



The cloud imperative in life sciences

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The life sciences industry's primary goal is to ensure vital treatments are discovered, made available and used effectively to improve people's health outcomes, as efficiently as possible. Doing this involves an ecosystem with multiple organizations across geographies.

Thanks to New Science¹ – treatments that index high for scientific novelty, unmet need and technology convergence – this is happening with greater frequency to enable more precise, personalized treatments. However, this increased precision often means that the treatments are more complex and expensive to develop, and often reliant on a wide variety of data.

Siloed data and incompatible technologies cause delays and inefficiencies in bringing New Science to market. In order to speed the identification and development of these essential treatments and help manage the costs to do so, life sciences companies will need to find new ways to overcome these hurdles.

Moving to the cloud provides life sciences companies an opportunity to do so.

Accenture research indicates that New Science will represent **67%** of growth in the life sciences industry from 2021-26.¹ This is up **54%** from the previous forecasted period 2017-22.

¹ Accenture Research, August 2020

Why cloud? Why now?

The cloud is one of the most value-creating technologies of our time. It is the foundation for the digital transformation that is driving profound changes in how businesses operate, compete and create value for all their stakeholders.

In 2019, Accenture analyzed 8,300 organizations to understand the relationship between technology adoption and business growth. The research assigned a tech adoption score to each company and found that the top 10% of companies (tech adoption “leaders”) – those companies that were 2.5 times more likely to adopt new technologies – grew revenue at more than twice the rate of the bottom 25% (“laggards”).² The same holds true in life sciences. Companies who are leading in New Science are investing six to seven times more in digital, data and genomics than their peers to develop more precise treatments and interventions that improve patient outcomes.³

Almost overnight, the COVID-19 crisis widened this digital performance gap. Faced with the need to transform ways of working while accelerating therapies to market, life sciences companies are being challenged to drive

forward this kind of digital change during a crisis. A few leading life sciences companies had already started their digital transformations before the pandemic as there was an increased demand for cloud-enabled capabilities such as digital biology, digital clinical trials and data science. As the crisis has unfolded, these leaders have further increased these investments while those who have not now have a much bigger challenge to address.

For life sciences companies, the cloud’s virtue is not just about running a more streamlined business, lowering costs and computing on demand. It is about the ability to unlock data, collaborate better across the ecosystem, create more meaningful patient and healthcare provider engagement and transform their culture to embrace these new ways of working.

All of this helps life sciences companies deliver more effective treatments to patients across the world in a more economically viable way. These are the imperatives that the ongoing health, economic and societal crisis demands.

A new inflection point

The COVID-19 pandemic has created a new inflection point that has given all life sciences companies the opportunity to realize the impact a move to the cloud can have on their business. Three capabilities – insights, efficiency and speed – are fundamental to the clouds enabling role in delivering on the growth promise of New Science:

- **Insights:** The Global Alliance for Genomics and Health estimates that over 60 million patients will have their genome sequenced in a healthcare context by 2025.⁴ This represents a large technical challenge for healthcare systems, and a huge opportunity for research. Extracting insights from this data to make better decisions and more precise medicines is paramount.
- **Efficiency:** Patients face a global affordability crisis of more than \$300 billion⁵ which represents the gap between the estimated sales from new medicines and the money the market must spend on them. It just costs too much to identify and develop treatments – a cost which is passed on to consumers and health systems. Many people struggle to access or afford vital treatments.
- **Speed:** It takes an average of about ten years from discovery to delivery to bring a safe and effective treatment to patients. Yet, during the COVID-19 pandemic, that status quo has been challenged as the life sciences industry and governments come together to produce one or more viable vaccines in less than a year.

Accelerating digital transformation

Unmet needs and affordability are at the forefront of industry leaders' minds. But to realize those goals, digital transformation isn't just desirable, it's demanded. Four-to-five-year digital transformation schedules are now being reframed to deliver value much earlier—in as soon as 18 to 24 months.

Many life sciences companies have already selected their cloud partners and started their journey with private clouds or public cloud pilots. Today, a mix of private and public clouds is the predominant strategy for most life sciences companies.

However, only a few life sciences companies are taking a “cloud first” approach where the cloud is primary (80% in the cloud)⁶ and prioritized, extended beyond the IT organization and embraced by the whole organization.⁷ This could explain in part why two-thirds of life sciences companies said they haven't achieved the results expected of their cloud initiatives to date.⁸ (See Figure 1)

Just adopting cloud technology or moving parts of the business to the cloud does not ensure business value. It must be part of an overall digital strategy that values data and its essential role in discovering, developing and delivering New Science and enables new ways of collaborating and working.

The ever-increasing flow of venture investments in cloud reveals its growing importance in the industry. In 2019, life sciences and healthcare-focused cloud venture investments peaked at \$401 million, a 228% increase from the \$176 million invested in 2014.ⁱⁱ Much of this investment is in clinical trials, where more than one-third of the current venture investment is heldⁱⁱⁱ.

ⁱⁱ Accenture Research HC2020 Database, 2019

ⁱⁱⁱ Accenture Research and Informa Database

Figure 1. Extent to which life sciences respondents report they have fully achieved their expected cloud outcomes.

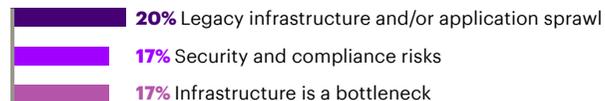


Source: Lost in the cloud? Navigating to maximum value, Accenture 2020

Obstacles in sight

There is, superficially, little incentive to transform your business model when it seems to work, and margins remain high. Despite forecasts of compressed future value⁹ and margin declines,¹⁰ life sciences companies have not been as motivated as other industries to prioritize moving to the cloud and may fear that the barrier is too high compared to the potential disruption to status quo.

Figure 2.
What are the greatest barriers to your organization achieving its expectations from cloud? (cited as top barrier by life sciences respondents)



Source: Lost in the cloud? Navigating to maximum value, Accenture 2020

Five obstacles to cloud adoption in life sciences:

- 01 Competition for talent with other industries**, particularly tech giants and start-ups, leaves the industry at a disadvantage to access the best human capital.
- 02 Margin decline** is so slow that it can be hard to see or be considered alarming, especially when profitability is still high compared to other industries.
- 03 Individual data silos, different systems and security concerns** across the value chain add complexity and risk to the move to cloud.
- 04 Disparate groups have the responsibility and funding for digital and cloud as well as ecosystem collaboration**, resulting in multiple stakeholders with different incentives, allotment of funding and ways of measuring success. For example, CIOs are pressed to find efficiencies and cost reductions in their budgets while other parts of the organization are increasing their IT investments in digital—this results in misalignment on how to allocate funds to capitalize on new digital investments.
- 05 Regulatory policies are slow and complex** whereas new IT methods that cloud enable are agile and faster. They require a different approach for regulatory approval, many of which are still in development. This disconnect can delay a company's investment and adoption of cloud and other modern technologies.

The next major business disruption will see those companies who overcame these obstacles with a mature cloud strategy able to respond in an agile, cost-effective fashion.

COVID-19's drive to the cloud

Recently, COVID-19 has revealed many of the fault lines of life sciences treatment development, data organization, security and more. At all stages of the value-chain, the development of treatments and the well-being of people have been deeply affected. In the first few months of the pandemic, 77% of patients had their clinical trials suspended or delayed.¹¹ In addition, 64% of Americans scheduled for a cancer screening test such as a mammogram, colonoscopy, skin check and PAP/HPV test during the COVID-19 pandemic, reported that it was delayed or cancelled.¹²

While the economic impact was felt across the industry, even more obvious was the fragility of the treatment development. Leaders that had not prioritized remote work, virtual clinical trials and digital education were forced to overcome cultural barriers and reprioritize their importance. The

interoperability required for a connected supply-chain was found to be incomplete. As the industry races to treat COVID-19 and find a vaccine, the entire life sciences ecosystem finds itself needing to reexamine its capabilities across the value chain.

Meanwhile, biotech companies that were born in the cloud (digital biotech natives) have accomplished milestones in a fraction of the time, and for a fraction of the cost. For example, during the early stages of COVID-19, Moderna progressed an asset from sequence to a phase one clinical trial in just 63 days.¹³ On May 12, Moderna received FDA Fast Track designation for its mRNA-1273 vaccine trials. By relying on a New Science platform (mRNA) and cloud, Moderna was able to reduce the amount of time it takes to get a vaccine into clinical trials,¹⁴ overcoming the common obstacles that many life sciences companies face.

Rising above

An intelligent cloud journey needs to balance speed and value. A rushed migration without clear strategy can end up costing the business more, leaving legacy applications racking up consumption—and costs—at an alarming rate. While there is no one-size-fits-all approach, each company should start with defining the value, mapping out the journey and determining how cloud will enable the overall business strategy and ambition. For life sciences companies, that means adopting and adhering to the following key strategies:



Embrace cloud as a CEO priority embedded among the business enablers in the growth strategy. The whole enterprise will need to be aligned, with detailed scenario planning to ensure the cloud delivers its intended ROI and a more resilient enterprise and culture. Migration to the cloud cannot be a purely IT-driven exercise. All aspects of the business need to be part of the solution and agree that cloud is a critical enabler to business initiatives that drive efficiency, innovation and growth.



Build cross-functional digital teams and partnerships to allow the cloud to serve as a catalyst for business reinvention using advanced digital technologies across the organization – integrating data to draw fresh insights on everything from discovering new treatments to providing the right support for the patients taking them.



Expand your company's innovative spirit to embrace digital and analytics as the core to developing and delivering these new treatments and supporting services. Cloud enables experimentation at speed, including testing new ways of working. It enables companies to spin up new environments instantly, try out several ideas at once and see what's working quickly and securely. It can also provide a way to open ways of working to greater diversity in thinking and culture.



Unify responsibility and success metrics so that all parties and functions with a vested interest in moving to the cloud are doing so in tandem – agreeing to what they want to achieve, how they will achieve it and how to measure success. One way of doing this is by creating a Cloud Center of Excellence (COE) – a small team of cross-functional experts to accelerate cloud adoption and the value realized from it. This brings central governance and direction to cloud architecture and design choices, helping manage the complexities of distributed and multi-cloud solutions and prevents the confusion that can ensue if each part of the business goes its own way.¹⁵



Invest in developing talent with digital skills such as improving organizations' technology quotient (TQ), going beyond building pockets of excellence, to implementing a strategy for achieving enterprise-wide transformation.¹⁶



Find ways to reshape the regulatory environment, including faster approval processes and policies around risk, security and data, for new IT methods that will enable the industry to speed tech-enabled treatments to market.

Reaching **new heights** and **outcomes**

To support the innovation and pace of New Science with the cloud, it is important that life sciences companies continue to prove that the science not only works in the lab but also prove its effectiveness in patients in the form of better health outcomes. This means they need a digital capability with speed and agility that can support accelerated cycles of new treatments and services. Moving to the cloud enables this to happen in multiple ways:

- 1 Free the data**
- 2 Unify the value chain**
- 3 Ignite growth**

1

Free the data: Agile data access yields greater efficiency, speed, security and patient outcomes.

The irony that effective medicine development and delivery should be patient-centric is not lost on an industry that does not have a comprehensive view of patient data. Managing and measuring patient outcomes and experiences is impossible without freeing patient data while securely accessing it across the company and partners. The cloud can enable end-to-end internal and external patient views and thereby reshape drug discovery, delivery and health management. This propagates advanced therapies and opens the opportunity for new health service models and reimbursement based on outcomes.

Cloud technology can shorten medicines' time-to-market, and life sciences companies' time-to-value. For example, advanced analytics are much more effective when leveraging the vast internal and external datasets becoming available in the cloud. The Internet of Things can provide close to real time data capture from devices linked to patients, lab and manufacturing equipment or medical devices to feed those cloud-based data sets. In fact, more sophisticated AI algorithms are simply unaffordable to companies not in the cloud, as the compute-power necessary for them to "learn" is unattainable in a traditional on-premises data center model.

Cloud at Work

We worked with a large life sciences company to create a COVID-19 home-care app that helps patients manage the illness from home, in partnership with their healthcare providers. Patients capture their own symptoms daily, and the data is stored in the cloud. With hospital systems overwhelmed by COVID-19 patients, the ability to monitor patients at home, and admit them to hospital only when necessary, is critical to managing scarce resources.

Making It Happen



A research lab environment where direct data capture from instruments streamed to a data lake and evaluated by artificial intelligence and machine learning algorithms inform the next best action.



A digitally enabled salesforce providing exactly the right information to HCPs at the right time based on real-world data collected from patient support apps and other patient services.



2

Unify the value chain: To make more effective decisions internally and create more outcome-based partnering externally.

High industry margins have often made internal company inefficiencies more tolerable. That is no longer true. Overcoming internal and external silos with improved structure, data flow and interoperability between players has huge potential to unlock critical insights that can speed the development of medicines. Unifying the value chain supports the evolution of culture, talent and work styles with better sharing and collaboration. This makes the whole organization more accessible, attractive and open, enabling everything from attracting top talent to advancing the discovery of New Science.

“Control tower” software connects cross-functional data sources in the cloud to enable rapid decisions and agile operations that could significantly benefit R&D, supply chain and manufacturing effectiveness and efficiency. Inter-company silos can also be broken down, to allow seamless data exchange throughout the life sciences value chain (e.g. CRO, CMO). Ecosystem partnerships and platform economies can aggregate data capture between partners and integrate with external applications.

Cloud at Work

Accenture’s collaboration with a global specialist kidney therapy group led to a breakthrough cloud-based therapy management system. Using a cloud platform, the system enabled streamlined project management and a market-prioritized MVP scenario that helped end users to improve their daily work. Cloud-based technology was leveraged to automate, capture and increase quality data entry and usage. Accenture created a foundation and enabled technology to future integrate different machine scenarios and provide a basis for data analytics and applied intelligence AI scenarios to improve machine development and treatment efficiency for better patient care.

Making It Happen



A data-driven control tower across the entire manufacturing footprint, with automated manufacturing and quality testing, and connectivity to a network of suppliers driving speed, accuracy and agility.



The transformation of the patient and HCP experience with devices capturing patient data in real time and sharing it among care providers, flagging any immediate concerns instantly.

3

Ignite Growth: Greater efficiency unlocks greater speed for innovation and faster revenue growth.

Faster innovation has always been a competitive differentiator for life sciences companies. For example, many cutting-edge therapies require genomic technology for diagnosis. The flexibility of cloud technology allows companies to scale computational resources to the volume of genomic data being analyzed.¹⁷ The cloud's pay-as-you-go system allows companies to hire computing and data storage capacity as needed, without the risk of wasted capacity.

The cloud's ability to facilitate the analysis of vast data sets, quicker decisions and scenario planning goes beyond discovery and development of science and into a need to respond to external threats. Securely partnering and taking on new opportunities in converging sectors will be critical as the industry grapples with cross-sector disruption and new entrants.

Cloud at Work

Takeda's Plasma-Derived Therapies Business Unit, which develops critical, life-saving and life-sustaining therapies for patients with rare and complex diseases, plans to increase its plasma collection and manufacturing capacity by at least 65% by 2024 to expand access to essential medicines and accelerating new treatments for patients.

Making It Happen



New areas like cell and gene therapy require a fundamental transformation of the core infrastructure (R&D, supply chain, commercial) that must be reoriented to support a highly specialized patient experience.



The view from above

Cloud isn't some future aspiration—it's an urgent mandate at the heart of the business. COVID-19 has created an unprecedented wake-up call and an opportunity to embrace the promise of cloud in life sciences.

It takes courage and investment to shape the near-term progress of cloud technology in life sciences. It's a big lift, but those companies that do will lead the New Science revolution with unparalleled resilience, agility, adaptability and scalability. They will empower their workforce, digitally transform their company and improve their ability to deliver better patient outcomes.

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Accenture’s Life Sciences group is committed to helping our clients make a meaningful impact on patients’ lives by combining new science with leading edge technology to revolutionize how medical treatments are discovered, developed and delivered to people around the world. We provide end-to-end business services as well as broad range of insight-driven services and solutions in strategy, consulting, digital/analytics, technology and operations in all strategic and functional areas—with a strong focus on R&D, Sales & Marketing, Patient Services and the Supply Chain.

We have decades of experiences working with the world’s most successful companies to innovate and improve their performance and across the entire Life Sciences value chain to better serve patients and stakeholders. Accenture’s Life Sciences group connects more than 15,000 skilled professionals in over 50 countries who are personally committed to helping our clients achieve their business objectives and deliver better health and economic outcomes.