



# Transforming healthcare:

Integrating digital solutions  
for enhanced federal health IT



## Embracing digital transformation for future healthcare excellence

The goal of this white paper is to underscore the value of digital transformation in healthcare. This includes the broad concept of building and delivering secure, private connectivity across numerous sources. By laying down the connectivity framework, healthcare teams are equipped to navigate the expanding landscape of artificial intelligence within the healthcare domain effectively.

The provided roadmap, spanning from basic digitization to real-time innovation, presents agencies with both the path forward as well as a more insightful understanding of their current position. Through this roadmap, healthcare agencies gain a secure pathway towards constructing a digitally transformed infrastructure for the future.

The ultimate advantage offered by this roadmap approach lies in the agency's capacity to construct for tomorrow, starting today. By delivering a robust network capable of supporting present needs while facilitating the effective transition to the evolving network requirements of the future.

Digital Transformation is the process of modernizing your networks and integrating digital technologies into your daily operations, processes, work culture, and customer experiences. Government agencies and other public sector organizations are working to follow-through on their own digital transformation journeys, and this includes the largest healthcare system in the United States—none other than the U.S. government.

Many people are aware of some government healthcare programs, but the number of people who receive services is not often apparent.

According to data from the U.S. government, Medicare covers about 65 million people, Medicaid covers approximately 85 million people (including adults and children), the Children's Health Insurance Program (CHIP) covers about 7 million children, the Veterans Health Administration (VHA) services over 9 million veterans, and the Indian Health Service (IHS) services over 2.6 million Native Americans and Alaskan Natives.<sup>1</sup>

Given the size and scope of federal healthcare, there are some significant factors that influence their operations and digital transformation initiatives.

Cost emerges as a significant concern, prompting a critical examination of expenditure intelligence — the strategic allocation of resources to optimize outcomes. Amidst escalating

1. <https://www.kff.org/medicaid/what-does-the-federal-government-spend-on-health-care/>

## U.S. Government Healthcare Spending

The U.S. healthcare system includes a significant portion that is managed by the government, which requires a large investment.

Medicare	Medicaid
<b>\$900b+</b>	<b>\$700b+</b>
Veterans Affairs (VA)	Total public spending *
<b>\$122b+</b>	<b>\$4.3t+</b>

\* Combines federal, state, and local government spending on healthcare <sup>2</sup>

costs and persistent access inequalities, the quest for enhanced quality of care intensifies. Recent global health events have further emphasized the need for adaptable and resilient infrastructure capable of meeting evolving demands. Advanced technologies are essential to fortify health-care systems, ensuring uninterrupted delivery of care amidst unprecedented challenges.

By leveraging innovative technologies such as artificial intelligence (AI)-driven diagnostics, AI support for clinical studies, AI support for drug development, as well as improved telehealth, all delivered through an integrated interconnected network, federal agencies and healthcare organizations are unlocking new possibilities. “By harnessing the power of information and leveraging recent technological advancements, we’re better equipped to meet the evolving needs of the people and communities we serve,” Andrea Palm, Former Deputy Secretary of Health and Human Services (HHS), aptly stated with the recent announcement of the release of the HHS Data Strategy.<sup>3</sup>

This white paper explores the potential of digital transformation in health-care, drawing insights from healthcare leaders at HHS, the National Institute of Health (NIH), and the Department of Veterans Affairs (VA), coupled with pioneering documents such as Verizon’s “Transforming Healthcare”<sup>4</sup> and Equinix’s “Digital Transformation in U.S Federal Health IT.”<sup>5</sup> By synthesizing these perspectives and integrating real-world examples, the aim is to provide a comprehensive framework for improving modern healthcare delivery and driving sustainable change in the digital age.

## Current landscape of healthcare digitization

Understanding the federal healthcare landscape and the primary obstacles for agencies are crucial components to appreciating the impact of digital transformation. Access disparities exist nationwide, especially in certain regions, such as small rural towns, sparsely populated areas, American Indian reservations and Alaska Native villages and some sections of urban America. Inadequate health coverage exacerbates this issue,<sup>6</sup> as the 2018 census revealed that approximately 1 in 10 individuals in the United States lack insurance.<sup>7</sup>

Meanwhile, the United States has some of the world’s highest health-care costs, nearly double those of other developed nations. In 2024 U.S. healthcare spending reached \$5.3 trillion, averaging about \$15,475 a

2. <https://www.medicaid.gov/medicaid/eligibility-policy/seniors-medicare-and-medicaid-enrollees>

3. <https://www.hhs.gov/about/news/2023/12/14/hhs-releases-new-data-strategy-enhance-data-capabilities-accelerate-progress-cancer-moonshot-goals.html>

4. <https://www.verizon.com/business/resources/whitepapers/the-path-to-connected-healthcare-excellence.pdf>

5. <https://www.equinix.nl/resources/whitepapers/us-federal-health-it-digital-transformation>

6. <https://health.gov/healthypeople/priority-areas/social-determinants-health/literature-summaries/access-health-services#cit3>

7. <https://health.gov/healthypeople/objectives-and-data/browse-objectives/health-care-access-and-quality#cit1>

person.<sup>8</sup> Rising prices of medications, medical procedures and chronic disease management strain budgets and hinder equitable access to care. Despite these expenditures, disparities in healthcare quality also persist due to inconsistent care practices, fragmented healthcare delivery systems, understaffing and limited access to preventive services.

In this landscape, technology plays a pivotal role in bridging gaps and enhancing healthcare delivery. Digital transformation initiatives offer opportunities to streamline processes, improve access, and optimize resource allocation.



## Addressing challenges faced by federal health IT teams

Federal health IT teams are charged with multifaceted missions aimed at safeguarding public health, providing healthcare services to specific populations and advancing healthcare research and innovation. One of the primary hurdles they encounter is the presence of legacy IT systems, which hinder progress due to outdated infrastructure and technologies.

While upgrades take time and financial investments, they are worth the spend. For example, the NIH is proactively investing in its future as it looks to replace its Electronic Health Record (EHR), which has been in use for over 20 years.<sup>9</sup>

Chief Information Officer at NIH, Jon McKeeby explained why change was necessary now in a recent panel discussion: “The problem with the EHR for the last few years is that we’re trying to replicate a paper medical record. Now we have all the tools to make it so we can be more visual, interact with it, but also have it create summaries, and also predictive models to help us in health care.”<sup>10</sup>

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**Jon McKeeby**  
 Chief Information Officer at the NIH

8. <https://www.cms.gov/data-research/statistics-trends-and-reports/national-health-expenditure-data/nhe-fact-sheet>

9. <https://www.cms.gov/priorities/key-initiatives/e-health/records>

10. <https://federalnewsnetwork.com/it-modernization/2024/02/nih-seeks-new-ai-friendly-ehr-to-make-better-use-of-health-care-data/>

ed healthcare network. Strong security measures play a crucial role in safeguarding patient data privacy, while robust network management strategies optimize performance and scalability. Connectivity solutions ensure ubiquitous access to network resources, fostering mobility and interoperability. Moreover, automation, driven by technologies like AI and ML, streamlines operations, minimizes human error, and enhances overall service delivery efficiency.

Yet, challenges persist in achieving smooth data exchange and interoperability due to fragmented healthcare data and standardized protocols. The 21st Century Cures Act, enacted in 2016, is one law serving to address these issues by promoting interoperability and supporting biomedical research. More recently, the Department of Defense (DoD), the VA, the U.S. Coast Guard and the National Oceanic and Atmospheric Administration (NOAA) began use of MHS GENESIS, a single, common EHR to be used throughout a service member's life, even after they become a veteran.<sup>11</sup> In a press release, Dr. Neil Evans, the Acting Program Executive Director of the Federal Electronic Health Record Modernization program office explained, "The COVID-19 pandemic underlines the importance for clinicians on the front lines to quickly access a patient's health records, regardless of where that patient previously received care."<sup>12</sup>

Additionally, protecting sensitive healthcare data from cyber threats and ensuring compliance with stringent security regulations are ongoing battles for federal health IT teams, necessitating robust security measures and proactive risk management strategies.

## Charting the path: The four stages of digital transformation

Against this backdrop of challenges, digital transformation offers a pathway for reshaping the federal healthcare system by addressing structural inefficiencies. Each agency is at a different stage in their transformative journey. Typically, progression follows four stages, each building upon the other to drive continuous improvement and innovation for a connected healthcare system.

### Basic transformation

At this initial stage, healthcare organizations focus on digitizing fundamental processes such as patient record management, appointment scheduling and billing, laying the groundwork for more advanced digital solutions.

### Efficient transformation

As healthcare organizations mature in their digital journey, they move to implementation of advanced analytics tools, automation technologies and interoperable systems.

### Enhanced transformation

Building upon the efficiencies achieved in the previous stage, this next phase encompasses the integration of patient-generated health data, personalized medicine approaches, and predictive analytics to tailor treatments and interventions to individual patient needs.

### Real-time innovation

The final stage involves continuous innovation and adaptation, using emerging technologies like AI, ML, and IoT for real-time monitoring, proactive interventions and predictive modeling, thereby enhancing patient outcomes and population health management.

11. <https://www.va.gov/lovell-federal-health-care-tricare/programs/electronic-health-record-modernization-ehrm/#:~:text=Yes.,the%20military%20through%20veteran%20status>

12. <https://news.va.gov/press-room/va-dod-implement-new-capability-for-bidirectional-sharing-of-health-records-with-community-partners/>

## Elevating healthcare services through network infrastructure

At the heart of modern healthcare lies a resilient network infrastructure, serving as the cornerstone for the delivery of effective and efficient patient care. This foundational support system, comprising cloud-based platforms, secure networks, and edge computing solutions, serves as the catalyst for innovation, guiding the transformative journey of healthcare. Keys to this transformation involve the integration of functions, Network as a Service (NaaS) solutions, collaboration, and connectivity, playing pivotal roles in addressing prevailing challenges and driving digital transformation.

### Integration of functions

Seamless integration of key functions, such as security, management, connectivity and automation, is central to the effectiveness of a connected healthcare network. Strong security measures safeguard patient data privacy, while effective network management strategies optimize network performance and scalability. Connectivity solutions provide ubiquitous access to network resources, supporting mobility and interoperability. Automation, powered by advanced technologies such as AI and ML, streamlines operations, automates routine tasks and enhances operational efficiency, minimizing human error and improving overall service delivery.

## Discussion on Network as a Service (NaaS) and its potential in addressing healthcare challenges

NaaS helps healthcare providers offload the complexity of network management to experienced service providers, allowing them to focus on delivering high quality patient care. “The network should be invisible to the user, something s/he does not have to think about, regardless of device or location. Most importantly it should be reliable and deliver secure connectivity,” Bill Shealy, Distinguished Architect, Public Sector at Verizon stated in an interview. NaaS solutions address the three major challenges of access, costs

and quality of care, offering several potential benefits for healthcare organizations, including:



**Scalability:** NaaS solutions can scale dynamically to accommodate fluctuations in demand, ensuring that healthcare organizations have the resources they need to support evolving clinical workflows and patient care needs.



**Flexibility:** NaaS allows healthcare organizations to adapt their network infrastructure to changing requirements quickly.



**Cost-efficiency:** By outsourcing network management to NaaS providers, healthcare organizations can reduce upfront capital expenditures and ongoing operational costs.



**Security and compliance:** NaaS providers typically implement robust security measures and adhere to industry best practices and government requirements to protect sensitive healthcare data and ensure compliance with regulatory requirements.

## Empowering healthcare transformation through collaboration

Achieving national healthcare goals necessitates collaboration among diverse stakeholders, including healthcare providers, government agencies, technology partners and even patients. By fostering collaboration, healthcare agencies can break down silos, share best practices and co-create solutions. A connected healthcare network, supported by robust infrastructure and powered by NaaS solutions, holds immense potential to transform healthcare delivery and operations by partnering with the right organization. “When it comes to NaaS, this should include finding a partner to provide a fully integrated, end-to-end solution that evolves with the care organization to meet its specific connected healthcare goals,” Shealy explained.

13. <https://www.cio.com/article/1247095/how-5g-is-driving-big-innovations-in-healthcare-for-veterans.html>



## Leveraging technologies for enhanced connectivity

The adoption of advanced connectivity technologies, such as 5G fixed wireless access (FWA), enable seamless communication, data exchange, and collaboration across the federal healthcare system.

Secure cloud fabrics represent a distributed and interconnected infrastructure that spans multiple data centers and cloud environments, enabling healthcare organizations to seamlessly access and deploy resources on-demand. “Supporting a secure cloud fabric should provide a care organization true control over the quality of user experience, application performance, and data security for its cloud services,” Shealy said. Secure cloud fabrics help healthcare providers achieve greater agility, scalability and flexibility in managing their IT infrastructure, optimizing resource utilization, and supporting emerging healthcare applications and services. A secure cloud fabric safeguards sensitive patient data, ensuring regulatory compliance and mitigating cybersecurity risks.

5G technology is helping revolutionize connectivity in healthcare by delivering ultra-fast, low latency and reliable wireless communication capabilities. 5G onsite private networks offer healthcare organizations a dedicated and secure communication platform for transmitting sensitive data, facilitating real-time collaboration among healthcare professionals, and ensuring privacy and confidentiality in patient care delivery. Some agencies have begun piloting private 5G networking last year to improve their healthcare services for the 9 million Veterans it serves each year.<sup>13</sup>

With 5G onsite private networks, agencies can help deploy connected medical devices and sensors for remote patient monitoring, enabling continuous health tracking, early intervention, and proactive management of chronic conditions. By harnessing the low-latency and high-bandwidth capabilities of 5G networks, agencies are delivering more personalized and responsive care to patients, improving clinical outcomes, and reducing healthcare costs.

FWA solutions leverage 5G networks to provide high-speed internet connectivity to healthcare facilities, enabling rapid

data transfer, real-time communication, and seamless access to cloud-based applications and services. With 5G FWA, federal healthcare agencies are overcoming the limitations of traditional wired networks and extend connectivity to remote or underserved areas, improving access to care and enhancing operational efficiency.

## Key transformations post-network platform development

Much like a building's foundation, the network is constructed first and provides the basis upon which all other elements are built. Thus, it is imperative that the network is first modernized, as described above, to take advantage of this digital revolution. Once the foundational network is secure, hardened, and optimized, then attention can be focused to the three main tenets of digital transformation:

### Digital core

At the core of digital transformation lies the integration of fundamental clinical applications essential for care delivery. These include EHRs, Picture Archiving and Communication Systems (PACS), Laboratory Information Systems (LIS), Radiology Information Systems (RIS), central scheduling, and emerging AI platforms. The true potential of these core applications is unlocked when securely exposed through standardized data formats, enabling seamless data exchange among clinicians, partners, suppliers, and patients.

### Digital ecosystem

Once key digital services are securely integrated and accessible, they can be shared within a broader healthcare digital ecosystem. This ecosystem encompasses various stakeholders, including bio-research organizations, pharmaceutical manufacturers, research hospitals, pharmacies, and academic institutions. Collaboration within this ecosystem fosters innovation, efficiency, and value creation, driving advancements in healthcare delivery and patient outcomes.

## Four tenets of digital transformation



### Digital core



### Digital ecosystem



### Digital edge



### Secure digital assets



### Digital edge

The digital edge encompasses the frontline of healthcare delivery, extending from patients' homes to rural clinics and virtual care platforms. It also includes platforms facilitating doctor-patient consultations and patient engagement initiatives aimed at empowering individuals to take an active role in managing their health. The digital edge is also where care is delivered, or clinical research is performed, or more simply, where the virtual and physical worlds meet. As the healthcare landscape evolves, the digital edge becomes increasingly vital in ensuring accessibility, responsiveness, and personalized care delivery.

### Secure digital assets

As security frameworks evolve, healthcare agencies can capitalize on these advancements to enhance the security of their digital assets. This enables the provision of secure remote healthcare services, complementing the capabilities outlined in the preceding components. By establishing a secure enterprise, the healthcare agency can prioritize its commitment to delivering world-class patient care.

As federal agencies with healthcare missions contemplate transitioning towards a digitally transformed future, they can harness the power of commercial solutions as a pivotal element of their digital transformation strategy. Embracing commercially available technologies, already utilized by many healthcare agencies, serves as a guiding roadmap for their journey. It allows them to embrace industry standards like Fast Healthcare Interoperability Resources (FHIR) to modernize their IT infrastructure and improve healthcare delivery. Recent regulatory shifts, designed to alleviate provider burdens and enhance patient access to health data, are catalyzing the uptake of innovative applications. These applications empower patients and citizens to effectively manage their health, aligning with the overarching goals of improved healthcare accessibility and quality.

Verizon understands that federal agencies have missions that matter -- delivering critical services to citizens, enabling first responders and defending the nation. Our federal customers continue to rely on our decades of experience in delivering the networks and the technology that make government work—reliably, securely, and cost-effectively.

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