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DAVID W. JOHNSON
Commentary

AI in Healthcare

A 3-Part Series

4sight Health
BUILD BETTER HEALTHCARE

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Part 1

The **AI infrastructure** advantage: Build it and consumers will come



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As a Peace Corps volunteer in Liberia, West Africa, I witnessed the transformative power of connecting isolated rain-forest villages to road networks. Suddenly, never-before-seen goods and services appeared. Villagers could travel for education, work and pleasure. A road's arrival was both exciting and disruptive. New opportunities emerged as old ways disappeared.

Based on its traditional structures, U.S. healthcare today resembles those remote, pre-road African villages. And an AI-powered digital road is barreling toward its legacy organizations, opening the way for self-actualizing intelligence platforms that will disrupt and transform their clinical and business operations.

To prepare, enlightened healthcare companies are building the digital infrastructure now to gain the connectivity needed for success in the industry's value-creating and consumer-centric future. They will increase their market presence and relevance. To understand how quickly digital technologies can drive this kind of transformation, let's play a hand at the sports betting table.

ALL BETS ONLINE

Healthcare has lagged other industries in technology adoption. Its highly regulated operations and convoluted pricing mechanisms stifle innovation, which explains the industry's excessive costs and poor outcomes and why service providers routinely disappoint their end-users (i.e., patients, customers, consumers).

An advantage (if you want to call it that) of being a technological laggard is that healthcare can learn from other industries how to jump the digital chasm. Insights can come from unexpected places, even those far removed from healthcare. An example is the rapid emergence and growth of the sports-betting industry.

FanDuel and DraftKings dominate this industry. As of January 2025, their combined market share was approaching 80%.[a] The two upstart companies have outcompeted more established gaming and media giants to become market leaders. Their success testifies to the importance of early investing in digital technologies.

THE RISE OF THE SPORTS-BETTING GIANTS

FanDuel and DraftKings emerged in 2009 and 2011, respectively, as New Jersey passed laws that challenged the legality of the Professional and Amateur Sports Protection Act (PASPA). Congress had passed PASPA in October 1992 to limit sports betting outside the state of Nevada. Hoping sports betting would become legal nationwide, both companies developed digital intelligence platforms to support daily fantasy sports leagues that circumnavigated PASPA's betting prohibitions.

Their approach paid off. In a surprising May 2018 ruling, the Supreme Court overturned PASPA and created a path for states to legalize sports betting. A race to monetize ensued. FanDuel and DraftKings were ready.

Their digital infrastructure mattered. By 2018, FanDuel and DraftKings already had customer databases, payment processing systems, analytics platforms and personalized apps. With this digital infrastructure in place, both companies launched New Jersey sports books and bookmaking operations within months.

Since 2018, 38 states and the District of Columbia have legalized sports betting. Now collectively valued at over $45 billion, FanDuel

a. Saba, J., "US sports-betting duo's growth wager is paying off," *Reuters*, Jan. 23, 2025.

and DraftKings launch expansive operations in new jurisdictions as they come to market. Meanwhile, big-name gaming and sports media companies, including MGM and ESPN, needed time to develop their digital infrastructure. They have never caught up.

HEALTHCARE'S DIGITAL INFRASTRUCTURE OPPORTUNITY

Unlike sports betting, the obstacles to engaging consumers in healthcare are institutional, not legal. That institutional resistance is crumbling. With CMS's push to achieve full health data interoperability this year, healthcare could see consumer-first business models emerge as expansively and dramatically as sports betting did after the Supreme Court's 2018 decision.

Who will become healthcare's pro-consumer market leaders? Which companies will marry data interoperability with AI-driven analytics to transform healthcare delivery? Here's the answer: companies that invest expansively in digital AI infrastructure.

In a column last year, I argued that health systems should embrace consumerism as a growth strategy.[b] Since then, AI-driven platforms like Anthropic's Claude and Open AI's ChatGPT have gone from grade-school to grad-school level capabilities. Even scarier for health systems, these intelligence platforms are getting smarter and becoming increasingly autonomous.

Here's the good news. The evolution of AI platforms makes it much easier for health systems to build digital infrastructure. These platforms now have an organic, almost biological character. They can orient their source code (unified data, algorithms, applications) to create a panoply of environmentally driven outputs.

In nature, genomes rewire DNA to give birds wings to fly. In data science, intelligent platforms create applications to optimize business operations. Only imagination limits their impact.

Enlightened healthcare companies are building the digital infrastructure now to gain the connectivity necessary for success in the industry's value-creating and consumer-centric future.

In healthcare, algorithms can deliver clarity to discharge planning, efficiency to claims adjudication, innovation to preventive care and sanity to clinical documentation. Indeed, there is an emerging singularity to platform intelligence that will negate the need for isolated point solutions.

In my earlier column, I profiled Baylor Scott & White's and AdventHealth's consumerism-first operating models. Their digital infrastructure investments have generated enormous returns. Collectively, the companies have added millions of new customers to their networks through custom-built, digital apps. As it happens, these two health systems are achieving what may be the highest profit margins among all nonprofit health systems, at 10.7% and 10.3%, respectively.[c]

Is that a coincidence? No, it's a growth strategy. Healthcare's future belongs to organizations that invest in AI infrastructure to reap the benefits of consumer-first business practices.

Are there any healthcare leaders who want to bet me and their organizations' futures that this prediction is wrong? ▮

b. Johnson, D.W., "Consumerism introduces itself to U.S. healthcare," *hfm*, February-March 2025.

c. Cass, A., "Baylor Scott & White Health posts 10.7% operating margin in H1," *Becker's Hospital Review*, Feb. 20, 2026; and Cass, A., "AdventHealth posts 10.3% operating margin in Q3," *Becker's Hospital Review*, Dec. 1, 2025.

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Part 2

The **biology of AI** and its role in the survival of healthcare



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There's no denying my title for this column is absurd. AI is bloodless. It has no flesh and bone. Beneath the "skin" of large language models, predictive algorithms and other AI manifestations are endless streams of numeric codes. Unlike biological creatures that are born, reproduce and die, AI produces outputs that are inert and can last forever. They have no biology, just computational origins.

And yet …

AI's evolutionary development mimics that found in nature. When genetic mutations emerge in species, most die, but some beneficial mutations take root. The most successful of these amplify throughout a species' total population over generations. In this way, natural selection differentiates superior traits through an evolutionary fitness test that enables existing species to develop new traits or become entirely new species.

With AI, computational models ingest gargantuan quantities of data to gain understanding, situational awareness and the power to act. As happens in nature, AI's evolution is self-sustaining, exogenous and incremental. Superior models differentiate themselves from less effective models by generating more accurate responses to queries. The outcomes that emerge from this form of human-machine collaboration are often novel and increasingly autonomous solutions.

Unlike natural evolution in species, which can take millennia to unfold, AI's evolution is happening with breathtaking speed.

WHERE BEINHOCKER MEETS DARWIN

In 2006, the economist Eric Beinhocker published the *Origin of Wealth*. The book's title references Charles Darwin's *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (known more simply as *On the Origin of Species*).

Published in 1859, Darwin's pathbreaking and controversial book introduced a new theory of evolution based on natural selection to explain why and how species adapt to their surroundings (i.e., the organisms best adapted to their environment stand the best chance of passing on their heritable traits to next generations). In the struggle for survival, species that cannot adapt go extinct. Darwin's theory is often characterized as "survival of the fittest." That phrasing ignores the way his theory also describes the roles collaboration and symbiosis play in the adaptation of species to new environments.

In much the same way Darwin challenged the scientific community of his time, Beinhocker challenges traditional neoclassical economists, by asserting that markets are complex adaptive systems (not equilibrium-seeking machines) that mirror biology in their function. Beinhocker draws on Darwin's theories to explain how marketplace mechanisms organically create wealth. This occurs in a three-stage evolutionary process.

1 **Differentiate:** Companies *differentiate* their offerings through innovative ideas, business models and/or technologies.

2 **Select:** Purchasers *select* preferred offerings through their individual buying decisions, thereby enabling the most successful offerings to demonstrate their *market fitness*.

3 **Amplify:** Successful offerings *amplify* into the marketplace through replication, enhancement and proactive scaling. Failed offerings disappear.

For Beinhocker, physical technologies (e.g., steam engines) and social technologies (e.g., laws, business models) co-evolve. Feedback loops within the ecosystem transmit information that enable individual actors to make better decisions and generate incremental value. More than money, knowledge and its applications are the true sources of wealth creation.

HOW BEINHOCKER'S THEORY APPLIES TO AI

Beinhocker's framework applied to AI demonstrates how AI is not simply a new technology, but the core engine of an economic transformation that is moving through its evolutionary development with remarkable speed.

Consider AI in relation to Beinhocker's three evolutionary stages.

1 **Differentiate:** AI can rapidly propose thousands of new *designs* — from new drug molecules to targeted gene therapies to personalized fitness regimens — far faster than human trial-and-error mechanics.

2 **Select:** Machine-learning models act as digital *fitness functions*, simulating millions of scenarios to predict which designs will succeed before they are ever built in the physical world.

3 **Amplify:** Once successful designs emerge, AI-enabled tools support their development, replication and improvement on a global scale with near-instantaneous digital feedback loops that inform personal preferences and local-market demand characteristics.

HOW AI'S DATANOMES MIMIC EVOLUTION'S GENOMES

Darwin discovered and explained the mechanics of an organic natural-selection process that gave birds wings, humans opposable thumbs and dolphins fins. However, it wasn't until the 1950s with the discovery of DNA's three-dimensional double-helix structure that scientists began to understand biology's building blocks at a molecular level.

As with DNA and RNA in natural biology, there is an equivalent organic organization to AI. AI's building blocks consist of a three-layer *stack*, as shown in the exhibit below. An *intelligence platform* ingests gargantuan amounts of unified data (the *infrastructure*) to generate insights that support end-user *applications*. Like DNA and RNA in nature, it is possible to apply this stack to respond to almost any environmentally driven signal demanding change.

Think of this stack as the genome (or *datanome*) of an increasingly autonomous healthcare ecosystem. It encrypts what a health system knows, can see and can do. Like genes, AI models and applications express suggestions for potential actions. They switch on, adapt and specialize in response to clinical and operational context.

The datanome stack

This "stack" (i.e., AI's building blocks) can be likened to a genome for an increasingly autonomous healthcare ecosystem.



Source: 4sight Health, 2025

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At this moment of profound AI-driven transformation, the existential question for healthcare incumbents is whether they can adapt their operations quickly enough to accommodate AI's emergent impact.

Over time, the system learns the way living systems learn: through iterative differentiation, selection and amplification.

Mining datanomes with AI can optimize almost any clinical, operational or administrative business function. Only imagination limits AI's reach. In healthcare, for instance, algorithms can bring clarity to discharge planning, efficiency to claims adjudication, innovation to preventive care and sanity to clinical documentation and improvement. In this way, datanome solutions have a singularity that encompasses the universe of all existing point solutions.

THE PERMANENCE OF ACQUIRED KNOWLEDGE WITHIN THE DATANOME

One final point on the datanome. Within evolutionary circles, there is a vigorous debate whether one generation can pass encoded knowledge to the next generation. A parent's ability to play the saxophone doesn't pass automatically to their child; yet every monarch butterfly has knowledge of migration patterns at birth.

Within the datanome, however, there is no debate. AI is endogenous. Any knowledge acquired by AI models becomes permanently encoded within its algorithms and cloned into its agents. Mechanically, that's how AI's pattern recognition and decision-making capabilities advance.

While the datanome's operations can seem alien to human understanding, they cannot be ignored. The machines don't wait for human intervention. They learn and develop solutions on their own with remarkable speed. This is why AI's machine-driven evolution occurs immeasurably faster than biological evolution.

SURVIVAL OF THE MOST ADAPTABLE

Abhinav Shashank, the CEO of the data analytics company Innovaccer, recently explored these and other ideas with my assistance in a manifesto titled *Autonomous Healthcare*.[a] Shashank describes a moment when, while touring a health system's operations center a dozen years ago, he realized that healthcare's data infrastructure lacked intelligence and the ability to act:

> I had seen this pattern before in other industries. Data preparation is the cost of entry. Intelligence, however, only emerges when systems are designed to act on that data, to complete work, reduce human effort, and learn from outcomes over time. Healthcare had invested heavily in the first step, but it had barely begun the second.

AI's version of DNA reconfiguration moves from *data* to *model* to *action* (DMA), which represents the underlying organic process that moves existing manual functions toward increasingly autonomous solutions. As Shashank asserts, healthcare lags other industries in its ability to translate data into actionable solutions efficiently and cost-effectively. Its DMA is under-developed.

Dinosaurs roamed the earth for approximately 150 million years until a meteor struck just offshore of Mexico's Yucatan peninsula 66 million years ago. The meteor's impact led to significant climate change. The dinosaurs largely became extinct, but there now is a consensus among paleontologists that today's birds are the descendants of the group of meat-eating dinosaurs called theropods, the smallest of which were able to adapt to the changed environment.

An AI "meteor" is now striking human society. At this moment of profound AI-driven transformation, the existential question for healthcare incumbents is whether they can adapt their operations quickly enough to accommodate AI's emergent impact. A coherent strategic response requires investing in AI infrastructure today to prepare for the new operating paradigms that will soon govern industry operations.

In 1963, Leon C. Megginson, a professor of management and marketing at Louisiana State University, extrapolated on Darwin's theory as it relates to business management with the following observation: "It is not the most intellectual of the species that survives; not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself."

Megginson draws a direct link between Darwin's theory of biological evolution and a management theory explaining the evolution of human ideas. Beinhocker subsequently linked Darwin's theory to marketplace behaviors, successes and failures. Collectively, these works have created an incisive framework for understanding how AI is rewiring human behaviors, business operations and healthcare itself. Dig in. Ignoring AI's evolutionary impact is a path to organizational decline and extinction. ▮

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a. Shashank, A., and Johnson, D., *Autonomous Healthcare: A Manifesto for the System Healthcare Was Always Meant to Be*, Innovaccer, December 2025.

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Part 3

How **synthetic scaling** can help healthcare nonprofits achieve national scale



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Two massive segments of the healthcare ecosystem operations — nonprofit health systems and nonprofit health insurance companies — have struggled to achieve operations at the national level.

These organizations consistently find it difficult and time-consuming to merge, and as a consequence, neither has achieved national scale. This situation compromises nonprofits' capacity to generate operating economies and create value for their customers.

The strongest healthcare nonprofits dominate regional markets but have difficulty extending their geographic footprints. Meanwhile, national for-profit companies consolidate easily and have dominant market positions within industry verticals, including commercial insurance, pharmacies, life sciences, drug wholesaling, device manufacturing and niche providers.

The rise of AI and aligned platforms offers nonprofit organizations a novel solution for achieving national scale and operating economies. *Synthetic* consolidation, where independent organizations use the same underlying intelligence platform, creates a path for nonprofit providers and payers to align their operations without the burden of formally merging.

THE AGONY OF NONPROFIT MERGERS

Several factors complicate formal mergers between nonprofit organizations. Most notably, the parties cannot negotiate on purchase price and organizational control the way for-profit companies do. Being unable to exchange stock and cash proceeds, nonprofits negotiate over issues such as organizational name, board seats, leadership positions and corporate-headquarter locations.

Organizational pride and bruised egos often thwart logical combinations. And when mergers occur, they often incorporate sub-optimal transaction components, including dual headquarters, bartered leadership formulations and large capital commitments, limiting the consolidated organization's operational efficiency and strategic flexibility.

Given the public character of nonprofit assets, state attorneys general have a disproportionate voice in determining the terms of negotiated arrangements, particularly those that cross state lines. Moreover, external transaction scrutiny has increased in the face of extensive empirical evidence indicating that nonprofit mergers increase costs and reduce access.

Nonetheless, nonprofits can achieve scale without the pain, suffering and unrealized synergies that accompany formal mergers through a *synthetic alliance*. Look skyward to find inspiration.

THE PLATFORMING MAGIC OF SYNTHETIC CONSOLIDATIONS

I have flown almost 6 million lifetime miles on American Airlines (AA). While not proud of this accomplishment, I have earned permanent elite status not only on AA but also on all its partner airlines within Oneworld, an

international alliance of 16 airlines. Elite status carries significant perks, including upgrades, early boarding and priority rebooking.

As a collective enterprise, Oneworld boasts that it serves "more than 900 destinations in 170 territories with hundreds of airport lounges." I can literally travel with elite status to almost any part of the globe within network. How great is that?

Within the broader marketplace, each airline retains its unique branding, organizational identity, service characteristics and competitive positioning. Below the surface, they're sharing data that enhances route design, ticket pricing, loyalty programs, aligned services (e.g., hotels, rental cars) and customer experience. This platform is seamless to consumers while improving their travel experiences.

There's no reason nonprofit healthcare organizations cannot emulate Oneworld's consolidation model with unified data sharing to achieve operating economies on a national scale and deliver superior customer experience. The potential for the application of such a model in healthcare is exemplified by an approach used by Mayo Clinic.

HOW SYNTHETIC SCALING CAN WORK IN HEALTHCARE

As an example of synthetic scaling, Mayo's platform is at the forefront of global movement toward AI-powered intelligence platforms that orchestrate personalized care delivery, empower pathbreaking medical research and reimagine health education/training programs.

Launched in 2019, Mayo's platform, now operating in nine countries with institutional partners, is a digital health ecosystem designed to accelerate the development, validation and deployment of AI and other data-driven healthcare solutions.

The platform magnifies its reach by providing a secure environment where healthcare providers, technology companies and others can collaborate using high-quality clinical data. The platform's focus is to accelerate medical discovery and their application broadly.

Although still young, the platform has lready realized tangible clinical advances, including:

- Identifying hidden signs of heart failure
- Diagnosing pancreatic cancer 438 days earlier than traditional manual reviews
- Predicting the likelihood of strokes more accurately
- Enhancing the diagnostic power of colorectal screenings

Mayo's platform is not specific to any one electronic health record. It ingests and harmonizes data from multiple sources, including Epic, Oracle Health, Meditech, imaging and laboratory systems, pathology, genomics and wearable devices, using industry standards. This vendor-neutral architecture allows organizations with different technology environments to participate without replacing their existing clinical systems.

MAYO'S DIGITAL APPROACH TO GLOBAL HEALTHCARE

Accelerating medical discovery requires a massive, unified data layer. Consequently, the most valuable asset of Mayo's platform is its secure, governed repository of de-identified, multimodal clinical data. It contains 54 million patient records and 36 petabytes of health data. Mayo's vision is to make personalized, predictive and innovative care more accessible globally through technology and partnerships.

The race to achieve scale is on and the ground underneath all payer and provider organizations is shifting quickly.

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This is a golden opportunity for nonprofit payers and providers that lack scale to break free from the legal, political and cultural impediments that have stifled their ability to grow, develop and thrive.

Rather than simply storing data, Mayo's platform provides sophisticated tools for:

- Identifying cohorts
- Normalizing data
- Developing AI models
- Validating clinical models
- Monitoring real-world performance

Developers can train algorithms using diverse patient populations, evaluate them for bias and clinical effectiveness and generate evidence required for regulatory approval and clinical adoption.

A distinguishing feature of Mayo's platform is its emphasis on *clinical validation*. Many AI models demonstrate excellent performance in laboratory settings but fail when deployed across different hospitals or patient populations. Mayo's platform overcomes this challenge by testing models across multiple institutions before introducing them into routine clinical practice. This process improves confidence that algorithms are safe, accurate and generalizable.

Mayo's platform also serves as an innovation ecosystem that connects healthcare providers, AI startups, pharmaceutical companies, medical device manufacturers and academic researchers. The platform enables innovators to gain access to Mayo Clinic's clinical expertise, secure computing infrastructure and real-world validation capabilities. Mayo's goal with these initiatives is to move promising technologies from concept to bedside faster and more cost-effectively.

Wow! This is today. Imagine tomorrow.

THE PROMISE AND PERIL OF SYNTHETIC CONSOLIDATION

As with airline companies, healthcare providers and payers can consolidate synthetically at the platform level to achieve scale, improve operational efficiency and better serve their customers. Failure to do so will compromise their market relevance.

Two unknowns will determine this dynamic:

- How many of these federated platforms will emerge? (My guess is 10 to 15.)
- Which organizations will spearhead their creation?

This is a golden opportunity for nonprofit payers and providers that lack scale to break free from the legal, political and cultural impediments that have stifled their ability to grow, develop and thrive. While these types of platforms focus on clinical advances, emerging intelligence platforms will also bring coherence and efficiencies to administrative and operational functions. Arguably, this is already occurring within novel provider organizations, including Longitude Health, Risant Health and the Mindshare Institute.

Of course, synthetic consolidation through intelligent digital platforms is available to for-profit as well as nonprofit organizations. The race to achieve scale is on and the ground underneath all payer and provider organizations is shifting quickly. Successful organizations will be differentiated from also-rans by their readiness to embrace these opportunities now.

Don't be left at the starting gate. ▮

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DAVID W. JOHNSON
Commentary

David W. Johnson is the CEO of 4sight Health, an advisory company working at the intersection of healthcare strategy, economics, innovation. Johnson is a healthcare thought leader, keynote speaker, and strategic advisor to organizations busting the status-quo to reform our healthcare system. He is the author of Market vs. Medicine: America's Epic Fight for Better, Affordable Healthcare, and his second book, The Customer Revolution in Healthcare: Delivering Kinder, Smarter, Affordable Care for All (McGraw-Hill 2019). As a speaker, Dave plays the role of rebel, challenger, industry historian, investor and company evaluator to push audiences forward. (Watch bio video.) Johnson applies his 25+ years of investment banking in healthcare to identify ways the healthcare industry must change to deliver better care. He received a Masters in Public Policy from Harvard Kennedy School, an English degree from Colgate University, and served in the African Peace Corp service. Join over 10k+ healthcare executives who read our weekly insights and commentary on www.4sighthealth.com.