Innovate health business models with data in the cloud

How health executives can separate the buzz from the business
For years now, talk of the cloud has had healthcare abuzz. Separating the buzz from the business is the real challenge. Cloud-based computing has become a basic utility among some health organizations, but leaders and fast followers go a step further and leverage cloud to create innovative new revenue streams. It’s not enough to move your infrastructure to the cloud—it’s about having a data strategy that 1) leverages the cloud to deliver analytical products and insight to market faster and 2) enables seamless patient and healthcare workforce experiences.

The concept of data itself has also evolved. Data now exists in multi-structures, multi-speeds, and different locations, and understanding how to leverage data in a cloud-based paradigm is critical to success. But what does this all mean for health organizations, in practical terms?
How have healthcare leaders responded to the cloud?

First, cloud strategies will impact organizational performance profoundly—if you delay, your competition will outperform you. The Accenture Future Systems report confirms this view. As the largest survey of C-Suite executives on enterprise systems, the survey collected data on technology adoption, application of technologies at scale across organizational processes, organizational and cultural readiness to adopt and create symbiotic systems of technologies and multiple measures of financial and operational performance. As part of the study, we looked at the technology-related behaviors of Leaders and Laggards¹ with respect to 25 key technologies—including cloud technologies.

In the past betting on cloud service providers meant picking between public or private. That is no longer the case—lines are now blurred between public and private clouds, with many healthcare organizations finding themselves in hybrid environments. However, unlimited computing and storage capacity and innovation in the public cloud provide numerous data analytics tools with massive scale, speed and ultimately competitive advantage.

The Accenture Future Systems report indicates that while cloud adoption is high at first glance (88 percent of health industry leaders are leveraging cloud to develop new products and streams), enterprise use still lags.

Acceleration of time-to-value by leading healthcare payers and providers is a key feature of cloud adoption with respect to data.

¹Leaders achieved scores in the top 10 percent of our sample, based on a scoring model that measured technology adoption, the extent of this adoption across organizational processes, and organizational and cultural readiness for technology adoption. The Laggards made up the bottom 25 percent. https://www.accenture.com/us-en/insights/health/digital-health-future-systems-2020
Understand cloud-based health business models

Leading hospitals leverage data analytics in the cloud to enhance healthcare operations, clinical research, and care delivery. Health executives are also realizing that cloud allows them to understand, manage, and (based on permission) use enterprise and patient data in ways formerly constrained by the nature of data storage and computing environments. The cloud allows them to do so while still providing appropriate protection of privacy, security and consent. Here’s how:

Leaders invest in services and capabilities to leverage exponential data growth.

Implementation of artificial intelligence (AI) and other cognitive services will help to make sense of this sea of data. Current investments in machine learning (ML) innovation come mainly from leading cloud service providers, as computing and storage capacity limitations mean these technologies aren’t viable in our clients’ data centers.

- Missing out on cloud data means missing out on a full suite of AI tools that form the foundation for intelligent payer and provider capabilities, because investing in cloud technology provides automatic access to these tools.
- Over half of Platform-as-a-Service (PaaS) offerings (including AI/ML) are already cloud-only, and 75 percent of health CFO executives say they are actively pursuing new areas of business growth and value for the healthcare enterprise using technology solutions, most of which are in the cloud. The cloud enables healthcare executives to pursue and expand new revenue streams (through research-based data collaboration, data monetization and outcomes-based research), diversify beyond the core business, and advance healthcare research. Accenture’s Future Systems study shows that 97 percent of health industry Leaders (vs. 50 percent of Laggards) are heavily reinvesting in PaaS cloud-based capabilities. These solutions include AI/ML instruments that are cloud-only, or heavily influenced by leading public cloud vendors.

Leaders democratize the cloud for broad enterprise use.

In the past, data environments allowed for just one consumption pattern. Cloud provides non-data analyst users with the ability to pilot advanced analytics capabilities using pre-packaged analytics routines and models. Lower costs and transparent consumption paradigms will allow future users to self-provision cloud analytics and manipulate data according to their needs. Cognitive tools in the cloud are truly becoming democratized for broad enterprise use – beyond IT.

---

2Strategy enabler: the new Healthcare CFO
3Staff that do not specialize in or have data analytics as part of their job.
Leaders address cloud’s biggest challenges.
Healthcare leaders tell us the biggest challenges facing data science models for business intelligence and research are either latency of the data (takes time for the engineering team to feed-extract-engineer necessary features) or current IT infrastructure (never enough and always too expensive).

The public cloud’s fine-grained, “deny by default” standard greatly enhances security and, when consistently applied, minimizes the risk of inadvertent malicious access. A well-planned cloud hosting facility provides built-in, default security protocols that shield proprietary data and transactions from unauthorized access and distributed denial of service (DDoS) attacks, and provide regulatory security compliance. As with storage and computing capacity, cloud also provides flexible, scalable security levels.

Survey of Accenture Technology Services Leads, n=276, Internal Survey, January 2020

Healthcare leaders perspective on cloud

- **OVER 54%** of respondents said that cloud’s transformational benefits like speed, application agility, and security eclipse cost savings benefits.
- **54%** of healthcare executives (more than any other industry) said that moving to cloud was mostly about business agility.
- **81%** of respondents are pursuing hybrid or primarily public cloud strategies, while just 12 percent are focused on private cloud-only expansion.

---

4. The healthcare cloud security paradox
5. A distributed denial-of-service (DDoS) attack is a way of preventing a target server from performing its normal functions by means of flooding it with malicious Internet traffic (from compromised computers or servers) that overwhelms its processing capacity.
Public health data cloud benefits for providers, payers and patients

For healthcare providers, patient data collected from clinical trials can generate significant value, or even be appropriately monetized, using the public cloud. A combination of clinical (disease state, progression, previous treatment), financial, and genomic data could enable more proactive treatment precision and facilitate the clinical trial enrollment/matching process. Both providers and payers can anonymize and share deeper patient-level data to collaborate across a number of national and global institutions—consumer, insurance and finance industries are showing increasing interest in this data, for example. Many research data sets are already “in the cloud”, such as NIH Database of Genotypes and Phenotypes (dbGaP) or the Cancer Genome Atlas (TCGA), and we see this trend continuing.

In dealing with the social determinants of health (SDoH), care delivery organizations can use alternative data structures in the public cloud to create cohorts of patients, analyze potential social issues and find appropriate partners to provide social care solutions like meals and transport. For example, we often hear of healthcare executives embracing graph technology, a new generation of databases that yields insights most effectively and efficiently when implemented in the cloud. Using graph, new database containers can be created, and innovative data science and/or machine learning-based patterns can be applied.
Cloud use case based on Graph technology

Graph technology, applied to the cloud, could identify previously unknown relationships between patients, providers, claims and outcomes across the care delivery system to help optimize provider/system quality and effectiveness based on care protocols, and uncover fraud based on data patterns, for example.

This type of analysis would normally take organizations months or years of work by data analysts using traditional, non-cognitive technologies. Trying to use graph technology in house would mean procuring their own graph technology, their own user interface technology, their own embedding services—an expensive project over several months. The cloud provides analysts with immediate access to storage and computing capacity. They can ingest the data, use embedding technology, and generate insights that have business value in a couple of weeks.

Scalable, low cost, on-demand access to new tools and capabilities democratized to many types of end users based on need and skillset—these are the major combined benefits of effective cloud usage.

What is Graph Analytics?

When trying to analyze complex relationships between objects in a large pool of data, graph analytics is likely to be the most effective means of doing so. Healthcare data is much better represented in a graph than traditional rows and columns. It represents data the way humans think about the world and allows us to look at natural, although unknown, and sometimes unnatural relationships. Often, underlying relationships between seemingly far-flung data objects may not be obvious to the naked (even experienced) eye, and only emerge when queried using graph analytics algorithms. Graph analytics allow data points and relationships between data points to be depicted using graphs—known as nodes and links, or vertices and edges. Graph analytics allow complex relationships between data (as well as the extent and quality of those relationships) to be queried more easily, and results to be presented in an accessible, visual format.
Climb the business stairway to cloud

We’d recommend the following steps to place you firmly on the stairway to data in the cloud.

**Commit to a vision to become an AI-driven organization.**
Use the public cloud as your preferred platform for data analytics, sharing and collaboration. A key lesson from leading users of cloud technology is: be bold and go all in. The cloud unlocks all elements of the data science pyramid, from data to wisdom. Moving sooner also allows for earlier realization of benefits from analytics tools to drive capabilities such as machine learning, natural language processing and text processing which democratize access to analytics.

**Design a health cloud business case and strategy.**
Communicate to your leadership team that the future of operations, revenue generation, and better health outcomes lies in effective cloud-based data analytics. Reluctance to change sometimes holds organizations back internally from helping to unlock cloud’s benefits. Our experiences suggest an effective cloud strategy supports temporary co-existence with on-premises capabilities not yet ready to move to the cloud.

**Foster a data governance and agile cloud operating model.**
Piloting and effective ecosystem collaboration are primary drivers of soft business value. Experience shows that “data on premises” efforts fail due to poor governance. Cloud allows for digital decoupling—moving from monoliths to more agile technology structures where the inflexibility of legacy systems is left behind. Generating business value on the cloud forces data hygiene, and Leaders often leverage the opportunity to make data platforms more conducive to strategic success.

**Leverage the unique consumption and purchasing strategies of the public cloud.**
These include on-demand pricing (e.g. spot instances) and optimization techniques for computing and storage capacity (to drive optimal utilization), which do not exist in an on-premises environment but are critical components of effective cloud data strategy.

**Collaborate within your ecosystem.**
Work closely with partners inside and outside of industry to leverage combined datasets. Identify care gaps and the next best required action. Expose those analytic models in the form of open APIs that allow your ecosystem partners, such as self-insured employers that bear risk, to leverage them.
Cloud enables data science

Data and compute availability allow the unlocking of insights from information. Cloud makes it easy and cost efficient to build higher order of information management.

What health executives can do next

Committing to a strong cloud vision supported by a clear strategy and operating model will help healthcare organizations separate the buzz from the business. What that means is moving beyond incremental cost benefits; enabling rapid realization of new revenue streams; leveraging the unique consumption and purchasing strategies of the public cloud; delivering seamless patient and employee experiences. The evidence from the Accenture Future Systems report is clear—your competition will outperform you if you don’t adopt the behaviors of Leaders with respect to cloud technologies.
ABOUT THE ACCENTURE FUTURE SYSTEMS SURVEY
We surveyed C-level executives from 8,356 companies and organizations (half IT, half non-IT) from 20 industries and 20 countries, including respondents from 356 healthcare organizations across the US, UK and Australia. Our dataset captures key growth and revenue indicators over an eight-year time period. About 80% of the organizations included have $1 billion or more in annual revenues.

ABOUT THE ACCENTURE 2018 HEALTHCARE CIO CLOUD SECURITY SURVEY
Accenture commissioned a survey of 100 healthcare payer executives and 100 healthcare provider executives in the US to assess healthcare organizations’ cloud strategy, positioning, maturity, drivers and organizational readiness. The survey was conducted online by McGuire in May 2018 and has a confidence level of 95%.

ABOUT THE AUTHORS
Oleg Kucheryavenko, MD, MPH  
Senior Manager, NA Cloud & Innovation Lead, Health and Life Sciences – Technology Strategy & Advisory  
oleg.kucheryavenko@accenture.com

Oleg is a physician executive who helps design, develop and execute business-driven technology strategies and clinical transformation models to grow healthcare enterprises and improve the lives of populations with complex medical and social needs.

Matt Arellano  
Managing Director – Strategy & Consulting, Applied Intelligence  
matthew.a.arellano@accenture.com

Matt works with senior business and IT leaders helping to shape their data-enabled business strategies and how cloud can help accelerate organizational vision and outcomes.

David Wood  
Managing Director, Health Cloud Lead – Technology Growth & Strategy  
david.e.wood@accenture.com

David works with senior executives overseeing IT strategy, business innovation initiatives and large transformation programs.

ABOUT ACCENTURE INSIGHT DRIVEN HEALTH
Insight driven health is the foundation of more effective, efficient and affordable healthcare. That’s why the world’s leading healthcare providers and health plans choose Accenture for a wide range of insight driven health services that help them use knowledge in new ways—from the back office to the doctor’s office. Our committed professionals combine real-world experience, business and clinical insights and innovative technologies to deliver the power of insight driven health. For more information, visit: www.accenture.com/insightdrivenhealth.

ABOUT ACCENTURE
Accenture is a leading global professional services company, providing a broad range of services in strategy and consulting, interactive, technology and operations, with digital capabilities across all of these services. We combine unmatched experience and specialized capabilities across more than 40 industries — powered by the world’s largest network of Advanced Technology and Intelligent Operations centers. With 509,000 people serving clients in more than 120 countries, Accenture brings continuous innovation to help clients improve their performance and create lasting value across their enterprises. Visit us at www.accenture.com.