capability base is eroded. As the previous section argued, AI that replaces rather than augments higher-order thinking diminishes the very human capacities required for sensing, seizing, and reconfiguring. The ROI² lens ensures that capability erosion is visible and that augmentation—not substitution—is prioritised.

From a measurement standpoint, integrating dynamic capabilities with HCS allows leaders to:

- Track human capability growth alongside organisational agility.
- Identify capability bottlenecks that constrain sensing, seizing, or reconfiguring.
- Align AI adoption strategies with the development of durable, transferable capabilities rather than just task efficiency.

In doing so, this bridge between dynamic capabilities and HCS transforms abstract strategy into actionable workforce development priorities—ensuring that the AI-rich organisation remains not only faster, but also smarter and more adaptable than its competitors.

The conclusion draws this together as a call to leaders: to recognise that the real race is not about automation speed, but about renewing intelligence in context, and amplifying the human capacities that machines cannot replace.

Case Study: Australian Retail – Sensing and Seizing in Practice

During the COVID-19 pandemic, a major Australian retailer faced severe supply chain shocks. Under a traditional ROI lens, the rational response would have been to reduce costs and minimise inventory to protect short-term margins. However, leaders instead applied a **dynamic capabilities** perspective, focusing on sensing early signals of disruption in global shipping and seizing opportunities to diversify suppliers.

Crucially, they engaged store managers in this process. These frontline leaders contributed tacit knowing of local demand patterns and customer behaviours, which enabled more resilient reconfiguration of distribution networks. What appeared inefficient under old ROI logic—maintaining redundant suppliers and investing in localised logistics—proved to be a source of adaptability and resilience when disruption intensified.

By embedding **HCS-aligned behaviours** such as collaboration, critical thinking, and adaptive mindset into decision-making, the organisation transformed potential fragility into strategic agility. Through the ROI² lens, the outcome was not simply operational continuity but the preservation of long-term capability: sustaining supply resilience, protecting customer trust, and reinforcing the workforce's capacity to sense, seize, and reconfigure in uncertain conditions.

The Lesson

Dynamic capabilities provide the organisational blueprint—sensing, seizing, and reconfiguring—while the Human Capability Standards supply the micro-level architecture that makes these capabilities observable and measurable. ROI² links the two, ensuring AI strengthens, rather than erodes, the human foundations of adaptability. This integration turns abstract strategy into actionable workforce priorities, confirming ROI² as the missing metric in the productivity equation.

Conclusion: Winning the Right Race

The argument for **Return on Intelligence (ROI²)** is, at its heart, an argument about what we choose to value. For more than a century, organisations have measured progress through the industrial logic of **Return on Investment (ROI)**—a mindset born in an era when efficiency, scale, and cost reduction were the levers of advantage. That logic once made sense. But today, it fuels the **industrialisation of intelligence**: reducing human capability to codified routines, stripping away judgement, and hollowing out the tacit knowing on which cohesion and resilience depend.

AI exposes the fault lines in this outdated model. Deployed under an “old ROI” lens, it promises rapid efficiency gains but accelerates the erosion of higher-order human intelligence. In doing so, it delivers short-term returns while undermining the very capacities—critical thinking, collaboration, empathy, and adaptability—that determine long-term survival.

ROI² offers a different path. It reframes productivity not as *more of the same* but as *better thinking, better adaptation, and better choices*. It calls for measurement systems that capture learning velocity, decision quality, resilience, and cognitive diversity alongside operational efficiency.

Linking dynamic capabilities theory with the Human Capability Standards (HCS) provides a practical way forward. Dynamic capabilities supply the strategic blueprint—sensing, seizing, and reconfiguring—while the HCS define the human capability architecture that makes these capacities measurable across all levels of work and learning. Together, they ensure that AI adoption is judged not by efficiency alone, but by the intelligence uplift it creates across the system.

The stakes are clear. Left unchecked, the industrialisation of intelligence will strip organisations of the tacit knowing and human distinctiveness that drive relevance. ROI² insists that we measure—and protect—the slow-built, hard-to-replace human capabilities that underpin adaptability, trust, and long-term value. Over time, it is these flows of capability that generate the **Human Dividend**: the compounding return on human potential that no machine can replicate.

This paper argues that ROI² is the **missing metric in the productivity debate**. Just as behavioural economics reframed rationality to show that intangibles had hard economic effects, ROI² reframes productivity to recognise the economic value of human capabilities. In the end, ROI may still tell us whether we are profitable today. But ROI² tells us whether we are future-ready. Those who understand this distinction will not merely survive disruption—they will shape it, and more often than not, define the terms of the race.



End Notes

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