

AI and the Vanishing Entry-Level Ladder: The Talent Pipeline at Risk

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Even AI-savvy business leaders are sounding alarms about a new threat in the workplace: the disappearance of entry-level jobs. As artificial intelligence systems like large language models and generative tools take over “grunt work,” companies are cutting junior roles. In the short term this boosts efficiency. But in the long term, it could be disastrous. Amazon Web Services executive Matt Garman warned that replacing entry-level staff with AI is “one of the dumbest things I’ve ever heard”, noting that if you eliminate new hires now, in ten years “you have no one that has built up or learned anything” . Across industries – from law firms and newsrooms to design studios and IT departments – entry-level roles are drying up as AI handles tasks once done by beginners . These were not just low-paying, menial jobs; they were the on-ramps where workers learned their craft. Without these on-ramps, we risk breaking the ladder that produces the next generation of skilled professionals.

Entry-Level Jobs: The Foundation of Professional Growth

Entry-level positions have always been more than just a cheap labor pool – they are how people learn to become experts. Fresh graduates don’t start their careers already knowing how to read between the lines of a contract, craft the perfect headline, or debug a complex program. They learn through repetition, mistakes, and mentorship – starting with simple tasks that gradually build into complex responsibilities . For example, new financial analysts traditionally began by updating spreadsheets and assembling basic reports. Through this “seemingly mundane work,” they learned to spot data inconsistencies, recognize market patterns, and develop the intuition that separates truly competent professionals from those who merely follow checklists . Each small error corrected by a supervisor, each client email drafted and redrafted, and each successful project became part of their education . Over time, junior staff absorbed not just technical skills but judgment – the nuanced understanding of context and consequences that seasoned practitioners rely on.

In essence, entry-level roles function as apprenticeships in white-collar careers. A junior employee observes experienced colleagues, practices under guidance, and slowly earns the autonomy to tackle bigger challenges. Psychologists sometimes call this process a “cognitive apprenticeship,” but it boils down to learning by doing, with support. A new reporter might start

by writing obituaries or covering local meetings; a junior lawyer might review documents for hours; a trainee designer might refine someone else's draft logo. These tasks aren't glamorous, but they provide the "authentic workplace challenges" and feedback loops necessary for growth. AI cannot replicate this holistic learning environment. A machine may crank out a decent press release or debug code, but it doesn't teach a human novice why a press release is effective or how to approach a debugging strategy next time. Without the rich learning ground of entry-level work, workers miss out on the gradual seasoning that produces sound judgment.

AI Is Eliminating the On-Ramps in Multiple Fields

Today, AI systems are rapidly encroaching on these foundational tasks in virtually every sector. That has immediate upsides – speed, cost savings, consistency – but it also means far fewer opportunities for newcomers to learn by doing. Consider how this is playing out across different industries:

- **Law:** In the legal profession, mundane but educational tasks are being automated. Junior attorneys once spent their days slogging through document review and due diligence, comparing contract clauses or flagging relevant case law. It was tedious, but this "humble" work taught young lawyers to spot nuance and patterns in legal text. Now, AI tools can summarize contracts in seconds, suggest edits, and even draft complete policy memos. One seasoned lawyer notes that these advances "save time and money" yet leave her uneasy: "How do [we] grow the next generation of senior lawyers... if junior lawyers no longer spend time immersed in the building blocks of legal practice?" She calls it not just a training problem but a "leadership pipeline issue". The routine grunt work that taught young attorneys to "think like lawyers" is vanishing – and with it, the natural path to developing trusted legal advisors.
- **Software Development:** A similar shift is happening in programming. Entry-level coders used to cut their teeth writing basic boilerplate code, fixing simple bugs, and doing quality assurance – tasks that build understanding of how software works. Now AI coding assistants (like GitHub Copilot) can generate substantial portions of code automatically. In fact, GitHub's own data shows Copilot contributes about 46% of new code across organizations. This means that many programming duties once reserved for junior developers are handled by AI. Companies from Silicon Valley to Bangalore have responded by hiring far fewer new graduates. Indeed, postings for junior software engineers have fallen sharply (one report cites a 60% drop in entry-level developer listings over two years). Tech giants like Google and Meta are hiring half as many college grads as they did in 2021. One software engineer described the situation bluntly: "AI is now doing the work once reserved for freshers... If AI is doing what juniors used to do, who will become the seniors of tomorrow?" Critics have compared automating junior coding work to "eating the seed corn" – devouring the resources needed for the next harvest. Today's junior programmers are tomorrow's lead architects and technical managers, but not if they never get a chance to develop through hands-on

experience.

- **Design and Creative Work:** In creative fields, junior roles are also evaporating. Graphic designers, illustrators, and other creatives traditionally started on small tasks like producing draft visuals, touch-ups, or rough layouts under the guidance of senior designers. Those tasks helped novices learn the tools and the craft. Now, generative AI tools can produce logos, layouts, or artwork in a fraction of the time – often good enough for client use with minimal human polishing. An experienced designer lamented that “the tactical tasks that juniors traditionally cut their teeth on are increasingly being delegated to AI tools”. Work that once required a trained junior can now be done by a generative model “in a fraction of the time and cost”, fundamentally changing the entry path into the profession. The result is “no natural onramp” for new designers: if simple production work is automated, companies now expect even entry hires to be seasoned and self-sufficient from day one. This creates the absurd requirement of “needing experience to get experience”, shutting out young talent. Design firms stay “lean” and only hire senior-level designers, leaving no slack in the system to bring up juniors.
- **Marketing and Media:** Marketing departments and content teams have been quick to use AI for repetitive chores – sometimes to the point of not needing junior staff at all. Organizations can now automate tasks like drafting social media posts, basic copywriting, market research, and even preliminary graphic design. One advertising CEO admitted her firm felt “we didn’t need as many junior marketers” because AI was handling so much admin and production work. The agency became more efficient and kept headcount lean – until leadership looked a few years ahead and realized “not having junior staff now will create a crisis later”. The concern was who would rise into mid-level and senior roles if no one was hired at the bottom. In fact, data show a sharp decline of young employees in tech and media companies. In the past two years, the percentage of employees aged 21–25 was cut in half at technology companies, and the average employee age has jumped up nearly five years. This reflects a stall in entry hiring. Even journalism is feeling this pinch: some news organizations now use AI to write straightforward news reports – earnings summaries, sports recaps, weather updates – that used to be the proving ground for cub reporters. In the U.K., one wire service’s AI system enabled five journalists to produce 400,000 local news stories in three years. Impressive as that productivity is, it also means dozens of rookie reporters never got hired to learn how to report those stories themselves. As one media expert observed, this substitution of AI for junior reporters is already “unfolding in some areas of journalism”, potentially shrinking the pipeline of investigative journalists and editors down the road.
- **Customer Service:** Entry-level service jobs are among the first to be automated by AI chatbots and voice assistants. Companies have eagerly deployed bots that can handle routine customer inquiries, from password resets to order tracking, at any hour of the day. The technology has advanced to the point that some firms proudly advertise “AI agents that deliver human-like customer experiences” at a fraction of a human

employee's cost . One Indian startup reports its bots now resolve 70% of customer complaints for client companies, and it is aiming for 90–95% within a year . By one calculation, a bot service costing roughly \$1,100 a month can replace 15 full-time human support agents . For businesses, the savings are tremendous – but the flip side is fewer entry-level customer service reps learning how to solve problems and handle customers. Industry insiders are seeing a “huge shift”, as companies simply “are not investing in human agents” when an AI alternative is available . The result is that call center hiring has plummeted despite growing service demand . Young people who might have gained communication skills and experience in a support center are now often passed over entirely. In the long run, this raises concerns: who will be left to handle the complex cases or angry customers that bots can't deal with? Experienced customer care managers don't spring out of nowhere – they typically start on the phones at entry level, a path that's disappearing.

Across all these examples, the pattern is clear. AI is great at grunt work – which normally would be welcome, except that grunt work had a hidden purpose. It was how humans learned the work. When algorithms take over basic tasks, new entrants lose their practice arena. They don't get the full “ground-up” understanding of the domain, whether it's how to interpret a client's tone from a hundred emails, or how to diagnose a bug by slogging through error logs. In short, the entry-level pipeline is being squeezed at both ends: companies see less need to hire novices, and novices get fewer chances to gain experience. The immediate effects are lower labor costs and often higher output. The delayed effect is a talent bottleneck that builds slowly and then hits hard.

From Talent Pipeline to Talent Bottleneck

Eliminating entry-level roles doesn't just trim the workforce – it breaks the talent pipeline that organizations rely on to sustain themselves. Senior professionals don't materialize out of thin air; they are forged through years of training, much of it beginning in those junior jobs. If that forge is shut down, the long-term consequences can be dire. As one analysis put it, organizations may be walking into a “perfect storm”: their most experienced experts are retiring just as the mechanism to train new experts is being automated away . Consider that many economies are facing a wave of Baby Boomer retirements – the largest exodus of experienced talent in modern history . These veteran managers, engineers, doctors, and other professionals take with them decades of hard-earned wisdom, client relationships, and institutional knowledge that can't be easily replaced . Normally, the next generation would be coming up to take their place – but if we have severed the pipeline for developing their replacements, there will be nobody ready when they're gone . In business terms, it's a massive succession planning failure in the making.

Crucially, this is a structural problem, not a temporary fluctuation. It's not a recession that will bounce back; it's a hole in the bottom of the workforce bucket. The effects may not be felt immediately – hence why some leaders are lulled by the short-term efficiency gains. But this is a

“delayed feedback” situation . The gaps in skills and leadership will show up years from now when complex, unanticipated challenges arise and there are too few seasoned professionals to step up . Imagine a law firm in 5–10 years with plenty of senior partners but almost no mid-level associates ready to take over cases – because no one trained enough associates years earlier. Or consider a tech company facing a critical security crisis, but the veteran engineers who understand both the technical and human aspects of the problem have all retired, and the remaining staff mostly know how to run AI tools on routine tasks. As one observer noted, organizations that “prioritize short-term efficiency gains over professional development” may find themselves unable to adapt or respond when a novel crisis hits . When there’s another financial meltdown, will there be enough bankers who understand not just algorithms, but also the human psychology of market panic ? When an AI system in a hospital misfires, will there be doctors on hand who have the clinical intuition – built from years of hands-on practice – to notice and correct the error? These are the scenarios that keep thoughtful leaders up at night.

We can already see hints of the future if we continue down this path. In software, for instance, McKinsey predicts a shortfall of 14 million skilled developers by 2030 due to the disruption of entry-level training . In other fields, the numbers may vary but the trajectory is similar: a shallow bench of qualified mid-career professionals a few years from now. One management expert termed it the “vanishing ladder” problem – the rungs that people need to climb are being pulled out, creating a gap that future employees can’t easily leap. It’s not just a human resources issue; it’s a strategic threat to organizational resilience . Companies that maintain robust development pathways for juniors will have a huge advantage in the long run . They’ll have people who both leverage AI tools effectively and provide the human judgment for complex decisions . Meanwhile, firms that became “AI-only” and neglected to cultivate new talent could find themselves hollowed out – overly dependent on machines and lacking the adaptable human expertise that true leadership and innovation demand . In effect, a talent bottleneck will choke their growth. You can’t promote people who were never hired, nor conjure seasoned judgment in an emergency if no one paid their dues learning the basics.

Perhaps the most ironic risk is that as AI takes over routine work, the need for human oversight and high-level judgment of AI increases – but those humans won’t exist in sufficient numbers. This has been called the “supervision paradox”: powerful AI systems require knowledgeable humans to steer and check them , yet the people best equipped (experienced domain experts) are retiring, and the junior folks who should be learning the ropes aren’t getting the chance. We could end up in a dangerous situation where AI operates with too little human oversight, leading to mistakes compounding over time . For instance, if a generation of junior doctors doesn’t develop diagnostic intuition because AI handled all the routine cases, who will catch the AI’s error when it confidently suggests a wrong treatment? In aviation, when pilots started relying heavily on autopilot, some lost the ability to manually recover from unusual situations. The industry had to react by re-emphasizing manual flying skills after some close calls. In business and government, however, the erosion of human capability due to AI may not be immediately obvious – it might only become painfully clear when a major failure occurs and the “human backup” isn’t there. Organizations cannot simply eliminate junior positions and expect skilled professionals to emerge spontaneously . The pipeline has to keep flowing, or eventually the well runs dry.

Human Judgment: No Shortcuts, No Quick Fixes

One critical point often gets lost in the excitement over AI's efficiency: human expertise cannot be rushed, and it cannot be bought off the shelf. Developing real professional judgment is a slow process that "requires deliberate practice – sustained engagement with progressively challenging problems". There are no hacks to instantly acquire wisdom or intuition; no amount of venture funding or last-minute hiring spree can replace the years of cumulative learning that shape a competent leader or specialist. In plain terms, you can't throw money at a missing generation of talent and magically fill the gap. If entry-level roles vanish for a decade, then a decade later you simply won't have 5- or 10-year veterans – no matter what you're willing to pay. As the saying goes, nine women can't make a baby in one month. Similarly, a manager with 15 years of diverse experience can't be manufactured overnight.

Research on skill acquisition backs this up: people follow predictable learning curves that technology can't easily accelerate. Yes, AI can aid training (by providing tutorials, simulations, etc.), but it cannot substitute for the real-world experience of exercising judgment and facing consequences. True expertise – whether it's diagnosing an illness, mediating a tough client negotiation, or designing a user-friendly interface – comes from encountering a wide array of situations, successes and failures, and reflecting on them over time. Those "metacognitive skills" and gut instincts are built through countless small lessons and feedback moments. Eliminating entry-level work essentially starves the future talent pool of those learning opportunities. One MIT researcher vividly warned that "automating entry-level work is like eating the seed corn" – you get a short-term gain, but at the cost of destroying your future harvest. If we consume the seeds today (the junior roles), we will have nothing to plant for tomorrow (the senior experts).

Unlike capital or software, human judgment doesn't scale instantaneously. It must be cultivated. That's why a freshly minted MBA still starts as an analyst, or a new medical school graduate still has years of residency. We recognize that classroom education alone doesn't create seasoned professionals; they have to practice under real conditions. Yet in the rush to adopt AI, some companies act as if they can skip straight to having a workforce of fully formed experts. The reality is, if an entire cohort of would-be trainees is skipped over, the deficit is cumulative. The longer this goes on, the deeper the skills gap becomes. And that gap isn't easily closed later. You can't simply "catch up" on a missing generation of experience. No amount of money can purchase institutional knowledge and seasoned intuition on demand – those qualities are only earned over time.

Moreover, over-relying on AI can even degrade the skills of the existing workforce. If junior employees are told to "just use AI" instead of learning the fundamentals, they may never develop a true understanding of their domain. Already, there are anecdotes of young engineers who can prompt an AI tool for code but can't explain what the code actually does. In the long run, that's not efficiency; that's fragility. It creates workers who might panic or falter if the tool is unavailable or outputs something incorrect. In a very real sense, we risk eroding human competence and confidence by skipping the hard-but-necessary stages of learning. This erosion

isn't immediately visible on a balance sheet, but it's happening beneath the surface when entry-level opportunities dry up.

To be clear, this is not an argument against AI. It's an argument against using AI in a way that undermines human development. If we treat junior employees as obsolete because AI can do their initial tasks, we effectively sabotage our future human talent pipeline. It's a slow, self-inflicted wound. The good news is that this future is not inevitable. We have a choice in how we integrate AI into work, and whether we use it to support human growth or to supplant it. As we'll discuss next, there are strategies to harness AI's benefits without sacrificing the vital training of new professionals.

Preserving the Pathways: Solutions for an AI-Augmented Future

Avoiding a talent crisis will require deliberate action by businesses, educational institutions, and policymakers. The goal should be to blend AI automation with human apprenticeship, so that we get efficiency gains and continue to cultivate human expertise. Here are some proposed solutions to preserve meaningful entry-level pathways in the age of AI:

- **Augment, Don't Replace, Junior Roles:** Rather than completely automating entry-level jobs, companies should use AI to assist human juniors while they learn. This means redesigning junior roles as hybrid positions – a new employee might work alongside an AI tool, but not in isolation. For example, young lawyers could use AI to quickly sift documents without skipping the step of reviewing and verifying the results themselves. In coding, a junior developer can let an AI write boilerplate code, then study that code to understand it and practice improving it. AI can handle the drudgery, freeing up time for the human to focus on understanding and problem-solving. The key is to treat AI as a teaching aid and productivity booster, not a replacement for learning. In practice, this could look like assigning entry-level employees real tasks but with AI co-pilots, and instructing them to compare, check, and build on the AI's output. They remain actively engaged in the work, developing skills – just with some “training wheels.” Research suggests this approach is viable: companies are already experimenting with “hybrid roles” where newcomers learn to interpret AI outputs and handle exceptions, instead of being replaced by the AI outright. In short, use AI to make junior workers better, faster learners – not to remove them from the picture.
- **Structured Apprenticeship and Mentorship Programs:** As routine tasks get automated, businesses should double down on mentorship and intentional training programs for new talent. This might require formalizing what used to be informal. For example, if junior accountants aren't spending hours on data entry anymore, firms can create rotations where those new accountants shadow senior colleagues in meetings, assist in analysis projects, or engage in simulations of complex scenarios. The idea is to provide scaffolded experiences that replace the learning previously gained through grunt work.

Some law departments are already doing this: one general counsel suggests bringing junior lawyers into high-level meetings and client calls earlier, so they gain context and see how experienced lawyers think. Another tactic is to use AI in a training mode – for instance, letting junior staff practice negotiations or problem-solving with an AI that can role-play a scenario, then giving them feedback. Companies can also pair every entry-level hire with an experienced mentor explicitly tasked with teaching (not just supervising output). Knowledge transfer should be a measured KPI, not left to chance. In essence, companies need to recreate the “cognitive apprenticeship” environment on purpose: provide juniors with guided, real-world practice and regular feedback, even if the tasks are simulated or assisted by AI. This structured mentorship ensures that automation doesn’t equate to the end of learning. It’s worth noting that many senior employees want to mentor – studies show they are willing to share knowledge with juniors – but they need the opportunities to do so. Organizations should incentivize and reward senior staff for taking the time to coach younger colleagues, maintaining that human chain of expertise.

- **Protected Experiential Learning Phases:** In some fields, it may be necessary to protect certain early-career experiences as essentially “off-limits” to full automation, because of their importance in skill-building. Just as medical residents must perform a number of procedures or pilots must log manual flight hours even though autopilot exists, we might say that junior auditors should manually analyze a sample of reports (even if AI can do it) as part of their development, or entry-level journalists should still go out and report a few local stories firsthand rather than only edit AI drafts. These could be built into professional qualification processes – essentially requiring a training curriculum of real experiences. Companies and professional bodies could collaborate to ensure that early-career employees get hands-on practice with safety nets. For instance, an accounting firm could implement a policy that first-year associates rotate through a set of tasks (like an internal “internship” curriculum) where they must complete work manually or semi-manually before being allowed to rely on automation. This ensures they actually understand the work at a fundamental level. Such experiential learning phases might seem inefficient in the short term, but they are an investment in quality and capability. Industries that deal with high stakes – law, medicine, engineering – already have some version of this (think of the bar exam practical components or supervised medical residencies). The challenge now is to extend that philosophy to all sectors disrupted by AI: don’t eliminate the training ground, even if you streamline it. In the long run, maintaining these human experience requirements will produce professionals who can work with AI but not be helpless without it.
- **Policy and Incentives to Sustain the Pipeline:** Market forces alone might not solve this, especially when individual firms feel pressure to cut costs with AI. This is where industry leadership and government policy can make a difference. Industries could establish standards or accreditation that include workforce development metrics, essentially encouraging companies to maintain a pipeline of junior talent. Governments and regulators, meanwhile, could offer incentives (tax breaks, grants, public recognition) to

companies that invest in apprenticeships, internships, and training programs in AI-heavy fields. Another approach is incorporating the “human oversight pipeline” into risk assessments: for example, financial regulators might examine whether a bank that automates credit analysis still has humans who understand credit risk coming up the ranks – treating the lack of human succession as a safety risk. In critical infrastructure sectors, regulators could even require that AI deployment plans include a human capital development plan, to ensure long-term oversight capability. These measures would nudge organizations to balance efficiency with sustainability. Additionally, education systems can adapt by working more closely with employers – creating cooperative education programs or joint AI-and-apprenticeship curricula that feed graduates into roles where they use AI but also get real experience. The bottom line is that there’s a public interest in not allowing the well of expertise to run dry. Just as governments invest in physical infrastructure for the economy, they may need to invest in human infrastructure – the training and development of skilled workers – especially in an AI-transformed landscape. This could include funding for on-the-job training initiatives, or even mandates in certain sectors to hire a minimum number of entry-level employees (analogous to apprenticeship quotas used in some trade sectors).

None of these solutions suggest turning back the clock or rejecting AI. On the contrary, they embrace AI as a tool – but a tool to be wielded by humans, not a total replacement for them. The vision is an augmented workforce where AI handles the repetitive, low-level tasks, while humans focus on developing higher-order skills and exercising the judgment that only comes with experience. This requires conscious effort. It may even require short-term sacrifices (like hiring some juniors you theoretically could do without, or slowing down some processes to allow learning). But it is an investment in long-term capacity and resilience. As one tech leader remarked, “How’s that going to work in 10 years... when you have no one that has built up or learned anything?” . The only way to avoid that future is to keep humans in the loop – especially young, learning humans.

Conclusion: Building a Sustainable Future of Work

The rapid advance of AI does not have to mean a lost generation of talent. If we recognize what’s at stake – the very development of human judgment and expertise – we can take steps to adapt. History has shown that technology revolutions often eliminate some jobs but create others; the key is managing the transition so that people are prepared for the new roles. In this case, the new roles for entry-level workers may be different (more oriented toward supervising AI, solving atypical cases, or doing creative and interpersonal tasks). But those roles can be rich learning experiences if we design them to be. We have to ensure that a junior employee working with AI is still growing into a senior professional over time.

In an AI-powered world, human professionals will still be needed – arguably more than ever – to provide oversight, ethical judgment, creativity, and strategic thinking. These qualities are the product of education plus experience. We cannot afford to skip the experience part. The coming

years will test whether companies can resist the temptation to achieve efficiency at the expense of developing people. It will also test whether societies can update their support systems to foster human growth in tandem with technological growth.

The narrative that “AI will inevitably take all the jobs” is simplistic and defeatist. A more nuanced view is that AI will change jobs – especially entry-level ones – and we have a say in how that change happens. We can choose a path where AI complements human workers, acting as a powerful tool that makes them more productive while they learn, rather than a replacement that leaves them with nothing to do and nothing to learn. The future of each industry will likely belong to organizations that figure out this balance. Those that blindly automate away the farm team of talent will discover, a few years down the road, that they’ve run out of players. Those that consciously cultivate new talent, with AI as an aid, will have a deep bench of skilled humans who understand technology and have seasoned judgment.

In sum, the current displacement of entry-level roles by AI is a warning sign. It’s telling us that we need to reinvent the ladder of career growth, not destroy it. By implementing apprenticeship-style training, keeping humans in the learning loop, and perhaps nudging this along with smart policy, we can ensure that the human element in the workforce remains robust. The goal should be to let AI handle the drudgery while humans continue to climb, learning step by step, into the high-responsibility roles that no machine can truly fill. This is not automatic; it will take foresight and effort. But with intentional action now, we can keep our talent pipeline flowing and avoid a future where efficiency today means expertise lost tomorrow.

The choice is ours – and the time to act is now, before the ladder vanishes further. By treating human development as importantly as we treat technological development, we can create an AI-augmented economy that is both innovative and sustainable, with each new generation of professionals ready to step up when it’s their turn.

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