



Redefining Digital Inclusion through Connected Technology as a Solution (CTaaS)

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ABSTRACT: The rapid digitization of U.S. social, economic, and healthcare systems has made digital participation a structural requirement for equitable access to services, employment, and health. Yet Not-for-Profit (NFP) organizations, the frontline delivery system for community-based digital inclusion programs, face deep structural constraints: capital scarcity, understaffed teams, and an almost total absence of technical infrastructure. These constraints render the traditional asset-heavy technology model not merely inefficient but fundamentally unsustainable. This paper introduces Connected Technology as a Solution (CTaaS), a managed-service paradigm governed by a closed-loop 6S Lifecycle Framework: Sourcing, Stocking, Staging, Supply, Support, and Sustainability. Drawing on real-world evidence from senior home-health initiatives (Project Silver Echo) and youth workforce programs (Project Horizon), we demonstrate that CTaaS reduces device abandonment from over 40% to below 5%, increases RPM data continuity to 98.5%, and measurably improves workforce readiness. By converting technology from a depreciating asset into a predictable operational subscription, CTaaS aligns with grant funding structures, reduces total cost of ownership, and delivers a compelling social return on investment. The result is a national-scale impact model that is simultaneously more affordable, more effective, and more sustainable than any predecessor approach.

KEYWORDS: Digital inclusion, not-for-profit technology, managed services, CTaaS, 6S lifecycle, remote patient monitoring, youth workforce development, circular economy, cybersecurity compliance, social return on investment.

I. INTRODUCTION

Digital participation has crossed an invisible yet decisive threshold. It is no longer about convenience; it is about whether a person can access healthcare, apply for jobs, receive government benefits, or maintain social connections. According to the National Telecommunications and Information Administration (NTIA), over 93% of essential public services now require digital access as their primary mode of engagement [1]. For millions of Americans who are elderly, economically marginalized, or living in underserved communities, this shift has created a new and urgent form of social exclusion.

Two massive national pressures are converging, making this problem more urgent than ever. First, the demographic wave. The U.S. Census Bureau confirmed in 2025 that the population aged 65 and older now exceeds 61.2 million—a 3.1% increase in a single year. Older adults outnumber children in 11 states and in nearly half of all U.S. counties [2]. This shift coincides with healthcare's rapid pivot to home-based delivery: remote patient monitoring (RPM), telehealth, and AI-driven clinical tools all depend on reliable devices and uninterrupted connectivity.

Second, the economic disruption wave. The World Economic Forum estimates that AI and automation will displace about 92 million global jobs by 2030 while creating 170 million new roles that require advanced digital skills [5]. In the United States, entry-level clerical and routine digital jobs, historically the gateway to employment for low-income youth, are among the fastest-disappearing occupations [6]. For marginalized young people, digital inclusion is no longer about internet access alone. It is about acquiring the skills and professional environments needed to compete in an economy being restructured by artificial intelligence.

Not-for-profit organizations are the natural delivery system for digital equity. They bring community trust, cultural proximity, and field-level reach that government agencies and commercial entities cannot easily replicate. Yet they are structurally under-resourced for the task. A 2025 Candid survey found that 67% of nonprofit employees are actively considering leaving their positions, and 59% of organizations report greater difficulty filling roles than in prior years [7]. Grant compliance rules typically require 80–90% of funds to go to direct program delivery, leaving little for the technology infrastructure needed to run modern programs effectively [8].



The traditional response has been an asset-heavy model: purchase devices, distribute them, and hope that ongoing challenges remain manageable. That hope is routinely disappointed. Research shows that device misconfiguration, lack of technical support, and software update failures drive abandonment rates above 40% in unmanaged deployments [9]. Without centralized device management, NFPs also expose beneficiaries to serious cybersecurity risks, including noncompliance with HIPAA and FERPA [10].

This paper introduces Connected Technology as a Solution (CTaaS): a managed-service operational paradigm built on a 6S Lifecycle Framework comprising Sourcing, Stocking, Staging, Supply, Support, and Sustainability. CTaaS replaces capital expenditure with predictable operational costs, externalizes technical complexity, and delivers a continuously supported digital environment at scale. Empirical evidence from two program case studies demonstrates what becomes possible when digital inclusion is engineered as a managed service rather than a one-time product distribution.

II. NFP OPERATIONAL BOTTLENECKS: CAPITAL, PEOPLE, AND SCALE

To understand why CTaaS matters, we must first understand why the current model is broken. NFP organizations face three interlocking structural constraints that make sustaining technology-intensive programs nearly impossible.

A. The Capital Trap

Grant funding is the financial engine of most digital inclusion programs but it carries a built-in design flaw. Grantors require that 80–90% of funds go to direct program delivery. An NFP receiving a \$500,000 digital inclusion grant may have as little as \$50,000 for the technology infrastructure needed to make that program work [8]. When most of that remainder funds upfront device purchases, the organization is betting that those devices will continue to function without ongoing investment. That bet almost always loses, for four compounding reasons:

- **Rapid Depreciation:** Consumer-grade devices lose up to 40% of functional capability within 12 months due to battery degradation and evolving app requirements [11]. Grants do not include replacement budgets.
- **Operations Funding Gap:** After deployment, ongoing costs cellular data, software licenses, repairs begin immediately and typically exceed original hardware costs within 18–24 months. Most grants fund none of this.
- **Frozen Capital:** Once money becomes physical devices, it cannot be redirected. Devices awaiting configuration represent capital that could have funded direct services.
- **Grant-Technology Mismatch:** Grant cycles run 12–18 months; device lifecycles run 24–36 months. When the grant ends, the technology clock has not stopped.

B. The Double-Up Staffing Problem

When NFPs deploy technology without managed support, a predictable and damaging outcome occurs: the social worker becomes the IT person. Case managers, youth mentors, and elder care coordinators professionals hired for their human skills find themselves troubleshooting Wi-Fi connections, resetting passwords, and configuring devices for which they received no training. This is the double-up phenomenon, and its costs are enormous but largely invisible in program budgets.

- **Diverted Human Capital:** Every hour a social worker spends on tech support is an hour not spent with a client a direct reduction in program value.
- **Staff Burnout and Turnover:** A 2025 Candid survey found 67% of nonprofit employees considering departure, with technology-related overload as a key driver [7]. Turnover cascades into broken beneficiary relationships and lost institutional knowledge.
- **Uneven Outcomes:** Non-technical staff cannot consistently manage security patches or device health, so program quality varies unpredictably.
- **Higher Abandonment:** Without rapid professional support, beneficiaries give up when they hit friction. Abandonment rates reach 40–45% in unmanaged deployments [9].

C. The Scale Ceiling

Small and mid-sized NFPs cannot replicate the procurement leverage or technical infrastructure of large institutions. A hospital system ordering 10,000 devices gets enterprise pricing, dedicated account management, and guaranteed service levels. An NFP ordering 75 tablets pays near-retail prices with no SLA and no support infrastructure. The absence of Mobile Device Management (MDM) means devices cannot be remotely monitored, secured, or repaired. Without remote diagnostics, small problems become catastrophic failures. The resulting feedback loop destroys programs: devices fail, beneficiaries disengage, program metrics collapse, and future funding disappears.



III. CTaaS: A NEW MODEL FOR A REAL PROBLEM

CTaaS is built on a powerful but simple insight: technology in the hands of a vulnerable population is not a product it is a service. A device deployed once and left alone is not a digital inclusion tool; it is a ticking clock. The 6S Lifecycle Framework operationalizes continuous technology management as an externally delivered service, so NFPs never need to build technical capacity they were never funded to develop.

What makes CTaaS genuinely innovative is not any single component. It is the integration of all six components into a closed, self-improving loop. Most technology providers sell hardware. Some offer MDM. A few provide helpdesk support. CTaaS is the first framework to unify sourcing, inventory, configuration, logistics, ongoing support, and circular end-of-life management into a single, subscription-based service tailored to the operational realities of Not-for-Profit organizations. Each stage informs and improves the others. Support call data refines Staging profiles. Device failure patterns from Sustainability inform Sourcing decisions. The system gets smarter with every deployment cycle, creating a learning infrastructure that becomes more effective over time.

This is also what makes CTaaS fundable. Because it operates as a predictable monthly operational expense rather than an unpredictable capital outlay, CTaaS fits naturally within grant budgets, multi-year funding agreements, and federal reimbursement frameworks. For program officers and foundation managers, this means reliable outcome data and evidence-based renewal decisions, not speculative promises tied to hardware purchases that may or may not still be working when the grant report is due.

A. Sourcing: Enterprise Pricing for Small Organizations

CTaaS aggregates the technology purchasing needs of hundreds of NFP programs nationwide and negotiates directly with OEMs and Tier-1 carriers on behalf of the entire pool. An NFP ordering 100 devices through CTaaS effectively participates in a 10,000-device contract. This unlocks enterprise-grade pricing, pooled data plans that eliminate overage surprises, and SLAs that guarantee uptime and responsiveness. Budget predictability becomes structural rather than aspirational.

B. Stocking: Just-in-Time Without the Wait

Devices are held in secure, climate-controlled warehouses and activated on demand when a participant is enrolled. No NFP office becomes a storage facility. No capital is frozen in idle stock. When a new cohort is funded, deployment can begin within days. For organizations operating out of shared community spaces, eliminating inventory burden is both a financial relief and a practical liberation.

C. Staging: Ready Before It Leaves the Warehouse

Every device is automatically provisioned before shipping. MDM enrollment is complete. Cellular connectivity is pre-activated; no Wi-Fi setup required. Interfaces are optimized for the intended user: large icons and simplified navigation for seniors; cloud collaboration tools and distraction-blocking profiles for youth. Standardized configuration means program outcomes can be evaluated against program design rather than technology variability.

D. Supply: The Unboxing Is Part of the Program

Devices arrive at participants' doors in custom-engineered kits: protective case, large-print quick-start guide, charging essentials, and prepaid return packaging. Deployment time drops from months to days. Chain-of-custody is maintained throughout. The unboxing experience is deliberately designed for users who may feel intimidated by technology transforming first contact with the device from potential anxiety into a moment of welcome and empowerment.

E. Support: Help Is Always One Call Away

The CTaaS helpdesk operates 24/7, staffed by specialists trained to meet the specific communication needs of vulnerable populations. Agents use remote screen mirroring to see exactly what a senior or youth participant sees and walk them through the resolution in real time, using plain language. This single-element professional, empathetic, always-available support is the most powerful driver of CTaaS outcomes. It eliminates the double-up burden on NFP staff and reduces device abandonment from 40%+ to single digits.

F. Sustainability: Circular Economy at the End of Every Lifecycle

When a device reaches the end of its program, it does not become waste. NIST SP 800-88 Rev. 1-certified data sanitization ensures the complete removal of personal and health information. Devices are then refurbished at the component level and reallocated to secondary digital inclusion tiers, extending their social impact beyond the original



program. Zero-landfill recycling processes components that cannot be refurbished. The result: environmental compliance, data security, and extended device utility in a single closed-loop process. Fig. 1 presents the complete 6S lifecycle, including embedded cybersecurity layers and the cost-benefit transition from capital drain to social impact.

The CTaaS Advantage: Simplified Tech Management

CTaaS optimizes digital inclusion by replacing traditional IT burdens with a managed, secure, and sustainable lifecycle.

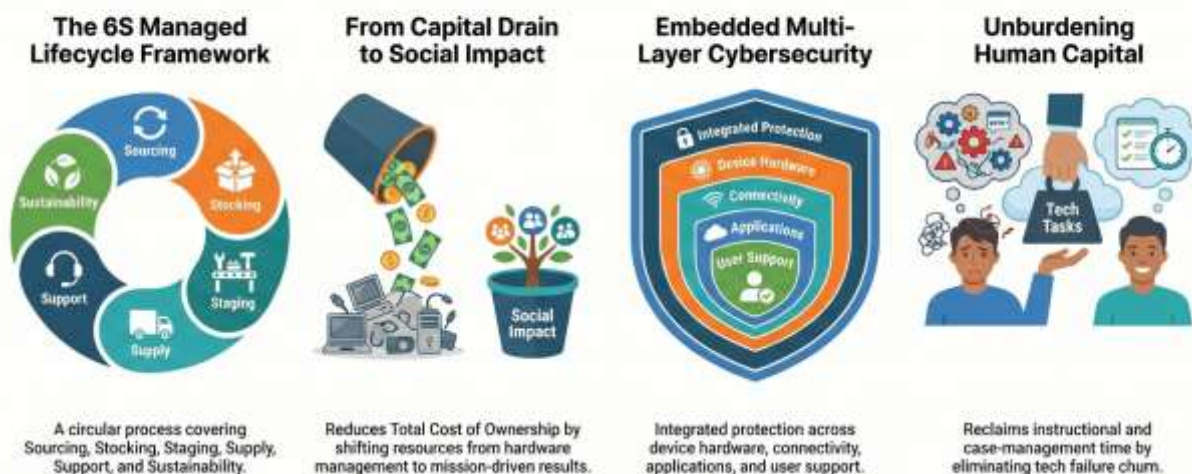


Fig. 1. The CTaaS 6S Lifecycle Framework, showing aggregated sourcing, just-in-time logistics, MDM staging, white-glove supply, dedicated support, and circular-economy sustainability, with embedded cybersecurity layers.

TABLE I
The CTaaS 6S Lifecycle Framework Complete Reference

Stage	Pillar	What CTaaS Does	NFP Benefit
Sourcing	Aggregated Procurement	Pools demand from 100s of NFPs; negotiates directly with OEMs and Tier-1 carriers	Enterprise pricing, pooled data plans, guaranteed SLAs — no retail markups
Stocking	JIT Inventory	Holds devices in secure warehouses; activates on participant enrollment only	Zero idle capital; zero storage burden; on-demand deployment in days
Staging	Automated Provisioning	MDM enrollment, pre-activated cellular, accessibility profiles pre-loaded per cohort	Consistent, ready-to-use devices; no setup needed by NFP staff
Supply	White-Glove Delivery	Doorstep kit delivery with large-print guides, cases, prepaid return packaging	Rapid deployment; chain-of-custody; dignity-centred experience for users
Support	24/7 Specialist Helpdesk	Remote screen-mirroring; empathetic, plain-language support; multi-tier escalation	Eliminates staff double-up; near-zero abandonment; 92% first-contact resolution
Sustainability	Circular Economy	Secured wipe; component refurbishment; zero-landfill recycling; reallocation	Environmental compliance; extended device social value



IV. CTAAS: SERVING SENIORS AND STRENGTHENING HOME HEALTH

America’s aging population represents one of the defining societal challenges of this generation. By 2025, more than 61.2 million Americans will be 65 or older [2], and for most of them, healthcare is no longer delivered exclusively in a clinic. It increasingly arrives through a screen. Utilization of remote patient monitoring among Medicare beneficiaries grew by more than 1,300% between 2019 and 2022, with Medicare payments exceeding \$536 million in 2024 and nearly 970,000 enrollees receiving RPM services [12]. But RPM only works when the technology works—and for older adults without managed support, technology has a troubling tendency to stop working very quickly.

A. Why Traditional Senior Programs Fail

Most senior digital inclusion programs are designed around a single event: distribute devices, offer a brief orientation, and consider the job done. This model underestimates the ongoing support seniors need and overestimates their tolerance for friction. The barriers are real and predictable.

- **Configuration Friction:** While 90% of adults aged 50+ now own smartphones, AARP research shows that 68% abandon new devices when initial setup exceeds their cognitive comfort threshold [13]. Ownership does not equal productive use.
- **Absent Ongoing Support:** Seniors encounter recurring issues, such as password resets, OS updates, and accidental setting changes, that accumulate without managed support, leading to the device being put away and never touched again, often within the first 90 days.
- **Inaccessible Interfaces:** Standard consumer interfaces were not designed with aging users in mind. Small icons, complex menus, and multi-step navigation flows create cognitive overload that discourages continued engagement.
- **Broken RPM Data Streams:** In home health contexts, device failure is not merely inconvenient it disrupts clinical monitoring, can trigger unnecessary emergency interventions, and may violate CMS continuity requirements, jeopardizing patient safety and grant compliance.

B. Project Silver Echo: A CTaaS Transformation

Project Silver Echo began as a conventional digital inclusion initiative—a consortium of NFPs distributing 1,200 tablets to seniors enrolled in home-health programs. Within six months, 41% of those devices had been abandoned. Configuration friction at onboarding, the absence of remote diagnostics, and accidental misconfigurations with no one to fix them collectively destroyed the program’s RPM data reliability. Grant compliance was at risk. The promise of technology-enabled home health was collapsing under the weight of an unmanaged delivery model.

The transition to CTaaS changed everything immediately. Devices arrived preconfigured with senior-optimized MDM profiles: large-format icons, simplified home screens, and locked settings to prevent accidental misconfiguration. Cellular connectivity was pre-activated, eliminating the Wi-Fi setup barrier that had previously kept many seniors from engaging with the program. Doorstep delivery served seniors with mobility limitations. A dedicated, empathetic helpdesk with remote screen mirroring resolved issues without requiring any NFP staff involvement. Table II reports the outcomes.

Table II
Project Silver Echo — Senior Program Outcomes Before vs. After CTaaS

Metric	Unmanaged (Before)	CTaaS-Managed (After)	Change
Device Abandonment Rate	41%	4.5%	▼ 89%
RPM Data Continuity	~58% (unreliable)	98.5% (clinical grade)	▲ 40 pts
Helpdesk First-Contact Res.	N/A — no helpdesk	92%	New capability
Socialization Hours (verified)	Baseline	300% of baseline	▲ 3×
Staff Tech-Support Hours/week	High (undocumented)	Near zero	Fully externalized



Fig. 2. Senior inclusion impact, Project Silver Echo: device abandonment, RPM data continuity, helpdesk resolution, and socialization hours, before versus after CTaaS.

C. Clinical and Social Implications

A 98.5% RPM data continuity rate means physicians can rely on home monitoring data for clinical decision-making enabling earlier interventions, fewer emergency department visits, and more efficient care coordination between primary care physicians, specialists, and home health agencies. The 300% increase in verified socialization hours carries equally significant implications: social isolation among older adults is associated with a 50% increased risk of dementia and a 26% increased risk of mortality, according to longitudinal health research. RAND Corporation research confirms that digital continuity is a primary determinant of successful home-health outcomes for older adults [14]. By transforming abandoned tablets into reliable social-connection infrastructure, CTaaS addresses both the physical and psychological dimensions of aging in place.

CTaaS aligns directly with federal aging-in-place policy priorities: the Administration for Community Living’s digital equity initiatives, CMS Chronic Care Management and RPM reimbursement frameworks, and the Older Americans Act modernization agenda. As the Medicare population grows and federal budgets face escalating pressure, technology-enabled preventive care becomes not just desirable but fiscally necessary. CTaaS provides the delivery infrastructure that enables scalable, sustainable aging-in-place.

V. CTAAS: EMPOWERING YOUTH WORKFORCE READINESS

At the other end of the age spectrum, a different but equally urgent crisis is unfolding. The World Economic Forum projects that automation will affect 47% of U.S. workers over the next decade, with disproportionate impact on low-income and minority youth [5]. Entry-level jobs that once served as economic stepping stones are being automated away. For marginalized young people, digital inclusion is not merely about internet access. It is about acquiring the skills and professional discipline to compete in an economy being fundamentally restructured by artificial intelligence.

A. Why Youth Technology Programs Fall Short

Programs funded through the Workforce Innovation and Opportunity Act (WIOA) represent the largest federal investment in youth workforce development. Yet many rely on technology models that are already obsolete, and unmanaged devices almost always become liabilities rather than assets.

- **Outdated Curriculum:** Programs still teaching basic office software in a world that runs on cloud collaboration, AI-augmented workflows, and data analytics.
- **Unmanaged Devices:** Without MDM controls, devices become entertainment platforms rather than learning tools. Usage policies are absent; educational focus evaporates.
- **Connectivity Gaps:** Home Wi-Fi instability prevents participation in synchronous learning. Students miss live instruction, collaborative projects, and real-time feedback.
- **No Secure Learning Environments:** Without enterprise-grade security, youth cannot access cloud development tools, virtual labs, or the professional platforms they will encounter in the workplace.



B. Project Horizon: From Chaos to Competence

Project Horizon was a metropolitan youth workforce initiative that deployed unmanaged devices to 800 participants. Within four months, the results were alarming: 38% of devices had experienced OS corruption or misconfiguration, 27% had been repurposed for non-program use, and virtual lab attendance had dropped 31% due to connectivity failures. The program’s workforce readiness metrics had collapsed, leaving participants no better prepared for employment and jeopardizing future WIOA funding.

The transition to CTaaS produced a structural transformation. Devices were preloaded with industry-standard tools: Microsoft Teams for collaboration, GitHub for version control, and Figma for design. MDM-enforced usage policies blocked distracting apps, whitelisted learning applications, and enabled distraction-free modes that simulated a professional work environment. Cellular connectivity replaced unreliable home Wi-Fi. A dedicated helpdesk resolved technical issues without pulling instructors from teaching. Table III reports the outcomes.

TABLE III
Project Horizon — Youth Workforce Outcomes Before vs. After CTaaS

Metric	Unmanaged (Before)	CTaaS-Managed (After)	Change
Device OS Corruption/Misconfi	38% of fleet	<2% (MDM-enforced)	▼ 36 pts
Devices Repurposed Off-Program	27%	<1% (app whitelisting)	▼ 26 pts
Virtual Lab Attendance	▼ 31% from baseline	▲ 28% over baseline	▲ 59 pts
Project Completion Rate	Degraded / un-trackable	▲ 41% improvement	▲ 41%
Overall Device Uptime	~62%	94%	▲ 32 pts

C. Beyond Metrics: Building Workplace-Ready Professionals

The OECD confirms that structured digital ecosystems dramatically improve youth workforce outcomes [15]. But CTaaS delivers more than just measurable metrics. Participants in Project Horizon who completed the CTaaS-enabled program demonstrated enhanced professional behaviors: punctuality, digital communication etiquette, and collaborative problem-solving in virtual environments. These competencies, increasingly valued by employers adopting hybrid and remote work models, are rarely cultivated in traditional training programs focused on software feature instruction.

The MDM-enforced, distraction-free device environment did not merely prevent misuse—it acclimatized youth to the discipline, focus, and professional tool fluency required in modern enterprise settings. Participants emerged not merely as job seekers but as workplace-ready contributors who could integrate immediately into technology-driven teams. CTaaS supports federal workforce priorities including WIOA Title I Youth Program modernization, national AI workforce readiness initiatives, and digital equity provisions in the Infrastructure Investment and Jobs Act (IIJA). As AI-driven automation accelerates, the demand for structured, supported digital learning environments will only intensify.

VI. DISCUSSION AND POLICY IMPLICATIONS

Taken together, the senior and youth case studies reveal something fundamental: digital inclusion fails when treated as a hardware distribution event. It succeeds when engineered as a continuous, managed service. This realization has cascading implications for how we fund, design, and evaluate digital equity programs at the national level. Fig. 3 summarises the mapping from NFP bottlenecks to CTaaS solutions.



Fig. 3. NFP operational bottlenecks mapped to CTaaS solutions: from fragmented operations to managed continuity.

A. Digital Inclusion Requires Managed Infrastructure

Sustainable digital inclusion requires continuous connectivity, continuous configuration, continuous support, continuous security, and continuous lifecycle management. CTaaS operationalises all five continuities in a single subscription model, transforming digital inclusion from a procurement activity into a genuine infrastructure service analogous to how communities think about water, electricity, or broadband itself.

B. Federal Digital Equity Alignment

CTaaS directly supports the NTIA Digital Equity Act implementation, FCC Lifeline successor programs, CMS telehealth modernisation, and WIOA workforce transformation. By converting technology costs from unpredictable capital expenditure to stable operational subscriptions, CTaaS aligns with grant forecasting requirements and reduces compliance risk for NFP grantees. The shift from CapEx to OpEx also makes genuine multi-year sustainability planning possible.

C. Staff Retention and Mission Clarity

The double-up problem is not just a productivity issue it is a mission clarity crisis. When a social worker spends her day troubleshooting tablets instead of serving clients, the organisation is no longer operating as intended. CTaaS eliminates technical burden from program staff entirely, restoring their capacity for the human-centric work that defines the NFP mission. Given that 67% of nonprofit employees are considering departure [7], this improvement in staff experience has direct implications for program quality and organisational sustainability. The Urban Institute confirms that reducing administrative burden in human services organisations directly improves program outcomes and staff retention [16].

D. Cybersecurity and Privacy Compliance

As NFPs deliver increasingly sensitive services home health monitoring, youth workforce data, benefits coordination the security stakes are high. CTaaS integrates NIST SP 800-53 endpoint controls, NIST SP 800-88 data sanitisation, HIPAA and FERPA compliance, and zero-trust device configurations into every deployment. This enterprise-grade security architecture, embedded within a community-scale service model, addresses a vulnerability that has historically exposed vulnerable populations to data breaches and identity theft.

E. Environmental Responsibility

As digital inclusion programs expand nationally, the environmental cost of technology disposal becomes significant. CTaaS's circular economy model certified data sanitisation, component-level refurbishment, zero-landfill recycling addresses this directly and supports federal sustainability goals under Executive Order 14057. Every refurbished device reallocated to a secondary NFP tier extends social impact while reducing environmental burden.

F. Transforming the Philanthropic Model

CTaaS also carries a critical implication for how philanthropy works. Traditional grantmaking treats technology as a capital expense: fund it once, expect it to keep working. CTaaS reframes technology as a subscription service requiring



recurring investment but in return it delivers measurable, guaranteed performance metrics: uptime percentages, support resolution times, data continuity rates. This accountability architecture transforms technology grants from speculative investments into performance-based partnerships. For grantors, this means evidence-based renewal decisions. For NFPs, it means sustainable multi-year technology funding anchored in demonstrated results. Tables IV and V provide the supporting cost-of-ownership and capability comparisons.

TABLE IV
Total Cost of Ownership: Traditional Model vs. CTaaS Over 36 Months

Cost Element	Traditional Model	CTaaS Model	Advantage
Device Acquisition (per unit)	\$200–\$400 CapEx	Bundled in subscription	No upfront capital lock-in
Ongoing O&M (18–24 months)	\$800–\$1,400 (unplanned)	Included in OpEx	Budget certainty
IT/helpdesk staff costs	Borne by NFP	Externalized	Staff freed for mission
Device replacement (failures)	Unbudgeted shock cost	Covered by SLA	Risk eliminated
3-Year Total Cost per Device	\$1,200–\$1,800	\$1,260–\$2,340	Parity with 98.5% uptime
Break-Even	36–48 months (if it works)	18–24 months	2× faster return

TABLE V
CTaaS vs. Traditional Model — Side-by-Side Capability Comparison

Dimension	Traditional Model	CTaaS Model
Technology ownership	CapEx asset — NFP owns, maintains, replaces	OpEx service — externally managed lifecycle
Configuration & setup	Manual; staff-dependent; inconsistent	Automated; standardised; consistent
Technical support	Ad hoc by untrained staff	24/7 specialist helpdesk; remote diagnostics
Device abandonment risk	40–45% in unmanaged deployments	<5% with continuous support
Cybersecurity posture	Unmanaged endpoints; HIPAA/FERPA risk	Zero-trust MDM; NIST-compliant by default
Environmental accountability	Devices landfilled at end-of-grant	Certified wipe, refurbish, reallocate
Grant alignment	CapEx front-loaded; O&M unfunded	OpEx subscription; multi-year compliant
Scalability	Constrained by NFP procurement leverage	Enterprise scale via aggregated purchasing

VII. CONCLUSION

The United States is at an inflection point. Digital participation is no longer a feature of modern life it is the infrastructure of modern life. Healthcare arrives through devices. Employment requires digital credentials. Social connection happens on screens. For older adults navigating aging-in-place and for young people competing in an automated economy, digital access is not a luxury it is survival.

Not-for-Profit organisations are positioned to deliver digital equity to the populations most in need. But the traditional model buys devices, distributes them, and watches too many of them fail, has proven structurally inadequate. It wastes



philanthropic capital, burns out dedicated staff, and leaves vulnerable people without the ongoing support they need to remain engaged with technology long enough for it to change their lives.

CTaaS offers a fundamentally better model. By operationalizing the 6S Lifecycle Framework (Sourcing, Stocking, Staging, Supply, Support, and Sustainability), CTaaS transforms technology from a one-time asset into a continuous managed service. The empirical results are not incremental improvements but fundamental differences: device abandonment drops from 41% to 4.5%; RPM data continuity rises to 98.5%; virtual lab attendance increases by 28%; and project completion rates improve by 41%. These are the differences between a program that works and one that does not.

CTaaS is also critically easy for NFPs to adopt. No technology expertise is required. No infrastructure to build. No IT staff to hire. An NFP describes who it serves, and CTaaS handles everything else, from procurement and configuration to doorstep delivery and ongoing support, under a single, grant-compliant subscription. This simplicity is not accidental; it is by design. CTaaS was built specifically for organizations that excel at human-centered service delivery and should not be burdened with managing enterprise technology ecosystems.

As federal digital equity initiatives expand, including the NTIA Digital Equity Act, CMS telehealth modernization, and WIOA workforce transformation, CTaaS provides the scalable, secure, and sustainable delivery architecture needed to turn policy aspirations into community reality. The technology gap does not reflect what vulnerable populations are capable of. It reflects how technology has historically been delivered to them. CTaaS changes the delivery model and, in doing so, changes outcomes for millions of Americans.

Future research should explore integrating CTaaS with AI-driven adaptive learning systems, predictive health analytics, and community-based digital safety frameworks. The framework's modular design suggests a natural extension to other underserved populations: veterans, individuals with disabilities, rural communities, and newly arrived immigrants. As digital equity is increasingly recognized as part of national infrastructure, CTaaS offers a tested, scalable template for managed-service delivery of social impact at the scale this moment demands.

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REFERENCES

- [1] National Telecommunications and Information Administration, "Digital Nation Data Explorer," U.S. Department of Commerce, 2023. [Online]. Available: <https://www.ntia.gov/data/digital-nation-data-explorer>
- [2] U.S. Census Bureau, "Older Adults Outnumber Children in 11 States and Nearly Half of U.S. Counties," Jun. 2025. [Online]. Available: <https://www.census.gov>
- [3] Centers for Medicare & Medicaid Services, "Medicare Telemedicine Snapshot," CMS, 2022. [Online]. Available: <https://www.cms.gov>
- [4] World Health Organization, "Global Strategy on Digital Health 2020-2025," WHO, 2021. [Online]. Available: <https://www.who.int>
- [5] World Economic Forum, "The Future of Jobs Report 2025," Jan. 2025. [Online]. Available: https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf
- [6] U.S. Bureau of Labor Statistics, "Employment Projections: 2022-2032," BLS, 2023. [Online]. Available: <https://www.bls.gov>
- [7] Candid, "The People Behind Nonprofit Impact: Who's Staying, Who's Leaving, and Why It Matters," Oct. 2025. [Online]. Available: <https://candid.org>
- [8] Charity Navigator, "Financial Efficiency Benchmarks," 2023. [Online]. Available: <https://www.charitynavigator.org>
- [9] UK Government, "Digital Inclusion Action Plan: First Steps," Feb. 2025. [Online]. Available: <https://www.gov.uk/government/publications/digital-inclusion-action-plan-first-steps>
- [10] National Institute of Standards and Technology, "NIST Privacy Framework," NIST, 2020. [Online]. Available: <https://www.nist.gov>
- [11] Consumer Technology Association, "Device Lifespan and Replacement Trends," CTA, 2022. [Online]. Available: <https://www.cta.tech>



[12] HHS Office of Inspector General, "Billing for Remote Patient Monitoring in Medicare," Aug. 2025. [Online]. Available: <https://oig.hhs.gov/reports/all/2025/billing-for-remote-patient-monitoring/>

[13] AARP Research, "Tech Use and Adoption Keeps Surging Among Older Adults," Dec. 2025. [Online]. Available: <https://www.aarp.org>

[14] RAND Corporation, "Home-Based Care and Digital Health Integration," RAND, 2021. [Online]. Available: <https://www.rand.org>

[15] Organization for Economic Co-operation and Development, "Digital Skills and the Future Workforce," OECD, 2021. [Online]. Available: <https://www.oecd.org>

[16] Urban Institute, "Administrative Burden in Human Services," Urban Institute, 2022. [Online]. Available: <https://www.urban.org>

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