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New technologies and the learning organisation:

Why the learning capacity of organisations decides what technology delivers

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The skills nexus between productivity and job quality
30 June 2026, CEDEFOP

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The paradox we start from

Technology is accelerating. Outcomes are not.

- **Digitalisation is surging**, backed by unprecedented money: InvestAI (€200bn mobilised), France 2030 (€54bn), national Industry 4.0 plans across the EU
- **Productivity tells no success story**: EU labour productivity per hour rose just 0.9% (2019-24) vs. 6.7% in the US (ECB); economists debate the size of the gap (Aghion et al. vs. Krugman, 2026), but agree the slowdown is structural — TFP growth has been declining since before 2008, and more capital/technology isn't fixing it
- **Job quality outcomes are mixed at best**: work intensity worsening for women; new digitalisation-linked risks (prolonged sitting, blurred work/life boundaries, algorithmic management already monitoring 1 in 3 workers in finance); and workers' ability to apply their own ideas at work declining since 2005 (Eurofound EWCS 2024)
- **Industrial policy doubles down regardless**: it overwhelmingly funds technology adoption (fixed capital, R&D), while support for labour and training stays, in the OECD's own words, "less common" (OECD QuIS, 2026)

If technology alone isn't delivering, more technology subsidies won't fix it

BRIDGES 5.0's central argument

- The dominant Industry 5.0 narrative, including the EU Commission's own framing, treats **human-centric** as an **engineering** question:

  → humans are good at certain cognitive tasks, so good technology design mobilises rather than replaces them

- That definition still treats people as a kind of technology, valued for what their brains contribute to the firm

- We ask a different question:

  → can organisational practices deliver Industry 5.0 outcomes?

- Our answer: the decisive variable is not **which technologies** firms adopt, **but whether firms have the organisational capacity to learn alongside them**

- We call this the **Learning Capacity of Organisations (LCO)**

From Industry 4.0 to Industry 5.0: what is actually new

- **Industry 4.0** = automation-centred
- **Industry 5.0** proposes to reconcile technology and the human, subordinating technology adoption to unlocking human potential, not the reverse
- The EU vision is explicit: digital transformation left unchecked **risks sacrificing strategic autonomy, human flourishing and the environment** for efficiency alone
- This is why **common good** is the right test: the question is not just “does the firm produce more?”, it is “does increased production serve workers, society, the planet?”
- **That is the bar our framework is built to test, not assume**

Introducing the Learning Capacity of Organisations

The Learning Capacity of the Organisation is its systemic ability to adapt and remain competitive through continuous learning
(Greenan & Lorenz, 2010; Greenan & Napolitano, 2024)

It is rooted in **three building blocks**:

- Management practices
- Work organisation principles
- Human resource policies

Together, these establish **dynamic routines** that:

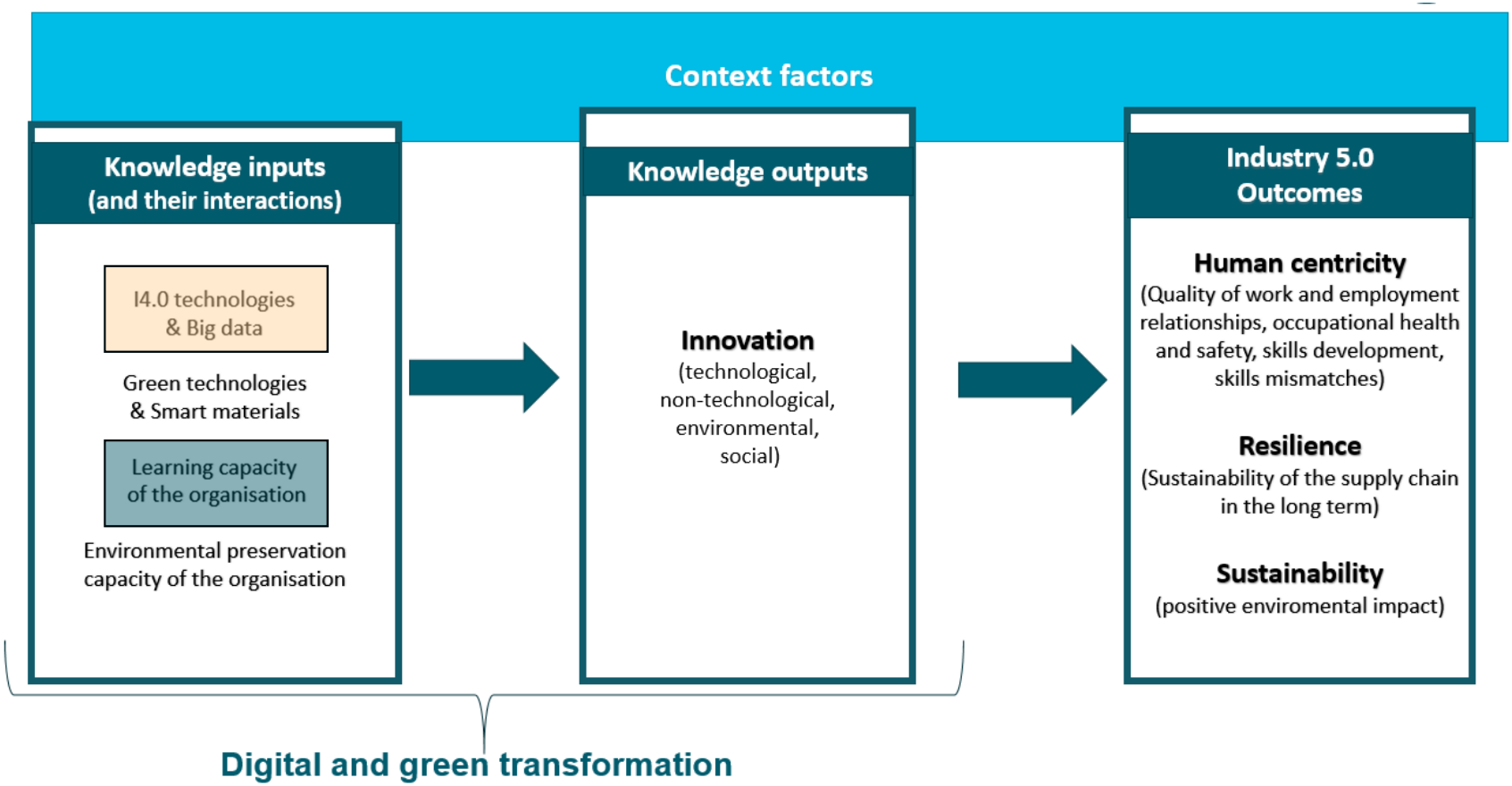
- Facilitate circular knowledge flows between workers and across the organisation
- Support workers' skill development and flourishing
- Empower workers to exercise autonomy and engage in innovative work behaviour

The eight dimensions of the LCO

Circular knowledge flows	
Cognitive dimension of work	solving unforeseen problems, complex tasks, learning new things
Social support	colleagues and management help and support
Supportive supervision	feedback, respect, conflict resolution
Skill development & flourishing	
Training opportunities	on-the-job training, employer-provided training
Organisational motivation	workers agree the organisation motivates them
Autonomy & innovative work behaviour	
Cognitive autonomy	assessing own work quality, applying own ideas
Autonomous teamwork	team decides task division, leadership, timetable
Direct participation	influence over partners, targets, processes, decisions

Composite indicator, normalised sum of the 8 dimensions · Cronbach's α = 0.80, measured using EWCS (Eurofound) and ECS (Eurofound and Cedefop)

The theoretical framework



The EU-wide evidence base about the technological transformation

- Unique combined dataset built at the country–sector–year level ("common cell")
- Three sources, integrated for the measurement of the technological transformation: **CIS** (innovation outputs, Eurostat), **ICT usage survey** (digital technology adoption, Eurostat), **EWCS** (Learning Capacity, Eurofound)
- Coverage: EU27 + 5 non-EU countries, 11 sectors, 3 time windows, 2010–2016
- Careful time path design, estimation with Structural Equation Modelling, mediation analysis

LCO is a powerful, distinct driver of innovation

Greenan & Napolitano, Industrial and Corporate Change, 2024

- LCO significantly drives all four types of innovation: product, process, organisational, marketing
- Its effect is strongest on organisational innovation:
  a 1-point rise in LCO → +0.32 percentage points in the share of organisationally innovative firms
- It also drives the most advanced, complex form of innovation combining technological and non-technological innovation: +0.20pp
- Crucially: this holds even after controlling for R&D and digital technology, LCO truly adds new information, it's not just a proxy for something else

Technology and LCO are complements, not substitutes

- Digital technology adoption alone matters most for product innovation (+0.26pp) and marketing innovation (+0.14pp), but loses significance for organisational innovation once LCO is in the model
- The interaction between LCO and digital technology adoption is significant and positive for product and process innovation
- Hence: investing in technology pays off more when the organisation can learn alongside it, and investing in learning capacity pays off more when technology is also being adopted

Not a one-off: the same pattern, four times over

Same model — knowledge inputs → innovation → outcome — estimated on **three EU-wide datasets**, each with a different outcome:

- ECS–ESJS: skills matching (Curci, Greenan & Napolitano, WP Cedefop 2026)
- ECS–LFS: working time flexibiliy (Greenan & Napolitano, ROPE, 2025)
- CIS–CICT–EWCS–LFS: unemployment & polarisation (Curci, Greenan & Napolitano, forthcoming)

Same pattern, for innovation, and for outcomes:

- LCO → **direct** effect on outcomes
- Digital technology → effect almost **fully mediated** through innovation
- The sign depends on which innovation: product innovation helps workers, marketing innovation works against them
- **And it holds at firm level**: ongoing analyses on representative samples in France, the Netherlands, Italy and Norway point the same way

The uncomfortable finding

- Between 2010 and 2016: **digital technology adoption rose steadily and sharply** across every European region
- Over the same period: the **Learning Capacity of the Organisation stagnated**, and in some regions, slightly declined
- This is not a technology problem. It's an organisational one.
- The bottleneck to realising Industry 5.0 outcomes is not technological capacity, it is **organisational inertia**

Enter AI: same fallacy, higher stakes

- The dominant approach to AI and jobs measures **exposure**, what a system could technically do to a task
- But exposure is not destiny: it is a potential, mediated by organisational choices
- Acemoglu et al. (2026) make this vivid: two tools for service workers "**Empowerment Companion**" and "**Amazon Flex**" run on near-identical architectures but produce opposite effects on worker autonomy
- Their own conclusion: "*the difference between these tools is a matter of intention rather than technology*"
- Same lesson as the technology–innovation story, just sharper: the technology doesn't decide. The organisation does.

AI does not just need the right conditions, it tests LCO, level by level

Level of LCO	What it depends on	What AI specifically puts at risk
Individual work situations	Cognitive dimension of work, cognitive autonomy, training opportunities	**Over-reliance & cognitive dispossession:** skills atrophy when judgment is routinely outsourced to the system
Collective work	Autonomous teamwork, social support, cooperative supervisory style	**Algorithmic management:** systematically documented to erode collective autonomy and professional dialogue
Organisational level	Direct participation, organisational motivation	**Deployment decisions made top-down**, bypassing worker participation altogether

When LCO is high at a given level, workers keep the capacity to detect the system's errors and exercise professional judgment. When it's eroded, they do not
So, this is not "AI used badly" as an abstract risk, it is AI eroding the very capacity that would let an organisation use it well

Why supporting LCO matters more than ever

- **AI must serve organisational learning, not bypass it.** The question is not whether firms adopt AI, it is whether deployment strengthens or hollows out each of the three levels of LCO
- **Four interconnected levers**: social dialogue before deployment choices are locked in; *in-situ* experimentation rather than big-bang rollout; participatory project design that mobilises workers' expertise on work performance; direct, sustained investment across all three levels of LCO
- **The urgency is structural, not just technological**: at the very moment AI deployment needs stronger guardrails, the post-Draghi competitiveness push is loosening the competition and regulatory guardrails that could otherwise tilt this choice toward the pro-worker path
- **Policy implication**: technology subsidies without a learning-capacity requirement buy technology adoption, not Industry 5.0 outcomes, and that gap is likely to widen rather than narrow

From the common good to two policy instruments

- Coming back to the common good test: technology adoption alone doesn't pass it, only organisations with the capacity to learn alongside AI can turn it into outcomes that serve workers, not just firms. This translate into two concrete policy openings:
- → **Quality Jobs Roadmap / Act**: the four levers aren't just findings, they're a ready-made recommendation; social dialogue before deployment, *in-situ* experimentation, participatory design, and sustained LCO investment are conditions for a "quality job" transition.
- → **Algorithmic Management Act**: The urgency point is precisely the AMA's terrain. The EU's simplification agenda is reducing the regulatory space for social dialogue at the very moment AI deployment needs it most. the AMA is the instrument that can re-impose what is currently being narrowed.

Thank you for your attention!

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