DHA ANALYTICS | CHIME Digital Health most wired Survey

INFRASTRUCTURE TREND REPORT

MODERNIZING IT TO ACCELERATE DATA USAGE

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Digital Health Analytics (DHA) is a global market intelligence and survey research hub for digital health technology. Provided by the College of Healthcare Information Management Executives (CHIME), DHA was created in 2022 as the gateway for provider organizations and companies to better understand how digital technology supports leaders in transforming health and care and delivering data insights that help them make the greatest business impact possible.

The Digital Health Most Wired Survey and Infrastructure

In the ever-changing landscape of today's healthcare, the annual CHIME Digital Health Most Wired (DHMW) survey is a significant digital health "north star" healthcare organizations (HCOs) have relied on for years. Widely known for the annual Most Wired recognition awards, the DHMW survey provides healthcare leaders a comprehensive profile of digital health usage in U.S. HCOs and a reliable resource by which to benchmark their own digital health progression.

Reflecting the digital profiles of approximately 40% of U.S. hospitals, the array of HCOs included in the 2023 DHMW survey is representative of the known U.S. Health System landscape. As such, the survey serves as a critical resource in identifying major themes and shifts in the HCO marketplace. The 2023 DHMW survey findings have identified an overarching theme that can be characterized as the acceleration of data usage.

In a digital health world shaped by Meaningful Use, HCOs have largely moved on from focusing on their data capture and storage capabilities to improving outcomes. In this environment, leveraging data emerges as a critical activity in the realization of improved operational and clinical outcomes. It is little surprise then to see evidence of the "acceleration of data usage" in all eight sections of the survey, including the Infrastructure section.

Infrastructure is the foundation of digital health. It brings together connectivity, interoperability and security to help ensure the delivery of a seamless digital experience for HCOs and their patients. In the context of accelerating data usage, IT infrastructure plays a critical role in facilitating an HCO's ability to digest data.

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Spectrum Enterprise: A Leader in Connectivity

To help explain the Infrastructure findings in the 2023 DHMW survey and the connectivity market in general, CHIME spoke with Spectrum Enterprise Vice President of Segment Marketing Andrew Craver. Spectrum Enterprise, a leading national provider of scalable network, communication, collaboration and security technology solutions, has an extensive HCO client list and is well positioned to offer insights from their market vantage point. Using the 2023 DHMW survey as a starting point, we profiled survey findings around infrastructure support, governance, monitoring practices and performance before turning to Craver to provide context and clarity around the many complex issues HCO leaders must navigate to ensure their organizations operate reliable and resilient modern infrastructures.

Emerging from this effort, we reinforce the critical role infrastructure plays in an HCO's acceleration of data usage. This will grow in importance as consumer technologies and patient-generated health data are increasingly absorbed into the data metabolism of care delivery networks.

Defining Infrastructure

DHMW considers infrastructure as the combined components needed for the operation and management of enterprise IT services and IT environments. In CHIME's 2023 Digital Health Most Wired (DHMW) survey, an HCO's infrastructure was adjudicated by assessing the following four factors:

1. Support
2. Governance
3. Monitoring practices
4. Performance

Representing approximately 11% of an HCO's total DHMW performance score, the Infrastructure section of the survey serves as a valuable indicator of an HCO's digital transformation capabilities.

"Data usage in healthcare has accelerated in recent years with innovations like the Internet of Medical Things (IoMT), telehealth and AI-driven diagnostic tools, yet if the IT infrastructure supporting these innovations isn't up to the task, these advances are moot," noted Lorren Pettit, CHIME's Vice President of Digital Health Analytics (DHA), on the weighting assigned to DHMW's Infrastructure section. "For healthcare organizations, meeting these demands requires a digital infrastructure that can support the swift, reliable and secure transport of patient data that results in a better patient experience. This ability benefits not just the patients, but also the HCOs."

The right network supported by the right technology partner can provide the common foundation needed to support multiple innovation priorities. This is especially true for HCOs still operating on legacy systems which are often costly and lack the scalability, resiliency and reliability needed to meet the needs of modern healthcare.

"Hospitals and health systems cannot afford to continue investing in 'legacy' networking technology in today's competitive, digital-first environment," Craver said. "By simply maintaining the status quo with respect to IT infrastructure, organizations risk losing their competitive edge."

Budget limitations have a direct impact on an HCO's ability to upgrade legacy applications and networks. Competing priorities and limited resources can impede innovation. However, organizations that do not invest in connectivity solutions that help them innovate and differentiate themselves from their peers may lag in market share.

1. Data connectivity — examples include broadband, fiber internet and fiber Ethernet connections
2. Managed network services — examples include software-defined wide area networks (SD-WAN), WiFi and routers
3. Secure access to the cloud — ample bandwidth and full visibility into network activity and threats
4. Voice — includes unified communications, video conferencing and connecting internet phone systems to the public phone network
5. TV/video — for example, streaming video solutions/services, programming, and interactive patient systems

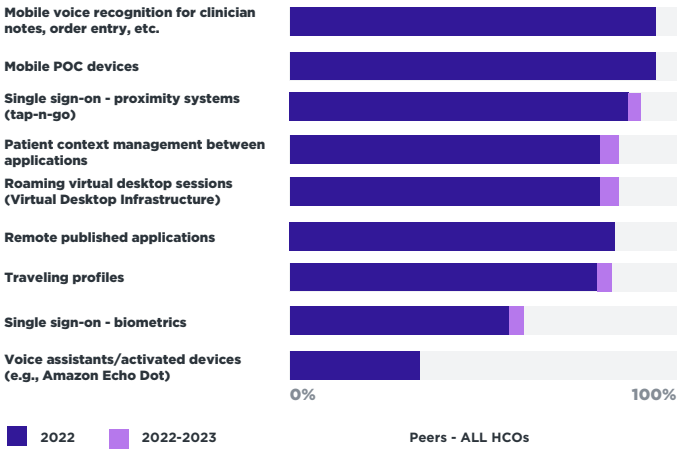
1 Infrastructure Support

The first category in the Infrastructure section of the DHMW survey addressed infrastructure support. In this section, the HCO's network capability was assessed by considering the varied types of digital technologies supported:

Caregiver workflow technologies

Question 3

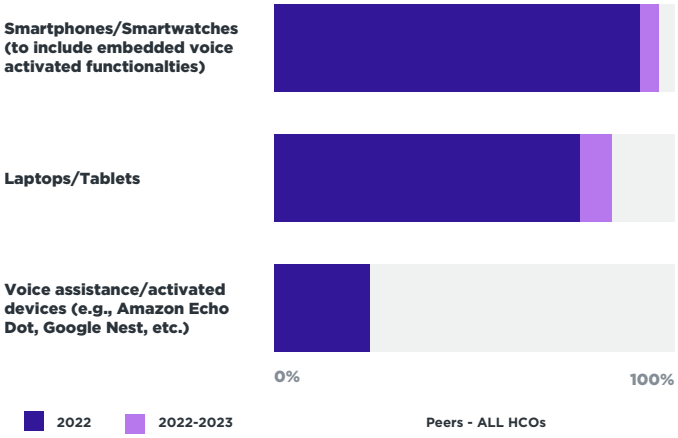
Which of the following technologies does your organization utilize to improve caregiver workflows?



Employee-owned devices

Question 4

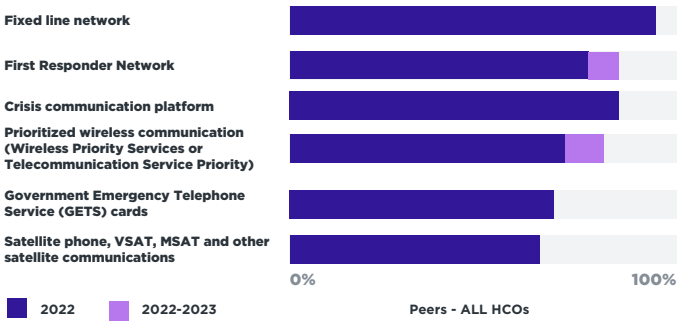
Which of the following types of employee-owned devices are your clinical staff to use in the care of your patients?



Emergency communication equipment and services

Question 7

Which of the following communication equipment and services could your staff potentilly use in the event of an emergency?



Commenting on these findings, Pettit noted that the findings align with multiple market reports that show the number of IT-connected devices and users is on a sharp upward trend, "forcing HCOs to adapt, embrace and support an expanding array of applications and technologies."

Of these findings, Pettit found the increased percentage of HCOs supporting wireless patient elopement/infant abduction technologies particularly notable: Jumping to nearly 87% in the current survey from 61% the year prior, the increased support reflects, in part, the challenges of caring for a growing aging population with cognitive declines. "Patient elopement and wandering have become such serious issues in facilities; it's been reported the Centers for Medicare & Medicaid Services (CMS) have even begun monitoring certain facilities where large numbers of patients are known to 'elope' on a regular basis," Pettit reported.

Another notable finding in this section involves the integration of wireless patient wearables with Electronic Healthcare Records (EHR). With just over half of HCOs supporting this functionality, the percentage is expected to rise as wearables have become a permanent part of the digital health landscape. These devices capture and transmit patient information that must be stored, retrieved, archived and categorized. The proliferation of wearables not only increases the amount of patient data HCOs must manage but acts as another source for accelerating data usage.

As with wearables, voice-activated assistants (think Alexa and Siri) are another emerging technology making their way into HCOs. Citing that only 31% of DHMW participants allow clinical staff to use their own voice-activated devices (e.g. Google Nest, Amazon Echo, etc.) in patient care whereas 95% claim clinical staff are allowed to use personal smartphones or smartwatches (which have embedded voice assistants) in patient care. "The percentage of HCOs where personal voice-activated technologies are actually used may be greater than we fully appreciate," Pettit noted.

Where patient wearables add more data to the copious data clinicians already digest, voice-activated technologies promise to reduce the workload from clinicians and improve their experience. Secure, hands-free technologies can free clinicians to focus on patient care and less on notetaking and ordering. Given this upside, it is understandable that nearly 97% of HCOs in the 2023 DHMW survey support the use of voice recognition technology for clinician notes and order entry as a means improve workflow.

Craver advised that the introduction of apps and connected devices into the care model and EHR requires increased focus on interoperability. "Network complexity and its management will continue to grow more sophisticated as emerging technologies like machine learning, generative AI, and predictive analytics are increasingly adopted and add larger amounts of data to healthcare enterprises," Craver said. "As HCOs evolve their networks, interoperability should be top of mind. The network infrastructure components — such as the WAN, the data center, and the network edge — are key elements of interoperability, as are all devices, applications and protocols that operate on the network."

Commenting on the near universal capability of HCOs to support telehealth for clinicians (98%), Craver noted that the use of telehealth is anticipated to grow as patients in rural areas obtain access to robust and reliable connectivity.
Spectrum Enterprise is a part of Charter Communications, a leading broadband connectivity company and cable operator. Charter has undertaken a multi-year, multi-billion-dollar rural construction initiative that will add over 100,000 miles of fiber-optic network infrastructure and deliver gigabit-speed internet access to more than 1 million currently unserved, mostly rural homes and small businesses across the country.

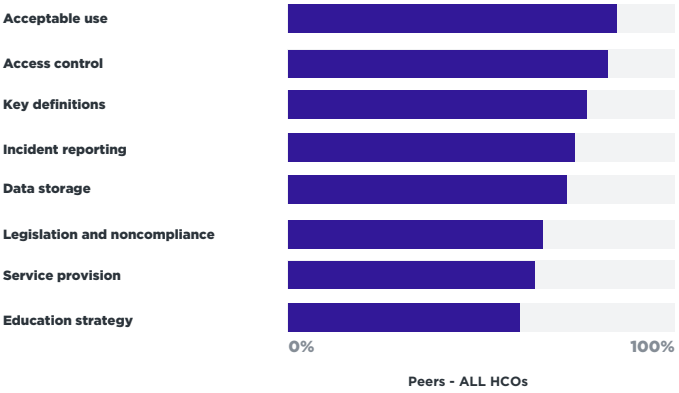
"It is crucial to have a modern infrastructure in place that is scalable as bandwidth needs increase," Craver said. "Healthcare organizations will need a technology partner to develop and maintain a modern infrastructure that is resilient and reliable. By leaving the technical and administration duties to network management experts, HCOs will be able to focus their IT and clinical teams on delivering the best possible care."

2 Infrastructure Governance

A second infrastructure category assessed by the DHMW survey focused on Infrastructure Governance. Following the assessment of an HCO's ability to support the influx of employee-owned devices in patient care, the DHMW survey gauged an HCO's efforts to govern the use of these devices by considering the varied elements included in a BYOD (bring your own device) policy. HCOs must be diligent to create policy and security measures as it relates to personal smart devices as they are projected to remain a permanent fixture on the digital health landscape. A BYOD policy for healthcare operations is important for a variety of reasons, chief among which is the need to protect patient data. Thus, while virtually all participating DHMW HCOs (98%) reported their BYOD policy included at least one of the eight elements considered in a BYOD policy, those elements most closely aligned with the protection of patient data — acceptable use and access controls were understandably the most cited policies.

Question 5

Which of the following elements are included in your organization's bring-your-own-device (BYOD) policy?



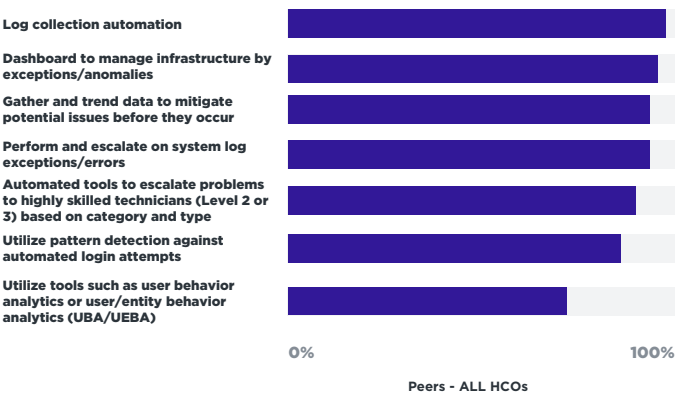
Craver noted that cybersecurity also needs to be a key consideration when supporting increased connectivity of additional users, devices and technologies. HCOs face significant challenges in supporting mobile applications and wireless technologies and need cybersecurity measures to protect patient data and prevent a breach, both at the device/application level and at the network level. Endpoint devices, for example, are primary access points for cybercriminals who then move laterally inside the enterprise network with an intent to disrupt operations and access protected, valuable data such as patient information. As more endpoints (smartphones, smartwatches, medical devices, etc.) join the network, it expands the cyberthreat landscape and increases the need for strong cybersecurity.

3 Infrastructure Monitoring Practices

The third Infrastructure category assessed in the DHMW survey looked at varied ways HCOs manage and monitor the performance of their network. Infrastructure monitoring is the process of collecting and analyzing data from IT infrastructure, systems and processes and using that data to improve outcomes and drive value across the enterprise. Being able to prevent technical problems with the right monitoring and reporting tools can not only help keep clinical staff working efficiently without the anxiety of failed calls, but it can provide visibility into usability trends, equipment performance, downtime and much more that can save time and resources.

Question 1

Which of the following methods does your organization use to monitor your IT systems?



The results of the survey suggest there is wide agreement on the usage of varied infrastructure monitoring methods, including automated log collection, dashboard management of exceptions and anomalies, and pattern detection across automated login attempts. User behavioral analytics (UBA) was the only exception to the items considered in the DHMW survey even though it still had nearly 80% usage.

Given the complexity of backend systems many organizations operate, HCOs can be challenged to find a suitable infrastructure monitoring tool, especially when the enterprise has migrated to the cloud or relies on cloud infrastructure. Many HCOs look to a managed services

partner to help monitor their infrastructure as well as leverage the partner's software management support to access the latest patches, fixes and releases. This is one way that a single technology provider can reduce the burden on internal IT staff so HCOs can do what they do best, patient care delivery.

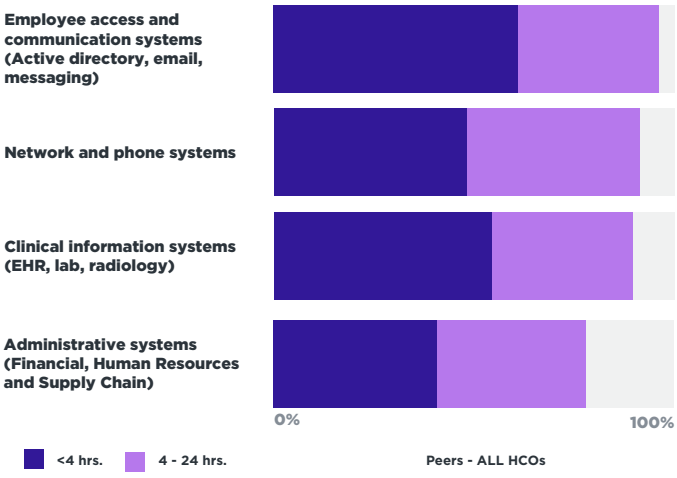
Managed services provide infrastructure support by monitoring and managing the network, ultimately relieving overloaded IT teams. For instance, Spectrum Enterprise offers its Managed Network Edge and Enterprise Network Edge solutions, which include security, routing, WiFi, SD-WAN and remote access combined with the connectivity, equipment and network management services HCOs need. HCOs gain complete visibility of the entire network via a centralized, cloud-based management portal that provides real-time analytics and adaptable bandwidth prioritization to meet critical traffic and application needs.

4 Infrastructure Performance

Many healthcare professionals operate under the assumption that their workplace will remain largely unchanged from one day to the next, finding comfort in rhythms and routines. Sometimes, however, events disrupt business as usual. A critical aspect for IT leaders is preparing for those interruptions, creating strategies and plans that can keep core business functions intact even under duress. Therefore, the final category considered in the Infrastructure section of the survey assessed an HCO's ability to restore the organization's primary data center in the event of a disaster.

Question 6

How quickly can your organization restore mission critical operations should disaster cause the complete loss of your organization's primary data center?



The findings of the DHMW survey suggest a majority of HCOs are able to restore most mission critical operations — except for administrative systems — within four hours of a complete loss of the primary data center.

"While it may not be financially feasible to have redundancy in every situation due to budgets and application architectures, HCOs should consider partnering with external organizations to understand their core technology needs and design to their systems to minimize downtime for business and clinical units," Pettit said.

When preparing for the unexpected, healthcare organizations will benefit from working with a technology provider to address network redundancy and diversity. The digital infrastructure should support data transport volume and meet growing network evolution needs.

Anticipating demands on the network, such as size and volume of traffic for electronic health records, will help improve traffic management and ensure bandwidth and cybersecurity protections meet infrastructure needs.

5 Partnerships for Success

For many HCOs, supporting a growing roster of innovative applications and technologies means looking outside their organization for help from a technology expert. As data demands expand, including the rising use of predictive analytics and generative AI, few HCOs will be able to manage this type of computing on their own. A single network partner can help manage these technology solutions — organizations don't have to go at it alone.

The right infrastructure partner can foster digital health innovation in several meaningful ways, such as:

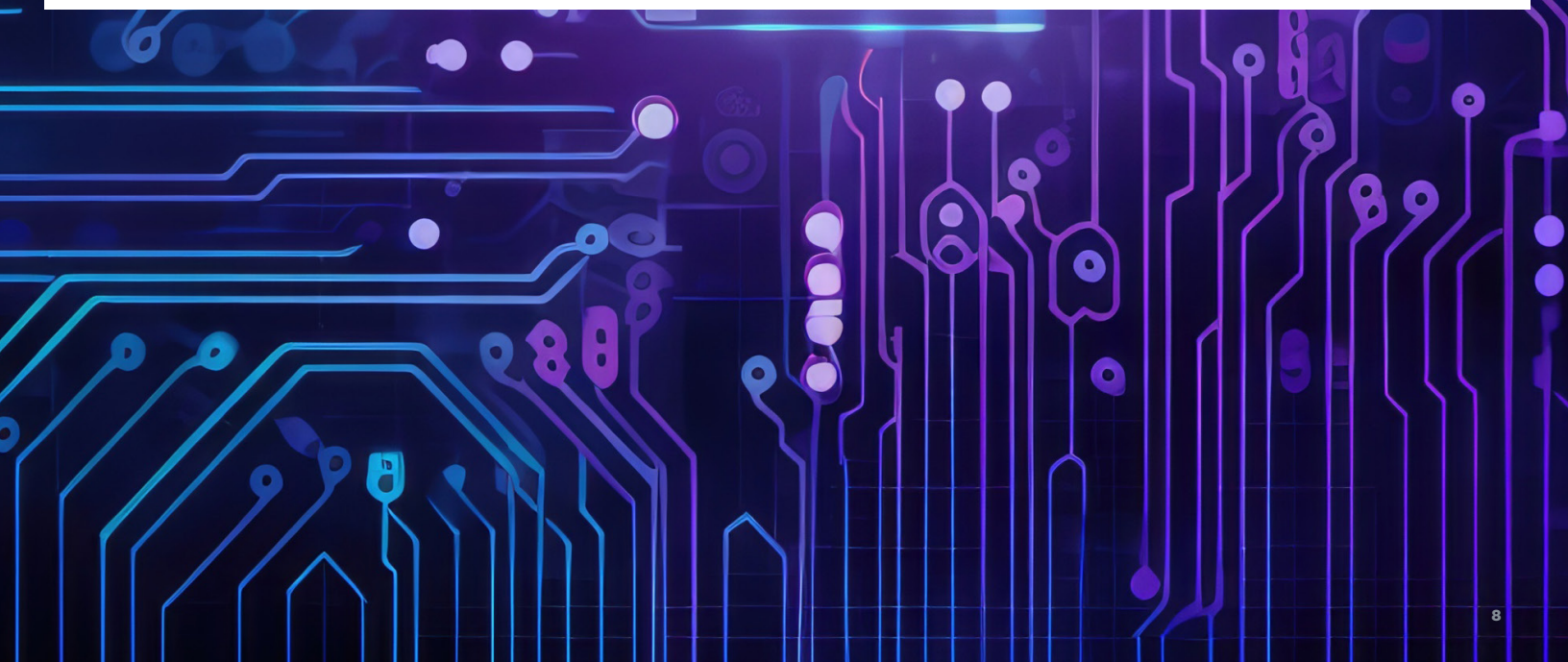
- **Supporting multiple innovation priorities** simultaneously by providing a modern, secure and flexible network.
- **Driving better coordination of support** with connectivity that enables interoperability of patient information among clinicians, departments and locations. The right IT infrastructure can help deliver continuity of care, as well as reduce costs, even in disparate and rural facilities.
- **Supporting a breadth of solutions** (data, cloud access, voice, TV/video and managed services) concurrently. Leveraging a trusted connectivity partner with a full portfolio of solutions can simplify services by eliminating the need to interact with multiple vendors; it can also be an efficient and a cost-effective way of meeting infrastructure needs.

As HCOs continue to turn to the cloud for their data storage and computing needs, cloud infrastructure becomes a concern. Many healthcare enterprises are hybrid cloud and multi-cloud users. While the benefits are significant, so are the cost and complexity of managing this infrastructure that supports cloud applications.

Simplifying the management of digital infrastructure is an important aspect of managing disparate cloud platforms. Managing the flow of data among these various platforms is complex and requires multifaceted skills and resources.

HCOs can reduce the administrative and maintenance burden on their IT departments by using managed services that allow the organization to focus on core competencies — healthcare applications of technology — instead of managing the underlying technology itself. Further, by partnering with a trusted solutions provider to manage networking, communications and cybersecurity issues, HCOs can devote more resources to other key areas, including adding more qualified talent to support their digital transformation.

- **For information about the CHIME Digital Health Most Wired (DHMW) survey program, please visit the CHIME Digital Health Analytics (DHA) website at dhinsights.org/analytics.**
- **For more information about other trends/findings emerging from the 2023 DHMW survey, visit the 2023 National Trends Report home page on Digital Health Insights (DHI) at www.dhinsights.org/insight/dhmw-2023-segment-trends-reports.**



About CHIME

The College of Healthcare Information Management Executives (CHIME) is an executive organization dedicated to serving chief information officers (CIOs), chief medical information officers (CMIOs), chief nursing information officers (CNIOs), chief innovation officers (CIOs), chief digital officers (CDOs), and other senior healthcare IT leaders. With more than 5,000 members in 58 countries plus 2 US territories and over 190 healthcare IT business partners and professional services firms, CHIME and its three associations provide a highly interactive, trusted environment enabling senior professional and industry leaders to collaborate, exchange best practices, address professional development needs, and advocate the effective use of information management to improve the health and care in the communities they serve. For more information, please visit **chimecentral.org**.

About Digital Health Analytics

Digital Health Analytics (DHA) is a global market intelligence and survey research hub for digital health technology. Provided by the College of Healthcare Information Management Executives (CHIME), DHA was created in 2022 to supercharge organizations' digital health transformation capabilities by moving from a one-snapshot-in-time, static Most Wired survey to a 365/24/7 data and analytics resource. DHA is the gateway for provider organizations and companies to better understand how digital technology supports leaders in transforming health and care and delivering data insights that help them make the greatest business impact possible. For more information, please visit **dhanalytics.org**.

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About Spectrum Enterprise

Spectrum Enterprise, a part of Charter Communications, Inc., is a national provider of scalable, fiber technology solutions serving many of America's largest businesses and communications service providers. The broad Spectrum Enterprise portfolio includes **networking and managed services solutions**; **Internet access**, **Ethernet access and networks**, **Voice** and **TV solutions**. The Spectrum Enterprise team of experts works closely with clients to achieve greater business success by providing solutions designed to meet their evolving needs. For more information, visit **enterprise.spectrum.com**.

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