

Structural barriers to women in ICT as a direct impediment to competitiveness

Why do so few women progress into leadership roles, despite outperforming male counterparts?

This paper is part of the Digital Skills & Jobs Platform's 2026 Digital Briefs series – a set of deep-dives on key topics in the area of digital skills and technology, produced by some of Europe's leading experts in the field.



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Summary

Europe is short of Information and Communication Technology (ICT) specialists, and that shortage has essentially become a competitiveness problem: based on current progress, the EU will reach around 12 million of its 20-million target for 2030, just as the adoption of Artificial Intelligence (AI) pushes demand for digital skills even higher. Meanwhile women, who already match or outperform men on several digital education indicators, make up under a fifth of the ICT workforce, and an even smaller share of its leadership. That is not simply an equity gap. Research on corporate performance consistently ties more gender-diverse leadership teams to stronger financial and innovation outcomes, which makes the leadership gap part of the competitiveness problem, not a separate item next to it. This Digital Brief sets out the structural barriers behind that gap, including **biased performance evaluation, uneven access to high-visibility projects and senior sponsorship, and gendered assumptions about what technical leadership looks like. It argues that one missing piece of EU labour-market data – who actually gets promoted into first-line ICT management, and at what point women's careers tend to stall – would make these barriers far easier to see, target and fix.** Two European initiatives already underway show what addressing this gap looks like in practice, and the Brief closes with a specific, testable proposal tied to EU policy instruments due in 2026.

Keywords

women in ICT, leadership progression, gender equality, digital competitiveness, talent shortage

About the author

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A shortage Europe cannot afford, and a talent pool it is not using

Europe does not have enough people to run its own digital economy. The EU employed around 10.5 million ICT specialists in 2025, roughly half of the Digital Decade's target of 20 million by 2030, and current trends put the workforce closer to 12 million by that date – a shortfall of some 7 to 8 million ([European Commission, 2026b](#)). The Commission's own 2026 State of the Digital Decade report names this skills gap a structural risk to EU competitiveness, and AI adoption is only sharpening it, pushing demand for advanced digital skills beyond the ICT sector itself into healthcare, manufacturing, logistics and public administration.

At the same time, fewer than one in five ICT specialists in the EU is a woman, a share that has barely shifted in a decade, even though women now match or outperform men on several digital education indicators ([European Commission, 2026b](#)). Put simply, Europe is short of digital talent and is failing to make full use of a large pool of qualified people already there.

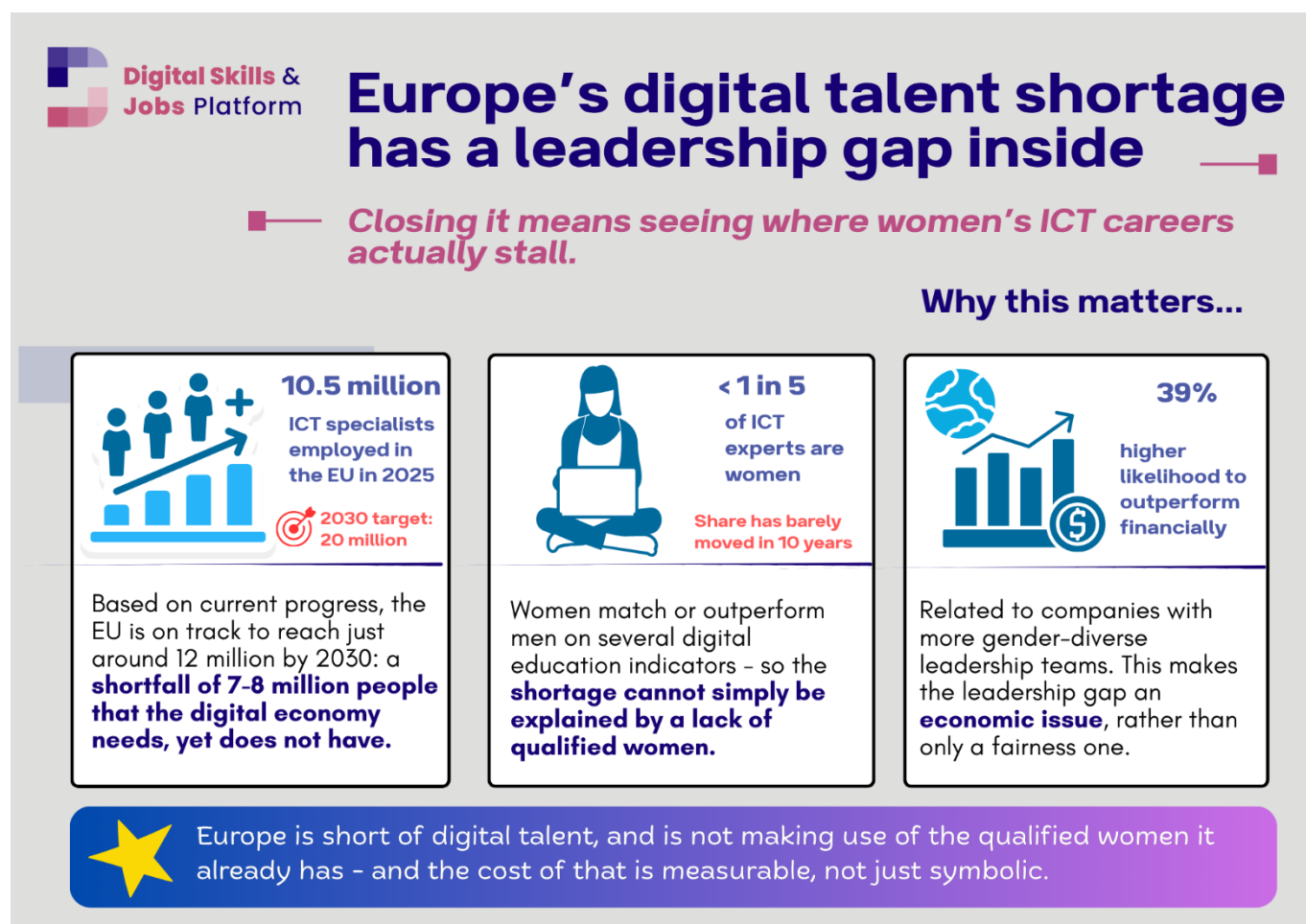


Figure 1. Europe's digital talent shortage - leadership gap

The scale of that underuse matters beyond headcount. McKinsey's long-running analysis of executive teams finds that companies in the top quartile for gender diversity in leadership are 39% more likely to outperform financially

than those in the bottom quartile – up from 15% when McKinsey first measured this in 2015, so the gap has more than doubled over the past decade ([McKinsey & Company, 2023](#)). Diverse leadership teams are also linked to stronger innovation outcomes, which matters in a sector, whose product is – increasingly – the technology that shapes how every other sector operates. None of this says that any individual woman is more capable than any individual man; it says something about what happens in aggregate when a sector's leadership draws on a narrower slice of the workforce's actual talent pool. A persistent leadership gap, then, is not a separate equity issue sitting next to Europe's competitiveness problem: it is one of the things driving it.

Much of the current policy debate still assumes the main challenge is attracting more girls and women into ICT in the first place. Practitioners closer to employers increasingly point to a different concern: what happens *after* entry.

What the evidence already shows

Before turning to what is missing from EU data, it is worth setting out what the existing research already shows clearly. None of the four mechanisms below is seriously disputed in the literature on women's career progression. What is missing is EU-level data on how strongly each one operates in ICT specifically, and at which career stage.

Performance evaluation bias is probably the best documented of the four. Where evaluation criteria are loosely defined, especially around '*leadership potential*' or '*readiness for management*', research across sectors repeatedly finds that assessors credit men's performance to ability and women's performance to context or team effort. The pattern compounds over repeated review cycles even when no single decision looks unfair on its own, and it matters more in ICT than in fields where promotion depends on a fixed credential, because a first technical management role is so often decided on exactly this kind of subjective judgement.

A second barrier sits in who gets access to high-visibility, strategically important projects. Promotion into management is rarely decided on technical competence alone. It depends heavily on whether someone has been seen leading work that matters to the organisation, and that kind of work is allocated informally, through manager discretion and existing networks rather than open competition. Where that allocation already skews towards men, whether through habit, risk tolerance or simple familiarity, the resulting promotion gap can look meritocratic while actually reflecting unequal access to the opportunities that build a promotable track record in the first place.

Sponsorship, which is different from mentorship, is a third mechanism with a strong evidence base of its own. Mentors give advice; sponsors spend their own organisational capital advocating for a specific person, often in rooms that person is not in. Because sponsorship relationships tend to form along lines of similarity, including gender, women in a technical pipeline that is already disproportionately male are structurally less likely to find the kind of senior advocate whose support most directly converts into a promotion decision.

The fourth barrier is more specific to ICT than the other three. Research on technical credibility and leadership perception documents a persistent association between '*looking like a leader*' in engineering-heavy environments and displaying traits – technical assertiveness, comfort with risk, a certain register of confidence under technical scrutiny – that are themselves culturally coded as masculine. Women are not lacking these traits; rather, evaluators' instinctive sense of who '*seems ready*' for technical management is shaped by a narrower template than the actual range of effective leadership styles, and that template is harder to shift in fast-moving technical fields where credibility gets judged informally and quickly.

Each of these four mechanisms is independently well evidenced. None of them currently has occupation-level EU data showing how strongly it operates specifically in the move into ICT management, as distinct from management in general. That gap – not the existence of the barriers themselves – is what this Brief is trying to add.

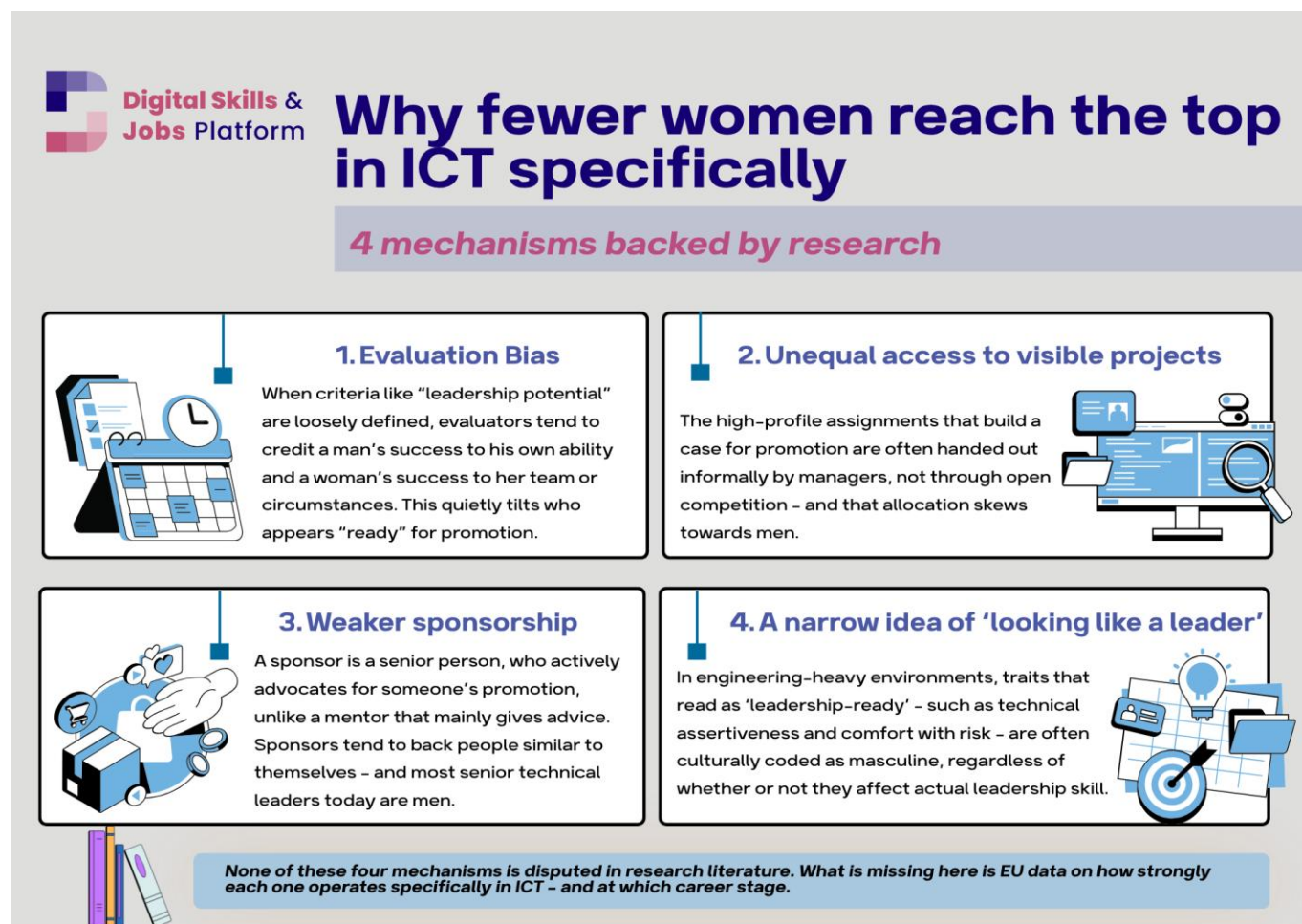


Figure 2. Women in leadership ICT roles

A missing metric, not a missing mystery

None of the four mechanisms above are in dispute. What is much harder to establish, with the data EU and national statistical systems currently collect, is where in a career each one matters most, and how that compares with simpler explanations: women leaving the sector altogether, moving into specialisms with weaker paths to senior roles, or building shorter average tenures than their male peers. A full account of the EU’s ICT leadership gap would need to weigh all of these against each other. This Brief’s claim is narrower: that the point where an individual contributor becomes a first-line manager is where the evaluation-bias, sponsorship and project-allocation mechanisms described above would be expected to be concentrated at, and that this is currently the least visible stage to EU monitoring – not necessarily the most important one in absolute terms.

Composite indices show the scale of the aggregate gap without resolving what drives it. The Women in Digital (WiD) Index, launched in November 2025 by the Connecting Women in Digital consortium, tracks women’s progress through ICT careers in four stages – STEM education, ICT education, digital employment and leadership, the last measured through the presence of women in director and managing-director roles ([Connecting Women in Digital, 2025](#)). Its EU averages are broadly comparable across the first three stages, with leadership the lowest of the four. The European Institute for Gender Equality’s Gender Equality Index 2025 points the same way from a different angle: of its six domains, women’s representation in positions of power scores lowest of all, well behind the education-related domains ([European Institute for Gender Equality, 2025](#)). Two indices, built independently for

different purposes, land on the same general picture. Neither was designed to show, and neither shows, which of the four barriers above is doing the most work, or at which career stage.

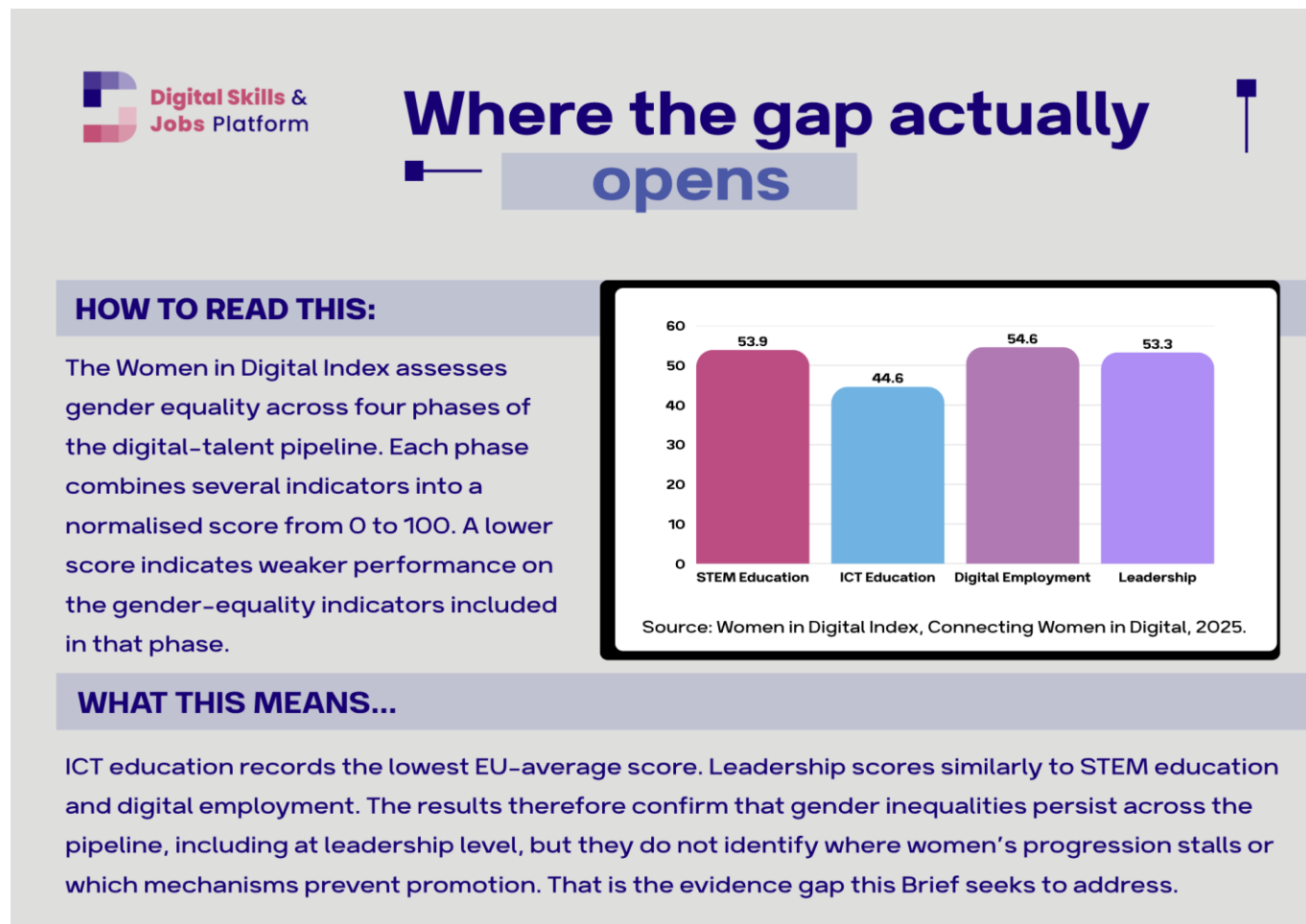


Figure 3. Women in Digital Index - examining layers of the skills gap

This is deliberately a Brief about ICT leadership rather than leadership in general. Evaluation bias, unequal project access, sponsorship gaps and masculine-coded credibility templates operate in banking, healthcare administration and public administration. What is specific to ICT is the pace of change underneath the management layer itself, which sharpens each of the four mechanisms rather than adding a new one. A first-time manager in software engineering or infrastructure is usually still expected to make credible calls on architecture, security or AI-tooling choices while taking on people-management responsibilities, in a field where the underlying technology can shift meaningfully within a single promotion cycle. That dual expectation – technically current, and newly responsible for people – shortens the window in which sponsorship, project visibility and fair evaluation need to do their work, and raises the stakes attached to an evaluator's instinctive sense of who 'looks like' a credible technical leader. The same four barriers exist elsewhere; it is ICT's compressed timelines that make them harder to absorb.

One further pressure compounds these mechanisms around the years when a first promotion would typically happen. EIGE's EU-wide CARE survey found that 34% of women with children under twelve, against 30% of men, report difficulty combining paid work with childcare at least four days a week ([European Institute for Gender Equality, 2023](#)). If sponsorship, project visibility and evaluation outcomes are all sensitive to a temporary dip in availability, as the mechanisms above suggest, this care-related pressure is plausibly a multiplier on top of them, landing hardest in exactly the years a technical career would normally turn into a managerial one. That is a plausible

interaction, not a demonstrated one: the EIGE data was not collected with ICT promotion in mind, and sizing the actual effect is precisely the kind of question occupation-level promotion data could answer and currently cannot.

What is missing from EU and national monitoring, then, is not awareness that these barriers exist, but the resolution to see how strongly each one operates at the specific point where an individual contributor becomes a manager – separately from broader questions of attrition, specialisation or tenure. A woman who leaves ICT entirely has a different policy story from one who stays in the sector for fifteen years without managing a team – and current monitoring frameworks, where they record anything at all, tend to log both simply as ‘*not advancing*’. Building the seniority- and occupation-disaggregated data needed to tell these stories apart and see which mechanism is doing the most damage at which career stage, is the concrete step this Brief returns to in its conclusion.

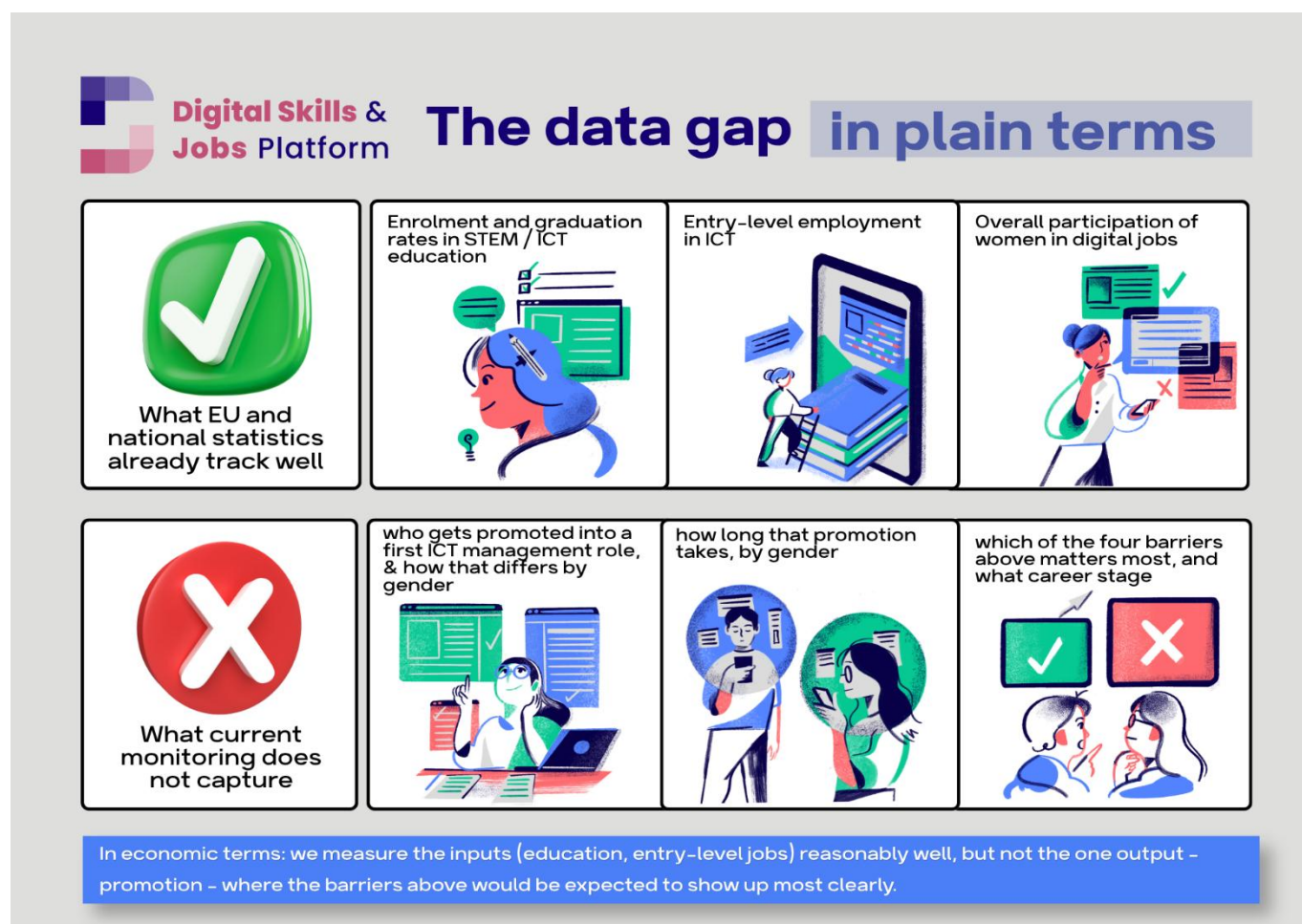


Figure 4. The data gap explained in plain terms

The part of the career nobody is designed to support

If the barriers above concentrate at the point of first promotion, the practical question is what organisations actually do at that transition – and what they don't.

Most organisations, and the training systems feeding into them, are reasonably good at supporting two moments: the start of someone's career, and the point of finishing a qualification or certification. What is far less often built as a deliberate, resourced function is structured support at the mid-career step into a first technical leadership role –

exactly where the sponsorship gap, the project-access gap and evaluation bias described above would be expected to compound, alongside the care-related pressure EIGE documents.

Ireland offers a concrete illustration of what targeted intervention at this stage can look like. NOVA, launched in late 2025 by Technology Ireland Digital Skillnet with the industry network Connecting Women in Tech (CWIT), is a six-month leadership accelerator for women already identified as high-potential technical talent, combining strategic and AI-enabled capability building with one-to-one coaching ([Technology Ireland Digital Skillnet, 2025](#)). Una Fitzpatrick, the programme's industry sponsor, put the rationale in competitiveness terms: she stated that women in the sector already excel technically but remain under-represented in senior management, and closing that gap matters as the sector competes for AI-era talent. NOVA is one national, sector-specific example, not proof that a first-promotion bottleneck is the dominant mechanism EU-wide. What it does show is that at least one national tech industry body, facing the same talent shortage described at the start of this Brief, has independently built an intervention around the transition into management rather than around earlier-stage confidence-building or entry-level recruitment.

A second, EU-level example points the same way. In March 2026 the European Commission and a consortium of Member State development agencies – co-funded by France, Estonia, Germany, Belgium and Latvia, and coordinated by Expertise France – launched a €15 million initiative on [Women's Leadership in the Public ICT Sector](#), targeting capacity-building for decision-makers and structural barriers to leadership specifically, alongside – but separate from – the Science, Technology, Engineering and Mathematics (STEM)-education pillar most prior EU-funded initiatives have focused on. That a leadership-specific funding line now exists alongside a decade of education-pipeline funding is itself telling: practitioners closer to the ground than any composite index have started treating the promotion stage, not just the entry stage, as a distinct problem worth its own budget line, with direct implications for how much of the available talent pool the EU's digital economy can actually draw on.

A related, yet less visible gap concerns the frameworks used to assess technical and managerial competence in the first place. Existing European competence frameworks, including DigCompEdu, were not primarily designed to address organisational bias in talent evaluation or career progression – meaning that an organisation can score well across every formal competence area in a digital skills framework while remaining structurally unable to notice whether its own promotion decisions are shaped by who looks like a 'natural' technical leader.

What job postings for senior roles might suggest, cautiously

A separate, more speculative body of evidence concerns the language used in job advertisements, and what it may signal about who feels invited to apply before any formal assessment of qualifications takes place.

Research applying natural language processing to ICT job postings found that advertisements attracting predominantly male applicants leaned on engineering-oriented, tool-specific language, while postings drawing more female applicants emphasised collaboration and communication ([Grljević and Kecojević, 2026](#)). Separately, a study covering more than 37,000 participants found that replacing stereotypically masculine wording in job postings for male-dominated roles with neutral synonyms measurably increased application rates among women, and among men whose self-identity sat further from a masculine template ([He and Kang, 2025](#); [Cheryan and Muragishi, 2025](#)).

Both studies concentrate on general and entry-level postings. Whether the same dynamic holds for senior ICT roles has not, to this Brief's knowledge, been tested, and it would be a mistake to assume the finding simply carries upward. Senior-role advertisements do frequently use language emphasising decisiveness or 'driving' results – the kind of wording earlier research associates with masculine coding – suggesting that a similar mechanism could plausibly be at work at the promotion stage too. That needs testing before any policy weight is placed on it, but it sits alongside the EU's existing skills-intelligence infrastructure, which already analyses job advertisements at scale, as a worthwhile extension.

A narrow, testable policy ask for 2026

Two EU developments due in 2026 converge on the specific data gap this Brief is concerned with. The Gender Equality Strategy 2026–2030 ([European Commission, 2026a](#)), adopted in March 2026, commits to gender-sensitive tracking of EU-funded programme outcomes, which will shape how [Erasmus+](#) and [European Social Fund Plus \(ESF+\)](#)-funded digital skills programmes report results going forward. More directly relevant, the Council Recommendation on human capital in the European Union ([Council of the European Union, 2026](#)), adopted on 9 March 2026 as the first instrument of its kind, calls on Member States to use big data and AI to build better, more timely skills intelligence, and to apply it systematically to career guidance rather than only to curriculum design. Neither instrument is framed in gender terms. Both are, in effect, asking Member States to build exactly the kind of granular labour-market data infrastructure needed to test – rather than assert – the mechanism set out here.

That is the narrow ask this Brief makes of both instruments: not a new strategy, but a single additional indicator within data infrastructure already being built for other reasons. If even one Member State, in implementing the Human Capital Recommendation, began tracking promotion into first-line ICT management by gender, that would do more to confirm or rule out the mechanism proposed here – and size its real cost to EU competitiveness – than any further composite index could.

A competitiveness problem with a name and a missing measurement

Europe's digital competitiveness problem and its ICT gender-leadership gap are not two separate items on the same policy agenda. To a significant extent they are the same problem, seen from two angles. A continent short of several million digital specialists, racing to keep pace with AI-driven demand, cannot afford to draw its leadership from only half of an already scarce technical talent pool, and the research linking diverse leadership to stronger financial and innovation performance suggests the cost of not doing so is not merely symbolic.

This Brief has tried to make that link more explicit than it usually is, while staying precise about what is established and what is not. Performance evaluation bias, unequal access to high-visibility projects, weaker sponsorship and masculine-coded templates of technical credibility are well-evidenced structural barriers to women's progression into ICT leadership specifically, not speculative ones. What is not yet established is how strongly each of these operates at the specific point of first promotion into ICT management, relative to other explanations such as attrition or specialisation into roles with weaker paths to leadership, because no EU or national monitoring system currently collects gender-disaggregated data on promotion into first-line technical management. That is a reasoned case for where to look next, not proof of the mechanism.

Two concrete European initiatives – NOVA in Ireland and the EU's Women's Leadership in the Public ICT Sector programme – are already responding to this gap in practice, independently of the argument made here, which suggests the diagnosis holds up beyond this Brief alone. The most useful next step for policymakers is not a new strategy or a new composite index, but a single additional data point, built into labour-market infrastructure the EU is already constructing under the 2026 Council Recommendation on human capital: who gets promoted into ICT management, broken down by gender, and at what career stage. Given how directly the underlying talent shortage already threatens the EU's competitiveness targets, that is a small, specific, and unusually actionable thing to ask for.

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