DXC TECHNOLOGY

# Healthcare in the cloud: Improve outcomes by breaking down traditional boundaries

Health outcomes for an individual are influenced by several key factors — the person's genetics and biology, the level of care received, their social and economic status, their behavior, and their social and physical environment[1]. Addressing one area alone won't deliver the desired results for the patients and the healthcare organizations involved in their care. For healthcare organizations, the current healthcare models also are not delivering satisfactory treatment within their cost constraints because people with chronic illnesses are living longer.

To make a real difference, a high-level, integrated, digital transformation across the broader health, socio-economic network is needed. The cloud can help healthcare organizations address inefficiencies and service shortfalls, while also improving health outcomes by delivering a digital, 360-degree view of patient health and treatment history.

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## Life and health in the digital world

Outside of healthcare, consumers have grown accustomed to integrated, device-agnostic and highly available technology that makes life easier. Travel apps, for example, enable consumers to book an entire holiday in a single transaction. A travel app integrates various services and providers, seamlessly combining flight and hotel bookings, insurance purchases and rental car agreements.

But in healthcare, the experience is completely different. Patients are asked to provide the same information over and over again. They are often subjected to the same tests by different healthcare organizations. Patients have limited access to their own health data and often can't access healthcare providers outside of standard office hours.

With few back-end systems integrated, patients' care experience can feel poorly organized and out of date as they struggle to navigate a complex service network. The lack of integration affects not only the patients' experiences but also their outcomes. Poor integration can lead to care delays, missed detection opportunities, overtreatment and/or undertreatment, and a number of other avoidable impacts.

Successful digital outcomes depend on some important considerations. The first consideration is that providers should determine the best applications to use. Healthcare must be ready and able to adapt to provider and patient preferences.

[1]The Centers for Disease Control and Prevention (CDC) said that 60 percent of factors affecting premature death can be attributed to a person's social/environmental or economic status, while genetic heritage accounts for 30 percent, and care received accounts for the remaining 10 percent.

The second consideration is that new platforms are already disrupting value chains and creating new service models. An example of this is Inova Health hospital in Ashburn, Virginia. Inova Health offers instant doctor appointments conducted via Skype video chat. This service is being adopted by the "Fitbit" (or other activity/ health wearables) generation and is creating massive disruption in the marketplace


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## Adapting to change is not optional

So, what should traditional healthcare organizations do? Their success depends on enhancing their innovation agility. To adopt change faster, they need to implement and adapt to the necessary infrastructure management changes. Organizations' infrastructure approach must support easy aggregation of services, applications and data across traditional boundaries. The approach must ensure continuous availability of critical healthcare delivery data to those who need it. At the same time, health organizations must not compromise their approach to data protection.

Innovative, agile organizations are flexible enough to adopt new platforms and will therefore move ahead of their peers in the healthcare ecosystem. They will accelerate deployment of new clinical products and services. They will make better use of the clinical data they hold. And, they will directly counter or leverage the value proposition of digital health entrants, such as Google, Amazon and Apple.

This shift requires organizations to reconceptualize many current healthcare offerings into as-a-service or cloud solutions. Innovative service management techniques help to accelerate adoption of cloud-native technologies, such as artificial intelligence (AI) and the internet of things (IoT). New tools and faster processes enable healthcare organizations to innovate so they can keep up with patient expectations and enable better patient experiences and outcomes.

## Digital transformation by cloud

Cloud capabilities unlock data access from any system or device, anytime, anywhere. Yet, healthcare has been slow to follow the otherwise-ubiquitous adoption of the cloud.

The cloud can even make tackling important security issues less complex. For instance, working with a HIPAA-compliant cybersecure cloud vendor enables a deployment that supports secure data exchange with 24x7 availability and without data loss. While this can also be achieved using traditional methods, the cloud simplifies it.

Cloud vendors provide a rich, software-defined hosting fabric that streamlines tasks. One example of streamlining is automating workload deployment, which is auditable even before it is executed. Deployments are consistent. Updates to address vulnerabilities become easier. Innovative solutions can be made available faster.

Capabilities such as automated and audited deployments have remained elusive in healthcare. Elasticity for infrastructure investment is difficult to achieve. Access to essential data — when patients and clinicians require it — can become blocked.

Data access is constrained because it is locked into systems in different organizational silos. These systems have been built using traditional, on-premises, "hardwired" methods. Change management and integration are hard to achieve with a fragmented infrastructure and lack of governance.

Let us take prescription services as an example: A patient with diabetes may have forgotten to request an insulin prescription refill from the doctor. Now that patient needs urgent access to insulin, outside of normal doctors' hours. With siloed systems, the patient's only option may be to visit an emergency center.

That is an avoidable patient impact and cost to the healthcare system. A better alternative would be a system allowing patients to grant pharmacists one-time access to their medical records. Patients' control over their own records enables them to receive an emergency prescription. A "just-in-time" consent model improves the patient experience and reduces the complexity of service delivery.

**Cloud-enabled interoperability.** This kind of innovative consent model requires interoperability between software and services from different providers. It's easier to achieve that with a cloud-first technology strategy because the cloud's foundational building blocks provide "connective tissue" that enable providers to rapidly cross-connect services without new networks and additional investment.

The network is already shared. The rules for access are managed within the software. More resources can be elastically added and paid for on a pure utility consumption model. The right integration plan can help healthcare organizations place more focus on service capabilities. Security can be continuously reviewed and managed within the right software. New, innovative ways of solving problems can be developed.

As healthcare technology progresses, cloud platforms make it easier to leverage innovative solutions such as AI, machine learning (ML) and voice integration by lowering adoption thresholds, especially compared to on-premises asset acquisition and management and operational requirements.

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Let's consider traditional on-premises approaches. On-premises systems are protected by physical networks and air gaps. The complexity of firewall and network management can lead to many firewall rules being undocumented or poorly understood. They likely have been constructed from the layered requirements of many different solutions. Understanding the impact of change therefore takes longer than one would expect.

**Cloud-facilitated security and service deployment.** Cloud networking uses software-defined networking (SDN) technology, which differs from physically managed networks. For instance, in SDN, firewall capabilities are built into the network fabric. When security constraints are managed separately for each service — without an elaborate dependency tree — incremental change is easier. Security and service deployment can be more compartmentalized and componentized; they should be completely defined as software configurations. These configurations are readily updatable documents rather than device-specific procedures.

When compared to physical networking, with SDN and the cloud, the task of network security can be simplified. Secure data exchange therefore becomes easier to achieve, since compliance is less complicated to implement. This is a major reason why the cloud is crucial to enabling greater efficiencies and innovation. From a business perspective, the cloud makes it easy to have continuously upgraded capabilities and to ***pay for use rather than paying for infrastructure.***

## Innovating faster for better health outcomes

The ability to flexibly and securely exchange data is just the start of the healthcare digital transformation journey. Getting actionable insights from health records is much easier with advanced analytics capabilities in the cloud. Healthcare organizations can offer providers innovative solutions driven by new insights.

For example, DXC data scientists studied and compared hospital length-of-stays before and after knee and hip operations. They used an open, cloud-based analytics platform to detect patterns. The platform used ML technologies to find causality for variations. The results showed ethnicity or ethnic group as one of the common factors in patient hospital overstays, when compared to the ideal health pathway. This was called out because certain ethnic groups have a better family network and support system and are therefore less likely to overstay in the hospital.

This type of insight enables discharge teams to prepare before the patient even arrives. Without access to cloud-enabled applications, these insights — and therefore the actionable outcomes — would not be possible. Real-time information into care variations can open new possibilities for optimizing care and reducing costs.

Healthcare organizations can analyze more data, faster, by combining cloud platforms and digital transformation technologies. The larger and more accurate a clinical dataset, the more numerous, specific and valid the insights are likely to be. As we move closer to the age of true precision and personalized medicine, the cloud will become imperative. It will become the only way to process the vast amounts of data — genome, phenotype, etc. — at scale and at a reasonable cost.

Ultimately, these approaches start to bring healthcare providers together with life sciences and payer businesses. For example: Pharmaceutical companies make money selling their medications, but if patients aren't compliant, it is a cost without benefit to the payers and an additional burden for providers.

Payers increasingly want to shift to innovative payment models that reward pharmaceutical companies for outcomes. Pharmaceutical companies, in turn, argue that this model is only effective if patients take their medications in compliance with the suggested guidance.

The answer lies in digital capabilities such as IoT. If, for example, an asthma pump is also an IoT device, a message can be sent to an electronic health record system in the cloud each time the patient uses the inhaler. In this way, all stakeholders would be able to track patient compliance securely and determine outcomes with greater certainty.

## Digital uncertainty: What's preventing uptake?

With so much to gain from moving to a digital cloud environment, why have healthcare organizations been resistant to moving away from on-premises platforms? Security is the primary concern, both in terms of data security and data consent.

Security concerns are, however, based more on perception than reality. The fact is that large cloud platform providers invest heavily in both infrastructure and security. This investment dwarfs the level of infrastructure and security that a single healthcare organization could achieve.

Integrated, innovative healthcare cloud solutions make it possible to ensure that data is protected if deployed by teams experienced in secure healthcare cloud deployments. These solutions give confidence to both clinicians and patients that only those people who need to or should be able to access particular healthcare records are permitted to do so.

Consent is another often-raised area of concern. The U.S. government has recently tightened consent laws: Although consent is not needed for direct care — when a practitioner needs to access a patient's record to save their life — explicit consent is required whenever data is used for secondary purposes. That includes use for insurance or data analytics. The ability to establish patient consent and adhere to standards is the foundation for digital trust.

The inability to access talent is another barrier. Organizations struggle to attract the data scientists and engineers needed to develop cloud platforms. Healthcare organizations need to establish the right process for selecting the right partner. Resourcing from partners ensures that healthcare organizations' internal talent can concentrate on what they do best — treating patients and saving lives.

## A holistic approach: The future of healthcare in a digital world

Healthcare systems across the globe continue to struggle to contain costs and are under pressure to drive better outcomes. Their future will depend on shifting away from a sickness model and toward a wellness approach built on changing behaviors.

This will require healthcare organizations to move away from the traditional business-to-business model, where doctors interact with pharmaceutical companies and providers — a model that does not promote healthy behaviors because no one is paid to keep people well. Instead, the industry is being driven toward an innovative and agile business-to-consumer model. In this more progressive approach, providers and other stakeholders encourage the individual or patient to adopt healthier behaviors.

We're moving toward the concept of value-based care in all healthcare markets. The health and social ecosystem will start consuming healthcare from the same financial pot. It will become possible to implement transformational approaches for enabling and improving wellness, health and social services. Cloud and cloud-first strategies deliver this healthcare model better, faster and at a lower price.

## DXC can help healthcare providers and patients alike

DXC collaborates closely with leading cloud providers to offer the best cloud solutions. DXC Healthcare Cloud provides a secure cloud-hosting solution and cloud-native services to meet the needs of patients and healthcare providers around the world. This solution delivers data security and ensures regulatory compliance.

DXC Healthcare Cloud helps providers achieve integrated, cross-organizational care services, using a next-generation cloud infrastructure. It delivers the tools and processes to support regulatory requirements, while enabling secure and compliant cross-organizational data sharing.

The cloud makes it possible to transform the patient/consumer experience, empower caregivers and deliver important savings to providers and patients alike. DXC Healthcare Cloud offers a compliant, highly available infrastructure, and makes it easier to securely access patient data than ever before.

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