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Developing the Workforce for Tomorrow's Networks

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The broadband industry is entering a historic era of accelerated growth. Propelled by unprecedented public and private investment and surging consumer demand for ubiquitous, high-speed connectivity, we have embarked on a nationwide mission to build the infrastructure of tomorrow. This monumental effort promises to close the digital divide, power next-generation technologies, and fuel economic growth for decades to come. Yet, this vision is not guaranteed. Its success hinges not merely on the deployment of fiber and advanced hardware, but on the cultivation of our most critical asset: a skilled, adaptable, and forward-thinking workforce. The chasm between the talent we have and the talent we will need represents one of the largest challenges to realizing our fully connected future.



The Evolving Profile of the Broadband Professional

The modern network professional safeguards a community's critical infrastructure, providing a lifeline to emergency services, education, healthcare, and economic opportunity.

The nature of network technology and the role of those who manage it have undergone a radical transformation. Yesterday's technician was primarily a reactive problem-solver, dispatched to address service interruptions after they occurred. Today's professionals are proactive stewards of networks that are orders of magnitude more complex, shaped by the push toward Hybrid Fiber-Coax (HFC), fiber and multi-gig connectivity, and the explosion of the Internet of Things (IoT), edge computing, and low-latency applications. With automation now handling routine diagnostics and standard trouble calls, field professionals are freed to focus on the challenges that demand higher-order skills, resilience planning, and critical thinking.

This evolution demands a corresponding shift in our training philosophy, moving from a "break-fix" mentality to one of proactive stewardship. By 2029, predictive network maintenance is expected to be a \$48B market—growing more than 400%. This surge underscores how essential disciplines like Proactive Network Maintenance (PNM) have become. Instead of waiting for impairments to disrupt service, today's technicians must be fluent in using advanced tools and data analytics to identify, diagnose, and resolve potential

issues before they ever impact the customer. This preventative approach is vital for maintaining the robust, always-on networks that society now depends on. Effectively, we are asking our workforce to become network guardians, equipped not just with technical know-how but with the analytical foresight to prevent problems from ever arising.

Architecting a Modern Learning Ecosystem

With demand driven by fiber broadband expansion, 5G rollout, and an aging workforce, the U.S. will soon face a major shortage of qualified telecommunications technicians - making it urgent to create flexible, accessible, and rewarding pathways into the profession.

This growing urgency is spelled out in numbers. According to a 2024 report by the Fiber Broadband Association and Continuum Capital, network expansion, particularly through BEAD, is expected to require approximately 60,000 new hires, including 28,000 construction workers and 30,000 fiber and broadband technicians in the near future. At the same time, the U.S. Bureau of Labor Statistics projects a need for nearly 25,000 new telecommunications technicians annually to replace those retiring or leaving the workforce.

To address this workforce shortage and cultivate the necessary advanced capabilities, the industry must move beyond traditional, static training paradigms. The old model of episodic, one-size-fits-all courses is no longer sufficient. What is required is a dynamic and responsive learning ecosystem—one that is personalized, continuous, and directly aligned with the real-world competencies required for success.

The foundation of this ecosystem must be built on vendor-neutral, industry-ratified standards. When training is anchored to a common set of best practices and a shared technical language, skills become portable, quality becomes consistent, and collaboration across the industry is strengthened. Upon this foundation, we can construct role-based learning pathways that guide individuals from novice to expert. These pathways should be modular, allowing professionals to acquire skills in manageable, targeted increments that fit within demanding work schedules.

This model also embraces the concept of stackable credentials, where each completed course or certification builds upon the last, creating a clear and motivating trajectory for career advancement. This approach not only validates an individual's growing expertise but also provides employers with a reliable benchmark of their capabilities.

Bridging the Talent Gap Through Strategic Alliances

The scale of our workforce challenge is too vast for any single company or organization to address alone. Meaningful progress requires a concerted, collaborative effort between network operators, industry associations, and academic institutions. These strategic alliances are essential for building a sustainable talent pipeline that can meet the industry's long-term needs. Technical standards and training organizations must continue evolving and take an active role in preparing the next generation of professionals. One promising model is the collaboration between industry and higher education, where frequently updated professional certifications are directly integrated into academic programs.

For example, new programs are now allowing professionals to earn academic credit for completing industry-recognized courses, significantly reducing the time and cost required to obtain a college certificate or degree and providing real-world experience for the skills needed today. As just one example, SCTE launched its third partnership with a university partner, Colorado State University Global, to deliver CSU Global's fully online Broadband

Operations Management Certificate, which integrates hands-on, work-based learning with flexible, asynchronous coursework. This partnership joins similar relationships with Ft. Hays State and Rio Salado College, accepting SCTE industry certifications for college credit.

The recent online initiative with CSU Global accomplishes several critical goals simultaneously. First, it creates an accessible on-ramp into the industry for new entrants, career-changers, and individuals in underserved communities. The online format removes geographical barriers, allowing a student in a rural area to access the same high-quality training as someone in a major metropolitan hub. Second, it provides a clear upskilling pathway for incumbent workers, enabling them to acquire the leadership and management skills needed to advance in their careers. By bringing together practical industry training with academic rigor, these alliances legitimize broadband careers and create a powerful engine for talent attraction and retention. Ultimately, we cannot close the nation's digital divide without first closing this critical skills divide.

Leveraging Technology to Accelerate Skill Acquisition

Just as technology is revolutionizing our networks, it is also poised to revolutionize how we train our workforce. The next generation of learning tools will be more immersive, intelligent, and personalized than ever before, dramatically accelerating the journey from novice to proficient practitioner.

The global artificial intelligence (AI) in education market, for instance, is projected to reach \$32.27 billion by 2030, growing at a CAGR of 31.2% from 2025 to 2030. AI is moving from the back office to the front lines as a powerful performance support tool. Imagine a technician in the field equipped with an AI-powered virtual mentor on their tablet or smartphone. Trained in industry standards, equipment specifications, and vast datasets of network performance, this AI assistant can provide real-time guidance, suggest next steps for complex troubleshooting, and surface relevant technical documentation precisely when needed. This “augmented intelligence” doesn’t replace human expertise; it enhances it, enabling technicians to solve problems faster, more safely, and with greater accuracy.

Furthermore, technology can transform how we validate competency. Instead of relying solely on traditional multiple-choice exams, we can move toward performance-based assessments. By using AI to monitor real-time work and network telemetry, we can capture how technicians actually perform on the job—measuring their ability to apply skills, resolve issues, and maintain network performance under real conditions. These tools can objectively certify individuals against established standards, turning everyday job performance into verifiable proof of competency. This approach provides immediate, targeted feedback to the learner and offers employers a much richer, more accurate picture of their workforce’s true capabilities.

A Call for Collective Investment

The future of broadband connectivity is being built today, and the quality of that future will be determined by the quality of the people we empower to build it. The challenges are clear: an aging workforce, the escalating complexity of our networks, and a persistent shortage of qualified talent. Yet, the opportunities are even greater.

Meeting this moment requires a paradigm shift. We must view workforce development not as a cost center, but as a strategic investment as fundamental as fiber optic cable or spectrum allocation. It demands a unified commitment from every corner of our industry. Operators must invest in continuous training and create cultures that champion learning. Technology

partners must continue to innovate learning tools that make skill acquisition more effective and efficient. Educators must collaborate with industry to create relevant and accessible academic programs. And policymakers must recognize that funding infrastructure without funding the people to build and maintain it is a job left half-done.

The task ahead is to build a robust, diverse, and sustainable talent pipeline capable of powering the broadband industry for the next decade and beyond. By embracing new models of learning, forging strategic alliances, and collectively investing in our people, we can ensure that the promise of a fully connected future becomes a reality for all.

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