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Digital Infrastructure Innovation:
The Human Capital Challenge in AI, Cybersecurity, Electric Power, and Data Centers

Part 2: AI's Double-edged Sword: Enhancing Productivity while Creating new Human Capital Needs

A Kelly Telecom White Paper on Workforce Challenges, AI's Dual Role in Hiring, and the Future of Talent Acquisition in Critical Infrastructure Sectors

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Executive Summary

Kelly Telecom is a leader in supporting the rapid evolution of Artificial Intelligence (AI), Electric Power, and Data Centers by delivering workforce solutions that drive innovation, optimize operations, and sustain long-term growth. These industries are deeply interdependent, each requiring a skilled workforce to remain agile and competitive. However, a widening human capital gap threatens to slow progress across all three sectors.

To bridge this gap, Kelly Telecom provides customized workforce solutions that enable businesses to seamlessly integrate AI, strengthen their workforce, and future-proof operations in electric power, cybersecurity, and mission critical digital infrastructure. Addressing workforce shortages holistically—rather than in isolated silos—is essential for maximizing the benefits of AI and ensuring the smooth integration of intelligent automation critical infrastructure

This white paper explores the challenges facing these industries and how Kelly Telecom delivers talent solutions to close skill gaps, enhance AI-driven hiring, and optimize workforce integration. It also highlights recent AI investments, the most in-demand job titles, and practical solutions for building a resilient workforce in the digital age.

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1. Introduction

AI, Electric Power, and Data Centers are critical to modern innovation, yet all three sectors are facing significant workforce shortages. This paper examines these industries' interdependencies, the impact of AI on hiring, and strategies for closing the human capital gap.

Key Focus Areas:

- AI & Automation Workforce – Talent shortages, skill development, and AI's impact on jobs
- Cybersecurity Workforce – Hiring challenges, certifications, and talent pipeline issues
- Electric Power Industry – Workforce transitions, grid modernization, and labor demand
- Data Centers & IT Infrastructure – Staffing shortages, specialized skills, and labor sourcing

Suggested Research & Data Collection

- Industry Workforce Trends: Hiring rates, talent shortages, and demand forecasts
- Skills & Certifications: Essential qualifications and training programs
- Challenges & Gaps: Recruitment issues, skill mismatches, and workforce aging
- Policy & Workforce Development: Government initiatives, education, and training

The Future of Infrastructure Innovation Depends on a Skilled Workforce

The true potential of AI, Electric Power, and Data Centers will not be unlocked by technology alone—but by the people who design, manage, and optimize these mission critical infrastructures. Addressing the human capital challenge requires a unified effort and the speed such needs are fulfilled will determine how quickly these industries can scale and maximize their contributions to global innovation.

This report serves as a call to action, highlighting key industry trends and strategic solutions led by Kelly Telecom. It encourages leaders, policymakers, and educators to collaborate in building the skilled workforce needed to power the next era of AI-driven infrastructure.

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2. AI Enhances Productivity while Creating new Human Capital Needs

AI has the potential to increase efficiency and alleviate workforce shortages, yet paradoxically, its adoption exacerbates the need for specialized human capital in all three sectors:

AI in Electric Power

- In an electric power industry that was facing declining energy demand for the last decade AI is driving a once-in-a-generation spike in energy demand.
- The massive increase in demand is placing acute demands on engineering and procurement teams to fulfill interconnection demand and Expedited Project Review (EPR) requests for large power interconnections.
- AI enables predictive grid management and load balancing, reducing downtime.
- But the industry needs engineers, analysts, and utility lineworkers and field technicians trained in AI-powered energy forecasting and grid automation.

AI in Data Centers

- AI automates cooling systems, reduces energy consumption, and optimizes server workloads.
- But companies need AI engineers, network administrators, and data center operators to oversee AI integration.AI in AI Development
- AI models require massive computing power from data centers and optimized energy sources.
- But AI research and deployment are constrained by hardware specialists, AI model trainers, and infrastructure engineers.

In all three sectors, AI is not a substitute for skilled labor—it is an amplifier that increases productivity only when paired with human expertise.

3. The Irony of AI in Hiring: Faster Applications, Tougher Screening

Artificial Intelligence (AI) is playing a dual role in the job market—accelerating candidate applications while simultaneously complicating the hiring process. As AI-powered tools enable job seekers to apply for multiple positions with unprecedented speed, hiring managers are facing greater difficulty in identifying qualified candidates from an overwhelming pool of applicants.

AI's Acceleration of Job Applications

AI-driven resume builders, automated job application software, and platforms like LinkedIn's "Easy Apply" have significantly increased the velocity at which job seekers can submit applications. Candidates can now:

- Auto-generate resumes and cover letters tailored to job descriptions in seconds.
-

- Apply to dozens of jobs simultaneously using AI-powered tools that scan listings and submit applications automatically.
- Use ChatGPT and AI assistants to craft responses for pre-screening assessments, making applications more polished and keyword-optimized.

The result? Hiring managers are now receiving exponentially more applications per job posting than ever before—many of which look highly qualified on paper but lack true skill alignment in practice.

AI's Impact on the Hiring Process: Screening Challenges

While AI has made it easier for candidates to apply, it has made it harder for employers to filter, assess, and verify talent:

- ATS (Applicant Tracking Systems) Overload – With thousands of AI-generated resumes per job posting, HR software struggles to differentiate between truly qualified candidates and AI-enhanced applications.
- Increased False Positives – AI-driven applications often outsmart traditional keyword-matching algorithms, leading to less relevant candidates being prioritized over truly skilled ones.
- More Time Spent on Verification – Hiring teams must now incorporate additional technical assessments, live interviews, and portfolio reviews to separate genuine talent from AI-assisted applications. At the same time, qualified candidates may be erroneously culled by the ATS not due to qualifications but resume format.

The Workforce Paradox: AI Creates Jobs But Hinders Hiring

AI is driving massive job creation across AI, cybersecurity, electric power, and data centers—yet the very technology enabling job growth is simultaneously making it harder to fill these roles effectively. The gap between application quantity and actual skill competency is widening, forcing companies to rethink how they:

- Identify talent beyond resumes through practical skills assessments and real-world problem-solving challenges.
- Adopt AI-powered hiring tools that go beyond keyword matching and focus on candidate skill validation.
- Balance AI efficiency with human judgment in the hiring process to ensure the best candidates are selected.

Ultimately, AI has revolutionized how job seekers and hiring managers interact—but its unintended consequence is that while job applications have never been easier to submit, hiring the right talent has never been harder.

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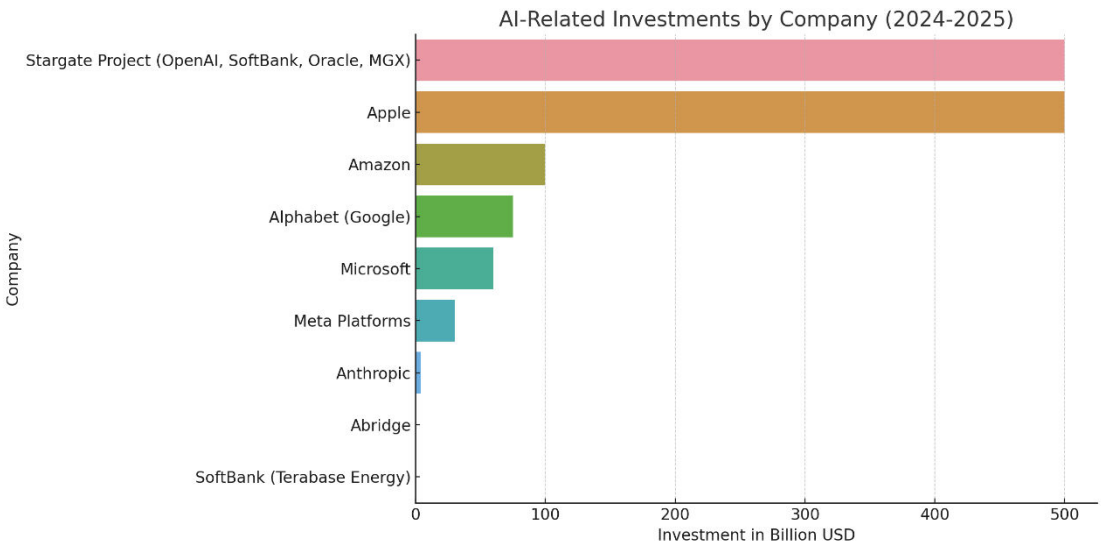
4. Illustrative AI-Related Investment Announcements in the US

Major companies, including OpenAI, Blackstone, QTS, Meta, Apple, Amazon, Microsoft, and Intel, have made significant AI investment announcements in 2024-2025. These investments are driving job creation but also amplifying workforce shortages in key areas such as AI engineering, cloud infrastructure, and cybersecurity.

Below is a summary of notable AI-related investment announcements:



Stargate Project:

- **Overview:** A joint venture formed by OpenAI, SoftBank, Oracle, and MGX, aiming to invest up to $500 billion in AI infrastructure in the U.S. by 2029. Source: investors.com
- **Details:** Announced on January 21, 2025, the project plans to build 10 data centers in Texas, with further expansions anticipated. The initiative is expected to create over 100,000 jobs in the United States.

Apple:

- **Overview:** Apple has announced a $500 billion investment in the U.S. over the next four years, marking its largest-ever investment plan.
- **Details:** The investment includes the establishment of a new factory in Houston, Texas, dedicated to producing AI servers. This initiative is projected to create approximately 20,000 jobs focused on research and development, silicon engineering, software development, and AI/machine learning.

Meta Platforms:

- **Overview:** Meta plans to invest $30 billion in AI infrastructure to enhance its platforms and develop new AI-driven products. Source: thetimes.co.uk
- **Details:** This investment focuses on building data centers and acquiring advanced AI hardware to support the company's long-term AI initiatives.

Amazon:

- **Overview:** Amazon has committed to a $100 billion investment in AI infrastructure, leading the industry in capital expenditure for AI development. Source: thetimes.co.uk
- **Details:** The investment aims to integrate AI across Amazon's services, including retail, cloud computing, and logistics, to enhance efficiency and customer experience.

Alphabet (Google):

- **Overview:** Alphabet plans to invest $75 billion in AI infrastructure, reflecting its commitment to AI-driven innovation. Source: thetimes.co.uk
- **Details:** The investment will support the development of new AI applications and the enhancement of existing services across Google's ecosystem. Source: investopedia.com

Microsoft:

- **Overview:** Microsoft has announced a $60 billion investment in AI infrastructure to bolster its cloud computing and AI capabilities.
- **Details:** The funds will be allocated to expanding data centers and developing AI tools for enterprise solutions.

SoftBank:

- **Overview:** SoftBank's Vision Fund 2 has invested $130 million in Terabase Energy, a company developing robots and AI systems for building solar farms. Source: ft.com
- **Details:** The investment aims to enhance Terabase's robotics-assisted assembly line, reducing construction costs and time for solar farms. Source: ft.com

Anthropic:

- Overview: Anthropic, an AI safety and research company, has secured significant investments to advance its AI models.
- Details: In September 2023, Amazon announced a partnership with Anthropic, becoming a minority stakeholder by initially investing $1.25 billion, with plans to invest a total of $4 billion. Source: en.wikipedia.org

Abridge:

- Overview: Abridge, a healthcare AI company, secured a $250 million venture capital investment, raising its valuation to $2.75 billion. axios.com
- Details: Abridge develops AI scribes that transcribe and analyze medical professionals' spoken notes, enhancing efficiency in the healthcare industry. axios.com

These substantial investments underscore the pivotal role AI plays in shaping the future of technology and industry in the United States.

5. Our Unified Approach to Addressing the Human Capital Challenge in Digital Infrastructure
Delivering solutions to bridge the workforce gap across AI, Electric Power, and Data Centers requires a strategic, cross-sector approach that includes:

- Collaborative Training Initiatives – AI companies, utilities, and data centers should create shared training academies to develop overlapping technical skills in software, automation, and energy management.
- Interdisciplinary Career Pathways – Electrical engineers should have pathways into data center operations, and AI specialists should receive training in energy-efficient AI deployment.
- Public-Private Workforce Investments – Governments, corporations, and universities must align investments to create scalable talent pipelines for all three industries.
- AI-Augmented Workforce Development – AI can be leveraged to automate training, create adaptive learning systems, and scale apprenticeship models.

Additional Initiatives to Bridge the Workforce Gap:

- **Workforce Readiness & Certification Programs**
  - Expand training academies to include **AI, cybersecurity, cloud computing, and digital infrastructure** workforce readiness programs.
  - Partner with **industry certification providers** (e.g., AWS, Cisco, Google Cloud, CompTIA) to fast-track credentialing and workforce placement in critical infrastructure roles.
- **Data Center Technician & AI Talent Apprenticeships**
  - Develop **apprenticeship models** for **data center technicians, AI engineers, and power grid analysts**, offering hands-on experience in real-world infrastructure settings.
  - Create **on-the-job training programs** with leading data center operators to support direct workforce placement.

- **AI-Powered Workforce Analytics & Strategic Reskilling**
  - Utilize **AI-driven workforce analytics** to identify skill gaps, predict labor shortages, and design **targeted reskilling pathways**.
  - Partner with **universities and trade schools** to transition **traditional IT, electrical, and mechanical professionals** into high-demand AI-powered infrastructure roles.
- **Digital Inclusion & Opportunity Initiatives**
  - Establish **scholarship and internship programs** for underrepresented groups in tech, engineering, and AI-driven infrastructure.
  - Expand **STEM outreach programs** to ensure a diverse and sustainable workforce pipeline.

Without deliberate coordination, these industries will continue competing for the same limited talent pool, delaying innovation and infrastructure expansion. However, by addressing the workforce gap collectively, AI can accelerate advances in electric power and data centers, while those industries supply the infrastructure needed for AI's next breakthroughs.

6. Recommendations for Addressing Workforce Challenges

To address the workforce gap, we recommend interdisciplinary training programs, public-private workforce investments, and AI-assisted talent screening tools to improve hiring efficiency while maintaining quality.

Companies should collaborate with universities and vocational programs to develop cross-sector training in AI, power systems, and data center operations.