How the cloud fits into the future of healthcare innovation

While we continue to see more cloud adoption across our industry, many organizations are understandably approaching cloud migration slowly and carefully. At the same time, cloud providers, such as industry leader Amazon® Web Services (AWS®), continue to invest in industry-specific infrastructure to further ramp up scalability, availability, and open-source technology. This gives software developers the opportunity to meet cloud hosts where they are, creating end-to-end, healthcare-specific solutions, fully integrated to provide the optimum user experience without customization.

At its core, cloud deployment helps reduce costs, centralize growing volumes of business and care data, and even boost staff engagement by reducing tedious tasks such as server maintenance and middleware implementation. Upgrades are automatic and consistent.

While productivity has historically been the main driver of cloud deployment, cloud experts continue to push us to think like for-profit companies and embrace innovations such as machine learning, artificial intelligence (AI), augmented reality, and others. This is the future of healthcare.

Cloud and key technology enablers

When we think of innovations in healthcare, we conjure thoughts of clinical advancements—the devices, therapeutic deliveries, breakthrough research—that focus specifically on direct patient care.

Simultaneously, we know we need to keep a close eye on the myriad challenges facing the operational side of our organization. That includes increased competition from new care deliverers, fluctuating payment models, and the sense of uncertainty we all know underlies all aspects of our industry.

With outside forces at work—and often beyond our control—we are looking at how cloud innovation helps us expand available technologies to optimize the business side of healthcare. These are tools to help us work smarter and will drive healthcare's ongoing evolution.

Some that are setting the stage for the future of healthcare include:

- Internet of Things (IoT)
- Predictive analytics
- Artificial Intelligence (AI) and machine learning
- Digital assistants
- Blockchain
- Augmented reality

All of these technologies are fueled by the digital revolution and rapidly changing consumer expectations. It's important we continue to pay attention to free-market indicators such as these, as we continue to experience increased patient consumerism and disruptive care models.

The Internet of Things (IoT)

The connectedness of systems has revolutionized everything from diabetes treatment adherence to mental health monitoring. However, IoT also helps us work smarter with tools to drive efficiencies, staff engagement, and save costs. And that's all with an eye on improving patient care. It's the foundation for any future innovation, and the catalyst for unprecedented productivity, including reducing real-time and predictive data analysis processing from weeks to minutes.

Applying predictive analytics

IoT, combined with the proliferation of the electronic medical record, has created an exponentially growing volume of clinical and operational data. But more is not always better. Cloud storage makes this information more centrally accessible to data scientists and others who need it, but applying predictive analytics means delving into the right pieces of data to provide strategic insights across clinical and operational systems.

The real value of AI (and machine learning)

When we talk about AI, we focus a lot about how it's being used in the clinical setting, modeling conditions and using the aforementioned predictive analytics to more accurately and quickly diagnose conditions. However, it's just as impactful on the operations side of healthcare.

Machine learning, a division of AI, recognizes data patterns through built-in algorithms. In healthcare, we are currently seeing it used in optimizing revenue management, with automated analysis of workflows and operational and clinical data, without human intervention. However, the healthcare organization of the future can expect to see it used to predict population risk, condition diagnosis, research, and any number of ways we have not yet realized.

Digital assistants proliferate

Voice activated digital assistants such as Amazon Alexa™ and Apple Siri®, are now the fastest-growing consumer technology, **according to Canalys.com**. And that reaches into the healthcare market.

According to a **recent survey of healthcare consumers**, more than 80% of millennials say they use digital assistants to monitor health, and 74% use the technology to receive medical alerts. In the hospital, we see direct-to-patient examples such as deploying digital assistants to the hospital room as a way for patients to request everything from assistance to meals. For staff, digital assistants are a familiar technology they can use to request supplies, after checking on supply levels on their mobile device.

Blockchain for better care

We are just seeing blockchain—a decentralized system of peer-to-peer systems commonly associated with Bitcoin and cryptocurrency—emerging in healthcare. This lets patients themselves wrest control of their own medical data and use it any way they wish, including sending it to specific professionals across the care continuum to enable everything from research to care information.

Augmented reality

Augmented reality has proven be a boon to educating staff and patients, translating information about the body into 3D images. With staff across the care continuum able to interact with visual representations of anatomy, they are able to more quickly and accurately learn, while improving accuracy and outcomes for patients.

Looking ahead with cloud

We know the lines are blurring between public and private approaches to healthcare challenges. It is also impossible to separate operational success from patient care and outcomes. With healthcare providers committed to the Triple Aim of optimizing care, overall population health, and savings costs, it's time to look at some of these—and other—technologies and consider how they can help shape our own organizations. Cloud technologies make this more possible than ever before.
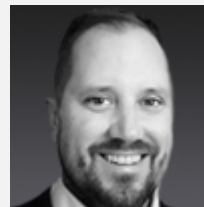
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