HEALTHCARE TRIANGLE™

What is Healthcare's Digital Future and How Should Providers Prepare?

4 Insights

Rapid-speed implementation of virtual care. Remote monitoring of complex conditions—in real time—from the comfort of home. The ability to determine how specific populations react to a single chemical in a prescription medication.

Throughout the pandemic, healthcare's digital transformation accelerated, with new technologies and new uses of data to drive innovation—and it changed our view of how healthcare should be delivered and experienced. A *Gartner analysis** predicts 30% of outpatient care will shift to virtual care by 2022. And nearly one-in-three healthcare delivery organizations will deploy virtual assistants for patient triage by 2023, empowering organizations to redirect human talent to deliver more value-added care.

> By 2022, 30% of outpatient care will shift to virtual care, according to a Gartner analysis.

But amid the digital advancements taking place, healthcare CIOs are finding that their technology infrastructure is ill-equipped to support digital innovation. Now, leaders must consider: What is digital transformation, really—and what steps should healthcare leaders take to strengthen their digital value proposition?

"True digital transformation encompasses the move toward systems that automate workflows, strengthen data capture and analysis, and securely send information where it is needed most," says Sudish Mogli, Chief Technology Officer, Healthcare Triangle. "It leverages artificial intelligence [AI], Machine Learning, and advanced analytics to turn data into actionable insight and direct live support efficiently and appropriately. Together, these elements are key to achieving value in healthcare in a rapidly evolving environment."

Attaining next-level value from digital investments requires leaders to adopt a more strategic approach to innovation—one that leverages data to inform the path to digital excellence, achieve the full value of digital investments, and ground innovation in real-world evidence.

How should healthcare leaders go beyond industry buzzwords such as digital front door and disruptive innovation to achieve true digital transformation? Our experience points to four starting points.

**Predicts 2021: Healthcare Providers Must Accelerate Digital Transformation to Address Disruption | Gartner*

> "For any healthcare organization that is trying to achieve digital transformation—which involves automation—the cloud is the best place to implement AI, Machine Learning, robotic process automation, and more."
>
> — Sudish Mogli, Chief Technology Officer, Healthcare Triangle

1

Strengthen Data Capture and Retrieval
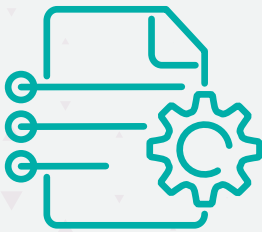
Achieving the promise of digital transformation in healthcare depends on the ability to capture and analyze data from disparate sources to understand individuals' health needs. Yet as we saw during the pandemic, healthcare organizations and public health agencies *lacked the data they needed** to track COVID-19 infections, pinpoint geographic areas at risk of an outbreak, or make informed care decisions, such as when information regarding a patient's existing conditions, such as diabetes and heart disease, is unavailable at the point of care.

Sometimes, breakdowns in data collection occur when clinicians do not capture patients' data fully at the point of registration or care, including the patient's phone number, address, and data regarding race, ethnicity, and social determinants of health. Data also *get stuck in electronic silos**, impeding the flow of healthcare information to the places where it is most needed. Even within the same health system, some EHRs cannot communicate with each other.

But one of the biggest obstacles to data access at the point of care is healthcare's continued reliance on 'paper'. Despite significant investments in EHRs, healthcare stakeholders still commonly share information via paper, faxes, PDFs, and unstructured reports. As a result, data often becomes trapped, making it difficult to share critical information with providers. At the height of the coronavirus pandemic, the volume of COVID-19 test results that came to hospitals and health departments via fax overwhelmed staff members, who had to manually enter the data into patient records. "The data is moving slower than the disease," one public health director told *The New York Times**.

The US Lacks Health Information Technologies to Stop COVID-19 Epidemic | Brookings

*Crucial Data In Electronic Health Records Hard To Harvest | KHN*

Bottleneck for U.S. Coronavirus Response | NY Times

This is an area where digital transformation could make a substantial difference. Action steps leaders should consider include the following:

- **Automate data retrieval.** Leading health systems are exploring the use of automation to capture data presented in document form—from paper to PDFs to faxes—and digitally transform the data into a usable format. Using cloud-based AI and Machine Learning, these solutions then turn the data into readable text, categorize the data, and help ensure the data are correctly matched with patients. With this technology, healthcare organizations can unlock the data in these documents to gain a comprehensive view of patients' medical history.

  "Healthcare has long been challenged by paper-based processes and difficulties deriving patient care insight from unstructured information," says Suresh Venkatachari, Chairman and CEO, Healthcare Triangle. "Automating paper-based data retrieval helps ensure that clinicians have the information they need when they need it most."
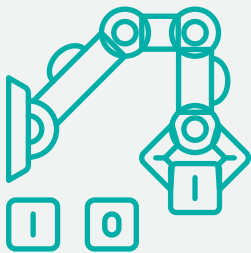
- **Apply AI and natural language processing to intelligently extract information from faxes, scanned documents, and narrative text.** "When an electronic fax is received—such as a prescription, a laboratory request, or a request for a health record—organizations can use AI to extract the name of the patient and the patient's data and tie the information to the patient's medical record," Mogli says. "This eliminates the need for staff to spend hours manually entering the data. Natural language processing also identifies discreet data within the documents to understand the context of the information. This streamlines healthcare workflows and processes, ensuring the necessary information is available for patient care."

  In healthcare, applying AI and natural language processing to turn faxes and PDFs into readable text is "slowly picking up speed," Mogli says. The market for these capabilities is strong: In the healthcare and life sciences markets alone, demand for natural language processing market is expected to grow to $3.7 billion by 2025*, up from $1.5 billion in 2020. Among health plans alone, natural language processing *demonstrates strong potential** to codify unstructured clinical data from multiple sources, automate clinical chart review, and conduct prospective risk adjustment.

*NLP in Healthcare and Lifesciences Market | MarketsandMarkets.com

*3 Ways Health Plans Can Leverage Natural Language Processing Technology | AJMC

> " In the healthcare and life sciences markets alone, demand for natural language processing market is expected to grow to $3.7 billion by 2025.

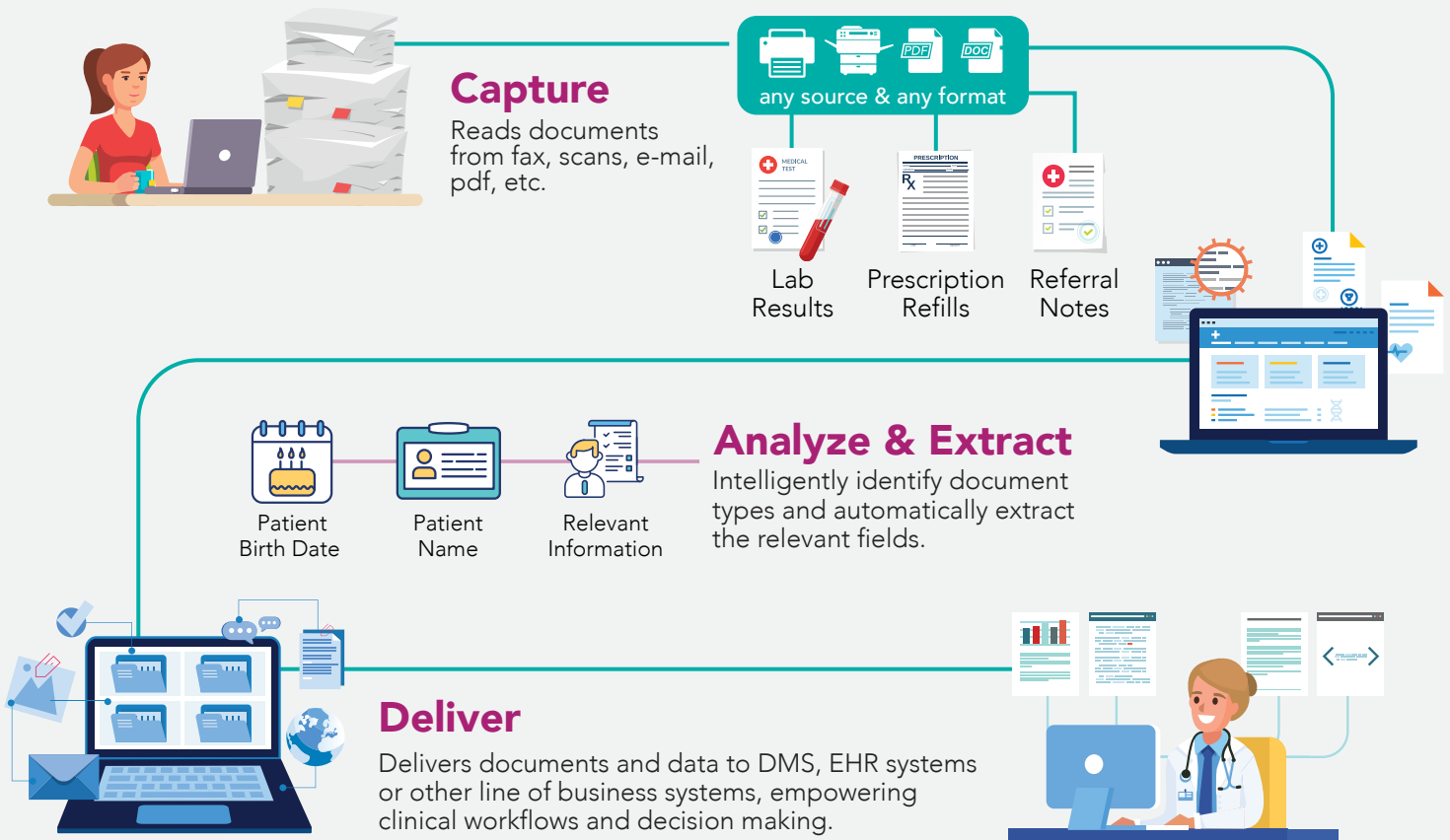# How One Health System Automated Paper-Based Data Retrieval

At one large, integrated health system serving 14 rural and urban communities, the use of natural language processing, AI, and Machine Learning empowers the health system to transform data that was trapped in paper form into actionable insight at the point of care.

Formerly, staff at this six-hospital system manually categorized and identified thousands of pages of data daily from faxes, PDFs, and more so that the information could be delivered to providers at the point of care. Now, with the help of *Healthcare Triangle's readabl.ai solution**, the health system automates the process of categorizing data from unstructured reports and pairing the right information with the right patients. This dramatically increases the speed with which the health system can share critical data with providers, providing a tool for more effective population health management.

"As a trail of paper records follows patients in their healthcare journey, Healthcare Triangle's readabl.ai solution helps unlock key data while reducing the burden of manual data capture," says Suresh Venkatachari, CEO, Healthcare Triangle.

*readabl.ai – Medical Document Automation l Healthcare Triangle

Transforming Data into Digital Intelligence - **readabl.ai**

Capture
Reads documents from fax, scans, e-mail, pdf, etc.

any source & any format

Lab Results

Prescription Refills

Referral Notes

Analyze & Extract
Intelligently identify document types and automatically extract the relevant fields.

Patient Birth Date

Patient Name

Relevant Information

Deliver
Delivers documents and data to DMS, EHR systems or other line of business systems, empowering clinical workflows and decision making.

2
Turn Up Investments in Data Analytics

Upscaling the use of data analytics is essential to achieving digital return on investment. Yet 64% of healthcare leaders say they don't have a strong data analytics function, an *EY survey** found. Six-in-10 healthcare leaders say their organizations struggle with incomplete data and data that is poor in quality.

"Data analytics is a powerful tool for answering questions such as, 'What is the length of stay for a patient in our hospital? What were they admitted for, and what are their comorbidities? What ZIP codes do our sickest patients come from—and are there environmental factors that could be affecting their health?'" says Suresh Venkatachari, CEO of Healthcare Triangle. "There is a lot of research taking place in healthcare that has the potential to transform care, but only if organizations have advanced analytics capabilities in place to drive improved outcomes and a better patient experience."

In the years ahead, Gartner predicts *"X analytics*"*—named for the surge in structured and unstructured content available for analysis, from social media posts to clinical trials research, text analytics, and more—will elevate healthcare's ability to predict the spread of disease, discover new treatments, and identify vulnerable populations. But the ability to leverage advanced analytics to identify disease in its earliest stages, when care is less expensive and the potential for positive outcomes is higher, depends on future proofing the organization's data analytics pipeline. Two places to start include the following:

- **Ensure your digital platform can handle the upcoming surge in digital data.** The influx of data from sensory devices and health wearables will be a significant trend in the next decade as the desire for more personalized, data-driven care rises. For AI and Machine Learning models to assess this data quickly, healthcare organizations need a data platform that can scale as data volumes and demands become more intense.

- **Create an infrastructure flexible enough to handle any data workflow.** For example, a data platform based in the cloud provides greater total capacity and access to a larger variety of services for ingesting, processing, and gaining insights from data. Such a platform provides a basic underpinning for large-scale collaboration—critical during the pandemic. It also supports efforts to reanalyze archived data, including privacy-protected data.

*How Health Care Organizations can Improve their Digital Strategy | EY

*Gartner Identifies Top 10 Data and Analytics Technology Trends for 2020

"
"There is a lot of research taking place in healthcare that has the potential to transform care, but only if organizations have advanced analytics capabilities in place to drive improved outcomes and a better patient experience."

— Suresh Venkatachari, CEO, Healthcare Triangle

3

Make the Move to Cloud-Based Data Security and Management

When the pandemic hit, healthcare IT departments faced an immediate challenge: how to protect business continuity across platforms amid increased ransomware attacks. It's one reason why spending on cloud computing rose 37%* across industries during the first quarter of 2020, including for disaster recovery—and why true digital transformation depends on cloud-based security and data management.

Healthcare ranked as the *most targeted industry for cyberattack**, including ransomware attacks, in 2020. Further, organizations' vulnerability for cyberattack increased. Given that patient data is viewed as a high-value target by hackers, as methods of cyberattack *become more sophisticated**, healthcare organizations must *create layers of protection**—including cloud-based protection—not only to protect their data, but to respond to a ransomware attack in cost-effective ways.

> " Nearly 70% of organizations currently using cloud services plan to raise their cloud spending investments amid the disruption of the pandemic, including for data security and management, a *Gartner survey** found.

For healthcare leaders, cloud investments that could strengthen data security and management while paving a path for digital transformation include the following:

- **Consider the move to a public cloud to bolster data security and management.** In 2021, Gartner projects end-user spending on public cloud services will grow 18.4% to nearly $305 billion as organizations look for ways to strengthen business continuity and achieve cost efficiency while accelerating digital business transformation. This eliminates the expense of maintaining an on-premise data warehouse and a backup facility offsite. It also provides access to the latest security patches and upgrades for a more robust cybersecurity defense.

At Fort Madison Community Hospital (FMCH) in southeast Iowa, for example, IT leaders implemented a public cloud-based backup and disaster recovery solution for its EHR in March 2021 as they bolstered their cybersecurity defense. The impact: a highly flexible, highly scalable, and more reliable solution for disaster recovery, with improved recovery time and a 30% savings over private cloud solutions.

*Can You Meet Customer Demand for Cloud-based Computing? | PWC

*From Crisis to Opportunity | Health Leaders

*Healthcare's Next Emergency | Security Magazine

*Prepare for Ransomware with Cloud Backup | LinkedIn

*Gartner Forecasts Worldwide Public Cloud End-User Spending to Grow 18% in 2021

"With our information now available on Amazon Web Services' public cloud platform, we know we can quickly and reliably recover from any disruptions, allowing our caregivers to continue to focus on patients," says Shane Tepper, Chief Information Officer, Fort Madison Community Hospital.

But while disaster recovery may have become healthcare's impetus to move to the cloud, it is not the only advantage healthcare organizations gain from a cloud-based approach. With the explosion in structured and unstructured data that comes with the shift toward a digital-first environment—from health wearables to biometric sensors to mobile health apps—healthcare organizations now require advanced capabilities for collecting disparate data, tying the data to patients' electronic medical records, and analyzing the data to improve outcomes.

"That's another area where we're beginning to see some traction in healthcare," Mogli says. "By hosting applications in the public cloud, hospitals and health systems gain the ability to leverage other services offered on public cloud platforms, from healthcare-specific artificial intelligence to machine learning capabilities."

> "With our information now available on Amazon Web Services' public cloud platform, we know we can quickly and reliably recover from any disruptions, allowing our caregivers to continue to focus on patients."
>
> — Shane Tepper, Chief Information Officer,
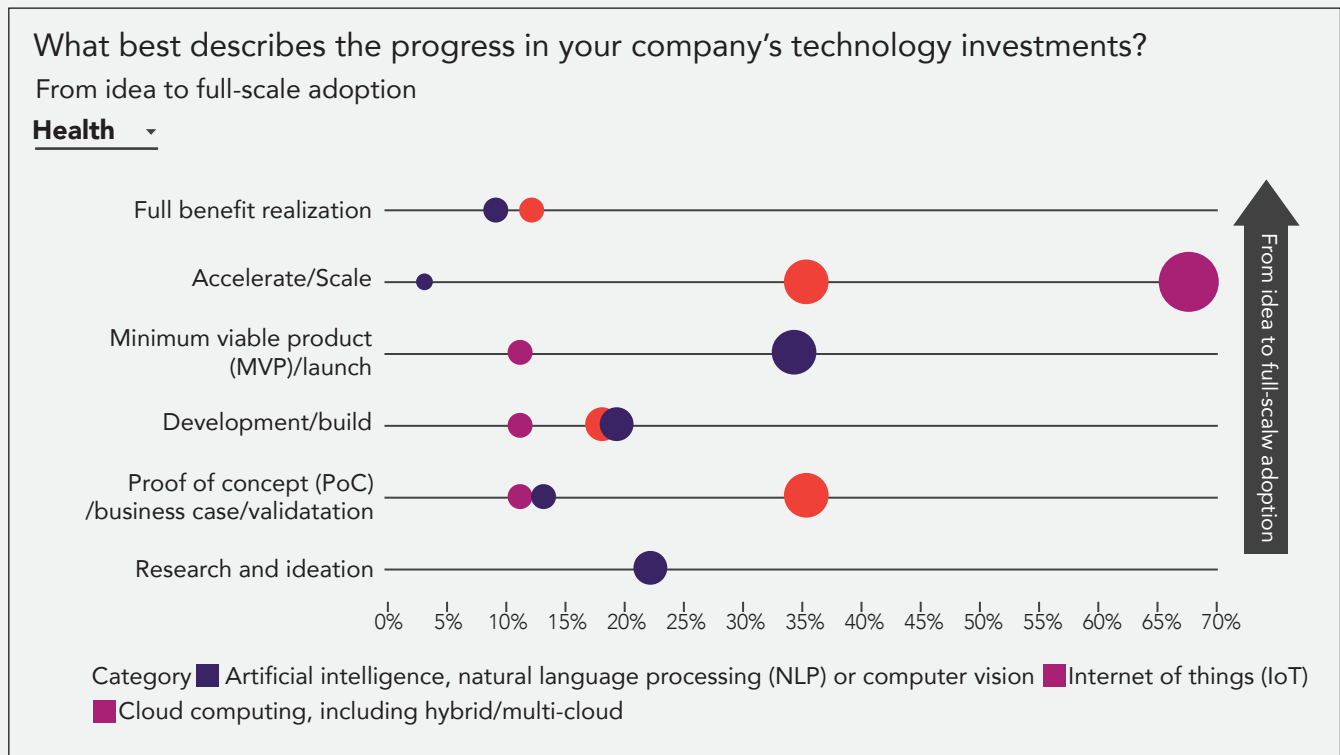> Fort Madison Community Hospital.

- **Create a cloud center of excellence—and staff it with specialized support.**

Achieving digital transformation demands not just investment in digital capabilities, but also a strong foundation of IT personnel. *Yet 64%* of healthcare executives say lack of IT skills and talent are the reason their digital transformation initiatives fail, according to an EY survey.* In our experience, this is especially true when healthcare organizations make the move to the cloud yet treat the cloud as simply an extension of their data center.

"The infrastructure in a data center is physical, whereas the infrastructure in the cloud is all virtual—it must be treated as software or code," Mogli says. "When leaders don't understand that a cloud-based platform must be managed differently than a data warehouse, they will fail to achieve the value they seek from the cloud."

*How Health Care Organizations can Improve their Digital Strategy | EY

Healthcare Organizations Report Mixed Value from Digital Investment

What best describes the progress in your company's technology investments?
From idea to full-scale adoption

Health ▾

Chart categories (y-axis, bottom to top): Research and ideation; Proof of concept (PoC)/business case/validatation; Development/build; Minimum viable product (MVP)/launch; Accelerate/Scale; Full benefit realization

X-axis: 0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50% 55% 60% 65% 70%

From idea to full-scalw adoption

Category ■ Artificial intelligence, natural language processing (NLP) or computer vision ■ Internet of things (IoT)
■ Cloud computing, including hybrid/multi-cloud

That's one reason why creating a cloud center of excellence and staffing it with the right talent is critical to gaining optimal value from your investment. Leading organizations support the transition to the cloud with a managed cloud services approach. This helps organizations optimize cloud performance, decrease cost, and enhance security and compliance. It also enables them to:

- Most effectively leverage AI, machine learning, predictive analytics, and other technologies to remain competitive in their market

- Adopt best practices for cloud platform management

- Gain insight into cloud usage across business units

- Identify trends and forecast patterns to make informed decisions

"If your organization is aspiring to achieve digital transformation, which involves automation, the cloud is the best place for AI, robotic process automation, and other technologies to be implemented," Venkatachari says. "Securing specialized support from a managed cloud services team allows your organization to fully leverage its investment, creating a strong foundation for digital innovation."

# How Managed Cloud Services Drive Next-Level Value

Access to expert advice and technical support

A flexible resourcing model that scales as your needs change

A cost-effective alternative to expanding your in-house IT team

Peace of mind that allows you to focus energy and resources on your strategic initiatives

A consistent customer service experience

> Sixty-two percent of healthcare leaders say they will focus digital investments on cloud computing over the next two years, an EY survey found. Find out more about IT managed services that support cloud deployment at
>
> https://www.healthcaretriangle.com/healthcare-it-managed-services/

4
Hone in on Data-Based Innovation
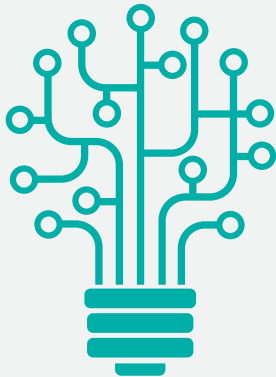
The range of data sources used to predict transmission of disease, forecast demand for healthcare services, and identify populations at risk *increased substantially** during the first year of the pandemic. Now, organizations "face a new urgency to manage and report on data in a timely and accurate manner"—including data they had not previously encountered, a *recent survey** found. More than half of healthcare and life sciences organizations now manage data as a critical business asset, and investment in data-driven decision making continues to gain momentum.

As healthcare organizations seek opportunities to advance data-fueled innovation—a vital component of digital transformation—two approaches demand consideration

- **Explore cloud-based data analytics.** By 2022, Gartner predicts that *90% of data analytics and innovation** will occur in the public cloud. In healthcare, cloud-based data analytics has increased access to specialized data analytics services, supercharging organizations' ability to ingest, process, and gain insights from their data—critical to achieving true digital transformation.

    "During the pandemic, we've seen cloud-based data analytics revamp the way in which COVID-19 is identified and treated, improving outcomes for patients with infectious disease and avoiding preventable deaths," Mogli says. "Now, healthcare organizations are applying this approach to understanding chronic disease and other conditions. The goal is to understand as much as possible about a patient through analysis of real-world data during the earliest stages of disease, when treatment is simpler and less expensive."

- **Connect disparate data sources for more powerful insights.** At Stay Smart Care, a home healthcare service in Macon, N.C., that helps seniors safely age in place, leaders invested in *a cloud-based, self-cataloguing data lake** to ingest and store structured and unstructured data from multiple sources, including real-time data from health wearables and remote monitoring devices. The organization then paired the data lake with AI and Machine Learning to detect health anomalies and prompt clinicians for follow-up. These investments positioned Stay Smart Care to chart a path toward digital transformation while closing gaps in care.

    Today, a scalable dashboard enables Stay Smart Care to remotely monitor hundreds of thousands of patients at a time. The impact:

    o Significantly improve quality of care for patients and state of mind for family members

    o Enhanced ability to detect early onset of disease using predictive analytics

    o Real-time detection of patient falls

    o A savings of $200 to $300 per month, per client using this solution

"This is a great example of the value that organizations can gain by ingesting digital health data from disparate devices and sensors and using it to continually monitor the health of patients with complex care needs," Venkatachari says.

> ❝ By 2022, Gartner predicts that *90% of data analytics and innovation** will occur in the public cloud.

Gartner Identifies Top 10 Data and Analytics Technology Trends for 2020

A Sustainable Approach to Digital Transformation

In the first months of the pandemic, healthcare leaders responded to the push for digital-first services by rapidly expanding their virtual care infrastructure and deploying remote care devices to manage the health of their most vulnerable patients. Now, leaders must develop a more strategic approach to innovation—one that seeks to intelligently transform processes to ensure the right information is received by the right person at the right time, including at the point of care. In 2021 and beyond, attaining the promise of digital transformation will depend on a data-based foundation and mindset.
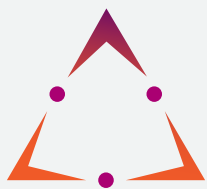
HEALTHCARE TRIANGLE

Reinforcing Healthcare Progess™

www.healthcaretriangle.com
(888) 706-0310
(203) 774-3323

For more information, please visit www.healthcaretriangle.com.

About Healthcare Triangle, Inc.

Healthcare Triangle, based in Pleasanton, Calif., reinforces healthcare progress through breakthrough technology and extensive industry knowledge and expertise. We support healthcare organizations—including hospitals and health systems and health plans—as well as pharma and life sciences organizations, in their efforts to improve health outcomes. Healthcare Triangle enables the rapid adoption of new technologies, data enlightenment, business agility, and response to immediate business needs and competitive threats. The highly regulated healthcare and life sciences industries rely on Healthcare Triangle for expertise in digital transformation encompassing the cloud, security and compliance, data lifecycle management, healthcare interoperability, and clinical and business performance optimization.

At Healthcare Triangle, we've implemented more than 350 cloud-based platforms in healthcare and life sciences, including for three of the five largest pharmaceutical companies. We are a full-scale AWS Premier Consulting managed services provider, a third-party audited Next-Generation AWS managed services provider, and a Google Cloud affiliate partner. For more information, visit HealthcareTriangle.com.