INTRODUCTION

5G DATA SERVICE AND DELIVERY

TECHNOLOGY BOOSTS HEALTHCARE OPERATIONS

HOW TECHNOLOGY ENHANCES HEALTHCARE IT

WORKING REMOTELY

CONNECTING THE HEALTHCARE ECOSYSTEM

PLANNING FOR SUCCESS

BUILDING A STRONG IT FOUNDATION to Drive Healthcare Innovation
Healthcare innovation starts with a secure, robust IT infrastructure

Keeping patients healthy and improving quality of care are part of every healthcare organization’s mission. From robotic surgical devices that run on 5G technology to electronic health records (EHRs) to predictive analytics and capacity management, technology helps healthcare providers achieve these goals more efficiently.

Emerging technologies in healthcare are the backbone of its infrastructure, and can include:

- Internet of Medical Things (IoMT) in the form of wearables to monitor patients’ blood pressure and breathing rate, for example
- Artificial intelligence (AI) to help process, analyze, and recommend actions from massive amounts of data
- Edge computing to reduce latency and bandwidth, with 5G to help it work faster and more efficiently
- Security at the center of everything

At the heart of all this technology lies data—specifically, patient data. To fully leverage this data, as well as support advanced technology, healthcare organizations need secure IT foundations.

Patients, payers, and providers don’t see or directly use storage, Unix-like operating systems, and other foundational hardware and software, but they know when they work well. With them, IT departments can build simple applications faster—apps that support patient care and engagement. They can also identify and mitigate bugs, install secure patches, and address security issues faster, giving them time to focus on activities that drive innovation.

Most importantly, a solid IT infrastructure ensures all elements of the healthcare IT ecosystem remain safe and secure. Because, without the highest level of security, even the fanciest new tools mean little.

This e-book highlights important healthcare IT trends and technologies, as well as the processes, systems, and tools needed to ensure healthcare organizations operate at their best.
5G: Data service and delivery at speed

Edge computing is making significant inroads in healthcare. It decentralizes processing power, which reduces latency and bandwidth, taking pressure off the network. Its purpose is to "bring computational power in close proximity to Internet of Things (IoT) sensors, smartphones, and connected technologies." And, 5G connectivity is one of the emerging technologies that makes it all possible.

"5G will help hospitals and healthcare organizations move data around more quickly," said Alden Globe, BMC Software Senior Value Engineer. "It will especially come into play around large data sets, low-latency telehealth applications and imagery." With 5G, transferring large clinical scan sets of images, for example, is practically instantaneous.

5G adds speed and flexibility to service delivery

In addition, 5G has the potential to transform healthcare in the following ways:

- Transmit large imaging files 10 to 100 times faster than current processes, which speeds delivery of results to doctors and treatment to patients, while also potentially lowering the overall cost of care.

- Improve remote patient monitoring and telemedicine quality. No more internet drop-outs help drive better patient and provider experiences.

- Make telesurgery and telerobotic surgery feasible. With no latency issues to contend with, surgeons can operate robotic devices from anywhere, bringing specialized care to more patients.²

Early use cases for 5G look promising. Chicago-based Rush System for Health teamed with wireless provider AT&T in 2019 to become the first U.S. hospital and health system to adopt a "standards-based" 5G network. The accelerated technology will help connect apps, people, devices, robotics, and more, according to a press release.³

The VA Palo Alto Health Care System, a member of the U.S. Department of Veterans Affairs (VA) healthcare group, in February 2020 became the first-ever 5G-enabled hospital in the VA, and one of the first in the world.⁴

Strategic planning is key

For all of 5G’s benefits, healthcare organizations have to think and plan strategically before implementation. “Transitioning to 5G must align with the healthcare organization’s priorities, business strategy, and mission,” said Globe.

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Emerging technology boosts healthcare operations

With the move toward value-based care, healthcare organizations have found myriad ways to improve operational efficiency, reduce administrative burden, and foster innovation through the use of emerging technology. Here are just a few ways technology is improving the operations side of the healthcare environment.

Revenue cycle management automates revenue processes

Today’s healthcare enterprise may use revenue cycle management software to automate claims processing, payment, and revenue generation processes. AI-powered tools automate pre-authorizations, manage EHRs, and detect fraud, waste, or abuse in reimbursement.5

Predictive analytics reduces operating room bottlenecks

The University of Chicago Medical Center is using predictive analytics to reduce bottlenecks in the operating room (OR). With a combination of real-time data and an AI-powered algorithm, turnover is down 20 percent—or four minutes per OR. This system improves workflows and communication and, at the time of this report, will save the hospital $600,000 per year, improve staff morale, and lead to more satisfied patients.5

AI is everywhere

Tomorrow’s healthcare enterprise may use AI to perform ultrasounds, deep learning to find cancerous lesions in radiology images, or machine learning to identify and correct coding issues. Other advances, such as blockchain for claims processing and virtual reality (VR) for physician training, have potential as healthcare advances.

In a recent Emerj survey, more than half the healthcare executives surveyed believe AI will be present everywhere in healthcare by 2025.7

When using AI in clinical care, Shelley Price, HIMSS Director of Payer and Life Sciences, said in an email that healthcare organizations must address “black box” decision-making and the potential for bias in the data, the algorithms, and the applications.

“These concerns should be addressed by IT departments through governance and both technical and nontechnical approaches,” she wrote. “Examples include third-party audits, using tools that probe for bias in machines, and comparing machine- and human-made conclusions.”

Whatever apps and tools adopted by a health organization/system, it all comes back to infrastructure. AI operations (AIOps) powered by AI technology helps automate operations with very little hands-on intervention.8

Patients of all ages want more control of their healthcare experience across the entire healthcare journey, and they want quick and easy access. Many healthcare organizations are answering the call by offering mobile and desktop apps for appointment scheduling, electronic access to medical records, and the ability to compare drug costs and communicate with healthcare providers online. For people with chronic or complex conditions, it’s important they are able to manage care across multiple providers.

A survey of 3,000 Americans conducted by ResMed, a digital health company, in October 2019 found 56 percent of respondents monitor their health with at least one digital tool. More than half said technology has improved their relationships with healthcare providers. The majority—68 percent—want technology to play a larger role in sharing real-time medical information.³

Patients may already use AI-enabled devices such as voice assistants to research symptoms or wearables to evaluate heart rhythm or sleep patterns. As technology makes further inroads into healthcare, we may see tools that allow data from wearables to integrate more easily into EHRs.

Application and capacity management help optimize resources

As healthcare organizations integrate AI and other advanced technologies into clinical practice, they’ll see an increased need for data and capacity management software, which helps IT departments optimize resources. If automating business or clinical functions disrupts the existing workflow, IT will need to not only implement the new technology, but also ensure adoption and acceptance.

“The IT department must carefully select and vet the AI technology before actually procuring it,” said Lee Kim, HIMSS Director of Privacy and Security, in an interview with the author. “Technical requirements should be spelled out, as well as any workflow and other administrative considerations. If the AI technology is not a good fit for the organization, additional software interfaces, components, and/or administrative procedures may need to happen in order to address any gaps.”

Lee Kim
Director of Privacy and Security
HIMSS

How technology enhances healthcare IT

Emerging technologies make it easier to work remotely

The COVID-19 pandemic pushed healthcare providers to adopt virtual methods of working at record speed. Devices that contain protected health information (PHI) must meet HIPAA security and privacy requirements, while telemedicine platforms need to be simple and accessible for all types of patients.

While today’s technology makes remote work possible, it creates several IT challenges:

- Because there is a shortage of cybersecurity experts, companies need to evaluate tools that automate the patching and scanning of vulnerabilities in the network.

- Telemedicine use has soared from a few to several hundred visits per day for many healthcare organizations. The increase in data transmitted through telemedicine platforms means more PHI is at risk.

- IT has a more difficult time educating remote staff on how to spot phishing scams, which are on the rise: During the week of April 12, 2020, alone, Google’s Gmail service blocked about 18 million malware and phishing emails per day.

- IT managers may also work from home. Do they have the tools to address incidents remotely?

To keep PHI secure, it is important to develop clear guidance for all staff, including physicians, on remote work policies and procedures. A web gateway, as well as updated guidance on how to spot suspicious emails, will help protect devices from infection.

Most healthcare organizations today use preconfigured mobile devices and virtual private network (VPN) connections to connect to the local network. Healthcare IT departments can further benefit from a service management solution to manage devices, automate endpoint management, maintain compliance, and ensure staff have a positive work-from-home experience.

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Connecting the healthcare ecosystem

In May 2020, the U.S. Department of Health and Human Services (HHS) published the Centers for Medicare & Medicaid Services (CMS) and the Office of the National Coordinator for Health Information Technology (ONC) Interoperability Final Rules. The new policies relate to giving patients easy access to their medical records and letting them decide how, when, and with whom to share that information.

These rules also touch on a growing concern: improving interoperability among healthcare IT systems. One patient may receive treatment from multiple providers in separate facilities. Providers should have access to all encounters throughout the patient journey. However, the lack of a national unique patient identifier, varying interoperability standards, and information blocking, among other issues, prevent that sort of exchange.

“Connecting the healthcare ecosystem means allowing visibility across a complex enterprise. It requires having an elastic architecture and capacity to handle surges in volume, whether [it’s during] open enrollment or flu season,” said Globe.

Building a secure, interconnected ecosystem starts with a solid IT infrastructure. The infrastructure includes the ability to capture, curate, manage, and store patient data safely at scale. On top of a sound infrastructure, healthcare organizations should enable tools that produce meaningful data insights.

As organizations add both healthcare and technology partners, it becomes even more important for all parts of the ecosystem to share patient data seamlessly and securely. Because much of that information is stored and shared in the cloud, automated vulnerability scans, end-to-end compliance, and automated patching are essential to reduce risk.

“Connecting the healthcare ecosystem means allowing visibility across a complex enterprise. It requires having an elastic architecture and capacity to handle surges in volume, whether [it’s during] open enrollment or flu season.”

Alden Globe | Software Senior Value Engineer | BMC

Planning for success

New and emerging technologies are making a difference every day in how healthcare is delivered. From the impact of wireless 5G and how IT is affecting the operational side of healthcare to the changes in remote healthcare services and how tech is protecting the healthcare ecosystem, a strong infrastructure is the linchpin that makes it all possible. Interoperability is an important component when designing new healthcare operations or delivery models.

Technology also enables the ecosystem—the network of providers, support services (e.g., diagnostics, imaging, outpatient care), vendors, and payers to interface efficiently. To work well, each part of the ecosystem needs an IT infrastructure to securely capture, curate, manage, and store patient data.

Alice Kirby, MD, a healthcare strategy consultant for Accenture, said, in an interview about data management in healthcare, “The opportunity with better data management is enormous. ...We have the chance to do things differently, if we build the proper foundation of data.”

A proper foundation includes sound solutions to help IT departments deploy these new tools. It also includes a bit of awareness and assurance. Software won’t replace talented people anytime soon. By eliminating repetitive tasks, it can, however, help them do their jobs better, giving them the freedom to focus on what matters most. As BMC Chief Information Officer Scott Crowder said, “Move work down and push people up.”


To find out how BMC can partner with your healthcare organization to improve IT infrastructure and streamline your ecosystem, visit bmc.com.